NASA/TM-2011-216142



SPACE SHUTTLE MISSIONS SUMMARY

Robert D. Legler Floyd V. Bennett

Mission Operations Johnson Space Center



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MOD EMBLEM



MOD EMBLEM DESCRIPTION

This emblem was developed during the Apollo program for the mission control team [JSC Mission Operations Directorate, MOD] to recognize their unique contribution to manned space flight since the Mercury program.

The sigma (Σ) represents the total mission team, including flight controllers, instructors, flight design and production specialists, and facility development and support teams including all engineering, scientific, operations disciplines, and supporting tasks.

The Shuttle launch represents the dynamic elements of space, the initial escape from our environment, and the thrust to explore the universe. The four stars on the Shuttle's plume represent the basic principles of the Mission Operations team: discipline, morale, toughness, and competence. Their place along the Shuttle's plume reminds us that they are the foundation upon which each mission is flown. Today's core principles include confidence, responsibility, teamwork, and vigilance. Each of these words comes into the vocabulary of Mission Operations personnel at critical points in their development. These words can never be forgotten if we are to succeed in the future.

The orbiting International Space Station symbolizes a permanent human presence in space, conducting research and developing materials leading to the commercial utilization of the space environment.

The Earth is our home and will forever be serviced by both manned and unmanned spacecrafts in order to improve our quality of life. A single star is positioned over Houston, the home of U.S. human spaceflight operations.

The comet represents those individuals who have given their lives for space exploration. The seventeen stars represent our fallen astronauts, to whom in part we dedicate our commitment to excellence. These symbols serve as a reminder of the risks inherent to space flight and recognize that we of Mission Operations provide the margin that makes the risk acceptable.

The Mercury, Gemini, Apollo, Skylab, and Apollo-Soyuz Test are represented on the bottom border. At the top of the emblem, the Moon and Mars represent our future, signifying our intent to lead the way.

The wording "RES GESTA PER EXCELLENTIAM" - "Achieve through Excellence" - is the standard for our work. It represents an individual's commitment to a belief, to craftsmanship, and to perseverance, qualities required to continue the peaceful development of space and the quest for the stars.

The original emblem was designed (at the request of White Flight, Gene Kranz) by Robert T. McCall in April 1973 and bears the inscription "For the Personnel of Mission Control with Great Respect and Admiration. Robert T. McCall." Mr. McCall died at age 90, May 5, 2010. In 1983, the original emblem was updated to support the Space Shuttle program. In 2004, with the artistic help of graphic designer Mike Okuda and participation of the Mission Operations team, the emblem was updated to recognize the achievements and contributions of the team supporting the International Space Station program as well as those that contributed to the success of the earlier Skylab and Apollo-Soyuz Test Project missions.

ABSTRACT

This document was originally produced as an informal Mission Operations book and has been updated since Space Shuttle Flight STS-1 and throughout the program. This version is a formally released NASA document. It is a handy reference guide for flight data for all Space Shuttle missions. "As-flown" data is provided as compiled from many flight support sources for ascent, on-orbit events, and descent mission phases. In addition, the specific shuttle vehicle configuration, payload, flight crew, and flight directors are

identified for each flight. In the development of this book, the data for the early flights are contained on a single page per flight. For later flights, more pages per flight have been added, primarily for growth in mission complexity as noted in the "Mission Highlights" data column. This particularly applies to missions involved in the assembly of the International Space Station. Pertinent photos for each mission are also included on each mission summary page.

FOREWORD



ABOVE: S81-30498 --- After six years of silence, the thunder of U.S. manned spaceflight is heard again, as the successful launch of the first Space Shuttle reusable vehicle, Columbia, ushers in a new concept in utilization of space - April 12,1981.

RIGHT: Thirty years later on STS-135, the Atlantis vehicle executes the final Space Shuttle landing on July 21, 2011 at KSC. With the closure of the Space Shuttle Program, the thunder of U.S. manned spaceflight is not expected to be heard again for another several years.

THE REUSABLE SPACE SHUTTLE

The Space Shuttle Vehicle (SSV) was the world's first reusable Spacecraft. It consisted of a reusable Orbiter Vehicle with three Space Shuttle Main Engines (SSMEs), two Solid Rocket Boosters (SRBs), and an expendable External Tank (ET). The Space Shuttle System consisted of the SSV elements, Shuttle Carrier aircraft, payload accommodations, and ground support systems. The SSV was designed to perform a variety of missions to low Earth orbit with heavy payload lift capability.

SSV missions included: Manned payload bay laboratory science, deployment and servicing of payloads, and special support to space activities such as sortie missions (rescue, repair, maintenance

servicing, assembly, and docking), and International Space Station (ISS) assembly, manning, and support including robotic and manned extra vehicular activities.

The SSV was flown for 30 years from 1981 to 2011. Brief mission summaries for each of these missions are provided in this document. The document contains "as flown" mission data and pertinent photographs for each flight. It was originally published as an informal document and routinely updated throughout the Shuttle era.



FOREWORD (Continued...)

----- SPACE SHUTTLE THOUGHTS------

The Space Shuttle--1981 to 2011

The Space Transportation System-STS-has had a spectacular career spanning three decades of intense and productive activities in space. The Shuttle was conceived as a reusable launch system to grossly reduce the cost of transporting humans and satellites into low earth orbit and to service the entire spectrum of government and commercial space operations requirements. To accomplish this challenging task required the development of a series of new technologies in rocket engines, space systems, unique materials, highly advanced manufacturing techniques, autonomous control concepts and never before attempted flight operations maneuvers. The fact that these devices were conceived and developed and in almost all cases could be reused is a testimony to the marvelous capability of the US and allied aerospace community.

Equally significant was the ability of the government industry team to bring about

the successful development of this phenomenal machine under the stringent and ever changing and fickle government budgetary process. The management team was required to continuously adjust the expenditure of funds because of both postponement and reductions in national budget that resulted in a delay in manufacturing facilities, extended testing periods and technology development which presented extraordinary circumstances regarding the ability to arrive at the first flight of the Shuttle. And although the first and subsequent STS flights were delayed by several years, the cost to build the transportation system was reasonably close to the original cost estimates. Indeed, if the effects of inflation are included, the overall cost of the program was probably within the costs estimates made almost ten years previously.

There were two devastating fatal accidents during the course of the STS time period. It should be noted that both of these accidents took place because of mismanagement. The accidents literally destroyed the user confidence in the STS and resulted in the eventual termination of the Shuttle. The Space Shuttle without these two unnecessary failures is an extremely safe space faring vehicle and it will be a long time in the future before a reusable rocket caring humans will match this accomplishment.

An overall assessment of the STS must say that history will show the accomplishments were spectacular.

Christopher C. Kraft, Jr. First Flight Director



I look at the three decades of Space Shuttle flights with a great deal of pride. John Young and I had the privilege of flying Columbia on the initial orbital test flight. While the Shuttle didn't live up to some of the preflight hype regarding flight rate and cost, it still is the most fantastic spaceship ever built and likely will be for the foreseeable future. Yes, we had two terrible tragedies, but spaceflight is not without risk now and for the foreseeable future.

The Shuttle has accomplished many wondrous feats in its 30 years of flight. In the beginning it flew very important DOD missions that I believe played a major role in the winning of the Cold War. The payloads it has taken to orbit have revolutionized knowledge of our solar system and the universe. The Shuttle Program made possible the construction of the unbelievably complex International Space Station.



All in all, everyone associated with the Shuttle should be proud of what the program accomplished. It will be a very long time before we see a spaceship with anywhere near the Shuttle's capability.

Bob (Crip) Crippen PLT STS-1, and CDR STS-7, STS-41C & STS-41g KSC Center Director 1992 - 1995

Continued...

FOREWORD (Continued...)

----- SPACE SHUTTLE THOUGHTS------

National Space Transportation System (Space Shuttle)

Developed primarily in the 1970's, the National Space Transportation System (Space Shuttle) was, and remains to this day, the most innovative and capable human rated space launch system created by man.

As much as Apollo, the Space Shuttle established the United States as the human space flight technology leader of the world, made human access to low-Earth orbit (LEO) relatively routine, and raised the expectations of the global population in regards to the value of space to mankind. It has enabled us to learn to live and work in space to create value on Earth.

The Shuttle designers both advanced the state of technology by levying seemingly unachievable technical challenges, such as the incredibly high power density Space Shuttle Main Engine (SSME), complex redundant data processing, and reusable thermal

protection systems, as well as utilizing available technology like aluminum structure and hydraulic flight control and thrust vector control systems.



The Shuttle designers both advanced the state of technology by levying seemingly unachievable technical challenges, such as the incredibly high power density Space Shuttle Main Engine (SSME), complex redundant data processing, and reusable thermal protection systems, as well as utilizing available technology like aluminum structure and hydraulic flight control and thrust vector control systems.

By advancing the state of the art in mission planning and execution, the Shuttle team took maximum advantage of the extensive capabilities available from both man and machine and the synergistic interplay between them. The results in mission accomplishments are undeniable and have forever transformed our understanding of the world in which we live.

Brewster H. Shaw, Jr. PLT STS-9 and CDR STS-61B & STS- 28 Space Shuttle Program Mgr 1993 -1995 VP & GM Space Exploration Boeing Houston

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ACRONYM LIST

		MPS	MAIN PROPULSION SYSTEM
AIM PT		MRN	MORON
AL	ASCENDING LEFT	M/S MTR	MISSION SPECIALIST MOTOR
AOA AR	ABORT ONCE AROUND ASCENDING RIGHT	N	NOTOR
ASC	ASCENT	NEG RET	NEGATIVE RETURN
ASC/ENT	ASCENT	NLGTD	NOSE LANDING GEAR TOUCHDOWN
AVE BRK DECEL	AVERAGE BRAKE DECELERATION	NEOTD	
AVE DINK DEGEL	AVERAGE BRAKE DECELERATION	01, 02, 03	ORBIT 1, 2, OR 3 FLIGHT DIRECTOR SHIFTS
		OFT	OFFICIAL FLIGHT DESIGNATOR
BEN	BEN GUERIRBRK INIT BRAKE INITIATION VELOCITY IN KGS	OI	OPERATIONAL INCREMENT
BR/UP	BREAK UP ALTITUDE OF ET	OMS	ORBITAL MANEUVERING SYSTEM
	IN THOUSANDS OF FEET	OPF ORB DIR	ORBITER PROCESSING FACILITY ORBIT DIRECTION
BYD	BANJUL	OKD DIK	ORDIT DIRECTION
		Р	SEQUENTIAL NUMBER OF PERSON FLOWN ON SS
CI	CLOSEIN	PAO	PUBLIC AFFAIRS OFFICE
CTOB	CREW TIME ON BACK	PERF	PERFORMANCE
		PERF MARGINS	PERFORMANCE MARGINS
DENS ALT	DENSITY ALTITUDE	P/L	PAYLOAD
DL	DESCENDING LEFT	PLNG PLS	PLANNING SHIFT PLANNED LANDING SITE
DOLILU DR	DAY OF LAUNCH I-LOAD UPDATE DESCENDING RIGHT	PLS P/S	PAYLOAD SPECIALIST
DR		PTA	PRESS TO ABORT ONCE AROUND
EDW	EDWARDS AFB	PTM	PRESS TO MECO
EMU	ENVIRONMENTAL MOBILITY UNIT		
ET	EXTERNAL TANK	R	SS ROOKIE NUMBER
EVA	EXTRA VEHICULAR ACTIVITY	RECON	RECONSTRUCTED
		RMS	REMOTE MANIPULATOR SYSTEM
F	SS FEMALE NUMBER	RPT RSRM	RUPTURE OF ET IN THOUSANDS OF FEET REDESIGNED SOLID ROCKET MOTOR
FD	FLIGHT DIRECTOR	RTLS	RETURN TO LAUNCH SITE
FDRD	FLIGHT DEFINITION & REQUIREMENTS DOCUMENT	ITTEO	
FPR	FLIGHT PLANNING RESERVE	SEQ	SEQUENTIAL
FRD	FLIGHT REQUIREMENTS DOCUMENT	SLS	SECONDARY LANDING SITE
CUTIO		SODB	SHUTTLE OPERATIONAL DATA BOOK
GMTLO	GREENWICH MEAN TIME OF LIFTOFF	SS SSME	SPACE SHUTTLE OR SUN SHIELD SPACE SHUTTLE MAIN ENGINE
HA/HP	APOGEE AND PERIGEE IN NAUTICAL MILES	S/T	SHUTTLE TOTAL FLIGHT TIME
HDOT	TOUCHDOWN ALTITUDE RATE	5/1	SHOTTLE TOTALTEIGHT HIME
TIDOT		TAL	TRANSOCEANIC ABORT LANDING
KEAS	KNOTS EQUIVALENT AIRSPEED	TD NORM 195	NORMALIZED TOUCHDOWN RANGE AT 195 KEAS
KGS	KNOTS GROUND SPEED	TDDP	TRAJECTORY DESIGN DATA PACKAGE
KSC W/D	KSC WORKDAY	TDEL	DIFFERENCE IN REFERENCE TIME
		ТК	FOR SSME THROTTLE ADJUSTMENT TANK
LD/O1	LEAD/ORBIT 1 SHIFT	T/V	TUMBLE VALVE
LDA	LAUNCH DANGER AREA	17 V	
		V	SS VETERAN NUMBER
M	SS MALE NUMBER	VAB	VEHICLE ASSEMBLY BUILDING
M 3 EOM	MACH 3 END OF MISSION	VEL	VELOCITY
MECO MET	MAIN ENGINE CUT OFF MISSION ELAPSED TIME	VI	INERTIAL VELOCITY
MLGTD	MISSION ELAPSED TIME MAIN LANDING GEAR TOUCHDOWN	W/D	WORKDAY
MLGTD	MAIN LANDING GLAR TOUCHDOWN MOBILE LAUNCH PLATFORM	WX	WEATHER
MMT	MISSION MANAGEMENT TEAM	**/\	WEATHEN
MMU	MANNED MANEUVERING UNIT/	X CG	X CENTER OF GRAVITY
MOD	MISSION OPERATIONS DIRECTOR	XRANGE	CROSSRANGE
	MISSION OPERATIONS DIRECTORATE	774	
		ZZA	ZARAGOZA (TAL SITE)
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CONVERSION FROM INFORMAL DOCUMENT

Robert D. "Bob" Legler/DA8/USA was the originator of this book as an informal Mission Operations Document to provide a "handy reference guide" for "as flown" mission data, often used by JSC Flight Controllers and Mission Planners.

Mr. Legler authored the informal book from flight STS-1 through flight STS-115. After Legler's death in 2007, Floyd V. Bennett/ DA8/USA/GHG took over the authorship for STS-116 and all missions to follow. In addition, a "Brief Mission Summary" statement for all ISS assembly missions and pertinent mission related photos to each summary file were incorporated.

This formal NASA document is a conversion of the informal version to provide an official historical record of pertinent Space Shuttle Missions Operational Data.

DOCUMENT FORMAT

The "as flown" operational mission data is presented in a summary table format of twelve columns. For early flights the book contains one page of data per flight. For later flights, as on-orbit activities became more and more complex, additional pages per flight were added, primarily for growth in the 12th column, "Mission Highlights".

In addition a summary table of weight data for each shuttle element and payloads for each mission is provided in Appendix A.

In Appendix B the authors acknowledge individuals for contributions to the preparation of this document and provides the data sources and Points of Contact (POCs) used in compiling flight and weight data.

Appendix C provides an historical record of JSC Flight Controllers originally compiled by Bob Legler, "History Flight". Since his death the listing has been maintained by the JSC Flight Directors Office.

And lastly, information about the authors is provided in the back of the book including an "In Memoriam" for Bob Legler.

MISSION SUMMARIES DATA DEFINITIONS

This section contains definitions of the data provided in the Mission Summaries by column number. Several entries have been assigned sequential numbers for reference purposes (e.g., # of rendezvous, # of night launches, # EVAs, etc.).

Column 1:

<u>FLIGHT NUMBERS</u> - The flight numbers include the official STS flight designator, followed by: the original flight designator (as applicable), the sequential flight number, the KSC launch sequential number, the OFT flight number (as applicable), the ISS flight number (as applicable), the launch pad sequential number, and MLP used.

Column 2:

<u>ORBITER</u> - Provides Orbiter designation, number of flights flown, & OMS PODs #'s.

Column 3:

<u>FLIGHT CREW</u> - Flight Crew members & titles are listed for each flight. Space shuttle flight (SS) number designators are listed for each crew member as follows:

P = sequential number of person flown on SS; R = SS rookie number; V = SS veteran number (second flight on SS); M = SS male number; F = SS female number. No attempt is made to determine which seat arrives first in orbit on the same flight. Example: P17/R2/V1/M2 - person 17, rookie 2, veteran 1, male 2. Once assigned a number, the crew member retains those R, V, & M or F numbers. Only the P number would change on subsequent flights.

 $\underline{\text{EVAs}}$ - Relates to SS EVAs. Includes type of EVA, dates/times of EVAs, EVA crew member names, and sequential number of SS EVAs and EVA times.

<u>FLIGHT DIRECTORS</u> - The Flight Directors and Mission Operations Director are listed for each flight.

 $\underline{\text{CAPCOMS}}$ - CAPCOMS are listed for missions STS-116 and all to follow.

ABOUT THIS DOCUMENT

Column 4:

<u>LAUNCH/LIFTOFF/ASCENT DATA</u> - Includes Pad Number, Liftoff Times [planned (P) and actual (A) in Eastern Time Zone and Greenwich Mean Time (GMT) liftoff time], Date of Launch followed by a number indicating how many SS flights have been launched on that month to date, Day-of-Week Launch followed by a number indicating how many SS flights were launched on the day of the week, Window Duration and Closure Rationale, Planned Landing Sites including those selected on Day of Launch, Ascent Events, and Abort Calls. In the later flights, there are two sets of data in the Ascent Events Column. The left set is planned METs and Velocities, and the right set is the actual METs and Velocities for the specified events.

Column 5:

LANDING DATA - Includes Landing Site/Runway followed by a Sequential Number indicating the Number of Concrete/Lakebed landings at EDW or a Sequential Number for Landings at NOR and KSC. Landing time is in local time for the landing site. The Landing Day of Week is followed by a Number indicating how many landings have been made on that day of the week. The Number after the Landing Date is the Sequential Number of Landings during that month, i.e., 4/2/92 (7), STS-45 is the seventh landing in April. Each Orbit Direction for Landing is followed by a Sequential Number. The Winds are designated in knots of head, tail and left and right crosswinds. The first listing was obtained from the MOD Descent Postflight Summary and is basically the Winds observed on a display at the touchdown time. The second listing is the "Official" Winds, which are the Two Minute Average Winds spanning the MLG Touchdown Time. The Flight Durations are determined from the time of liftoff to MLG Touchdown, specified in days, hours, minutes, and seconds.

 $\underline{S/T}$ - Shuttle Total Flight Time, i.e., Accumulated Total. This is followed by an Orbiter Designator and the Accumulated Flight Time for that Orbiter.

Column 6:

<u>SSME DATA</u> - Includes Nominal, Abort, and Emergency Throttles, Predicted and Actual Throttle Profile, and Engine Serial Numbers followed by the Number of Flights on that engine. For a lack of space elsewhere, the Mach 3 End-of-Mission Weights and X CG and Landing Weight and X CG have been added in this column.

Column 7:

<u>SRB/SRM/RSRM</u> - Includes the "Build Item" Number followed by SRM/RSRM Type or Number.

 $\underline{\text{ET} \text{ DATA}}$ - Includes ET Numbers, ET Rupture and Breakup Altitudes and Times in MET, and Tumble Valve Use. These times and altitudes were not available for flights after STS-46. However, the time, latitude, and longitude of ET Impact are included for all missions.

Column 8:

<u>ORBIT INCLINATION</u> - This is the Inclination after OMS-2 and is followed by a Sequential Number indicating how many flights were flown at that inclination. Inclinations between 28.45 and 28.55 have been considered the same for the purposes of assigning Sequential Numbers.

Column 9:

<u>ORBIT HA/HP</u> - Insertions were Standard Insertions unless specifically stating "Direct Insertion". Generally, Altitudes for Post OMS-2 are given, as well as Payload Deploy Altitudes and De-orbit Altitude.

Column 10:

<u>FLIGHT SOFTWARE DESIGNATORS</u> - OI (Operational Increment) numbers are followed by a Sequential Flight Number for that OI.

ABOUT THIS DOCUMENT

Column 11:

PAYLOAD DATA - Includes Cargo, Chargeable, Deployed, Non-Deployed, and Middeck Weights as documented in the SODB for flights STS-1 through STS-57. Effective with STS-51, the SODB data is no longer updated as flown. Therefore, the data has been obtained from the Day-of-Launch (DOL) Trajectory Design Data Package (TDDP). The following Shuttle Accumulated Weights are provided: (1) Total Payload Deployed Weights left in orbit, (2) Total Non-Deployed Payload Weights (does not include Ancillary Equipment such as ASE, cabling, etc.), and (3) Total Cargo Weights which include all Ancillary Equipment. Weights for seven DOD flights are not included. Performance Margins: Four numbers are provided - (1) Flight Planning Reserve (FPR); (2) Fuel Bias; (3) Final TDDP is margin above FPR, and Fuel Bias using mean wind and atmosphere for launch month, no unplanned drainback and final selected I-load; and (4) Recon is margin above MET wind and atmosphere, any unplanned drainback, final estimated MPS loads (a.k.a., "Reconstructed" Systems Performance). It should be noted that STS-27 Delta Margin was -295 lbs for drainback, -365 lbs for wind/atmosphere. STS-31 Delta Margin was -753 lbs for drainback, +461 lbs for wind/atmosphere. STS-41 was -358 lbs for drainback, -488 lbs for wind/atmosphere. Payloads are identified as being Primary, Payload Bay (PLB), and/or Middeck Payloads. Payload Column also contains the number of cryo Tank sets and whether a RMS was flown followed by a Sequential Number and serial number of the RMS.

Column 12:

MISSION HIGHLIGHTS/MISCELLANEOUS DATA COLUMN -

Includes the Number of KSC Workdays in OPF, at VAB, at Pad, and Total Workdays. Launch Postponements may not contain early postponements. Postponements are defined as launch delays which occurred prior to call-to-stations for OMI S0007 Shuttle Countdown. Scrubs are launch date changes after the start of Shuttle countdown (countdown was terminated or recycled to a later launch date). Launch Delays are delays which occur only on the day-of-launch. Other data included are TAL Weather Data, Night Launch and Night Landing Sequential Numbers, Flight Duration Changes, Landing Site Changes, Firsts, Events, and Significant Anomalies as judged by the compiler (not all Anomalies are included). Use of Alternate and DOLILU I-loads are included with a Sequential Number for Uplinks. STS-27 was the first flight with the capability to uplink Alternate Iloads for use and STS-48 was the first flight with DOLILU capability. Rendezvous operations are identified including the Target and Sequential Number of each Space Shuttle Rendezvous. Also, a Brief Mission Summary has been added for the first ISS Assembly Mission, STS-88/2A, and all missions to follow.

2. SPACE SHUTTLE MISSIONS SUMMARY SECTION

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ANDING SITE CREW LAUNCH SITE. RUNWAY. NOM-ABORT ORBIT PAYLOAD MISSION HIGHLIGHTS SRB (2) FLT ORBITER LIFTOFF TIME CROSSRANGE EMERG RSRM FSW WEIGHTS. (LAUNCH SCRUBS/DELAYS. NO. LANDING SITES. LANDING TIMES THROTTLE INC HA/HP PAYLOADS/ TAL WEATHER, ASCENT I-LOADS, AND TITLE, NAMES ABORT TIMES FLT DURATION, PROFILE **EXPERIMENTS** FIRSTS, SIGNIFICANT ANOMALIES, ETC.) FT & EVA'S WINDS ENG. S.N. EDW 23, LKBD STANDARD KSC W/D: OPF 531, VAB 33, PAD 104 =668 OV-102 CDR: KSC 39A 00/100 A7/8 40.3° R16/T9 CARGO: STS-1 (EDW 1, LKBD 1) 10823 lbs Flight 1 John W. Young 102:12:00:03.9Z (100) 86-80E (1) **INSERTION** SEO P1/R1/M1 7:00:00 AM EST (P) Columbia LAUNCH POSTPONEMENTS: Yes. FLT #1 10:20:57 AM PST OMS PODS 7:00:04 AM EST (A) 65% MTR KSC 1 START: INSERTION DFI: Tuesdav 1 I VO1 - 1 PLT: STD -25.6° ALTITUDE: 9290 lbs LAUNCH SCRUBS: Sunday 1 OFT-1 4/14/81 (1) 145 NM Scrubbed 4/10/81 launch at T-18 minutes because BFS RV01 - 1 Robert L. Crippen 4/12/81 (1) 1 = 2007(1)PAD P2/R2/M2 CASE: did not track PASS timing. Rescheduled launch for FRC2 - 1 2 = 2006(1)END: SHUTTLE 39A-1 XRANGE: 315 NM STD -19.9° ACCUMULATED WINDOW DURATION: 3 = 2005 (1) 152/152 4/12/81. 2-day slip. MCC FCR-1 (1) 4.7 hours 168-80 172/172 WEIGHTS: - Installed S/W patch to correct problem. ORB DIR: DR (1) SM MAX: FLIGHT DIRECTORS: PLS - EDW AIM PT: NOMINAL SWT DEPLOYED: LAUNCH DELAYS: 4 seconds. A/PLG - N. B. Hutchinson SLS - NOR ET-1 0 lbs MLGTD: 6053 FT ORBIT - C. R. Lewis NO TAL CONTINGENCY LANDING SITE (CLS) WX: 104:18:20:57Z AOA - EDW Rota was go. There was no TAL site for STS-1. ENT/ORB - D. R. Puddy NON-DEPLOYED: VEL: 190 KGS MOD - E. F. Kranz NOR 10823 lbs 183 KEAS CLS - HICKAM FLIGHT DURATION CHANGES: None. HDOT: -1.5 FPS KADENA CARGO TOTAL: 10823 lbs ROTA FIRSTS: TD NORM 195: - First orbital flight of reusable Space Shuttle vehicle. 4973 FT MAX Q = 617 PERFORMANCE First manned vehicle space flgiht w/o unmanned test M = 1.06 NLGTD: 9152 FT MARGINS NOT flight. AVAILABLE 104:18:21:07Z VEL: 156 KGS SIGNIFICANT ANOMALIES: SRB SEP: HDOT: -5.6 FPS SRB ignition overpressure (higher than expected) 2:11.7 MET PAYLOADS: IFCM/RFM deformed FRCS oxidizer tank aft Z strut. BRK INIT:105 KGS DFI OMS POD tile LRSI tiles lost. MECO: 8:34 MET WMS problems (degraded air suction). <u>AVE BRK DECEL</u>: 5.9 FPS/S NO RMS ET tumble system did not work. We Have Liftoff! PLBD closure overlap more than expected. ET SEP: -- April 12, 1981 --2 CRYO TANK 8:52.1 MFT Cabin temperature controller did not maintain selected WHEELS STOP: (S81-30500) ...On-Orbit... SETS temperature. 104:18:21:36Z Left: CDR Young in the cockpit OMS quantity gaging system was sticking during flight. OMS-1: 15046 FT Right: PLT Crippen prepares dinner on 10:34 MET Both Radar Altimeters lost lock at 75 feet (no valid data middeck ROLLOUT after 75 feet). 86.1 Seconds 8993 FT M 3 EOM Difficulty locking doors on two storage lockers due to 60 SEC OMS-2: ΕT misalignment. BR/UP 44:02 MET WEIGHT: WIND: 74.8 Seconds 195943 223K CONTINGENCY LANDING SITE: 2T, 2R KNOTS 47:42 - ROTA was a contingency landing site but not required OFFICIAL: 1H. 1R DEORBIT X CG: 1096.7 MET for one SSME out. 148 X DENS ALT: 2200 FT S-BAND TRACKING SITES: 146 NM LANDING ΕT IMPACT MIL, PDL, BDA, MAD, IOS, ORR, BUC, GDS, HAW, FLT DURATION: VELOCITY 2:06:20:53 WEIGHT: LAT: ACN, GWM, QUI, AGO, TUL (NOR), PTT, VDT. 54:20:53 25731 FPS 195473 30.95°S LONG: ... and Touchdown at EAFB! RADIATORS DEPLOY #1 ...In the MCC. DISTANCE RANGE X CG: 1098.1 93.2°E -- April 14, 1981 --Gene Kranz/FOD, Chris Kraft/JSC Ctr Dir. & 933,757 sm 4379 NM "That's the world's greatest flying machine" NOTE: ON STS-1 AND STS-2, THE NOMINAL OGS Max Faget/E&D (Father of U.S. Manned AIM POINT WAS 6500 FEET (5500 FEET WAS THE - CDR John Young! (S81-30746) Spacecraft Design) CLOSE-IN AIM POINT).

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		CREW	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(2)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-2 SEQ FLT # 2 KSC 2 OFT-2 PAD 39A-2	S81-39840)	& EVA'S CDR: Joe H. Engle P3/R3/M3 PLT: Richard H. Truly P4/R4/M4 MCC FCR-1 (2) FLIGHT DIRECTORS: ASC - N. B. Hutchinson PLNG - T. W. Holloway ORBIT - C. R. Lewis ENT - D. R. Puddy ORB - H. M. Draughon MOD - E. F. Kranz Plaunch from KSC Pad	ABORT TIMES KSC 39A 316:15:09:59.8Z 7:20:00 AM EST (P) 10:10:00 AM EST (P) 10:10:00 AM EST (A) Thursday 1 11/12/81 (1) <u>WINDOW</u> <u>DURATION</u> : 4.7 hours <u>PLS</u> - EDW <u>SLS</u> - NOR <u>TAL</u> - ROTA (Selected) <u>MAX Q</u> = 640 M = 1.09 <u>SRB SEP:</u> 2:10 MET <u>MECO:</u> 8:33.8 MET <u>ET SEP:</u> 8:57:2 MET <u>OMS-1:</u> 10:33.9 MET 77 Seconds <u>OMS-2:</u> 41:41.7 MET 69.2 Seconds	FLT DURATION, WINDS EDW 23, LAKEBED (EDW 2, LKBD 2) 1:23:12 PM PST Saturday 1 11/14/81 (1) XRANGE: 63 NM ORB DIR: DR (2) AIM PT: NOMINAL MLGTD: 780 FT 318:21:23:122 VEL: 186 KGS 197 KEAS HDOT: -1.0 FPS TD NORM 195: 960 FT NLGTD: 4429 FT 318:21:23:26Z VEL: 137 KGS HDOT: -5.1 FPS BRK INIT: 109 KGS AVE BRK DECEL: 6.1 FPS/S WHEELS STOP: 318:21:24:03Z 8491 FT ROLLOUT: 7711 FT 50 SEC WIND: 20H, 3R KNOTS OFFICIAL: 17H, 6L DENS ALT: 3500 FT FLT DURATION: 2:06:13:12 54:13:12 S/T: 4:12:34:05	PROFILE ENG. S.N. 100/100 (107) 68% 1 = 2007 (2) 2 = 2006 (2) 3 = 2005 (2)	ET A9/10 MTR: STD CASE: STD 168-80 SWT ET-2	38.0° (1) 63.25° <u>START</u> : -53.5° <u>END</u> : -56.2°	STANDARD INSERTION ALTITUDE: 137 NM 120/120 137/137 NM Contemportant State St	t		FIRSTS, SIGNIFICANT ANOMALIES, ETC.) KSC W/D: OPF 99, VAB 18, PAD 70 = 187 LAUNCH POSTPONEMENT: - 45-day postponement caused by FRCS N204 spill on tiles resulting in debonding of tiles. LAUNCH SCRUB: - Scrubbed 11/4/81 launch at T-31 seconds because APU's 1 & 3 lube oil outlet pressure high at 100 to 112 PSIA. Flushed APU's 1 and 3 gear boxes and changed clogged filters. Rescheduled launch for 11/12/81. 53 days total slip. LAUNCH DELAYS: - 2H40M delay MDM OF3 failure. Flew in replacement MDM which also failed. Replaced with OV-099 MDM. - 10-minute delay for KSC confidence review of systems status. - Total launch delay: 2H50M TAL WX: Rota go. FLIGHT DURATION CHANGE: - Shortened flight from 5D4H to 2D6H (priority flight after Fuel Cell 1 failed at 0/04:45 MET). FIRSTS: - First flight of RMS. SIGNIFICANT ANOMALIES: - Fuel Cell 1 failure at 0/04:45 MET resulting in priority mission. Shortened flight from planned 5D4H to 2D6H. - lcing in WSB 3 inhibited lube oil cooling, resulting in elevated APU gearbox outlet temp. - Excessive gas in drinking water. - TV camera B RMS elbow camera, PLB cameras A,B,C lenses had contamination. - CRT 1 failed due to HV power supply problem. - RH SRB lost one main chute.
Chris scree	topher C. Kraft n. The Preside	ent Ronald Reagan is brie , Jr., JSC Director, pointir ent said, "Dr. Kraft, I was II this." Then he talked to	ng to MOCR in the calvary,	<u>OV-102</u> : 4:12:34:05 <u>DISTANCE</u> : 933,757 sm	X CG: 1098.1	31.67°S <u>LONG</u> : 95.7°E		<u>RANGE</u> 4474 NM			flight) NOTE: ON STS-1 AND STS-2, THE NOMINAL OGS AIM POINT WAS 6500 FEET (5500 FEET WAS THE CLOSE-IN AIM POINT).

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SPACE SHUTTLE MISSIONS SUMMARY

				LANDING SITE/	SSME-TL						
		CREW	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(2)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		JKDH	FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.	UKDITEK		LIFTOFF TIME,				INC	HA/HP	FSW	PAYLOADS/	
NO.		TITLE, NAMES		LANDING TIMES	THROTTLE	AND	INC	HA/HP			TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
				WINDS	ENG. S.N.						
STS-3	OV-102	CDR:	KSC 39A	WSMR 1	100/100	A11/12	38.0°		R18/T11	CARGO:	KSC W/D: OPF 55, VAB 12, PAD 30=97
	Flight 3	Jack R. Lousma	81:15:59:59.875Z		(107)		(2)	INSERTION		22710 lbs	
SEQ	Columbia	P5/R5/M5	10:00:00 AM EST (P)	17 (LAKEBED) 9:04:45 AM MST		MTR:	64.14°				LAUNCH POSTPONEMENTS: None.
FLT # 3			11:00:00 AM EST (A)	Tuesday 2	68%	STD		INSERTION		CHARGEABLE:	LAUNCH SCRUBS: None.
121 # 0		PLT:	Monday 1	3/30/82 (1)			START:	ALTITUDE:			LAUNCH SCRUDS. NULL.
KSC 3		C. Gordon Fullerton	3/22/82 (1)	5/50/02 (1)	1 = 2007 (3)	CASE: STD	-33.2°	130 NM			LAUNCH DELAYS:
K3C 3		P6/R6/M6		XRANGE: 276 NM	2 = 2006(3)	86-80E				RETURNED:	- Launch delayed 1 hour. SSME GN ₂ purge heater temp
OFT-3	OMS PODS		WINDOW		3 = 2005(3)		END:	130/130 NM		24492.8 lbs	sensor failed in GSE.
UF1-5	LV01 - 3	MCC FCR-1 (3)	DURATION:	<u>ORB DIR</u> : AR (1)	0 2000 (0)	SWT	-26.0°	100/100 1411		21172.0103	School failed in COE.
DAD	RV01 - 3		6.1 hours			ET-3	20.0	DEORBIT		SHUTTLE	TAL WX: Rota go.
PAD	FRC2 - 3	FLIGHT DIRECTORS:	0.1110013	<u>aim pt</u> : Nom	M 3 EOM	LIJ	MAV	130 X		ACCUMULATED	
39A-3	11(02 - 3	ASC/PLG - T. W. Holloway	PLS - EDW	MLGTD: 1092 FT		ET RPT	<u>MAX</u> : -36.0°	120 NM		WEIGHTS:	LANDING SITE CHANGE:
		LD/ORB - N. B. Hutchinson	SLS - NOR	<u>89:16:04:44.8Z</u>	WEIGHT:	235K	-30.0			DEPLOYED:	- EDW lakebed to WSSH because EDW lakebed was
1.5	A 540		TAL - ROTA	VEL: 233 KGS		235K 49:18 MET					wet.
BA	A 20	PLNG - J. T. Cox		220 KEAS	207349			VELOCITY		0 lbs	
2		O/E - H. M. Draughon	(Selected)	HDOT: -5.7 FPS		ET		25659 FPS		NON-DEPLOYED:	FLIGHT DURATION CHANGE:
	anna -	MOD - E. F. Kranz			X CG: 1095.4	BR/UP				52311 lbs	- Flight extended from 7 to 8 days because of sand storm
			MAX Q = 651	TD NORM 195:		210K		RANGE		CARGO TOTAL:	at WSSH.
			M = 1.04	3342 FT	<u>LANDING</u>	49:58 MET		4144 NM		52311 lbs	FIDETC
4	LUWB					<u>et</u>					FIRSTS:
			SRB SEP:	<u>NLGTD</u> : 6261 FT 89:16:04:59.7Z	WEIGHT:	<u>IMPACT</u>	582-0	28746 : Firs	et .	PERFORMANCE	- First flight without white paint on ET. (800 lbs weight
			2:07.9 MET	VEL: 176 KGS	207073	<u>LAT</u> :				MARGINS (LBS):	savings. STS-1 and STS-2 ET's were painted white.)
······	1	P FOR A		HDOT: -8.4 FPS		31.2°S		with ET wh		FPR: 7444	SIGNIFICANT ANOMALIES:
3			MECO:		X CG: 1096.9	LONG:		deleted for		FUEL BIAS: 1050	- Early shutdown of APU 3 due to WSB3 freezeup
			8:33 MET	<u>BRK INIT</u> : 149 KGS		94.4°E	lb we	ight saving	S.	FINAL TDDP: 5343	causing high lube oil temp.
										RECON: 2278	- R ENG hydraulic lockup at 82% at To plus 8 min 12 sec
			ET SEP:	AVE BRK DECEL:				RE ET PAIN	іт 🗍		due to early shutdown of APU.
annen 11 Sta			8:51:5 MET	5 FPS/S	-				N I	PAYLOADS:	- RMS wrist TV camera failed causing IECM OPS to be
				WHEELS STOP:	<u>FLT</u> DURATION:	. And the second			and the second	IECM/REM	canceled.
			OMS-1:	89:16:06.09Z	8:00:04:45	1		700.00		EEVT	- AFT bulkhead latch did not fully latch (top sun for
20			10:34.4 MET	14824 FT	192:04:45					HBT-HEFLEX	15 minutes and latches operated normally).
	8		85.2 Seconds		172.04.43					OSS-1 PDP/REM	- WMS (slinger stopped on day 5).
	-	Caller		ROLLOUT:	S/T:					(PLASMA	- Missing tiles on FWD upper fuselage and upper body
			<u>OMS-2</u> :	13737 FT 84 SEC	<u>S/T</u> : 12:12:38:50			•		DIAGNOSTIC	flap.
		K ON ORBIT						4		PACKAGE)	- CCTV camera C failed, camera B zoom failed.
ABOV	E: s03-22-12	3 CDR Lousma	88 Seconds	<u>WINDS</u> : 14H, 2L KNOTS	<u>OV-102</u> : 12:12:38:50					DFI	- ARPCS GN2 usage excessive (cold soak induced
		8 PLT Fulerton	00 0000100	OFFICIAL: 13H, 1L	12:12:38:50						leak).
0220				OTTICIAL. ISH, TE	DISTANCE:		e	AN II		RMS 2 (S.N. 201)	- S-Band xponder 1 failed in hi and low power modes
	-		MGR's AT WORK	<u>DENS ALT</u> : 3700 FT	3,900,000 sm			15 million		11110 2 (0.11. 201)	(downlink).
- chia	10-		N MCC Lt to Rt:		3,700,000 311	-				LOADED TESTS	- S-Band xponder 2 failed in low power mode (downlink).
1 1	Annu		Glynn Lunney		-					USING PDP	(Contaminants in RF control relay.)
	13						Earden			031101 DI	- S-band Power Amp reduced power output.
	A LON		Mgr P/L Integ,		3	T		100		WAVE PDP	- VTR tape broke.
			Chris Kraft /JSC	and and the second	A COL			165 M		OUTSIDE P/L BAY	- Ammonia boiler controllers A&B failed.
			Ctr Director, a	Constant L	10 million	No.	and the second	Info Institution		UUT SIDE PIL BAY	- Cracked rotor RH outboard MLG brake.
		And and a second s	person unknown,	A DECOM	-200					3 CRYO TANK	- WSMR dust storm caused significant maintenance and
			Aaron Cohen	S AT			Contraction of the				cleanup of orbiter (gypsum contamination).
			Mgr Orbiter	Se star on	NAU ()	()A				SETS	- One RH SRB main chute failure 3 seconds after
	Photos Contraction				THE MAKE						deployment.
	De Cont		Project discuss a	8 Tanks							
s - 3 - 1 - 1			light issue.		62 - N						RADIATORS DEPLOYED #3

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		CREW		LANDING SITE/	SSME-TL						
FLT	ORBITER	(2)	LAUNCH SITE, LIFTOFF TIME,	RUNWAY, CROSSRANGE	NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.	URDITER		LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP	<u> </u>	PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
110.		TITLE, NAMES & EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
				WINDS	ENG. S.N.						
	OV-102	CDR:	KSC 39A	EDW 22, CONC (EDW 3, CONC 1)	100/100	A13/14			R18/T11	CARGO: 24492 lbs	KSC W/D: OPF 41, VAB 7, PAD 29=77
	Flight 4 Columbia	Thomas K. Mattingly P7/R7/M7	178:14:59:59.8Z 11:00:00 AM EDT (P)		(107)	MTR: STD	(1)	INSERTION			LAUNCH POSTPONEMENTS: None.
SEQ FLT # 4	Columbia	1 /////////	11:00:00 AM EDT(A)	9:09:40 AM PDT Sunday 1	100/65/	<u></u> . 510	START:	INSERTION		PAYLOAD CHARGEABLE:	ERONOMI OSTI ONEMENIS. None.
		<u>PLT</u> :	Sunday 2	7/4/82 (1)	100/65	<u>CASE</u> : STD	-1.2°	ALTITUDE:		11644 lbs	LAUNCH SCRUBS: None.
KSC 4		Henry W. Hartsfield	6/27/82 (1)		1 0007 (4)	86-80E	END	DOOT ON O A			
0FT 4	OMS PODS	P8/R8/M8	WINDOW DURATION:	XRANGE: 581 NM	1 = 2007 (4) 2 = 2006 (4)	SWT	<u>END</u> : +20.5°	POST OMS-2 139.2 X 131.05		PRIMARY P/L: 9800 lbs	LAUNCH DELAYS: None.
	LV01 - 4	MCC FCR-1 (4)	4.4 hours	<u>ORB DIR</u> : DL (1)	3 = 2005 (4)	ET-4	+20.3	NM			TAL WX: Dakar no go - crosswinds.
PAD	RVO1 - 4			AIM PT: NOM						ANCILLARY: 1844 lbs	
39A-4	FRC2 - 4	FLIGHT DIRECTORS:	PLS - EDW		<u>M 3 EOM</u>	ET RPT					FLIGHT DURATION CHANGE: None.
		Asc - T. W. Holloway Ld/Orb - C. R. Lewis	SLS - KSC CLS - NOR	<u>MLGTD</u> : 948 FT 185:16:09:39.9Z	WEIGHT:	228K 47:19 MET		<u>DEORBIT</u> 175 X		RETURNED: 24492.8 lbs	FIRSTS:
		Plng - J. T. Cox	AOA - EDW	VEL: 196 KGS	209141	47:19 IVIE I		160 NM			- First flight with student experiments.
		Plng - J. H. Greene	AOA WX - NOR	204 KEAS HDOT: -1.1 FPS		<u>et</u>				<u>SHUTTLE</u> ACCUMULATED	i not mgitt that olddorff oldpoliniontol
		Orb/Ent - H. M. Draughon	TAL - DAKAR	NDU11.1 FP3	X CG: 1092.9	<u>BR/UP</u>		<u>VELOCITY</u>		WEIGHTS:	SIGNIFICANT ANOMALIES:
		MOD - E. F. Kranz	TAL WX - ROTA	TD NORM 195:		204K		25800 FPS		DEPLOYED:	- Hail stones on tile at L-1 day (repaired tiles).
			(Selected)	1758 FT	LANDING	47:56 MET		RANGE		0 lbs NON-DEPLOYED:	 Water found in thrusters F2R & F4R. During prelaunch rain storms, approximately 500 lbs
	ahia		MAX Q = 721	<u>NLGTD</u> : 4988 FT	WEIGHT:	<u>ET</u>		3810 NM		63955 lbs	water absorbed by tiles requiring bottom-to-sun for many
1		h	M = 1.74	185:16:09:53Z VEL: 158 KGS	208947	IMPACT				CARGO TOTAL: 76803 lbs	hours to dry-out water (to prevent ice damage to tile).
				HDOT: -3.7 FPS	V 00 4004 4	<u>LAT</u> :					- GAS activation problems - successful workaround.
4			<u>SRB SEP</u> : 2:10 MET	BRK INIT: 133 KGS	X CG: 1094.4	28.4°S LONG:				PERFORMANCE MARGINS (LBS):	 VTR would not rewind. AFT bulkhead actuator on port PLBD stalled during
	1 June	KUY-HARTSFIELD	2.10 WE I			83.07°E				FPR: 6210	latch closure.
			MECO:	AVE BRK DECEL: 6.4 FPS/S	S82-333	94: Columbi	a stopo	ver at		FUEL BIAS: 1474 FINAL TDDP: 4038	- AFT STBD, FWD port, and FWD bulkhead floodlights
			8:32.7 MET			during retur				RECON: 1195	failed.
			ET SEP:	WHEELS STOP: 185:16:10:44Z		3 1 1					- Thermal conditioning required to close PLBD's. - WMS slinger slowed down.
			8:50:4 MET	185:16:10:44Z 10826 FT						PRIMARY: DOD 82-1	- Mid-deck TV camera operation erratic.
										ICEM/REM	- DFI PCM recorder data lost.
			<u>OMS-1</u> :	<u>ROLLOUT</u> : 9878 FT		1				ANCILLARY:	- Both SRB's lost (impacted water at extremely high
The action		A Strategy	10:32.6 MET 88 Seconds	64 SEC						ACIP	velocity). - Right and left inboard brakes damaged.
SEX 4	63		UU JECUIIUS	WIND:						GAS (UTAH STATE)	IFM - GAS EXPERIMENTS RECOVERY
	ASK :		<u>OMS-2</u> :	15H, 7L KNOTS			1			STUDENT EXP'S:	RADIATORS DEPLOYED #4
+ + 1			37:40.6 MET	OFFICIAL: 12H, 1R	- C					(1) CHOLESTEROL (2) CHROMIUM	
		MT PEST	104 Seconds	DENS ALT: 3563		AND .	1			LEVEL	
	1-01	H-SEL		FT	Constanting of the local division of the loc					(Deficiency)	
S.C.	n	Allen 115		FLT DURATION:						MLR CFES (MID-DECK)	
				7:01:09:40	Part of the second s					TGE	
L'AND	1 S 1			169:09:40	T		11111011000	00		NOSL	
	1			<u>S/T</u> : 19:13:48:30			A REAL PROPERTY.			3 CRYO TANK	
000	1007 07			OV-102:	2.0	The second				SETS	
		R Mattingly (right)		<u>OV-102</u> : 19:13:48:30						RMS 3 (S.N. 201)	COA 00 404: Mattingly flagts in still
		ready to fly fourth		DISTANCE	15	ATT	100			WAVED IECM	S04-23-131: Mattingly floats in mid-
& fin	al Orbital Fl	ight Test (OFT).		DISTANCE: 2,900,000 sm			ATT Sal	X1		OUTSIDE P/L BAY	deck with cameras.

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		CREW	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(4)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-5	OV-102 Flight 5	<u>CDR</u> : Vance D. Brand	KSC 39A 315:12:18:59.997Z	EDW 22, CONC (EDW 4, CONC 2)		A15/16	28.482° (2)	<u>STANDARD</u> INSERTION	R19/T12	<u>CARGO</u> : 32080 lbs	<u>KSC W/D</u> : OPF 48, VAB 9, PAD 45= 102
SEQ FLT # 5	Columbia	P9/R9/M9	7:19:00 AM EST (P) 7:19:00 AM EST (A)	6:33:26 AM PST Tuesday 3	100/85/65	MTR: STD	89.8°	INSERTION		PAYLOAD CHARGEABLE:	LAUNCH POSTPONEMENTS: None.
KSC 5		PLT: Robert F. Overmyer P10/R10/M10	Thursday 2 11/11/82 (2)	11/16/82 (2) XRANGE: 580 NM		<u>CASE</u> : STD 86-80	<u>START</u> : -26.0°	<u>ALTITUDE</u> : POST OMS-2		20830 lbs <u>ANCILLARY P/L</u> : 1078 lbs	LAUNCH SCRUBS: None. LAUNCH DELAYS: None.
<u>PAD</u> 39A-5	<u>OMS PODS</u> LVO1 - 5	<u>M/S</u> :	WINDOW DURATION: 39 Minutes	<u>ORB DIR</u> : DL (2)	3 = 2005 (5)	SWT ET-5	<u>END</u> : -7.2°	162.07 X 160.67 NM		<u>NON-DEPLOYED</u> : 5167 lbs	TAL WX:DAKAR GO
5775	RVO1 - 5 FRC2 - 5	William B. Lenoir P11/R11/M11	(SBS Day 2 Deploy Opportunity)	<u>AIM PT</u> : NOM						<u>DEPLOYED</u> : 14585 lbs	<u>CLS WX</u> : Rota go.
	aver.	M/S:	PLS - EDW	<u>MLGTD</u> : 1637 FT 320:14:33:26Z VEL: 201 KGS			Q!	-		<u>RETURNED</u> : 17495 lbs	FLIGHT DURATIONS CHANGE: None.
	1	Joseph P. Allen P12/R12/M12	SLS - NOR TAL - DAKAR (Selected)	198 KEAS HDOT:-1.0 FPS				- BT		<u>SHUTTLE</u> ACCUMULATED	FIRSTS: - First operational Shuttle flight.
2		FIRST SPACE SHUTTLE EVA SCHEDULED, BUT NOT ACCOMPLISHED	AOA - NOR AOA WX - KSC	<u>TD NORM 195</u> : 1907 FT	R		by		Nº	<u>WEIGHTS:</u> <u>DEPLOYED:</u> 14585 lbs <u>NON-DEPLOYED</u> :	 First flight with more than 2 crewmen (4). First flight to deploy PAM-D (SBS-C). First OV-102 flight after Micro-Mod including disabling
	OLUMPLA	BECAUSE OF EMU PROBLEMS.	CLS - KSC CLS WX - ROTA	<u>NLGTD</u> :4675 FT 320:14:33:34Z VEL:176 KGS HDOT:-4.6 FPS		Sometime Department at - Ace Maxing Ca		A TAK		70200 lbs <u>CARGO TOTAL</u> : 108883 lbs	the two ejection seats. - First flight of OV-102 with ejection seats disabled. - First Space Shuttle IFM.
		MCC FCR-2 (1)	<u>MAX Q</u> = 738 M = 1.70	<u>BRK INIT</u> : 167 KGS		VA DUIVE D			a	PERFORMANCE MARGINS (LBS):	IFM's:
		<u>FLIGHT DIRECTORS</u> : Ld/Asc/Ent - T. W. Holloway	<u>SRB SEP</u> : 2:09.08 MET	<u>AVE BRK DECEL</u> : 6.7 FPS/S	s05-07-2	67: First fo	ur-me	mber crew, f	irst	FPR: 5312 FUEL BIAS:1479 FINAL TDDP:822	 Switched CRT-2 and CRT-4 cables on FD4 after CRT 2 failed. Water hoses used for water dispenser failure.
		Orbit - J. T. Cox Planning - G. E. Coen MOD - E. F. Kranz	<u>MECO</u> : 8:30.68 MET	<u>WHEELS STOP</u> : 320:14:34:29Z 11190 FT	Moving C	Co." Clock	wise fr	d by the "Ac om bottom le	eft:	RECON:-1017 <u>PRIMARY</u> : SBS-C/PAM-D	· SIGNIFICANT ANOMALIES: - 46-hour STBD side-to-sun.
			ET SEP:	ROLLOUT:	CDR Bra Allen/MS		′MS, P	LT Overmye	er, &	(DEPLOYED) TELESAT-E/PAM D	- EVA canceled, EV-2 (Allen's) suit fan did not operate. EV-1 (Lenoir's) suit regulator was regulating to 3.8 psia
	-		8:48.77 MET	9553 FT 63 SEC						(ANIK-D) (DEPLOYED)	instead of 4.3 psia. - WCCU A & B failed.
	Reference and anti-		<u>OMS-1</u> : 10:30.8 MET 137.8 Seconds	<u>WIND</u> : 2 H, 0X KNOTS OFFICIAL: 2H, 0X	<u>M 3 EOM</u> WEIGHT:	<u>ET RPT</u> 236K 46:30 MET		<u>DEORBIT</u> 154 X 148 NM		<u>ANCILLARY</u> : STUDENT EXPERIMENTS	 CRT-2 failed (pot in "y" deflection board). Radar altimeter #1 failed. FWD port & STBD PLB lights failed.
	RU		<u>OMS-2</u> : 44:40.8 MET	DENS ALT: 1750 FT	202643 X CG: 1094.8	<u>ET BR/UP</u> 205K		<u>VELOCITY</u> 25758 FPS		- POFERIA (SPONGE) GROWTH	- High O ₂ flow during PCS switchover. - LHIB MLG brake locked during landing. - OMS nozzle cracks found postflight.
_			117.6 Seconds	<u>FLT DURATION</u> : 5:02:14:26 122:14:26	LANDING	47:18 MET		RANGE		- SOLUTION XTAL GROWTH - CONVECTION IN	RADIATORS DEPLOYED #5 (for SUN SIDE attitude
				<u>S/T</u> : 24:16:02:56	WEIGHT: 202480	<u>ET IMPACT</u> <u>LAT</u> : 28.3°S		4050 NM		ZERO-G GAS, TGE MATERIALS TEST	only)
		ne MOCR Lead om Holloway,		<u>OV-102</u> : 24:16:02:56	X CG: 1096.3	LONG:				ZERO-G DEMO 3 CRYO TK SETS	
	s the room			<u>DISTANCE</u> : 1,850,000 sm						NO RMS	

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FLTORBITERCREW (4)LAUNCH SITE, LIFTOFF TIME, LIFTOFF TIME, LIFTOFF TIME, LIANDING SITES, ABORT TIMESDAMABORTSRB EMERGORBITPAYLOA FSWNO.TITLE, NAMES & EVA'SLANDING SITES, & EVA'SLANDING SITES, ABORT TIMESLANDING TIMES FLT DURATION, WINDSTHROTTLE PROFILEAND ETINCHAHPPAYLOA PAYLOASTS-6OV-099 Flight 1 ChallengerCDR: Paul J. Weitz P13/R13/M13KSC 39A 94:18:30:00 016Z 1:30:00 PM EST (P) 1:30:00 PM EST (P) 1:30:00 PM EST (A) Monday 2 4/983 (2)EDW 22 CONC 1:05:3:42 AM PST saturday 2 4/983 (2)Inft:_STD89.7° 100/104/81/ 104/166STANDARD (109)VELT: Karol J. Bobko P14/R14/M14PLT: Monday 2 4/4/83 (2)KRANGE: 378 NM AMAGE: 378 NM1 = 2017 (1) 2 231-81231-81 END: 2 2015 (1) 2 31-81STANDARD INSERTION ALTITUDE:R19/T12 4662 lbsPAD 39A-6OMS PODS IP16/R16/M16M/S: POST OMS-2 P15/R15/M15MMS: TAL - DAKAR AOA - EDW AOA WX - NOR EOM - EDWTAL - DAKAR MAX = 6881 = 2017 (1) 2026 FT 9718:53:422 VEL: 180 KGS 190 NCEAS 190 NCEAS 1976 FTILWT-1 1-18.8° MAX: -21.9°NON-DEPLO 6650 lbsMXS: POST OMS-2 1976 R53:422 VEL: 180 KGS 190 NCEAS 1976 FTMXS: 10 NORM 195: 1576 FTIDNORM 195: 1576 FTIDNORM 195: 1576 FTSMICT 200 NCM 195: 1576 FTSMICT NMAX = 488 1576 FTRETURNED: 200 NCM 195: 10 NORM 195: 10 NORM 195: 10 NORM 195:NMAX: 200 NCM 195: 10 NO	S. (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.) E: KSC W/D: OPF 123, VAB 6, PAD 115=244 LAUNCH POSTPONEMENT: - 1/20/83 launch postponed 74 days to 4/4/83 because of H2 leak in aft compartment from engine 2011 (SSME #1) during FRF 1. Post-FRF 2 found crack in MCC of 2011. 2015 and 2012 had cracked ASI fuel lines. Replaced ASI lines in all three engines. 74-day slip for engine analysis and fixes. //ED: LAUNCH SCRUBS: None. //L: LAUNCH DELAYS: None. TAL WX: Dakar no go - haze. FLIGHT DURATION CHANGE: None.
NO.LIPTOPT INDE, ABORT TIMESCADSTRANGE ABORT TIMESENERGY LANDING SITES, ABORT TIMESENERGY LANDING SITES, FLT DURATION, WINDSENERGY PROFILEAND PROFILEINCHAHPPAYLOA EXPERIMSTS-6OV-099CDE: Flight 1 ChallengerCAS: Paul J. WeitzKSC 39A 94:18:30:00.016ZEDW 22 CONC (EDW 5, CONC 3)104/104 (109)A17/1828.48° (3)STANDARD INSERTION INSERTION INSERTION INSERTION MRESR19/T12 CARGOCARGO (4971 lbsSEQ 	DS/ NTS TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.) KSC W/D: OPF 123, VAB 6, PAD 115=244 LAUNCH POSTPONEMENT: - - 1/20/83 launch postponed 74 days to 4/4/83 because of H2 leak in aft compartment from engine 2011 (SSME #1) during FRF 1. Post-FRF 2 found crack in MCC of 2011. 2015 and 2012 had cracked ASI fuel lines. Replaced ASI lines in all three engines. 74-day slip for engine analysis and fixes. <u>KED:</u> LAUNCH SCRUBS: None. <u>VL</u> : LAUNCH DELAYS: None. <u>TAL WX</u> : Dakar no go - haze. FLIGHT DURATION CHANGE: None.
STS-6 OV-099 CDR: Paul J. Weitz Paul J. Weitz ABORT TIMES FLT DURATION, WINDS PROFILE ENG, S.N. ET ABORT DURATION EXPERIMU (09) A17/18 28.48° (3) STANDARD INSERTION R19/T12 CARGO: 46971 lbs SEO FLT # 6 Challenger P13/R13/M13 1:30:00 PM EST (P) 1:30:00 PM EST (P) 1:30:00 PM EST (A) Monday 2 10:53:42 AM PST Saturday 2 4/4/83 (2) 100/104/81/ 10/4/65 MTR: STD 89.7° NSERTION ALTITUDE: NSERTION ALTITUDE: R19/T12 CARGO: 46971 lbs PAD 39A-6 OMS PODS LPO1 - 1 RPO1 - 1 FRC9 - 1 MS: F. Story Musgrave P15/R15/M15 MMS: TAL - DAKAR NO TAL WX AOA - EDW AOA WX - NOR EOM - EDW MIGTD: 2026 FT 9918:53:42Z 0RB DIR: AL (1) AIT DORM 195: 157.6 FT 12017 (1) 231-81 231-81 END: 22015 (1) 3 = 2012 (1) END: 231-81 END: 155.45 X 154.48 DEPLOYED: 37546 lbs MMS: Donald H. Peterson P16/R16/M16 MS: EOM - EDW TAL - DAKAR NO TAL WX AOA - EDW AOA WX - NOR EOM - EDW MIGTD: 2026 FT 9018:53:42Z MAX: 2119° MAX: 2119° MAX: 2119° ANCLLARY 2423 lbs MUTTETHERED EVA: EVA: 477/83 EMUTTETHERED EVA: EVA: 477/83 MAX O = 688 TD NORM 195: 157.6 FT TD NORM 195: 157.6 FT TD NORM 195: 157.6 FT SHUTTLE	NTS FIRSTS, SIGNIFICANT ANOMALIES, ETC.) KSC W/D: OPF 123, VAB 6, PAD 115=244 LAUNCH POSTPONEMENT: - 1/20/83 launch postponed 74 days to 4/4/83 because of H2 leak in aft compartment from engine 2011 (SSME #1) during FRF 1. Post-FRF 2 found crack in MCC of 2011. 2015 and 2012 had cracked ASI fuel lines. Replaced ASI lines in all three engines. 74-day slip for engine analysis and fixes. YED: LAUNCH SCRUBS: None. YL: LAUNCH DELAYS: None. TAL WX: Dakar no go - haze. FLIGHT DURATION CHANGE: None.
STS-6 OV-099 CDR: Flight 1 Challenger KSC 39A EDW 22 CONC (EDW 5, CONC 3) IO4/104 (109) A17/18 28.48° (3) STANDARD INSERTION R19/T12 CARGO: 46971 lbs SEO FLT # 6 Challenger P13/R13/M13 1:30:00 PM EST (P) 1:30:00 PM EST (A) Monday 2 10:53:42 AM PST 3:30:00 PM EST (A) Monday 2 100/104/81/ 49/83 (2) MTR: STD 89.7° INSERTION NSERTION NSERTION ALTITUDE: R19/T12 CARGO: 46971 lbs YADD PLT: Karol J. Bobko 4/4/83 (2) YAMONG 2 100/104/81/ 104/63 (2) NTR: STD 89.7° INSERTION ALTITUDE: R19/T12 CARGO: 4662 lbs YADD PLT: Karol J. Bobko 4/4/83 (2) YAMONG 2 49/83 (2) 100/104/81/ 104/55 INSERTION 86-80 NITTUDE: POST OMS-2 155.45 X 154.48 NM NON-DEPLO 6853 lbs 39A-6 LPO1 - 1 FRC9 - 1 MS: Donald H. Peterson P16/R16/M16 NO TAL WX AOA - EDW P16/R16/M16 NICTL WX AOA - EDW P16/R16/M16 TAL - DAKAR NO A - EDW AOA WX - NOR EOM - EDW TD NORM 195: 1576 FT TD NORM 195: 1576 FT TD NORM 195: 1576 FT	KSC W/D: OPF 123, VAB 6, PAD 115=244 LAUNCH POSTPONEMENT: - - 1/20/83 launch postponed 74 days to 4/4/83 because of H2 leak in aft compartment from engine 2011 (SSME #1) during FRF 1. Post-FRF 2 found crack in MCC of 2011. 2015 and 2012 had cracked ASI fuel lines. Replaced ASI lines in all three engines. 74-day slip for engine analysis and fixes. <u>/ED:</u> LAUNCH SCRUBS: None. <u>//L</u> : LAUNCH DELAYS: None. <u>TAL WX</u> : Dakar no go - haze. FLIGHT DURATION CHANGE: None.
STS-6 OV-099 CDR: Flight 1 KSC 39A EDW 22 CONC (EDW 5, CONC 3) 104/104 (109) A17/18 28.48° (3) STANDARD INSERTION R19/T12 CARGO: 46971 lbs SEQ FLT # 6 P13/R13/M13 1:30:00 PM EST (P) 1:30:00 PM EST (A) Monday 2 1:03:02 PM EST (A) 4/4/83 (2) 1:053:42 AM PST Saturday 2 1:00/104/81/ 104/16 A17/18 28.48° (3) STANDARD INSERTION R19/T12 CARGO: 46971 lbs PAD 39A-6 OMS PODS LPO1 - 1 RPO1 - 1 FC 9 - 1 M/S: P15/R15/M15 M/MS: TAL - DAKAR P16/R16/M16 MIM PT: CLOSE IN AOA WX - NOR EOM - EDW 0RB DIR: AL (1) AIM PT: CLOSE IN P16/R16/M16 AIM PT: CLOSE IN P16/R16/M16 MAX: P16/R16/M16 AIM PT: CLOSE IN P16/R16/M16 MIGTD: 2026 FT NO TAL WX AOA - EDW MIGTD: 2026 FT P19/R5:3:42Z MIS: P10 NORM 195: TD NORM 195: TD NORM 195: TD NORM 1	E: LAUNCH POSTPONEMENT: - 1/20/83 launch postponed 74 days to 4/4/83 because of H2 leak in aft compartment from engine 2011 (SSME #1) during FRF 1. Post-FRF 2 found crack in MCC of 2011. 2015 and 2012 had cracked ASI fuel lines. Replaced ASI lines in all three engines. 74-day slip for engine analysis and fixes. LAUNCH SCRUBS: None. <u>LAUNCH DELAYS</u> : None. <u>TAL WX</u> : Dakar no go - haze. <u>FLIGHT DURATION CHANGE</u> : None.
Store Flight 1 Challenger Paul J. Weitz P13/R13/M13 94:18:30:00.016Z 1:30:00 PM EST (P) 1:30:00 PM EST (P) 1:30:00 PM EST (P) 1:30:00 PM EST (A) Monday 2 (EDW 5, CONC 3) (109) MTR:_STD 89.7° INSERTION 46971 lbs KSC 6 PLT: Karol J. Bobko P14/R14/M14 Monday 2 4/4/83 (2) MARS: 2) 10:53:42 AM PST Saturday 2 4/9/83 (2) 100/104/81/ 104/65 00/104/81/ CASE; LWC MIR: STD 89.7° INSERTION 46971 lbs PAD 39A-6 OMS PODS IP01 - 1 RPO1 - 1 FRC9 - 1 MS: F. Story Musgrave P15/R15/M15 MMS: TAL - DAKAR NO TAL WX MIR: AL (1) 1 = 2017 (1) 3 = 2012 (1) 231.81 END: 155.45 X 154.48 DEPLOYED: 37546 lbs MS: P16/R16/M16 F. Story Musgrave P15/R15/M15 TAL - DAKAR NO TAL WX MIGTD: 2026 FT 979:18:53:42Z CENTER WAS 2011 MAX: -21.9° NON-DEPLO 6853 lbs MS: Donald H. Peterson P16/R16/M16 MAX: EOM - EDW TAL - DAKAR NO TAL WX MIGTD: 2026 FT 979:18:53:42Z VEL: 180 KGS HDDT: -1.5 FPS MAX: -21.9° ANCILLARY 2263 lbs MOO: -1.0 FPS TD NORM 195: 1576 FT TD NORM 195: 1576 FT SHIITTLE	E: LAUNCH POSTPONEMENT: - 1/20/83 launch postponed 74 days to 4/4/83 because of H2 leak in aft compartment from engine 2011 (SSME #1) during FRF 1. Post-FRF 2 found crack in MCC of 2011. 2015 and 2012 had cracked ASI fuel lines. Replaced ASI lines in all three engines. 74-day slip for engine analysis and fixes. LAUNCH SCRUBS: None. <u>LAUNCH DELAYS</u> : None. <u>TAL WX</u> : Dakar no go - haze. <u>FLIGHT DURATION CHANGE</u> : None.
SEQ FLT # 6 P13/R13/M13 1:30:00 PM EST (P) 1:30:00	E: - 1/20/83 launch postponed 74 days to 4/4/83 because of H2 leak in aft compartment from engine 2011 (SSME #1) during FRF 1. Post-FRF 2 found crack in MCC of 2011. 2015 and 2012 had cracked ASI fuel lines. Replaced ASI lines in all three engines. 74-day slip for engine analysis and fixes. LAUNCH SCRUBS: None. <u>YL</u> : LAUNCH DELAYS: None. <u>TAL WX</u> : Dakar no go - haze. <u>FLIGHT DURATION CHANGE</u> : None.
DEC District of the second state of the	E: - 1/20/83 launch postponed 74 days to 4/4/83 because of H2 leak in aft compartment from engine 2011 (SSME #1) during FRF 1. Post-FRF 2 found crack in MCC of 2011. 2015 and 2012 had cracked ASI fuel lines. Replaced ASI lines in all three engines. 74-day slip for engine analysis and fixes. LAUNCH SCRUBS: None. <u>YL</u> : LAUNCH DELAYS: None. <u>TAL WX</u> : Dakar no go - haze. <u>FLIGHT DURATION CHANGE</u> : None.
PLT: Monday 2 Mon	H2 leak in aft compartment from engine 2011 (SSME #1) during FRF 1. Post-FRF 2 found crack in MCC of 2011. 2015 and 2012 had cracked ASI fuel lines. Replaced ASI lines in all three engines. 74-day slip for engine analysis and fixes. LAUNCH SCRUBS: None. <u>LAUNCH DELAYS</u> : None. <u>TAL WX</u> : Dakar no go - haze. <u>FLIGHT DURATION CHANGE</u> : None.
KSC 6Karol J. Bobko P14/R14/M144/4/83 (2)XRANGE: 378 NM XRANGE: 378 NM= 2017 (1) 2 = 2015 (1) 3 = 2012 (1)26-80 231-81-21.6° POST OMS-2 155.45 X 154.48DEPLOYED: 37546 lbs39A-6OMS PODS P14/R14/M14M/S: P15/R15/M15M/S: T / Minutes (TAL Lighting)ORB DIR: AL (1) AIM PT: CLOSE IN P15/R15/M151 = 2017 (1) 3 = 2012 (1)2 = 2015 (1) 3 = 2012 (1)END: END: END: END: END: END:POST OMS-2 155.45 X 154.48DEPLOYED: 37546 lbsM/S: P15/R15/M15M/S: P15/R15/M15TAL - DAKAR NO TAL WX AOA - EDW AOA WX - NOR EOM - EDWMIGTD: 2026 FT 99(18:53:42ZEND: END: END: END: END: END:-21.9°POST OMS-2 155.45 X 154.48DEPLOYED: 37546 lbsM/S: P16/R16/M16TAL - DAKAR P16/R16/M16M/GTD: 2026 FT AOA WX - NOR EOM - EDWMIGTD: 2026 FT 99(18:53:42ZMAX: END:	during FRF 1. Post-FRF 2 found crack in MCC of 2011. 2015 and 2012 had cracked ASI fuel lines. Replaced ASI lines in all three engines. 74-day slip for engine analysis and fixes. LAUNCH SCRUBS: None. ½: LAUNCH DELAYS: None. TAL WX: Dakar no go - haze. FLIGHT DURATION CHANGE: None.
PAD 39A-6 OMS PODS LPO1 - 1 RPO1 - 1 FRC9 - 1 P14/R14/M14 WINDOW DURATION: 17 Minutes (TAL Lighting) NMANGE: 378 NM 17 Minutes (TAL Lighting) 1 = 2017 (1) ORB DIR: AL (1) 231-81 2 = 2015 (1) 3 = 2012 (1) POST OMS-2 155.45 X 154.48 DOPPLOYED: 37546 lbs M/S: FRC9 - 1 M/S: P15/R15/M15 TAL - DAKAR NO TAL WX ORB DIR: AL (1) a = 2012 (1) 3 = 2012 (1) LWT-1 ET-8 -18.8° NM NON-DEPLO 6853 lbs M/S: Donald H. Peterson P16/R16/M16 TAL - DAKAR AOA - EDW EOM - EDW MLGTD: 2026 FT 99:18:53:42Z VEL: 180 KGS 190 KEAS HDOT: -1.5 FPS TAL - DAKAR MAX: -21.9° MAX: -21.9° -18.8° NM NON-DEPLO 6853 lbs M/S: Donald H. Peterson P16/R16/M16 AOA WX - NOR EOM - EDW TD NORM 195: 1576 FT TD NORM 195: 1576 FT FT FT FUITTLE	ASI lines in all three engines. 74-day slip for engine analysis and fixes. <u>LAUNCH SCRUBS</u> : None. <u>YL</u> : <u>LAUNCH DELAYS</u> : None. <u>TAL WX</u> : Dakar no go - haze. <u>FLIGHT DURATION CHANGE</u> : None.
PAD 39A-6 M/S: FRC9 - 1 M/S: P15/R15/M15 TAL - DAKAR NO TAL WX ORB DIR: AL (1) Z = Z013 (1) 3 = 2012 (1) LWT-1 -18.8° NM NON-DEPLO 6853 lbs M/S: FRC9 - 1 P15/R15/M15 TAL - DAKAR NO TAL WX MLGTD: 2026 FT 99:18:53:42Z VEL: 180 KGS 190 KEAS HDOT: -1.5 FPS MAX: -21.9° -130.43 × 104.46 NON-DEPLO 6853 lbs M/S: Donald H. Peterson P16/R16/M16 NO TAL WX AOA - EDW EMU/TETHERED EVA: EVA: 4/7/83 MAX 0 = 688 TD NORM 195: 1576 FT TD NORM 195: 1576 FT TD NORM 195: 1576 FT	YED: analysis and fixes. LAUNCH SCRUBS: None. YL: LAUNCH DELAYS: TAL WX: Dakar no go - haze. FLIGHT DURATION CHANGE: None.
RP01 - 1 F. Story Musgrave P15/R15/M15 (TAL Lighting) AIM PT: CLOSE IN CENTER WAS 2011 ET-8 MAX: -21.9° ANCILLARY M/S: NO TAL WX P16/R16/M16 AOA - EDW VEL: 180 KGS 190 KEAS P16/R16/M16 ANCILLARY P16/R16/M16 ANCILLARY EMU/TETHERED EVA: EVA: 4/7/83 MAX 0 = 688 TD NORM 195: 1576 FT TD NORM 195: 1576 FT TD NORM 195: TD NORM 195: FT FT FT FT	<u>'L</u> : <u>LAUNCH SCRUBS</u> : None. <u>'L</u> : <u>LAUNCH DELAYS</u> : None. <u>TAL WX</u> : Dakar no go - haze. <u>FLIGHT DURATION CHANGE</u> : None.
IN OFFT FRC9-1 P15/R15/M15 INE Lighting) AIM P1: CLOSE IN OLIVIENT ETO MAX: -21.9° 6853 lbs FRC9-1 P15/R15/M15 TAL - DAKAR NO TAL WX MLGTD: 2026 FT 99:18:53:42Z VEL: 180 KGS 190 KEAS HDOT: -1.5 FPS MAX: -21.9° -21.9° ANCILLARY 2263 lbs EMU/TETHERED EVA: EVA: 4/7/83 MAX 0 = 688 TD NORM 195: 1576 FT TD NORM 195: 1576 FT FT FT FT	LAUNCH SCRUBS: None. 'L: LAUNCH DELAYS: None. TAL WX: Dakar no go - haze. FLIGHT DURATION CHANGE: None.
INC 9 - 1 In Dirk 13/k13/k13 TAL - DAKAR NO TAL WX MLGTD: 2026 FT 99:18:53:42Z VEL: 180 KGS 190 KEAS HDOT: -1.5 FPS IN OTAL WX ANCILLARY EMU/TETHERED EVA: EVA: 4/7/83 MAX Q = 688 TD NORM 195: 1576 FT TD NORM 195: 1576 FT ANCILLARY ANCILLARY	<u>IAUNCH DELAYS</u> : None. <u>TAL WX</u> : Dakar no go - haze. <u>FLIGHT DURATION CHANGE</u> : None.
M/S: NO TAL WX 99:18:53:42Z ANCILLARY 2263 lbs Donald H. Peterson AOA - EDW AOA - EDW 190 KEAS 190 KEAS 190 KEAS 2263 lbs 2263 lbs 2463 lbs	TAL WX: Dakar no go - haze. <u>FLIGHT DURATION CHANGE</u> : None.
Donald H. Peterson P16/R16/M16 AOA - EDW AOA WX - NOR EOM - EDW VEL: 180 KGS 190 KEAS HDOT: -1.5 FPS 2263 lbs 2263 lbs EMU/TETHERED EVA: EVA: 4/7/83 MAX Q = 688 TD NORM 195: 1576 FT TO NORM 195: 1576 FT SHUTTLE SHUTTLE	TAL WX: Dakar no go - haze. FLIGHT DURATION CHANGE: None.
P16/R16/M16 AOA WX - NOR EOM - EDW 190 KEAS HDOT: -1.5 FPS 190 KEAS RETURNED: EMU/TETHERED EVA: EVA: 4/7/83 MAX Q = 688 TD NORM 195: 1576 FT Image: 4/7/83 RETURNED: 9462 lbs 9462 lbs	FLIGHT DURATION CHANGE: None.
<u>EMU/TETHERED EVA:</u> <u>EVA</u> : 4/7/83 <u>MAX Q</u> = 688 <u>TD NORM 195</u> : <u>1576 FT</u> <u>9462 lbs</u> <u>SHUTTL F</u>	FLIGHT DURATION CHANGE: None.
<u>EW0/TETHERED EVA</u> : <u>EVA</u> : 4/7/83 <u>MAX Q</u> = 688 <u>TD NORM 195</u> : <u>1576 FT</u> <u>INANA O</u> SHUTTLE	
EVA: 4/7/83 MAX Q = 688 1576 FT SHUTTLE	FIPSTS'
	FIRSTS:
EV1-Musgrave M = 1.47	
00-18-53-547 WEIGHTS:	- First flight of OV-099.
DEPLOYED: VEL: 146 KGS	 First flight with HUD. First EVA on Shuttle Program.
EVA HARDWARE MECO: BRK INIT: 136 KGS	- First use of LWT ET.
CHECKOUT 8:19.4 MET	
AVE BRK DECEL:	SIGNIFICANT ANOMALIES:
MCC FCR-2 (2) ET SEP: 7.3 FPS/S	- TDRS deploy at MET 10:00:01 (Rev 6). IUS problem
FLIGHT DIRECTORS: 8:37.55 MET WHEELS STOP: PERFORMA	
Ascent - J. H. Greene 99:18:54:31Z MARGINS (L	
Orb/Ent - G. E. Coen <u>OMS-1</u> : 9270 FT First crew to man Challenger. Seated are CDR FPR: 5720	attitude thrusters.
Ld/Orb - H. M. Draughon 10:19.6 MET Planning - B. R. Stone 139.6 Seconds ROLLOUT: Peterson/MS (left) and PLT Bobko. Standing are FUEL BIAS: FINAL TDDP	
MOD E E Kranz	
49 SEC	- Humidity separator failed (6 wires shorted).
43:37.6 MET WIND:	- High flow on 02 and N2 systems
119.1 Seconds 21H, 5L KNOTS M 3 EOM ET RPT TURS-AVIOS-	- WCCU A & B failed.
OFFICIAL: 12H, 3L 237K ANCH LARY:	- GPC 2 failed.
DENCALE 2177 FT WEIGHT: 40:19 WEI	- Teleprinter failed.
DENOTIEL SITTE 190627 ET DD/UD DECKBI	CK) - WMS slinger failed on day 5.
ILLI DURATION. V.CC. 1000.7 222/	- CRT-3 failed. - Gas path through putty on both SRM nozzle-to-case
120-32-42 MET	YS joints.
LANDING VELOCITY LADANESE	Jointo.
<u>S/T:</u> 29:16:26:38 ET IMPACT 25756 FPS SNOWEI AC	IFM
WEICHT, LAT, SNOWLARD	- Removed and stowed CCTV monitors.
<u>OV-099:</u> 5:00:23:42 190330 28.3°S <u>RANGE</u> 3 CRYO TAN	
LONG: 4056 NM SETS	
S06-10-417: First Shuttle EVA: Musgrave (left) Peterson (right) in cargo bay. DISTANCE: 1,820,000 sm X CG: 1101.2 83.0°E	
(left) Peterson (right) in cargo bay. 1,820,000 sm	

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		CREW (5)	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT NO.	ORBITER		LIFTOFF TIME, LANDING SITES,	CROSSRANGE LANDING TIMES	EMERG THROTTLE	RSRM AND	INC	HA/HP	FSW	WEIGHTS, PAYLOADS/	(LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS,
NO.		TITLE, NAMES & EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET	110			EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
CTC 7	OV-099	CDR:	KSC 39A	WINDS EDW 15, LAKEBED	ENG. S.N. 104/104	A51/52	28.484°	STANDARD	R19/T12	CARGO	KSC W/D: OPF 34, VAB 5, PAD 21=60
STS-7	Flight 2	Robert L. Crippen	169:11:33:00.33Z	(EDW 6, LKBD 3)	(109)	A01/02	20.404 (4)	INSERTION	R19/112	<u>CARGO</u> : 37124 lbs	<u>K3C W/D</u> . OPF 34, VAB 3, PAD 21=00
SEQ	Challenger	(Flt 2 - STS-1)	7:33:00 AM EDT (P)	6:56:59 AM PDT		<u>MTR</u> : STD				<u>CHARGEABLE</u> : 31893 lbs	LAUNCH POSTPONEMENTS: None.
FLT # 7		P17/R2/V1/M2	7:33:00 AM EDT (A) Saturday 1	Friday 1 6/24/83 (1)	100/104/75/104 /65	CASE: LWC	<u>START</u> : +17.5°	INSERTION ALTITUDE:			LAUNCH SCRUBS: None.
KSC 7		<u>PLT</u> :	6/18/83 (2)							<u>ANCILLARY P/L</u> : 3942 lbs	
	OMS PODS	Frederick H. Hauck P18/R17/M17	PLS - KSC	XRANGE: 738 NM	1 = 2017 (2) 2 = 2015 (2)	SWT ET-6	<u>END</u> : +41.0°	POST OMS-2 161 X 159.96 NM		<u>DEPLOYED:</u> 14949 lbs	LAUNCH DELAYS: None.
<u>PAD</u> 39A-7	LPO1 - 3		SLS - EDW	<u>ORB DIR</u> : DL (3)	3 = 2012 (2)	210	<u>MAX</u> :				<u>TAL WX</u> : Dakar go.
	RPO1 - 3 FRC9 - 3	<u>M/S 1</u> : John M. Fabian	TAL - DAKAR CLS - ROTA	<u>AIM PT</u> : NOM				<u>TELESAT</u> DEPLOY		NON-DEPLOYED: 13002 lbs	LANDING SITE CHANGE:
	11(07-5	(Rt. Rear Seat)	AOA - EDW	<u>MLGTD</u> : 2726 FT				162.21 NM		<u>RETURNED</u> : 22175 lbs	- KSC to EDW (Poor visibility at KSC).
		P19/R18/M18	AOA WX - KSC EOM - KSC	175:13:56:59Z VEL: 200 KGS				PALAPA DEPLOY			FLIGHT DURATION CHANGE:
CHAI	LENGER	<u>M/S 2</u> :	EOIVI - KSC	202 KEAS HDOT: -1.1 FPS				162.61 NM		<u>SHUTTLE</u> <u>ACCUMULATED</u> WEIGHTS: DEPLOYED:	- Extended 1 day from 5 to 6 days plus 2 revs to land
(·	1.	Sally K. Ride	MAX Q = 701					crew: In rear (WEIGHTS: DEPLOYED:	at EDW.
		(Center Seat) P20/R19/F1	M = 1.56	<u>TD NORM 195</u> : 3356 FT				le veteran re-fli		67080 lbs NON-DEPLOYED:	FIRSTS:
			SRB SEP:	<u>NLGTD</u> : 6843 FT	U.S.Femal			Front: Ride/MS	(1st	96260 lbs CARGO TOTAL:	- First flight with 5 crewmembers.
927		<u>M/S 3</u> : Norman E. Thagard	2:06.2 MET	175:13:57:19Z						192978 lbs	 First US flight with female astronaut. First payload deployed and retrieved same flight
A DUAN	HAUKER P	(Middeck Seat)	MECO:	VEL: 158 KGS HDOT: -5.1 FPS	2.	00 m 00 0	gen I		-	PERFORMANCE MARGINS (LBS):	(SPAS-01).
		P21/R20/M19	8:20.1 MET	<u>BRK INIT</u> : 125 KGS		n. N.	(STORAL CHARMAN	192	FPR: 5539 FUEL BIAS: 1603	- First PROX OPS and reberthing of payload (SPAS-
			ET SEP:		TOT REALEMENT	Lander and Literation	o no access	and States	e.ka	FINAL I DDP: 2940	- First flight with Ku-band antenna (Ku-band not used).
		MCC FCR-2 (3)	8:38.2 MET	AVE BRK DECEL: 3.6 FPS/S		200		All the second s	ранная	RECON: 2021	- First planned landing at KSC. - First PROX OPS (with SPAS-01).
		FLIGHT DIRECTORS:	OMS-1:	WHEELS STOP:		-	1-1/2			<u>PRIMARY</u> : TELESAT-F/	- FIISLEROA OFS (WILLI SPAS-01).
		Ascent - J. H. Greene	10:20.2 MET	175:13:58:14Z		Mar and			14	PAM-D (ANIK-C) DEPLOYED	EVENTS: - TELESAT-F deployed on rev 4.
		Ld/O1 - T. W. Holloway Orbit 2 - J. T. Cox	139.5 Seconds	13176 FT	17.00	18 27			1	PALAPA-B1/PAM-D	- PALAPA-B1 deployed on rev 15.
	No.	Plng - L. S. Bourgeois	<u>OMS-2</u> :	ROLLOUT: 10450 FT	10-10	Contraction of the	3		L-	DEPLOYED	
		Entry - G. E. Coen MOD - E. F. Kranz	44:30.2 MET 120 Seconds	75 SEC	- Frank		1			SPAS-01 DEPLOYED AND RETRIEVED	SIGNIFICANT ANOMALIES: - Reduced cabin pressure demonstration (10.2 PSIA).
				WIND:		ETRPT		DEORBIT		CFES, MLR	- Bus-tie demonstration post-landing fired one set of
			E Frank	9H, 8R KNOTS OFFICIAL: 10H, 3R	<u>M 3 EOM</u>	233K 46:20 MET		159 X		OSTA-2: (MPE,MEA,MAUS)	PYROS for MLG uplock release. - WCCU A. B and C failed.
			1000	<u>DENS ALT</u> : 3000 FT	WEIGHT:			154 NM		GAS-G002,G305, G009,G033,G088,G012	- WCCU C and E wall units failed.
					204340	<u>ET BR/UP</u> 188K		VELOCITY		AND G345	 Right braking system damaged. APU 3 underspeed shutdown on-orbit.
	12/20			FLT DURATION: 6:02:23:59	X CG: 1089.8	47:18 MET		25771 FPS		ANCILLARY:	- Locker and cabin door misalignment problems.
P. B.	BON .			146:23:59	LANDING	T/V OFF		RANGE		MLR CFES (MID-DECK) GAS (7) BAYS 2-5	 Right inboard MLG brake damage. Challenger window replaced after orbital debris
4		A MARKED		<u>S/T</u> : 35:18:50:37				4042 NM		GAS (7) BAYS 2-5 STUDENT EXP.	impact.
		S83-36179 Gene		<u>OV-099:</u> 11:02:47:41	WEIGHT:	ET IMPACT				3 CRYO TK SETS	
		esworth/MOD in ba		11:02:47:41	204043	<u>LAT</u> : 28.35°S				RMS 4 (S.N. 201)	
		os/FIDO. Rt Bottom astronaut Gordon (DISTANCE:	X CG: 1091.2	LONG:				Deployed and retrieved SPAS-01	
- chuc		ustroniuut Gordon (ocopor.	2,220,000 sm		83.7°E				SPAS-01	

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		00504		LANDING SITE/	SSME-TL						
		CREW (5)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(5)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
				WINDS	ENG. S.N.					01000	
STS-8		CDR:	KSC 39A	EDW 22, CONC (EDW 7, CONC 4)	100/104	A53/54	28.488		R19/T12	<u>CARGO</u> : 30076 lbs	<u>KSC W/D</u> : OPF 26, VAB 4, PAD 25 = 55
	Flight 3		242:06:32:00.009Z	248:07:40:43Z	(104)		(5)	INSERTION			LAUNCH POSTPONEMENTS:
SEQ	Challenger	(FLT 2 - STS-2)	2.13.00 AN EDT (I)	12:40:43 AM PDT	100//01	<u>MTR</u> : HPM	CTADT			<u>PAYLOAD</u> CHARGEABLE:	- 8/4/83 launch postponed 26 days to 8/30/83 due to
FLT # 8		P22/R4/V2/M4	2:32:00 AM EDT (A)	Monday 1	100/69/	CACE, CTD	<u>START</u> : -36.2°	INSERTION		<u>CHARGEABLE</u> : 25790 lbs	removal of TDRS-B from flight (IUS not ready because of
		PLT:	Tuesday 1 8/30/83 (1)	9/5/83 (1)	100/65	<u>CASE</u> : STD	-30.2	<u>ALTITUDE</u> :			problem on STS-6) and time required to checkout TDRS-
KSC 8		Daniel C. Brandenstein	0/30/03 (1)	XRANGE: 519 NM	1 = 2017 (3)	LWT-2	END:	POST OMS-2		<u>DEPLOYED</u> : 7445 lbs	A on orbit. 26-day slip.
	OMS PODS	P23/R21/M20	LAUNCH WINDOW:		2 = 2017 (3) 2 = 2015 (3)	ET-9	+29.4°	161.07 X			
<u>PAD</u> 39A-8	LP01 - 2	1 2 3/132 1/19/20	41 Minutes	ORB DIR: DL (4)	3 = 2013(3) 3 = 2012(3)	L1-7	TZ 7.4	160.14 NM		NON-DEPLOYED:	LAUNCH SCRUBS: None.
39A-8		M/S 1:	+1 minutes		5 - 2012 (5)		MAX:	100.14 100		13179 lbs	LAUNCH DELAYS:
	FRC9 - 2	Guion S. Bluford, Jr.	(INSAT Dply Rev 18)	<u>AIM PT</u> : NOM				INSAT DEPLOY		ANCILLARY: 5166 lbs	- 00H17M delay because of thunderstorms in launch
		(Center Seat)	(<u>MLGTD</u> : 2793 FT				159.18 NM		5166 lbs	area.
		P24/R22/M21	PLS - EDW	248:07:40:43Z						RETURNED:	TAL W/V. Dakar ga
			SLS - KSC	VEL: 196 KGS			10 50			22631 lbs	<u>TAL WX</u> : Dakar go.
		<u>M/S 2</u> :	TAL - DAKAR	195 KEAS HDOT: -1.2 FPS						SHUTTLE	FLIGHT DURATION CHANGE: None.
		Dale A. Gardner	NO TAL WX	11001. 1.211 3						ACCUMULATED	
			AOA - EDW	TD NORM 195:				201		WEIGHTS:	FIRSTS:
	and a second	P25/R23/M22	AOA WX - NOR	2793 FT		67	4	-		<u>DEPLOYED</u> : 74525 lbs	 First Shuttle night launch. First Shuttle night landing.
		N/O 0	EOM - EDW	<u>NLGTD</u> : 5515 FT		1 100		INSI TOTAL		NON-DEPLOYED:	 First Shattle hight failuling. First flight to use TDRS for communications (test
	1	M/S 3:	MANO 701	248:07:40:50Z	6	E ANT	E			114605 lbs	mode).
		William E. Thornton	<u>MAX O</u> = 701 M = 1.53	VEL: 177 KGS		AN CO MAN	See 9	All		CARGO TOTAL:	 First flight to use Ku-band communications.
CH	LLENCER	(Middeck) P26/R24/M23	11 = 1.53	HDOT: -4.3 FPS				A C		223054 lbs	- First flight using SRM HPM.
240	and ar	P20/R24/IVI25	SRB SEP:	BRK INIT: 154 KGS		Na a	No.			PERFORMANCE	- Bluford became the first African-American to fly in
	PHONE TO	MCC FCR-2 (4)	2:04.34 MFT		RA					MARGINS (LBS):	space. He was selected in the first class of Space
				AVE BRK DECEL: 6.9 FPS/S						FPR: 6756 FUEL BIAS: 780	Shuttle astronauts.
		FLIGHT DIRECTORS:	MECO:	6.9 FPS/S			_		_	FINAL TDDP: 14863	EVENTS:
				WHEELS STOP	S83-317	24 Crew: I	-ront ro	w (It to rt) PL	1	RECON: 15735	- Tile survey of Orbiter bottom made using RMS End
		Orbit 1 - B. R. Stone		<u>WHEELS STOP:</u> 248:07:41:33Z				Bluford/MS (1	st	<u>PRIMARY:</u> INSAT-1B/PAM-D	Effector TV camera.
			<u>ET SEP</u> :	12164 FT				ace). Back ro	w (lt	INSAT-1B/PAM-D	- INSAT-1B deployed on rev 27.
			8:59.66 MET		to rt): Ga	rdner/MS & ⁻	Thorton	/MS.		(DEPLOYED)	
		MOD - E. F. Kranz		<u>ROLLOUT</u> : 9371 FT			r	•	·	RMS/PDRS/PFTA	SIGNIFICANT ANOMALIES:
			<u>OMS-1</u> :	50 SEC		S83-36307 -		-	.9	PIPE EXPERI-	- Completed all 54 DTO's and DSO's planned for flight.
			10:41.7 MET		INSAT P	/L in prep at	KSC		-	MENT, 2 BOXES	- Hydraulic circulation pump 2 failed
The second second	-		138.8 Seconds	WIND:				and the second s		COVERS).	- GPC-1 failed to sync (recovered OK)
		100	<u>OMS-2</u> :	7H, 0X KNOTS OFFICIAL: 5H, 2L		ET RPT		6		RMS/PDRS/PFTA DFI PALLET (HEAT PIPE EXPERI- MENT, 2 BOXES OF POSTAL COVERS), RME EXP, EOM	- WCCW A wall unit failed, B&E noisy.
	1.00		<u>0MS-2</u> : 44:51.7 MET	OT FIGIAL, JEL	M 3 EOM	241K			(···)	ANCILLARY:	- CCTV C command problems & out of focus. - CCTV D failed.
			116.5 Seconds	<u>DENS ALT</u> : 3600 FT		46:30 MET				CFES (MIDDECK)	- TAGS failed.
Const 1	1	Sector.	110.0 0000000		WEIGHT:	10.00 IVIE I				GAS (3) BAYS 2-8	- Rt outboard brake had 3 cracked washers and right
				FLT DURATION: 6:01:08:43	204141	ET BR/UP		OK T		GAS (4) BAY 5 BIO-FEEDBACK	inboard had one cracked washer.
				145:08:43	N 00	223K				ANIMAL	- Nose gear thruster piston found on runway.
		R			X CG:	47:01 MET				ENCLOSURE POSTAL COVERS	- LH and RH SRB nozzles experienced off-nominal
Sand an and				<u>S/T</u> : 41:19:59:20	1090.4		L			POSTAL COVERS	erosion.
602.07	154 180 0	enter Director		01/-000-	LANDING	<u>ET IMPACT</u>		<u>DEORBIT</u>		3 CRYO TK SETS	- SRB nozzle erosion was found after recovery.
				<u>OV-099:</u> 17:03:56:24	LANDING	<u>LAT</u> :		118 X		RMS 5 (S.N. 201)	- RH mid window (W5) pitted.
		ne MOCR. Gene			WEIGHT:	28.4°S		116 NM			RADIATORS DEPLOYED #6 (for 2 days)
		sion Ops is in		DISTANCE: 2,220,000 sm	203945	LONG:		VELOCITY		USED FOR	INDINIONS DEFLUTED #0 (101 2 Udys)
		or Jay Greene is		2,220,000 SM		81.5°E		25649 FPS		PFTA OPS	
at right	. Others not	identified.			X CG: 1091.9			<u>RANGE</u> 4044 NM			
								4044 INIVI			

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		CREW		LANDING SITE/	SSME-TL	CDD		ODDIT			
FLT	ORBITER	(6)	LAUNCH SITE, LIFTOFF TIME.	RUNWAY, CROSSRANGE	NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-9	OV-102	CDR:	KSC 39A	WINDS EDW 17, LAKEBED	ENG. S.N. 104/104	A55/60	57.028°	STANDARD	01-2	CARGO:	<u>KSC W/D</u> : OPF 82 (2), VAB 12 (3), PAD 34 (2) = 128 days
(STS 41-A)	Flight 6	John W. Young	332:15:59:59.99Z	(EDW 8, LKBD 4)	(107)	1133/00	(1)	INSERTION	(1)	<u>CARGO</u> : 33264 lbs	
S/L1	Columbia	(FLT 2 - STS-1)	11:00:00 AM EST (P)	15:47:24 PM PST		MTR:				PAYLOAD	LAUNCH POSTPONEMENTS:
	Spacelab 1	P27/R1/V3/M1	11:00:00 AM EST (A) Monday 3	Thursday 1	100/104/ 78/104/65	HPM	<u>START</u> : -58.0°	INSERTION ALTITUDE:		CHARGEABLE: 33131 lbs	-10/30/83 Launch postponed 29 days to 11/28/83. Rolled back from pad and changed SRB nozzles
SEQ FLT # 9	LM (1)	PLT:	11/28/83 (3)	12/8/83 (1)		CASE:	-30.0	ALTTODE.			subsequent to STS-8 excessive nozzle erosion. 29-day
1 L 1 7 7		Brewster H. Shaw, Jr.		<u>XRANGE</u> : 69 NM	1 = 2011 (1)	STD		POST OMS-2		<u>PAYLOAD</u> <u>WEIGHT</u> :	slip.
KSC 9	OMS PODS LVO1 - 6	P28/R25/M24	LAUNCH WINDOW: 14 Minutes	<u>ORB DIR</u> : DL (5)	2 = 2018 (1) 3 = 2019 (1)	LWT-4	-79.0°	136.75 X 132.79 NM		33,131 lbs (includes 870 lbs	LAUNCH SCRUBS: None.
<u>PAD</u>	RV01 - 6	<u>M/S 1</u> :	(TAL Lighting)	<u>AIM PT</u> : NOM		FT 11	<u>MAX</u> : -79.9°			cryo tank)	LAUNCH DELAYS: None.
39A-9	FRC2 - 6	Owen K. Garriott P29/R26/M25	TAL - ZARAGOZA	<u>MLGTD</u> : 1649 FT		ET-11	- 19.9			DEPLOYED: 0 lbs	TAL WX: Zaragoza no go - winds, Koln-Bonn no go -
			PLS - EDW	342:23:47:247	Contraction of the second	2620	4	13 19	1		clouds.
1.073		<u>M/S 2</u> :	SLS - NOR	VEL: 200 KGS 185 KEAS	p C			Se Maria		<u>NON-DEPLOYED</u> : 32261 lbs	
A COL	HAD - MANY - O	Robert A. R. Parker P30/R27/M26	TAL - ZARAGOZA IN PLANE TAL -	HDOT: -1.7 FPS		1	2	1-10		<u>MIDDECK</u> : 0 lbs	FLIGHT DURATION CHANGE: - Flight extended 1 day for additional science.
		1 30/1127/10/20	COLOGNE/BONN	TD NORM 195:	10 -		97				- Landing delay 5 revs after GPC 1 and GPC 2 hard
	100.0	<u>P/S 1</u> :	AOA - NOR	749 FT	Rev 6			9	(<u>RETURNED</u> : 32394 lbs	failures
1.		Byron K. Lichtenberg P31/R28/M27	AOA WX - NONE	<u>NLGTD</u> : 5897 FT	C.				11		- Total extension - 1 day + 5 revs.
		F 3 1/KZ0/WIZ /	<u>MAX Q</u> = 676	342.23.47.377	AL.		(D).,	MRS	h	<u>SHUTTLE</u> ACCUMULATED	FIRSTS:
Car		<u>P/S 2</u> :	M = 1.52	VEL: 146 KGS HDOT: -9.9 FPS		100			3	WEIGHTS:	 First flight with 6 crewmen. First flight of Spacelab after Spacelab only
- Mino	ia · Spacela	Ulf Merbold (Germany)		BRK INIT: 126 KGS			2 - C	3 Cal		<u>DEPLOYED</u> : 74525 lbs	modifications to OV-102.
		P32/R29/M28	<u>SRB SEP</u> : 2:06.24 MET		AL AND	#				NON-DEPLOYED:	- First flight with non-astronauts (P/S) and first non-
				AVE BRK DECEL: 6.8 FPS/S	PH-1				1.60	147736 lbs CARGO TOTAL:	Americans. - First use of two shifts of 12 hours (red and blue shifts).
		MCC FCR-2 (5)	MECO:							256318 lbs	- First flight with galley and sleep station.
		FLIGHT DIRECTORS:	8:29.18 MET	WHEELS STOP: 342:23:48:17Z				mber crew, fi	rst	PERFORMANCE	- First flight with 3 substack fuel cells.
		Ascent - J. H. Greene	ET SEP:	10105 FT	non-astro					<u>MARGINS (LBS)</u> : FPR: 5404	SIGNIFICANT ANOMALIES:
		Ld/Orb 1 - C. R. Lewis	8:47.32 MET	ROLLOUT:				ttle veteran (C lentified in Co		FUEL BIAS: 1084	- GPC SV time tag to S/L incremented by 1 day.
		Orb 2 - J. T. Cox Orb 3 - L. S. Bourgeois	OMS-1:	8556 FT	- oung/re	ingrit.			. 0.	FINAL TDDP: 841 RECON: -411	- Ku-band TWT failed to come on (low temp problem). - Spacelab RAU 21/cooling problem.
		Team4/Ent - G. E. Coen	10:29.3 MET	(10105 FROM THRESHOLD)						SPACELAB-1/LM	- Excessive GH ₂ in water.
	VIII		68.5 Seconds	53 SEC						SPACELAB 1	- S-band power amp no. 2 failed.
			OMS-2:	WINDS:						WITH 73 EXP:	- Noises and oscillations reported by crew. - GPC 1 hard failure GPC 2 failure, re-IPL'ed, memory
18/10		A BALL A	40:37.4 MET	0 H/T, O X KNOTS OFFICIAL: 1T, OX	M 3 EOM					- ASTRONOMY - SOLAR PHYSICS	altered, failed again at NLG contact (delayed landing 7-
			101.6 Seconds	, .		<u>et</u>		<u>DEORBIT</u>		- SPACE PLASMA	3/4 hours).
Contract in				<u>DENS ALT</u> : 1900 FT	WEIGHT: 220288	<u>BR/UP</u> 199K		129 X 124 NM		- ATMOSPHERIC PHYSICS	- IMU 1 failed (power supply failure). - APU 1 and 2 hydrazine leak/fire shutdown after landing
	La Cal	83 A		FLT DURATION: 10:07:47:24	220200	1:01:00		124 10101		- EARTH	(APU 1 and 2 damaged).
The states				247:47:24	X CG: 1085.8			<u>VELOCITY</u>		OBSERVATIONS - LIFE SCIENCES	- Right outboard brakes damaged.
1 alla				S/T: 52:03:46:44	LANDING	ст		25696 FPS		- MATERIAL SCIENCES	 LH OMS pod TPS damage during entry. Mission extended one day. 8 hours extension to
ACA!	PA =				LANDING	<u>ET</u> IMPACT		RANGE			analyze GPC and IMU failures.
	N	No Mali		<u>OV-102</u> : 34:23:50:20	WEIGHT:	LAT:		4349 NM		5 CRYO TANKS NO RMS	- LH OMS pod removed for repair after burn-through (missing tile).
s9-32-1	112 First f	light of Spacelab			220027	59.96°S LONG:					
	acelab only n	nodifications to OV-		DISTANCE: 3,330,000 sm	X CG: 1087.1	<u>LONG</u> : 149.9°E					RADIATORS DEPLOYED #7 (stowed for 34 hours)
102.											

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		CREW	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(5)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-11 (STS 41-B) SEQ FLT # 10 KSC 10 PAD 39A-10	OV-099 Flight 4 Challenger <u>OMS PODS</u> LPO1 - 4 RPO1 - 4 FRC9 - 4	CDR: Vance D. Brand (FLT 2 - STS -5) P33/R9/V4/M9 PLT: Robert L. Gibson P34/R30/M29 <u>M/S 1:</u> Bruce McCandless II P35/R31/M30 <u>M/S 2:</u> Ronald E. McNair P36/R32/M31 <u>M/S 3:</u> Robert L. Stewart P37/R33/M32 UNTETHERED EVA'S <u>MMU:</u>	KSC 39A 34:12:59:59:998Z 8:00:00 AM EST (P) 8:00:00 AM EST (A) Friday 1 2/3/84 (1) <u>LAUNCH WINDOW:</u> 13 Minutes (PALAPA SUN SHIELD FAIL OPEN) PLS - KSC SLS - EDW TAL - DAKAR NO TAL WX CLS - KSC CLS - EDW AOA - EDW AOA WX - NOR EOM - KSC	KSC 15 (KSC 1) 7:15:55 AM EST Saturday 3 2/11/84 (1) <u>XRANGE</u> : 524 NM <u>ORB DIR</u> : DL (6) <u>AIM PT</u> : CLOSE IN <u>MLGTD</u> : 1930 FT 42:12:15:55Z VEL: 198 KGS 196 KEAS HDOT: -2.0 FPS <u>TD NORM 195</u> : 2020 FT <u>NLGTD</u> : 5789 FT 42:12:16:067	100/104 109 100/73/ 100/65 1 = 2109 (1) 2 = 2015 (4) 3 = 2012 (4) <u>M 3 EOM</u> WEIGHT: 201529 X CG: 1087.9 LANDING	<u>CASE:</u> MWC LWT-3	28.486° (6) <u>START</u> : -26.9° <u>END</u> : +4.5° <u>MAX</u> :	STANDARD INSERTION ALTITUDE: POST OMS-2 165.88 X 164.61 NM PALAPA DEPLOY 166.48 NM WESTAR DEPLOY 153.52 NM DEORBIT 157 X 145 NM	0I-2 (2)	CARGO: 33868 lbs CHARGEABLE: 28252 LBS DEPLOYED: 15073 LBS NON-DEPLOYED: 10198 lbs ANCILLARY: 2981 lbs RETURNED: 18795 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 89598 lbs NON-DEPLOYED: 89598 lbs NON-DEPLOYED: 89598 lbs	KSC W/D: OPF 52, VAB 6, PAD 21=80 LAUNCH POSTPONEMENTS: - - 1/24/84 launch was postponed 10 days to 2/3/84 because of ongoing analysis of APU failures on STS-9. 10-day slip. LAUNCH SCRUBS: None. LAUNCH DELAYS: None. TAL WX: Dakar no go - visibility. FLIGHT DURATION CHANGE: None. FIRSTS: - First use of Manned Maneuvering Unit (MMU) on EVA. - First use of Manned Maneuvering Unit (MMU) on EVA. - First use of Manned Maneuvering Unit (MMU) on EVA. - First use of Manned Maneuvering Unit (MMU) on EVA. - First use of Manned Maneuvering Unit (MMU) on EVA. - First use of Manned Maneuvering Unit (MMU) on EVA. - First use of Manned Maneuvering Unit (MMU) on EVA. - First use of Manned Maneuvering Unit (MMU) on EVA. - First use of 10.2 PSIA cabin for EVA prep. - First use of MER on RMS. - First landing at KSC. - First flight with spare GPC in locker (STS-9 GPC
Asc/Ent - C Orbit 1 - B. Ld/O2 - H. Draughon	IRECTORS: G. E. Coen . R. Stone M. . Bourgeois	EV1=McCandless EV2=Stewart EVA1=5:35/6:05 2/7/84 SS EVA #2 EVA2=6:02/6:17 2/9/84 SS EVA #3 FIRST UNTETHERED EVA's: FREE FLYER EVA's #1 & # 2 MMU CHECKOUT EVA'S	<u>MAX Q</u> = 676 M = 1.55 <u>SRB SEP</u> : 2:07.92 MET <u>MECO</u> : 8:41.42 MET	VEL: 159 KGS HDOT: -2.8 FPS <u>BRK INIT</u> : 136 KGS <u>AVE BRK DECEL</u> : 5.1 FPS/S <u>WHEELS STOP</u> : 42:12:17:02 12737 FT	WEIGHT: 201239 X CG: 1089.3	IMPACT LAT: 28.3°S LONG: 80.6°F	Landing	VELOCITY 25752 FPS RANGE 4137 NM at KSC	1	PERFORMANCE MARGINS (LBS): FPR: 5259 FUEL BIAS: 1038 FINAL TDDP: 12062 RECON: 6961 PRIMARY: WESTAR-IV/ PAM-D (DEPLOYED) PALAPA-B2 / PAM-D (DEPLOYED)	First hight with spare GPC in locker (STS-9 GPC failures reaction). EVENTS: Made Orbiter maneuver to recover foot restraint in PLB. PALAPA-B deployed on rev 6. WESTAR-IV deployed on rev 48. Saw Challenger entry trail from Houston during landing at KSC. RENDEZVOUS: Canceled planned RNDZ when IRT failed.
		rt, McNair & McCandless	ET SEP: 8:59:57 MET 10:41.6 MET 150 Seconds <u>OMS-2</u> : 45:24.6 MET 124.8 Seconds	ROLLOUT: 10,815 FEET 64 SEC WINDS: 5H, 3L KNOTS OFFICIAL: 3T, 2L DENS ALT: -200 FT FLT DURATION: 7:23:15:55 191:15:55 S/T: 60:03:02:39 OV-099: 25:03:12:19 DISTANCE: 2,870,000 sm	first unteth Manned M propelled b	ered exc aneuver backpack	ursions ing Unit, (. He flev	performed the wearing the a rocket w 320 ft from evious astronaut.		SPAS 01A MFR PLATFORM MMU (2) MMU/EMU CINEMA 360 (MID-DECK) ACES EXP. IEF EXP. RME EXP. RME EXP. ANCILLARY: IRT (DEPLOYED) GAS (5) STUDENT EXP (A.E.M.)	 SIGNIFICANT ANOMALIES: RMS wrist joint failure (RMS/SPAS-01 operations canceled). RMS used for PALAPA PKM burn witness plate ops. Left OMS POD damage from waste water dump nozzle ice (during entry). IRT failed to inflate properly after deployment (rendezvous canceled). Both SRB's lost one chute. WESTAR-IV and PALAPA-B failed to achieve desired orbit due to PAM-D nozzle failure. (Both satellites were retrieved on STS 51-A). LH SRM forward center field joint gas leak to primary O-ring with erosion. RH SRM gas leak and erosion to primary O-ring of nozzle-to-case joint. LH SRB main chute failed to inflate.

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		CREW	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(5)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
				WINDS	ENG. S.N.					04500	
••••		<u>CDR</u> :	KSC 39A	EDW 17, LAKEBED (EDW 9, LKBD 5)	104/104	BI-012	28.45°	DIRECT_	01-2	CARGO: 38266 lbs	<u>KSC W/D</u> : OPF 31, VAB 4, PAD 18 = 53
	Flight 5	Robert L. Crippen	097:13:57:59.999Z	(LDW 9, LKDD 3)	(109)	LITE	(7)	INSERTION	(3)	CHARGEABLE:	LAUNCH POSTPONEMENT:
	Challenger	(FIt 3)	8:58:00 AM EST (P) 8:58:00 AM EST (A)	5:38:07 AM PST	100/104/	<u>MTR</u> : HPM	CTADT.			33831 lbs	$- \frac{4}{4}$ /84 launch postponed 2 days to $\frac{4}{6}$ /84 to upgrade
050		(STS-1 & STS-7) P38/R2/V1/M2	Friday 2	Friday 2	67/104/	CASE:	<u>START</u> : -18.1°	252 NM DIRECT		DEPLOYED:	- 4/4/84 launch postponed 2 days to 4/6/84 to upgrade OMS pod TPS (STS 41-B problem during entry). 2-day
SEQ	OMS PODS	PLT:	4/6/84 (3)	4/13/84 (3)	65	MWC	-10.1	INSERTION		21396 lbs	slip.
	LPO3 - 1	Francis R. Scobee	1001 (3)	XRANGE:	00	WIWO	END:	INSERTION		NON-DEPLOYED:	LAUNCH SCRUBS: None.
	RPO1 - 5	P39/R34/M33	LAUNCH WINDOW:	381 NM	1 = 2109 (2)	ET-12	+12.0°	251.6 X 115.4		12394 lbs	
10011	FRC9-5	<u>M/S</u> :	~3.5 MINUTES	ORB DIR: DL 7	2 = 2020 (1)	LWT-5		NM		<u>MIDDECK</u> : 41 lbs	LAUNCH DELAYS: None.
PAD		Terry J. Hart	(PLANAR	UKD DIK. DL 7	3 = 2012 (5)		<u>MAX</u> :				TAL WX: Dakar no go - low clouds.
39A-11		P40/R35/M34	WINDOW/ET	<u>AIM PT</u> : NOM		<u>ET RPT</u>		<u>DEORBIT</u>		RETURNED: 16870 lbs	
	-	<u>M/S</u> :	FOOTPRINT NEAR	MI CTD. 1010 FT		246K		268 X			FLIGHT DURATION & LANDING SITE CHANGES: - Extended flight 1 day to replan use of RMS to grapple
JUNN HO	A DELET	James D. van Hoften	HAWAII)	<u>MLGTD</u> : 1912 FT 104:13:38:07Z		1:22:15		265 NM		<u>SHUTTLE</u> ACCUMULATED	- Extended flight 1 day to replan use of RMS to grapple SMM after TPAD docking failure. - Extended flight 1 rev to land at EDW because of
131	SIC	P41/R36/M35		VEL: 220 KGS	<u>M 3 EOM</u>	MET				WEIGHTS	- Extended flight 1 rev to land at EDW because of unacceptable weather (overcast) at KSC.
11 121		<u>M/S</u> : George D. Nelson	PLS - KSC SLS - EDW	213 KEAS	WEIGHT:	ET BR/UP		VELOCITY 25998 FPS		DEPLOYED:	- Total extension: 1 day+ 1 rev.
2472		P42/R37/M36	TAL - DAKAR	HDOT: -1.5 FPS	197170	228K		20770113		110994 lbs NON-DEPLOYED:	,
		2/10//100	TAL WX - ROTA	TD NORM 195:	.,,,,,,	1:22:45		RANGE		173350 lbs CARGO TOTAL:	FIRSTS: - First flight to use direct insertion.
CORPENS	TROBER	UNTETHERED EVA'S	AOA - EDW	3505 FT	X CG: 1100.0	MET		4090 NM		328452 lbs	- First rendezvous/satellite repair flight. - First use of TPAD. Nelson used MMU to translate to
		(MMU):	AOA WX - NOR	NLGTD: 7167 FT						PERFORMANCE	- First use of TPAD. Nelson used MMU to translate to
		EV1=Nelson		104:13:38:23Z	<u>LANDING</u>	<u>ET</u> IMPACT		and the state	162	MARGINS (LBS):	SMM and attempted to dock using TPAD. TPAD failed to fire because a thermal insulation button prevented it
		EV2=van Hoften	<u>MAX Q</u> = 635	VEL: 144 KGS			and a	And And	1 AL	FPR: 5052	from firing
	->		M = 1.03	HDOT: -4.6 FPS	WEIGHT:	<u>LAT</u> :	500	ALA	13/-	MARGINS (LBS): FPR: 5052 FUEL BIAS: 1038 FINAL TDDP: 995	 First grapple of satellite using RMS. First direct insertion (no OMS-1 burn).
MCC FCR-2 (EVA1=2:59/3:05 4/8/84 - SS EVA #4	SRB SEP:	BRK INIT: 110 KGS	196976	18.90°S LONG:	16		mr.	RECON: -3322	
FLIGHT DIRE		SMM TPAD DOCK ATTEMPT	2:05.57 MET	DICK INT. THE KOS	X CG: 1101.6	<u>149.9</u> °W	2 the			PRIMARY:	RENDEZVOUS 1 & 2:
Asc/Ent - G. E.		EVA2=7:07/6:30	2.03.37 WIL I	AVE BRK DECEL:	X 00. 1101.0	177.7	1	S AND		LONG DURATION	- To capture, repair, and release SMM.
Ld/O 1 - J. H. (4/11/84- SS EVA #5	MECO:	8.4 FPS/S						EXPOSURE FACILITY (LDEF)	EVENTS:
Orbit 2 - J. T. (SMM REPAIR AND RELEASE		WHEELS STOP:				- China Maria		(DEPLOYED)	 Nelson held onto solar panel during MMU ops to attempt to slow SMM rotation.
Planning - B. F				104:13:38:55Z						SMRM/FSS (RETRIEVED, REPAIRED &	- Re-rendezvous with SMM on 5th day & RMS grapple of SMM. Repair and redeploy of SMM on 6th day by van
MOD - E. F. Kr	ranz	FREE FLYER EVA'S	<u>ET SEP:</u>	10628 FT	070440	<u></u>		<u> </u>		(RETRIEVED, REPAIRED &	SMM. Repair and redeploy of SMM on 6th day by van
		#3 AND #4	8:48.9 MET	ROLLOUT:				Deployed by		RELEASED)	Hoften & Nelson. - RMS used to survery OMS pods and monitor water
-10			OMC 1.	8716 FT				amples for lo		MMLL(2)	dumps to ensure no ice chunks on nozzles.
60-			<u>OMS-1</u> : NONE	48 SEC				NASA LRC	. 10	MMU (2) MMU/EMU	
100		1 1 2 4	NUNE	WINDS:	be retriev	ed by ST	5-32 in1	990.		MER PLATFORM	ET TRACKING DTO 331/318 NEAR HAWAII - ET Reentry (tumble)-KPTC RADAR poor coverage, MOTIF unusable, CAST GLANCE - LH2 rupture 264-254 Kft debris large DV, "violent rupture."
	1		<u>OMS-2</u> :	2 H, O X KNOTS						BAY 10 CINEMA 360 I-MAX CAMERA	MOTIF unusable, CAST GLANCE - LH2 rupture
			42:54 MET	OFFICIAL: 0H, 0X			13003	ALC: NO		I-MAX CAMERA RME EXPERIMENT	264-254 Kft debris large DV, "violent rupture."
and the second			95.1 Seconds	DENS ALT: 1000 FT			AND DE				SIGNIFICANT ANOMALIES:
	322			DENS ALT: 1000 FT		1.5	2/-			ANCILLARY: STUDENT	- RH SRB main parachute failure. - WCS fan SEP 1 Iow airflow.
+ 400 .		A CONTRACTOR		FLT DURATION:		1 1				EXPERIMENTS	- WCS fan SEP 1 Iow airflow. - WCS fan SEP 2 failed.
REPART				6:23:40:07		CAR	2.0.	MA NEW CON		ACIP	- Brake damage similar to STS- 7 on left & right sides.
CO.	ANTELLIN .			167:40:07		1000	0			4 CRYO TANK	 Ku-band Rndz Radar failed self test & lost lock. RH SRB one chute failed to inflate.
	CO.	* ACE *		S/T: 67:02:42:46		2	FIINL			SETS	- RH SRB one chute failed to inflate. - RH SRM gas leak and erosion to primary O-ring
	- Mar I	AACE + HATELING								RMS 7 (S.N. 302) Used for LDEF de-	(blowby) nozzle-to-case joint.
41c-07-026		T Scobee		<u>OV-099</u> : 32:02:52:26	and a	- a bie	AUPP	1 17		Used for LDEF de-	RADIATORS DEPLOYED #8 (for one sleep period)
		en/MS, Hart/MS, &		32.02.32.20						berth, and deploy	ואטואדטאט עברנט דנט אט (וטו טוופ אפפף אפווטע)
CDR Cripp				DISTANCE:	STS	41C-38-1852	2 SSM R	epair EVA		and water nozzle and OMS pod survey	
ODIT Onpp				2,880,000 sm		Lines Manager				and Onio pou suivey	
			1	1	1					1	

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		(LANDING SITE/	SSME-TL						
		C	CREW (6)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB	(ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER		(0)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.			E, NAMES EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION,	THROTTLE PROFILE	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		α	EVAS		WINDS	ENG. S.N.						
	OV-103	<u>CDR</u> :		KSC 39A	EDW 17, LAKEBED	104/104	BI-011		<u>STANDARD</u>	01-4	<u>CARGO</u> : 47516 lbs	KSC W/D:
	Flight 1	Henry W. H		243:12:41:50Z	(EDW 10, LKBD 6)	109		(8)	INSERTION	(1)		OPF 123 (2), VAB 15 (3), PAD 72 (2) = 210
	Discovery	(Flt 2 - STS P/43/R8/V5		8:35:00 AM EDT (P) 8:41:50 AM EDT (A)	6:37:54 AM PDT	100/104/	<u>SRM</u> : HPM		INSERTION		CHARGEABLE: 41382 lbs	LAUNCH POSTPONEMENT:
SEQ		P/43/Ro/VC PLT:	/////0	Thursday 3	Wednesday 1	84/65/			ALTITUDE:			- 6/22/84 launch postponed 3 days to 6/25/84 because of
FLT # 12		Michael L.	Coats	8/30/84 (2)	9/5/84 (2)	104/65	CASE:		160 NM		DEPLOYED: 30086 lbs	debonded engine shield during FRF.
KSC 12	OMS PODS	P44/R38/M			<u>XRANGE</u> : 474 NM		LWC					
	LPO3 - 2	<u>M/S</u> :		LAUNCH WINDOW:	ORB DIR: DL 8	1 = 2109 (3)			160.8 X		NON-DEPLOYED: 10122 lbs	LAUNCH SCRUBS/PAD ABORT #1: - 6/25/84 launch scrubbed at T-20 minutes because GPC
1 //0	RPO3 - 1 FRC3 - 1	Steven A. H P45/R39/M		14 minutes thermal constraint		2 = 2018 (2)	LWT-6 ET-13		160.8 NM			5 (BFS) exhibited two parity errors at T-32 minutes.
39A-12	FRC3 - 1	P45/R39/W <u>M/S</u> :	138	SBS-D on 5A &	<u>AIM PT</u> : NOM	3 = 2021 (1)	E1-13		POST OMS-2		MIDDECK: 1174 lbs	Rescheduled launch for 6/26/84.
		Richard m.	Mullane	TELSTAR 34A EHS	<u>MLGTD</u> : 2510 FT		ET RPT		161.63 X		RETURNED:	- 6/26/84 launch aborted at T-4 seconds when SSME
		P46/R40/M		cutout	249:13:37:54Z		245K		160.95 NM		17436 lbs	#3 Main Fuel Valve failed the valve position check.
		<u>M/S</u> :			VEL: 216 KGS 200 KEAS		45:45				SHUTTLE	(PAD abort #1.) - Rolled back to VAB and re-manifested, combining
		Judith A. R		PLS - EDW	HDOT: -1.8 FPS		MET		<u>SBS DEPLOY</u> 161.43 NM		ACCUMULATED	STS 41-D and STS 41-F P/L's. SSME 2021 replaced
		P47/R41/F: <u>P/S</u> :	2	SLS - KSC TAL - DAKAR		M 3 EOM WEIGHT:	ETBR/UP		(REV 6)		WEIGHTS: DEPLOYED:	2017. Launch slip of 63 days.
		Charles Wa	alker	(Selected)	<u>TD NORM 195</u> : 2960 FT	202317	197K		(141080 lbs	- 8/29/84 launch scrubbed because MEC would not
-	LD C	(MDAC)		TAL WX - MORON			46:57		<u>SYNCOM</u>		<u>NON-DEPLOYED</u> : 184646 lbs	process certain critical events commands. Implemented a software patch to assure all 3 SRB fire commands are
STER +	200	P48/R42/M	40	AOA - EDW	<u>NLGTD</u> : 6713 FT 249:13:38:08Z	X CG: 1090.7	MET		DEPLOY		CARGO TOTAL:	issued in proper order. 69-day total slip.
1		MCC FCR-1	(5)	AOA WX - NOR	VEL: 170 KGS		ст		170.48 NM (REV 17)		375968 lbs	
	T A			EOM - EDW	HDOT: -5.6 FPS	<u>LANDING</u>	<u>ET</u> IMPACT		(KLV17)		<u>Performance</u> Margins (LBS):	LAUNCH DELAYS:
E 🧶 🖉	- E	FLIGHT DIRE		MAX Q = 611	<u>BRK INIT</u> : 107 KGS	WEIGHT:	LAT:		TELSTAR		MARGINS (LBS):	 - 6 M50 S delay at T-9 because of KSC GLS problems and two private planes in launch danger area.
AC		Asc/Ent - G. I Ld/O 1 - B. R		M = 1.26		201675	28.3°S		DEPLOY		FPR: 4987 FUEL BIAS: 1341	and two private planes in launch danger area.
1000	Comment of	Orbit 2 - J. T.			AVE BRK DECEL: 5.6 FPS/S		LONG:		174.94 NM		FINAL TDDP:-1611	FLIGHT DURATION CHANGES: None.
A WILL	Y REST	Plng - A. L. B		SRB SEP:		X CG: 1091.7	80.0°E		(REV 34)		RECON: -1564	
		MOD - E. F.		2:04.12 MET	WHEELS STOP:				DEORBIT		<u>PRIMARY</u> : SBS-D/PAM-D	<u>TAL WX:</u> DAKAR & MORON go.
1 A.		8 -0		MECO:	249:13:38:54Z 12785 FT				159 X 157 NM		(DEPLOYED)	FIRSTS:
				8:35.19 MET		41D-37-0	50 Tel	star	<u>VELOCITY</u>		TELESTAR 3-C/	- First flight of Discovery
		Contraction of the second			ROLLOUT: 10270 FT	last of thr			25776 FPS		PAM-D	- First flight to deploy 3 payloads.
5-6			41D-12-034:	ET SEP:	60 SEC	deployed			<u>RANGE</u> 4112 NM		(DEPLOYED) SYNCOM-IV-2	- First flight with commercial company P/S.
		and and	Crew	8:53 MET							(DEPLOYED)	SIGNIFICANT ANOMALIES:
		Ex.	members	OMS-1:	<u>WINDS</u> : O H/T, O X KNOTS						OAST-1/MPESS:	- CRT-2 failed (IFM replaced DU-2 with DU-4)
	A Carl and	31.34	(cc from ctr)	10:36.9 MET	OFFICIAL: 2H, 2L						SOLAR ARRAY	- Supply/waste water nozzle iced. (12 inches in diameter
		S. C.	CDR/	159.4 Seconds	DENS ALT: 3400 FT			A STATE			EXPERIMENT CFES (MIDDECK)	by 27 inches tapered to point). - Ice from supply water nozzle removed using RMS impact.
1-	1.	1	Hartsfield,	<u>OMS-2</u> :		She and					IMAX 70MM	Unable to dump waste water for remainder of flight.
1º		3	PLT/Coats,	<u>OMS-2</u> : 44:52.2 MET	FLT DURATION: 6:00:56:04	St. Sala		200			CAMERA RME	- O2 leak (30 lbs/hr).
	- All	15	MS/Hawley, MS/Resnik,	126.3 Seconds	144:56:04	NAME N					CLOUDS	- Fuel cell performance monitor failed.
	- A-F		PS/Walker,			NY SAM					STUDENT EXP. SSIP-FSA EXP.	 Vehicle pulled to right after NLGTD. Schrader valve leaking GN2 caused compressed strut.
			&		<u>S/T</u> : 73:03:38:50	State 1	Call I				4 CRYO TANK	- S-band Quad antenna (ULF) (switch was R & R'ed
		XX	MS/Mulane		<u>OV-103</u> : 6:00:56:04	779. 14		10			4 CRYO TANK SETS	postflight).
					6:00:56:04	13. 10 M	-	THE AREAST			RMS 8 (S.N. 301)	- Five microswitch anomalies in RCS & OMS.
-		ð · · ·			DISTANCE:	C TN		SUSA H	A second		Used for PKM burn	 RH SRM forward field joint erosion. LH SRM gas leak and erosion to primary O-ring of
Ch		2 Deser			DISTANCE: 2,210,000 sm	, Defe	20 and the	The second second	and the second	E.	viewing and water	nozzle-to-case joint (blowby).
E RE						All-	-		- all an	Contraction of the	dump nozzle survey and ice removal	· · · · · · · · · · · · · · · · · · ·
·					1							I

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				LANDING SITE/	SSME-TL						
		CREW	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB	(ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(7)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM	Ì		FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.	ORDITER		LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP	1011	PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
110.		TITLE, NAMES	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S		WINDS	ENG. S.N.						
STS 41-G	OV-099	CDR:	KSC 39A	KSC 33	100/104	A63/64	57.08°	STANDARD	OI-4	CARGO:	KSC W/D: OPF 53, VAB 5, PAD 22 = 80
(STS-17)	Flight 6	Robert L. Crippen	279:11:03:00Z	(KSC 2)	109	117-84	(2)	INSERTION	(2)	23465 lbs	
(010 17)	Challenger	(Flt 4 - STS-1, STS-7 & STS 41-C)	7:03:00 AM EDT (P)	12:26:38 PM EDT		BI-013	.,		. ,		LAUNCH POSTPONEMENT:
SEQ		P49/R2/V1/M2	7:03:00 AM EDT (A)	Saturday 4	100/92/			INSERTION		CHARGEABLE: 17592 lbs	- 10/1/84 launch postponed 4 days to 10/5/84 to replace
FLT # 13		PLT:	Friday 3	10/13/84 (1)	65/100/65	MTR:		ALTITUDE:			SSME #2012 with #2021 from OV-103 in slot #3. Engine
		Jon A. McBride	10/5/84 (1)			HPM				DEPLOYED: 4949 lbs	2012 had non-flight HPOTP and HPFTP. 4-day slip.
KSC 13	<u>OMS PODS</u>	P50/R43/M41		<u>XRANGE</u> : 614 NM	1 = 2023 (1)			POST OMS-2		4949 IDS	
	LPO1 - 5	<u>M/S</u> : Sally K. Ride	LAUNCH WINDOW:	<u>ORB DIR</u> : DR 3	2 = 2020(2)	<u>CASE</u> : LWC		191.74 X		NON-DEPLOYED:	LAUNCH SCRUBS: None.
<u>PAD</u>	RPO1 - 6	(Flt 2 - STS-7)	2 hours		3 = 2021 (2)	LWC		189.06 NM		11986 lbs	
39A-13	FRC9 - 6	È51/R19/V6/É1	(EOM - LANDING	<u>AIM PT</u> : CLOSE IN		11F FT		EDDC		MIDDECK	LAUNCH DELAYS: None.
		<u>M/S</u> : Kathryn D. Sullivan	KSC REV 7)			115 FT CHUTES		<u>ERBS</u> DEPLOY		MIDDECK: 657 lbs	FLIGHT DURATION CHANGES: None.
		P52/R44/F3	PLS - KSC	<u>MLGTD</u> : 962 FT 287:16:26:38Z	M 3 EOM	ON SRB'S		190 NM			FLIGHT DURATION CHANGES. Note.
1000		<u>M/S</u> :	AOA - NOR	VEL: 209 KGS		UN SKD S				<u>RETURNED</u> : 18484.8 lbs	TAL WX: ZZA no go - winds, Moron go.
ALLE		David C. Leestma	AOA WX-NOR	208 KEAS	WEIGHT:	LWT-8		DEORBIT			THE WA. EENTIG 90 Winds, Working 0.
		P53/R45/M42	TAL-ZARAGOZA	HDOT: -0.5 FPS	202829	20010		121 X		SHUTTLE	FIRSTS:
		<u>P/S</u> : Paul D. Scully-Power	TAL WX-MORON	TD NORM 195:	202027	ET-15		118 NM		ACCUMULATED	- First flight with seven crewmembers.
	E B	(Civilian - Navy)	(Selected)	2265 FT	X CG: 1083.7	-				WEIGHTS: DEPLOYED:	- First EVA by a female astronaut.
		P54/R46/M43	ÈMERGÉNCY			ET BR/UP		VELOCITY		146029 lbs	- First use of PSA.
		<u>P/S</u> :	COLOGNE-BONN	NLGTD: 5505 FT	LANDING	216K		25684 FPS		NON-DEPLOYED:	- First Flight with 360 degree saddle brakes.
Canada and State	THE REAL PROPERTY AND INCOMENT	Mark Garneau (Canadian)	AIRPORT	287:16:26:47Z VEL: 162 KGS		1:01:00				197289 lbs	- First flight with wing moment ties.
20120-000		P55/R47/M44		HDOT: -3 FPS	WEIGHT:	MET		<u>RANGE</u>		CARGO TOTAL: 399433 lbs	- First transfer of hydrazine in space.
MCC FCR-2 (8)		<u>MAX Q</u> = 716		202266			4321 NM		57755105	
	0)	EMU/TETHERED EVA:	M = 1.42	<u>BRK INIT</u> : 113 KGS	N 00 1001 0	<u>ET</u> IMPACT				PERFORMANCE	EVENTS:
FLIGHT DIRE	<u>CTORS</u>	EV1=Leestma EV2=Sullivan		AVE BRK DECEL:	X CG: 1084.8	IMPACT				MARGINS (LBS):	- Used RMS to latch SIR-B antenna.
Ascent - G. E.	الممماني	EVA1=3:29/3:27	<u>SRB SEP</u> : 2:04.5 MET	6.8 FPS/S		<u>LAT</u> : 57.1°S				FPR: 4594 FUEL BIAS: 1152	- Solar heating used to free ERBS solar array when -Y solar
O 1/Ent - T. C. Ld/O 2 - J. T. (10/11/84 - SS EVA #6	2:04.3 IVIE I			57.1 S LONG:				FINAL TDDP: 2194	array stuck during deploy attempt. MS2 tried deploy using SSP appendage arm and deploy switches, tb's functioned
Plng - G. A. Pe	nnington	DEMO ON ORBIT	MECO:	WHEELS STOP: 287:16:27:32Z		<u>150.0°</u> E				RECON: 3375	nominally but array did not deploy. Could not shake array
MOD - E. F. Kr		REFUELING SYSTEM UNSCHEDULED	8:50.34 MET	287:16:27:322 11527 FT		130.0 L					loose using RMS back-drive procedure. ERBS was
		KU-BAND ANTENNA STOW	0.50.54 MET	1152711						EARTH RADIATION BUDGET	positioned to direct sun on array deploy mechanism. Array
			<u>ET SEP</u> :	ROLLOUT:	- THE		V.1	and the	-	SATELLITE (ERBS)	deployed approximately 15 minutes later.
S84-4343	3 EVA: I	_eestma, left, &	9:08.41 MET	10527 FT					1	DEPLOYED	
		nan to conduct EVA.		54 SEC		n	10-10	APPL	12	OSTA-3 (SIR-B)	SIGNIFICANT ANOMALIES:
			<u>OMS-1</u> :	WINDS:					-	MAPS, FILE LFC-MPESS	- Found TPS screed problem postflight. Tile waterproofing
10			10:50.4 MET	8 H, O X KNOTS	A CONTRACT				and the second	ORS	caused screed deterioration requiring approx 4000 tiles to
		114 Francisco Contraction of the second seco	130.6 Seconds		100	100000	100 · 6		AT I	IMAX, RME	be replaced. Schedule impacted and OV-103 replaced
		and a state	0.10.0	OFFICIAL: 8H, 0X			12 1 10		-	CANEX (Canadian) APE, TLD	OV-099 on STS 51-A.
	-		<u>OMS-2</u> :	<u>DENS ALT</u> : 1100 FT		P BA	S Law	400	-	GAS (8)	- FES shutdown by both controllers, probably icing in FES
			60:30.4 MET 144.6 Seconds			-		4		G038, G032, G518,	CORE. - DEU 2 Failed.
MCK NOT			144.0 Seconds	FLT DURATION:			1		18	G013, G007, G469,	- DEU 2 Falled. - TPS damage on ROMS pod, approx 40-inch strip of FRSI
	- Contraction			8:05:23:38 197:23:38	and the			N/ASIA	1	G074	peeled off.
STORE & COM	1 Viet							63 A		4 CRYO TANK	- Ku-Band antenna gimbal failure (beta angle motor short).
and the second				<u>S/T</u> : 81:09:02:28	41-G-19-	006 Cı	ew: CD	R Crippen		SETS	EVA IFM to stow antenna.
				01/ 000	(center b	ack row):	front rov	v l.to.r. are:	PLT	RMS 9 (S.N. 302)	- R & R brakes post-flight.
	1 3			<u>OV-099</u> : 40:08:16:04				n/MS, and		Used for ERBS	- R & R MLG tires (damaged by rough runway).
the second is	10 -			10.00.10.01				v (left) Scully	/-	deploy, TPS survey,	
- And	A CONTRACTOR			DISTANCE:				pher and (rig		water nozzle survey,	
1		ALL ALL AND		3,400,000 sm	Garneau					SIR-B antenna latching assist	
			ļ	ļ						iaiching assist	

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		CREW		LANDING SITE/	SSME-TL					5.0.4.0.05	
	0001750	(5)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT	5014	PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER		LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
				WINDS	ENG. S.N.					01500	
STS 51-A	OV-103	<u>CDR</u> :	KSC 39A	KSC 15	104/104	BI-014	28.487°	<u>STANDARD</u>	OI-4	CARGO: 45306 lbs	<u>KSC W/D</u> : OPF 34, VAB 5, PAD 17 = 56
(STS-19)	Flight 2	Frederick H. Hauck	313:12:15:00Z	(KSC 3)	109	61-84	(9)	INSERTION	(3)		
	Discovery	(Flt 2 - STS-7)	7:15:00 AM EST (P)	6:59:56 AM EST						PAYLOAD	VEHICLE CHANGE:
SEQ		P56/R17/V7/M17 PLT:	7:15:00 AM EST (A)	Friday 3	100/89/	SRM:		INSERTION		CHARGEABLE: 38003 lbs	- OV-103 replaced OV-099 (TPS screed deterioration
FLT # 14		David M. Walker	Thursday 4	11/16/84 (3)	67/104/	HPM		<u>ALTITUDE</u> :			cased by waterproofing).
		P57/R48/M45	11/8/84 (4)		65	LWC				DEPLOYED: 22764 lbs	
KSC 14	OMS PODS	M/S:		<u>XRANGE</u> : 486 NM				POST OMS-2			LAUNCH POSTPONEMENT: None.
	LPO3 - 3	Joseph P. Allen	LAUNCH WINDOW:	ORB DIR: DL9	1 = 2109 (4)	136 FT		161.22 X		NON-DEPLOYED:	
PAD	RPO3 - 2	(Flt 2 - STS-5)	18 Minutes	OKD DIK. DL9	2 = 2018 (3)	Chutes		151.17 NM		15052 lbs	LAUNCH SCRUBS:
S84-40082	FRC3 - 2	P58/R12/V8/M12	PLANAR WINDOW	AIM PT: CLOSE IN	3 = 2012 (6)					MIDDECK: 187 lbs	- 11/7/84 launch scrubbed because winds aloft exceeded
(August		<u>M/S</u> :	(MAX YAW			LWT-9		<u>TELESAT</u>		187 lbs	Orbiter structural limits (excessive wind shear)
		Anna L. Fisher	STEERING MPS	<u>MLGTD</u> : 2724 FT				<u>DEPLOY</u>		RETRIEVED:	- 1-day slip.
S FISH	ER GAR	P59/R49/F4	LIMIT 1000 LBS	321:11:59:56Z	<u>M 3 EOM</u>	ET-16		163.48 NM		<u>RETRIEVED</u> : 2381 lbs	
ALL I		M/S: Dale A. Gardner	FOR RENDEZVOUS)	VEL: 194 KGS 192 KEAS						RETURNED:	LAUNCH DELAYS: None.
1		(Flt 2 - STS-8)		HDOT: -1.0 FPS	WEIGHT:	<u>ET RPT</u>		<u>SYNCOM</u>		24883 lbs	
Concession of the local division of the loca		P60/R23/V9/M22	PLS - KSC		207983	226K		DEPLOY			TAL WX:
		1 00/123/ 0 //0/22	TAL - DAKAR	TD NORM 195:		47:06		168.14 NM		SHUTTLE ACCUMULATED	- Dakar GO, Moron NO GO - low clouds.
MADICK	WALKER	UNTETHERED EVA'S	(Selected)	2454 FT	X CG: 1081.4	MET				WEIGHTS: DEPLOYED:	
	1. A	(<u>MMU)</u> :	TAL WX - MORON					PALAPA		DEPLOYED:	FLIGHT DURATION CHANGES: None.
MCC FCR-1 ((6)	EV1=Allen	AOA - EDW	<u>NLGTD</u> : 6380 FT 321:12:00:09Z	<u>LANDING</u>	<u>ET</u>		<u>RETRIEVE</u>		NON-DEPLOYED	
		EV2=Gardner	AOA WX-NOR,KSC	VEL: 160 KGS		IMPACT		194.44 NM		168793 lbs NON-DEPLOYED: 212528 lbs CARGO TOTAL:	FIRSTS:
FLIGHT DIRE		EVA1-6:13		HDOT: -4.6 FPS	WEIGHT:	<u>LAT</u> :				CARGO TOTAL: 444739 lbs	- First retrieval and return of satellites. PALAPA-B AND
Ascent - J. H.		11/12/84 - SS EVA #7	<u>MAX Q</u> = 651		207506	27.7°S		<u>WESTAR</u>			WESTAR-IV were deployed on STS 41-B but PAM Upper
Ld/O 1 - L. S. E	Bourgeois	EVA2-6:01	M = 1.10	<u>BRK INIT</u> : 142 KGS		LONG:		RETRIEVE		PERFORMANCE MARGINS (LBS):	Stages failed.
Orbit 2 - B. R. Plng - W. D. R		11/14/84 - SS EVA #8		AVE BRK DECEL:	X CG: 1082.6	82.0°E		189.55 NM		<u>IVIARGINS (LBS)</u> : FPR: 4633	- EVA crewmen captured spacecrafts using MMU/Stinger
Entry - T. C. La		CAPTURE AND STOW OF	<u>SRB SEP</u> :	6.5 FPS/S						FPR: 4633 FUEL BIAS: 1566 FINAL TDDP: 281	and stowed in payload bay.
MOD - E. F. Kr		PALAPA-B & WESTAR-IV	2:05.72 MET	0.011 0/0				DEORBIT		FINAL TDDP: 281 RECON: 1003	
	Tanz	FREE FLYER EVA'S	11500	WHEELS STOP:				191 X			RENDEZVOUS 3 & 4:
		#5 & #6	MECO:	321:12:00:54Z				188 NM		SYNCOM IV-1 (DEPLOYED)	- To capture and return PALAPA & WESTAR.
		No. of Concession, Name of Street, or other	8:33.16 MET	12178 FT							
44.5		CALCULATION OF THE OWNER.	ET CED.	ROLLOUT:				VELOCITY		TELESAT-H/ ANIK-D2/PAM-D	SIGNIFICANT ANOMALIES:
	-	-	ET SEP:	9461FT	51A-104-0	046: Gar	dner	25870 FPS		ANIK-D2/PAM-D	- APU 2 water spray valve system A failed.
			8:51.29 MET	58 SEC	donned MM			DANCE		(DEPLOYED)	- CRT 4 failed. - RCS F4R fuel leak.
			OMS 1		to Westar			<u>RANGE</u> 4141 NM		PALAPA-B2- (RETRIEVED &	
× +			<u>OMS-1</u> : 10:33.3 MET	WINDS:	satellite ret	trieval, b	y he	4141 INIVI		(RETRIEVED & RETURNED)	- Both left side EMU helmet lights failed (Bad Batteries). - Arriflex 16mm camera failed (IFM bypassed failed
	GIN I		10:33.3 ME 1 150.7 Seconds	4 H, O X KNOTS OFFICIAL: 2T, 1R	and Allen,					-	microswitch).
	-		150.7 Seconds	UTTUAL. 21, IK	Earth.					WESTAR-IV - (RETRIEVED &	- FWD RCS Manifold 3 fuel and oxidizer Iso valves lost
			OMS-2:	DENS ALT: -100 FT					<u> </u>	RETURNED	open indications.
			<u>01015-2</u> : 44:43 MET					and the second			- LRCS Sys B Fuel tank Iso Valve for manifold 3/4/5 lost
	1 Charles		114.8 Seconds	FLT DURATION:		-				RME DMOS-3M EXP.	open indication.
			114.0 JECUIIUS	7:23:44:56	1.000	The	1100	100	-	MMU (2), EMU (3)	- PLB blankets and metal discolored.
A AND				191:44:56		min	Ori			4 CRYO TK SETS	- Brake hydraulic pressure increased when Iso valves
	A CALLANS			<u>S/T</u> : 89:08:47:24	1 T. 1	12					
						20	and .			RMS 10 (S.N. 301)	טיטויכע מו בטטול נושט ימויכ וכמה).
	1			<u>OV-103</u> : 14:00:41:00	10 h	1		En	100	WESTAR canture	IFM's - Arriflex camera repaired, EVA helmet light repaired
C04 40000		seated, PLT Walker,		14:00:41:00		P-1	-	CAN UN	1	and berth, waste	and DAP key changeout
		51-A mascot. Others on		DISTANCE:	-		an Ola			water dump monitor,	and brit hoy blangood
		Iner/MS, Fisher/MS &		2,870,000 sm			TAN	- late	E.K.	RMS 10 (S.N. 301) Used for PALAPA/ WESTAR capture and berth, waste water dump monitor, and SYNCOM and TELESAT PKM viowing	
Allen/MS.	to i., ale Galt			,,	The Part of the second	100	Suma and	and the second		viewing	
Alleri/WO.				1						-	

Page 2-15 - STS 51-C

FLTORBITERCREW (5)LAUNCH SITE, LIFTOFF TIME, LIFTOFF TIME, LIFTOFF TIME, LANDING SITES, ABORT TIMESDAMING SITES, CROSSRANGEDAMONG SITE EMERGSRB EMERGORBITPAYLOAD FSWMISSION Hi (LAUNCH SCR)NO.TITLE, NAMES & EVA'STITLE, NAMES & EVA'SLANDING SITES, LANDING SITES, & LANDING SITES, ABORT TIMESLANDING SITES, FLIT DURATION, WINDSTHROTILE ENG, S.N.AND ENGLINCHA/HPPAYLOAD FSWPAYLOADS/ EXPERIMENTSTAL WEATHER, A FIRSTS, SIGNIFICANISTS 51-C (STS-20)OV-103 Flight 3 DiscoveryCDE: Thomas, K. Mattingly (FIT 2 - STS-4) P61/R7/V10M7KSC 39A 25:000 PM EST Thursday 5 12/24/85 (1)KSC 15 (SC 15 10/22/ 12/27/85 (1)II-00/22/ 1 = 2109 (5)BI-015 28.45° (10)OI-4 (0)OODKSC W/D: OPF 31, VAB 5, PA EXC 15SED FLT # 15 MSC 15PLT: Loren J. Shriver P63/R51/M46PLS - KSC SLS - EDW TAL - DAKAR TAL - DAKARKRANGE: 380 NM TAL - DAKARBI-015 2 = 2018 (4) 2 = 2018 (4)OI-4 CASE: 2 = 2018 (4) 2 = 2018 (4)OI-4 CASE: FINAL FRCS - 1 1 = 2109 (5) 2 = 2018 (4) 2 = 2018	UBS/DELAYS, SCENT I-LOADS, T ANOMALIES, ETC.) ID 20 = 50 None. I prior to ET tanking due to acreage ice on ET. 1-day
NO.TITLE, NAMES & EVA'SCARDING TIMESCROSSRAVAGE CARDING TIMESTENERG FLT DURATION, WINDSTENERG PROFILENO.PAYLOADS PAYLOADSTAL WEATHER, A FIRSTS, SIGNIFICANTSTS 51-C (STS-20)OV-103 Flight 3 DiscoveryCDR: Thomas. K. Mattingly (FIt 2 - STS-4) P61/R7/V10/M7KSC 39A 25:0:0 PM EST 1/24/85 (1)KSC 4)FIND FLT # 15INCHA/HPPAYLOADS PAYLOADS (10)OI-4 	SCENT I-LOADS, T ANOMALIES, ETC.) ID 20 = 50 None. I prior to ET tanking due to acreage ice on ET. 1-day
STS 51-C (STS-20)OV-103 Flight 3 DiscoveryCDR: Thomas. K. Mattingly (Fit 2 - STS-4) P61/R7/V10/M7KSC 39A 24:19:50:00ZKSC 15 (KSC 4)100/92/ 65/104/BI-015 65/104/28.45° (10)OI-4 (4)DODKSC W/D: OPF 31, VAB 5, PASEQ FLT # 15 SEQ FLT # 15 	T ANOMALIES, ETC.) ID 20 = 50 None. I prior to ET tanking due to acreage ice on ET. 1-day
STS 51-C (STS-20)OV-103 Flight 3 DiscoveryCDE: Flight 3 DiscoveryKSC 39A (SC 4)KSC 15 (KSC 4)100/92/ 65/104/BI-015 (D1)28.45° (10)OI-4 (4)DODKSC WD: OPF 31, VAB 5, PASEQ FLT # 15DMS PODS 	D 20 = 50 None. I prior to ET tanking due to acreage ice on ET. 1-day
STS-20)Flight 3 DiscoveryThomas. K. Mattingly (Flt 2 - STS-4) P61/R7/V10/M724:19:50:00Z 2:50:00 PM EST Thursday 5 1/24/85 (1)(KSC 4)65/104/ 65/(10)(4)PERFORMANCE MARGINS (LBS): FPR: 	None. I prior to ET tanking due to acreage ice on ET. 1-day
InstructionInstructin	I prior to ET tanking due to acreage ice on ET. 1-day
SEQ FLT # 15P61/R7/V10/M7Thursday 5 Sunday 2 1/24/85 (1)4.2.3.3 PM ES1 Sunday 2 1/27/85 (1)HPMMARGINS (LBS): FPR: 	I prior to ET tanking due to acreage ice on ET. 1-day
SEQ FLT # 15OMS PODS LPO3 - 4 RPO3 - 3PLT: Loren J. Shriver P62/R50/M461/24/85 (1)1 = 2109 (5) 1/27/85 (1)1 = 2109 (5) 2 = 2018 (4)FPR: CASE: LWCLAUNCH SCRUBS: FUEL BIAS: - 1/23/85 launch was scrubbed FINAL TDDP: slip.PAD 39A-15FRC3 - 3M/S: Ellison S. Onizuka P63/R51/M47PLS - KSC SLS - EDW TAL - DAKARXRANGE: 380 NM3 = 2012 (7)LWCFPR: LWCLAUNCH SCRUBS: FUEL BIAS: - 1/23/85 launch was scrubbed FINAL TDDP: Slip.PAD 39A-15FRC3 - 3M/S: FG3/R51/M47TAL ALT: Zaragoza (Selected)AIM PT: CLOSE IN 27:21:23:23Z115 FT ChutesARC ChutesLAUNCH DELAY: SFMDM/S: James F. BuchliTAL WX - MORON MIGTD: 175 SFT 185 KEAS HDOT: 1455LWT-7LWT-7VISION FLUID SHIFTTAL WX: - Dakar & Moron NO GO - haz	acreage ice on ET. 1-day
FLT # 15 OMS PODS PLT: Loren J. Shriver PLS - KSC XRANGE: 380 NM 3 = 2012 (7) LWC FUEL BIAS: - 1/23/85 launch was scrubbed KSC 15 LPO3 - 4 RPO3 - 3 P62/R50/M46 SLS - EDW TAL - DAKAR ORB DIR: DL 10 115 FT LWC RECON: -1457 slip. 9AD 39A-15 FRC3 - 3 M/S: Ellison S. Onizuka P63/R51/M47 TAL ALT: Zaragoza (Selected) AIM PT: CLOSE IN Chutes ARC LAUNCH DELAY: Launch delay caused by right I M/S: James F. Buchli James F. Buchli MI GTD: 2753 FT ET-14 VISION TAL WX: FLUID SHIFT VISION FLUID SHIFT - Dakar & Moron NO GO - haz	acreage ice on ET. 1-day
KSC 15LPO3 · 4 RPO3 · 3P62/R50/M46SLS · EDW TAL · DAKARORB DIR: DL 10115 FT ChutesRECON: ·1457slip.PAD 39A-15FRC3 · 3M/S: Ellison S. Onizuka P63/R51/M47TAL ALT: Zaragoza (Selected) TAL WX · MORONORB DIR: DL 10115 FT ChutesChutesARC LAUNCH DELAY: SFMD TREARC Launch delay caused by right I position.M/S: James F. BuchliM/S: James F. BuchliMIGTD: 2753 FT LAUX · MORONKIGTD: 2753 FT 27:21:23:23Z VEL: 179 KGS 185 KEAS H 3 EOMLWT-7 ET-14VISION FLUID SHIFTTAL WX: - Dakar & Moron NO GO - haz	
PAD 39A-15RPO3 - 3 FRC3 - 3M/S: FRC3 - 3TAL - DAKAR M/S: Flison S. Onizuka P63/R51/M47TAL ALT: Zaragoza (Selected)ORB DIR: DL 10115 FT ChutesARC ChutesLAUNCH DELAY: SFMD TRE Position.M/S: James F. BuchliM/S: James F. BuchliMIGTD: 2753 FT VEL: 179 KGS 185 KEASLWT-7KWT-7TRE FT-14VISION FLUID SHIFTTAL WX: - Dakar & Moron NO GO - haz	/D eleven net in concepted
PAD 39A-15 FRC3 - 3 M/S: Ellison S. Onizuka P63/R51/M47 TAL ALT: Zaragoza (Selected) AIM PT: CLOSE IN Chutes ARC LAUNCH DELAY: SFMD M/S: James F. Buchli F. Buchli MLGTD: 2753 FT 27:21:23:23Z LWT-7 FT-14 VISION ARC LAUNCH DELAY: Launch delay caused by right I position.	/D alayon not in avecated
39A-15 Ellison S. Onizuka (Selected) Image: Selected	VD alough making assessed
M/S: VEL: 179 KGS ET-14 VISION TAL WX: James F. Buchli 185 KEAS M 3 EOM FLUID SHIFT - Dakar & Moron NO GO - haz	/B elevon not in expected
James F. Buchli 185 KEAS M 3 EOM FLUID SHIFT - Dakar & Moron NO GO - haz	
	e. Zaragoza GO.
P64/R52/M48 <u>ETRPT</u> <u>DEORBIT</u> OCEANS	
	<u>.5</u> : res.
Gary E. Payton VEL: 146 KGS AFT-T SIGNIFICANT ANOMALIES:	
P65/R53/M49 HDOT: -3.9 FPS X CG: ET BR/UP VELOCITY IOCM - Right inboard elevon CH4 set	condary delta pressure force
TD NORM 195: 1853 FT LANDING 46:31 MET 227K 25855 FPS RMS 11 (S.N. 301) - IMU 1 and 3 excessive bias.	APU'S to full pressure).
RANGE Used to monitor - GHE leak in T-O umbilical.	
BRK INIT: 117 KGS WEIGHT: ET 4144 NM IUS/SRM burn - FWD RCS dilemma during d	
AVE BRK DECEL: 197700 IMPACT LAT: - BFS did not proceed to MM10 - BFS did not proceed to MM10	
8.9 FPS/S X CG: 1091.8 28.1°S - TACAN 3 did not lock up.	
WHEELS STOP: 27:21:24:13Z 10105 FT LONG: 78.3°E - RA2 erratic at high altitude. - TPS had long gouge under legender - RH SRM primary O-ring gas	oft wing.
field ioint (blowby)	
- LH SRM forward field joint ga	as leak and erosion to primary
73/0F1 50 SEC O-ring (blowby).	
WINDS: 8H, 0 X KNOTS	
OFFICIAL: 8H, 1R	
S84-43708: STS-51C Crew & Patch DENS ALT: -100 FT	
MCC FCR-2 (9)	
73:33:23	
FLIGHT DIRECTORS Ascent - J. H. Greene	
OV-103: Plog - C. W. Shaw Dry - C. W. Shaw 17:02:14:23	
Orb/Ent - T. C. Lacefield	
MOD - E. F. Kranz DISTANCE: 51C-08-023: Onizuki (left) & Shriver give thumbs up from Mid- 1,242,566 sm Deck for first Department of Defense Shuttle mission.	

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FLT NO.	ORBITER	т	CREW (7) TLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION,	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE	SRB RSRM AND ET	C)rbit Ha/Hp	FSW	Payload Weights, Payloads/ Experiments	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS 51-E (STS-22) SEQ FLT # PAD	OV-099 Flight Challenger	Asc/Ent - Orbit 1 - C Ld/Orb 2 -	Karol J. Bobko Donald E. M. Rhea Seddon S. David Griggs Jeffrey A. Hoffman Patrick Baudry ch) Jake Garn (U.S. Senator from (U.S. Senator from MRECTORS: T. C. Lacefield W. Shaw B. R. Stone J. M. Heflin			ENG. S.N.	MTR: <u>CASE:</u> STD ET-17 29 84 984			OI-5	CARGO: CHARGEABLE : TDRS-B/IUS-2 TELESAT-I/PAM-D FEE FPE PPE	 KSC W/D: OPF 57, VAB 8 (2), PAD 17 (2) = 82 days total LAUNCH POSTPONEMENT: Launch rescheduled from 2/20/85 to 2/27/85 due to tile replacement caused by deteriorated screed on OV-099. Launch rescheduled to 3/3/85 due to LH2 primary seal leak (17" ET/Orbiter) but decision was made that secondary seal would hold. LAUNCH SCRUBS: Flight canceled on 3/7/85 due to a TDRS-B problem and TELESAT-I was remanifested on OV-103 STS-51D. (Challenger was destacked.) ROLLED BACK TO VAB, CHANGED PAYLOAD TO SPACELAB 3 FOR STS 51-B. THESE DATA ARE INCLUDED BECAUSE THE FLIGHT WAS SCRUBBED AFTER GOING THROUGH ALL OF THE FLIGHT REVIEWS, ETC. 17-INCH LH₂ PRIMARY SEAL REDESIGNED REDUCING WIDTH & DEPTH WITH STS 61-A AS FIRST FLIGHT.
Server and the server ser	SEDDON + CRIGGS			Al Penningto Middle row: Back row: R	JSC) Front row: M on, & Cleon La Jay Greene, C andy Stone, C eois, & Lee Br	acefield. Gary Coer Chuck Sha	Bill Re n, Johr	eves, (n Cox, 8	Chuck Lev & Harold I	Draug		

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		CREW	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(7)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		UKDII	FSW	WEIGHTS.	(LAUNCH SCRUBS/DELAYS,
NO.	ORDITER		LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP	1.51	PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		TITLE, NAMES & EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
				WINDS	ENG. S.N.						
STS 51-D	OV-103	CDR:	KSC 39A	KSC 33	100/104	BI-018	28.511°	DIRECT	01-5	<u>CARGO:</u> 35794 lbs	<u>KSC W/D</u> : OPF 53, VAB 5, PAD 15 = 73
(STS-23)	Flight 4 Discovery	Karol J. Bobko (Flt 2 - STS-6)	102:13:59:05Z 8:04:00 AM EST (P)	(KSC 5)	109	MTD.	(11)	INSERTION	(1)		LAUNCH POSTPONEMENTS:
、 <i>,</i>	Discovery	P66/R14/V11/M14	8:59:05 AM EST (A)	8:54:28 AM EST	100/90/	<u>MTR:</u> HPM	START:	POST OMS-2		PAYLOAD	- 3/19/85 launch postponed 9 days to 3/28/85 to remanifest
SEQ		PLT:	Friday 4	Friday 4	65/100/			249.0 X		PAYLOAD CHARGEABLE: 28747 lbs	TELESAT-1 from STS 51-E.
FLT # 16		Donald E. Williams	4/12/85 (4)	4/19/85 (4)	65	<u>CASE:</u> LWC	END:	160.68 NM			- 3/28/85 launch postponed to 4/12/85 when PLBD was
1100 11	OMS PODS LPO3 - 5	P67/R54/M50 M/S:	LAUNCH WINDOW:	XRANGE: 518 NM	1 = 2109 (6)	LWC	MAX:	TELESAT		DEPLOYED: 22,576 lbs	damaged by OPF bucket (access platform dropped on PLBD). 24-day slip.
KSC 16	RPO3 - 4	M. Rhea Seddon	1 Hour, 11 Minutes	MININGE. STOTIM	2 = 2018(5)	136 Ft	<u>1017 075</u> .	DEPLOY		NON-DEPLOYED:	T LDD). 24 ddy siip.
PAD	FRC3 - 4	P68/R55/F5	(ANIK SS FAIL	<u>ORB DIR</u> : DL 11	3 = 2012 (8)	Chutes		221.09 NM		5092 lbs	LAUNCH SCRUBS: None.
39A-16		<u>M/S:</u> S. David Griggs	ÒPEN)	AIM PT: NOM		ET-18		(REV 5)		MIDDECK	LAUNCH DELAYS:
574-10		P69/R56/M51	PLS - KSC	AINTET. NOW		L1-10		SYNCOM		MIDDECK: 1079 lbs	- 55M5S delay - Ship in SRB recovery area.
		M/S:	SLS - EDW	<u>MLGTD</u> : 1639 FT	<u>M 3 EOM</u>	LWT-11		DEPLOY		RETURNED	
		Jeffrey A. Hoffman P70/R57/M52	TAL - DAKAR	109:13:54:28Z	WEICHT.			213.16 NM		<u>RETURNED:</u> 13248 lbs	<u>TAL WX</u> : Dakar no go - haze, Moron go.
		P70/R57/M52 P/S:	TALWX - MORON (Selected)	VEL: 209 KGS 200 KEAS	WEIGHT: 198167	ET <u>RPT</u>		(REV 15)		SHUTTLE	FLIGHT DURATION CHANGES:
millia	AMS C	Jake Garn	ÁOA - EDW	HDOT: -3.2 FPS		ET <u>BR/UP</u>		<u>DEORBIT</u> 249 X		SHUTTLE ACCUMULATED	 Extended flight from 5 to 7 days for attempt to operate
and i	12		AOA WX - NOR/KSC		X CG: 1092.7					WEIGHTS: DEPLOYED [.]	SYNCOM IV-3 arming switch using IFM "Fly Swatter"
	5	P71/R58/M53 P/S:	<u>MAX Q</u> = 666	<u>TD NORM 195</u> : 2089 FT	LANDING	<u>ET</u>		180 NM		DEPLOYED: 191369 lbs NON-DEPLOYED:	(SYNCOM failed to maneuver to altitude because of
		Charles Walker	MAX O = 000 M = 1.25	200711		IMPACT		VELOCITY		218699 lbs	defective mechanical arming switch. Crew re-rendezvoused with SYNCOM and snagged switch but
SEDGON	- GRIEGS - HOL	(MDAC)	000.050	<u>NLGTD</u> : 4303 FT	WEIGHT:	<u>LAT</u> : 20.24°N		25954 FPS		CARGO IOTAL:	switch was a single point failure and did not operate.
VALR	ER - GAW	(Flt 2 - STS 41-DR) P72/R42/V12/M40	<u>SRB SEP</u> : 2:06.84 MET	109:13:54:36Z VEL: 182 KGS	198014	20.24°N <u>LONG:</u>				480533 lbs	 Landing at KSC was extended 1 rev because of KSC weather.
			2.00.04 IVIE I	HDOT: -5.9 FPS	X CG: 1094.3	<u>LONG:</u> 149.37°W		<u>RANGE</u> 4064 NM		PERFORMANCE MARGINS (LBS):	- Extension: 2 days + 1 rev.
	(10)	EVA CREWMEN:	<u>MECO</u> : 8:51.96 MET							<u>MARGINS (LBS)</u> : FPR: 4732	, ,
MCC FCR-2 ((10)	EV1= Hoffman EV2= Griggs	8:51.96 MET	<u>BRK INIT</u> : 156 KGS						FPR: 4732 FUEL BIAS: 883 FINAL TDDP: 1243	RNDZ 5: To attempt to arm SYNCOM IV-3.
FLIGHT DIRE			ET SEP:	AVE BRK DECEL:			No.	The T		RECON: 1957	ET TRACKING DTO 331/318:
Asc/Ent - T. C Orbit 1 - J. T.		<u>UNSCHEDULED EVA</u> : 4/16/85 - 3:10/3:07	<u>ET SEP</u> : 9:10 MET	8 FPS/S			14	2 11 -			- ET Reentry (tumble) KPTC RADAR events detected at
Ld/Orb 2 - B. I		(ATTACHED "FLY SWATTER"	OMC 1.			7			2	SYNCOM IV-3 (DEPLOYED)	245K and 232K, benign rupture. AWAC RADAR and
Planning - J. N	VI. Heflin	TO RMS.)	<u>OMS-1</u> : NONE	WHEELS STOP: 109:12:55:31Z	100m			Beel -	-	TELESAT-I/	Doppler conflicting data. MOTIF unusable/cloud coverage. CAST GLANCE no coverage/engine failure.
MOD - Ē. F. K	Kranz	SS EVA #9 SS Unscheduled EVA#1		11937 FT			12		1	ANIK C.1/PAM.D	
			<u>OMS-2</u> : 43.15 MET		4	1200	X			(DEPLOYED)	SIGNIFICANT ANOMALIES: Broke/tire problems resulted in programmatic desision to
			43.15 MET 143 Seconds	<u>ROLLOUT</u> : 10,430 FT	A TO	And		-	The	GAS(2)	Brakeftire problems resulted in programmatic decision to land at EDW lakebed until Nose Wheel Steering is used
	000			63 SEC					N.C.	GAS(2) CFES-III, APE, PPE SSIP(2)	during landing at EDW
PLT Willia	ams CDR	BobkoGriggs/MS Se	en. Garns/PS						*		 Cryo 02 tank 1 htr ctlr auto mode failed.
	. 21			<u>WINDS</u> : 3T,5R KNOTS		The second		114	T	2 - MINIATURE COPPER STATUES OF LIBERTY MADE FROM "SOL" FRAMEWORK	 Right ET door latches A and B indicated off (Thermal barrier pinned between door and sill).
4				OFFICIAL: 4T, 7R				7-41:		OF LIBERTY MADE	- Ku-band antenna motion erratic.
			6 · ·				2000		R.	FRAMEWORK	 Hydraulic Sys 3 accum rapid pressure decay.
				<u>DENS ALT</u> : 1100 FT		3 1			-	ŞKIN CLAMP	- APU 3 shutdown load abnormal. - Right MLG inboard tire burst.
	K.A.	10 - 10 - RAN	aP	FLT DURATION:		Fred	000	1-10	1	(12 LBS)	 Right MLG brakes damaged (locked up).
-	10-10			6:23:55:23				-1-8	1	4 CRYO TANK	- Left OB elevon TPS damaged/skin burn.
F				167:55:23			-3	1 mile	1	SETS	- Right RCS thruster R2U oxidizer leak.
	NI	STEEL L		<u>S/T</u> : 99:10:16:10	10 -	1.5	1		1	RMS 12 (S.N. 301)	IFM: Developed and used "flyswatter" to snag SYNCOM
	R	MA TAR					141.			RMS 12 (S.N. 301) Used for flyswatter snag of SYNCOM	arm switch.
0		F		<u>OV-103</u> : 24:02:09:46	51D-09-0					arm switch. PKM	
			0	24:02:09:40				S (left) & CD	ĸ	arm switch, PKM monitor, ET door	
	P. 1		5 m	DISTANCE:	Bobko wit	n Doones	soury co	mic strip. Se	n.	survey, and water dump survey	
				2,500,000 sm				Trudeau's		adinp survey	
Hot	iiman/MS -	Seddon/MS Walker	/PS		creations	prior to th	e miss	ion.			
											Sector Se

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		CREW		LANDING SITE/	SSME-TL						
		(7)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB	(ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(')	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		Q EVA S		WINDS	ENG. S.N.						
STS 51-B	OV-099	CDR:	KSC 39A	EDW 17,LAKEBED	104/104	BI-016	57.004°	STANDARD	OI-4	<u>CARGO:</u> 31377 lbs	KSC W/D: OPF 31, VAB 4, PAD 15 = 50
	Flight 7	Robert F. Overmyer	119:16:02:18Z	(EDW 11, LKBD 7)	109		(3)	INSERTION	(5)	31377 lbs	
(313-24)	Challenger	(Flt 2 - STS-5)	12:00:00 PM EDT (P)		-	MTR:	(-7		(-7	CHARGEABLE:	AFTER STS 51-E (TDRS-B/TELESAT-1) WAS
SEQ		P73/R10/V13/M10	12:02:18 PM EDT (A)	9:11:04 AM PDT	100/94/	HPM	START:	INSERTION		30748 lbs	SCRUBBED, CHALLENGER WAS ROLLED BACK TO
FLT # 17	Spacelab 3	<u>PLT</u> :	Monday 4	Monday 2 5/6/85 (1)	65/104/		<u>o</u>	ALTITUDE:			THE VAB AND PAYLOAD WAS CHANGED TO
FLI#1/	Spaceiab 5	Frederick D. Gregory	4/29/85 (5)	5/0/05 (1)	103/72/	CASE:	END:	<u>METHODE</u> .		<u>DEPLOYED:</u> 105 lbs (NUSAT)	SPACELAB 3.
VCC 17	SECOND	P74/R59/M54	()	XRANGE: 274 NM	65	LWC		POST OMS-2			STROLLID S.
KSC 17	SPACELAB	<u>M/S</u> :	LAUNCH WINDOW:	<u>ARGINOE</u> . 27 THM	05	LVVC	MAX:	<u>191.74 X</u>		NON-DEPLOYED: 30341 lbs	LAUNCH POSTPONEMENT: None.
	FLIGHT	Don L. Lind	3 Hours	ORB DIR: AL 2	1 = 2023 (2)	ET-17	IVIAA.	191.74 X 189.37 NM		30341 lbs	LAUNCHT UST UNEMENT. NOTE.
PAD	LM (2)	P75/R60/M55	(CREW WORKDAY)		1 = 2023 (2) 2 = 2020 (3)	LWT-10		107.37 10101			LAUNCH SCRUBS: None.
39A-17	LIVI (Z)		(**********	<u>AIM PT: NOM</u>		LVVI-IU				MIDDECK: 302 lbs	LAUNCH SCRUDS. NUIR.
		M/S:	PLS-EDW		3 = 2021 (3)	гт					
	OMS PODS	Norman E. Thagard	SLS-KSC	MLGTD: 1576 FT		<u>ET</u>				RETURNED: 30,427 lbs	LAUNCH DELAYS:
	LPO1 - 6	(Flt 2 - STS-7)	TAL-ZARAGOZA	126:16:11:04Z VEL: 209 KGS		<u>RPT</u>		DEORBIT			- 2M18S delay due to an LPS failure at T-4 minutes (lost
	RPO4 - 1	P76/R20/V14/M19	(Selected)	204 KEAS		220K		192 X		<u>SHUTTLE</u> ACCUMULATED	GPC FEP).
	FRC9 - 7	<u>M/S</u> :	TAL WX-MORON	HDOT: -2 FPS	<u>M 3 EOM</u>	1:01:12		189 NM		ACCUMULATED	
ACEI	AB	William E. Thornton	MANUAL TAL-BONN			MET				WEIGHTS: DEPLOYED:	TAL WX: Zaragoza and Moron go.
SPACE	3	(Flt 2 - STS-8)		TD NORM 195:	WEIGHT:			VELOCITY		191474 lbs	
1 Alexandre		P77/R24/V15/M23	<u>MAX Q</u> = 700	2386 FT	213795	<u>ET</u>		25857 FPS		NON-DEPLOYED:	FLIGHT DURATION CHANGES: None.
		<u>P/S</u> :	M = 1.31	NU OTD FEAR FT		BR/UP				<u>191474 lbs</u> <u>NON-DEPLOYED</u> : 249342 lbs <u>CARGO TOTAL</u> : 511910 lbs	
° 658		Taylor Wang		<u>NLGTD</u> : 5528 FT 126:16:11:16Z	X CG: 1084.1	195K		<u>RANGE</u>		511910 lbs	SIGNIFICANT ANOMALIES:
1 6		P78/R61/M56	SRB SEP:	VEL: 159 KGS		1:01:42		4264 NM			- WSB 3 controller A inoperative.
122		<u>P/S</u> :	2:05.88 MET	HDOT: -7.1 FPS	LANDING	MET				PERFORMANCE MARGINS (LBS):	- Right ET door motor B inoperative.
QVII.		Lodewijk Van den Berg		1001. 7.1110						MARGINS (LBS):	- SM onboard display data exhibited erratic values.
CONTRACTOR OF THE OWNER	WANG	P79/R62/M57	MECO:	BRK INIT: 106 KGS	WEIGHT:	ET				FUEL BIAS: 849	- Right OMS pod TPS protrusion (AFRSI).
			8:34.96 MET		213499	IMPACT				FPR: 4887 FUEL BIAS: 849 FINAL TDDP: 2536	- Galley did not dispense water.
		MCC FCR-1 (7)		AVE BRK DECEL:		LAT:				RECON: 3609	- APU 3 seal cavity drain line heater 3A failed.
		FLIGHT DIRECTORS:	ET SEP:	7.1 FPS/S	X CG: 1085.4	57. 1°S				SPACELAB 3/LM·	- Smoke detector in avionics bay 2A failed self test.
		Asc/Ent - T. C. Lacefield	8:53.05 MET			LONG:				<u>SPACELAB 3/LM</u> : MPESS	- Right RCS thruster R4D heater failed.
		Ld/O 1 - G. E. Coen		WHEELS STOP: 126:16:12:03Z		150.8°E				VWFC	- S-Band upper right antenna reflected power high and
		O 2 - W. D. Reeves		9893 FT							upper left antenna reflected power erratic.
		O 3 - G. A. Pennington								BTS	- APU 1 fuel by-pass line heater B failed on.
		MOD - E. F. Kranz		ROLLOUT:						DEMS	- Mid MCA 2 OPS status 5 indicated zero.
				8317 FT						FES GEEC	- PLBD close sequence failed on port aft latches.
Gregory-L	ind-Thagard	-Wang-van den Berg		59 SEC						MIPESS VWFC AFT ATMOS BTS DEMS FES GFFC IONS MICG DALLE VIT	- MLG brakes damaged (LH inboard rotors destroyed).
				WIND:						MICG	- MLG dump valve leaked 3 days after landing (power left
				5H, 0 X KNOTS			A COLOR	And in case of the local division of the loc	-	KAHE-VI	on 3 hydraulic valves which had to be replaced).
				OFFICIAL: 5H, 2R			Concession of the local division of the loca	and the second second		(Monkeys & Rats) UMI	- Left OB elevon tile slumping and gap filler breach.
						-	ALC: NO			VCGS GAS (Deployable): - NUSAT (deployed) - GLOMR (failed to	- GLOMR failed to deploy (150 lbs).
	CAR PROP			<u>DENS ALT</u> : 3400 FT					S. E.	GAS (Deployable):	- Gas leaks and erosion in both SRM nozzle-to-case joints.
									-2.5	- NUSAT (deployed)	- Erosion to secondary O-ring on LH SRM (blowby).
				FLT DURATION:						deploy)	Erosion to secondary o mily on Eri Sittii (blowby).
17day	0	0		7:00:08:46 168:08:46						deploy) UMS	IEM's: S/L drop dynamics godulo ovporiment recovered
(10)	40		<u>OMS-1</u> :	100.00.40			-				<u>IFM's</u> : S/L drop dynamics godule experiment recovered. Spacelab ION experiment recovered.
1 -27	S Del		10:35 MET	<u>S/T</u> : 106:10:24:56				nyer capture	d	4 CRYO TANK SETS	Spaceian ION experiment recovered.
			132 Seconds		this aurora						
	9			<u>OV-099</u> : 47:08:24:50	hemispher	re halfw	ay betw	een Australia	a &	NO RMS	
	b t		<u>OMS-2</u> :	47:08:24:50				e are moonli			
- 170-	5		46.15 MET	DICTANOL				e-green ban			
	9.00		147.5 Seconds	DISTANCE: 2,900,000 sm				urora. Brow			
		r Thorton		2,900,000 SM							
	UN Overmye	er Thorton			Streak is a	amospi	ieric ium	inescence.			

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				LANDING SITE/	SSME-TL						
FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	RUNWAY, CROSSRANGE	NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS.	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND	INC	HA/HP	1.5₩	PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS 51-G (STS-25) FLT # 18 KSC 18 PAD 39A-18	OV-103 Flight 5 Discovery OMS PODS LPO4 - 1 RPO3 - 5 FRC3 - 5 FRC3 - 5	CDR: Daniel C. Brandenstein (Flt 2 - STS-8) P80/R21/V16/M20 PLT: John O. Creighton P81/R63/M58 M/S: John M. Fabian (Flt 2 - STS-7) R82/R18/V17/M18 M/S: Steven R. Nagel P83/R64/M59 M/S: Shannon W. Lucid P84/R65/F6 P/S: Patrick Baudry (France) P85/R66/M60 P/S: Sultan S. Al-Saud (Saudia Arabia) P86/R67/M61	KSC-39A 168:11:33:00Z 7:33:00 AM EDT (P) 7:33:00 AM EDT (A) Monday 5 6/17/85 (3) LAUNCH WINDOW: 4 minutes (CLOSE ON MORELOS EARTH HORIZON SENSOR CUTOUT - 10 MINUTES WITH WAIVER OF CUTOUT) NEOM - EDW EOM WX - KSC RTLS - KSC TAL - DAKAR (Selected) TAL WX - MORON AOA - EDW AOA WX - NOR/KSC MAX Q = 648 M = 1.24 SRB SEP: 2:04.68 MET MECO: 8:35.77 MET ET SEP: 8:53.93 MET OMS-1: NONE OMS-2: 40:29 MET 179.4 Seconds	EDW 23, LAKEBED (EDW 12, LKBD 8) 6:11:52 AM PDT Monday 3 6/24/85 (2) XRANGE: 694 NM ORB DIR: DL 12 AIM PT: CLOSE IN MLGTD: 1117 FT 175:13:11:52.42 VEL: 202 KGS 198 KEAS HDOT: -2 FPS TD NORM 195: 1387 FT NLGTD: 4990 FT 175:13:12:05Z VEL: 163 KGS HDOT: -8 FPS BRK INIT: 154 KGS AVE BRK DECEL: 8.8 FPS/S WHEELS STOP: 775:13:12:32 8550 FT ROLLOUT: 7433 FT 36 SEC WIND: 2H,11L KNOTS OFFICIAL: 2H, 11L DENS ALT: 3727 FT FLT DURATION: 7:01:38:52 169:38:52 S/T: 113:12:03:48 OV-103: 31:03:48:38 DISTANCE: 2,500,000 sm	104/104 109 % 100/104/ 83/65/ 104/65 1 = 2109 (7) 2 = 2018 (6) 3 = 2012 (9) M 3 EOM WEIGHT: 204321 X CG: 1082.1 LANDING WEIGHT: 204169 X CG: 1083.7		at EDW	DIRECT INSERTION POST OMS-2 192.37 X 190.37 NM MORELOS DEPLOY 191.1 NM ARABSAT DEPLOY 193.81 NM FELESTAR DEPLOY 196.35 NM SPARTAN DEPLOY 210.3 NM DEORBIT 191 x 150 NM VELOCITY 25850 FPS RANGE 4050 NM	Ol-6 (1)	CARGO: 44477 Tbs. CHARGEABLE: 38258 Ibs DEPLOYED: 22832 Ibs NON-DEPLOYED: 14866 Ibs MIDDECK: 560 Ibs RETURNED: 214306 Ibs MIDDECK: 560 Ibs RETURNED: 21310 Ibs SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 214306 Ibs NON-DEPLOYED: 244306 Ibs NON-DEPLOYED: 244306 Ibs NON-DEPLOYED: 244306 Ibs NON-DEPLOYED: 264768 Ibs CARGO TOTAL: 556387 Ibs PERFORMANCE MARGINS (LBS): FPR: 5088 PERFORMANCE MARGINS (LBS): FPR: 5088 FUEL BIAS: 849 FINAL TDDP: 160 RECON: -1664 PRIMARY: TELESTAR-3D/ PAM-D DEPLOYED MORELOS-A/ PAM-D DEPLOYED MORELOS-A/ PAM-D DEPLOYED SPARTAN-101DH (DEPLOYED & RETRIEVED) FEE, ADSF, FPE, HPTE, ASE G027-OFVLR G028-OFVLR G314-USAF/NRL 4 CRYO TNK SETS RMS 13 (S.N. 301) Used for SPARTAN deploy, retrieve, and berth, water dump survey, PKM monitoring, and ARABSAT solar array survey	 <u>KSC W/D</u>: OPF 37, VAB 7, PAD 14 = 58 <u>LAUNCH POSTPONEMENTS</u>: 6/12/85 launch postponed to 6/11/85 due to late OPF start. 6/14/85 launch postponed to 6/17/85 because STS 51-D landed at EDW not KSC. 2 day extension 5-day total slip. <u>LAUNCH SCRUBS</u>: None. <u>LAUNCH DELAYS</u>: None. <u>TAL WX</u>: Dakar & Moron go. <u>FLIGHT DURATION CHANGES</u>: None. <u>EVENTS</u>: MORELOS deployed orbit 6D. ARABSAT deployed orbit 32D. SPARTAN deployed orbit 32D. SPARTAN deployed orbit 51D. Rendezvous with SPARTAN. Wheels dug into lakebed » 6 inches at end of rollout. <u>RENDEZVOUS 6:</u> WCS Fan Separator 1 motor current high. RCS microswitch problems. Right RCS OX or Fuel Tank Iso Valve. Right RCS OX Tank Iso Valve 3/4/5. Left RCS OX or Fuel Tank Iso Valve. Right RCS OX Tank Iso Valve 3/4/5. S-Band lower left antenna beam switch intermittent. MDM FA3 failure (Intermittent output from secondary core power supply). WOW dilemma (wheel off ground 800 ft). RA2 late acquisition. TPS debris hits. Gas leaks and erosion on both SRM nozzle-to-case joints (blowby).

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		CREW		LANDING SITE/	SSME-TL	CDD	(דוחחר			
сі т	ORBITER	(7)	LAUNCH SITE, LIFTOFF TIME,	RUNWAY, CROSSRANGE	NOM-ABORT EMERG	SRB RSRM	(ORBIT	FSW	Payload Weights,	
FLT NO.	URBITER		LIFTOFF TIME, LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP	FSW	PAYLOADS/	(LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS,
NU.		TITLE, NAMES	ABORT TIMES	FLT DURATION,	PROFILE	ET	INC	ПА/ПР		EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S	ADUKT HIVES	WINDS	ENG. S.N.	E I				EAPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
	OV-099	CDD:	KSC 39A	EDW 23, LAKEBED	104/104	BI-017	49.491°	142 0 V 100 7	015-24	CARGO:	<u>KSC W/D:</u> OPF 39, VAB 5, PAD 31 = 75
STS 51-F	Challenger	CDR: C. Gordon Fullerton	210:21:00:00Z	(EDW 13, LKBD 9)	104/104	DI-U17	(1)	142.9 X 108.7 NM	(2)	34400 lbs	<u>KSC W/D.</u> OPF 39, VAD 3, PAD 31 = 73
(STS-26)	(Flight 8)		3:23:00 PM EDT (P)		109 70	SRM:	(1)	INIVI	(2)		LAUNCH POSTPONEMENT: None.
050	(Flight o)	(Flt 2 - STS-3) P87/R6/V18/M6	5:00:00 PM EDT (A)	12:45:26 PM PDT	100/104/	HPM		STANDARD		CHARGEABLE: 33012 lbs	LAUNCH POSTPONEIVIENT. None.
SEQ	Spacelab 2	PUT:	Monday 6	Tuesday 4	97/65/			INSERTION			LAUNCH SCRUBS/PAD ABORT #2:
FLT # 19	Spaceian 2	Roy D. Bridges	7/29/85 (1)	8/6/85 (Í)	104/91	CASE:		WAS		DEPLOYED:	- 7/12/85 launch aborted at T-4.2 seconds when SSME #2
1100.10	(IGL00 +	P88/R68/M62	1129103 (1)	XRANGE: 603 NM	104/91	MWC		PLANNED		0 lbs	(2020) chamber coolant valve (CCV) failed to ramp to 70%
KSC-19	3 PALLETS)	<u>M/S</u> :	LAUNCH WINDOW:	<u>XIVINGE.</u> 003 NW	1 = 2023 (3)	IVIVVC				NON-DEPLOYED: 31257 lbs	open by "CMD A," resulting in an MCF, causing shutdown.
DAD	JTALLETS)	F. Story Musgrave	2 Hours, 25 Minutes	ORB DIR: AL 3	2 = 2023 (3) 2 = 2020 (4)	ET-19		ATO AFTER		31257 lbs	(pad abort #2). Recycled engine 2020 at pad.
<u>PAD</u> 39A-19	THIRD	(Flt 2 - STS-6)	CREW WORKDAY		3 =2020 (4)	LWT-12		SSME #1		MIDDECK	- 17-day launch slip.
39A-19	SPACELAB	P89/R15/V19/M15	3 Hours, 50 Minutes	<u>AIM PT:</u> NOM	5 -2021 (4)			SHUT		MIDDECK: 1755 lbs	
	FLIGHT	M/S:	launch clearance and	MI GTD: 3713 FT		<u>et</u>		DOWN			LAUNCH DELAYS:
		Anthony W. England	service window	218:19:45:26Z		<u>RPT</u>		DOWN		RETURNED: 33555 lbs	- 1H37M delay because of an error in a TMBU CMD to
		P90/R69/M63	Scivice window	VEL: 204 KGS		211K		DEORBIT			BFS. BFS was Re-IPL'ed and IMU's were realigned.
	OMS PODS	<u>M/S</u> :	PLS - EDW	199 KEAS		1:03:35		174 X		SHUTTLE ACCUMULATED	
	LP01 - 7	Karl G. Henize	SLS - KSC	HDOT: -0.7 FPS		MET		164 NM		WEIGHTS	TAL WX: Zaragoza go, Moron no go.
	RPO4 - 2	P91/R70/M64	AOA - NOR	TD NORM 195:	M 3 EOM			VELOCITY		DEPLOYED:	<u>·····································</u>
	FRC9 - 8	<u>P/S</u> :	AOA WX - KSC	4073 FT		<u>et</u>		25814 FPS		214306 lbs NON-DEPLOYED: 297780 lbs	FLIGHT DURATION CHANGES:
		Loren W. Acton	TAL - ZARAGOZA		WEIGHT:	BR/UP		RANGE		297780 lbs	- Extended flight 1 day (+ 1 rev) to provide additional
		P92/R71/M65	(Selected)	<u>NLGTD:</u> 6412 FT	216894	193K		4221 NM		CARGO IUTAL:	Spacelab experiment time.
NCE		P/S:	TAL WX - MORON	218:19:45:35Z		1:03:58				590787 lbs	
Sphe	- ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	John-David F. Bartoe		VEL: 168 KGS HDOT: -7.1 FPS	X CG: 1079.8	MET				PERFORMANCE MARGINS: NOT AVAILABLE	FIRSTS:
E C	E E	P93/R72/M66	<u>MAX Q</u> = 762							MARGINS: NOT AVAILABLE	- First flight of Spacelab pallet only.
	二二里		M = 1.63	<u>BRK INIT:</u> 126 KGS	LANDING	<u>ET</u> IMPACT	51 E 1	33-005:			- First flight of IPS.
P .	S (/) 💡					<u>IMPACT</u>			<u> </u>	SPACELAB 2	
3	ĭZ : ₹	MCC FCR-1 (8)	<u>SRB SEP:</u>	<u>AVE BRK DECEL:</u> 8 FPS/S	WEIGHT:	<u>LAT</u> :		iments & IP		WITH 13 INVESTIGATIONS	PROX OPS: With PDP.
1000		FLIGHT DIRECTORS	2:05.24 MET	0113/3	216735	48.9°S		acelab 2 are		IIN 7 SCIENTIFIC	
ACTON	GRADE	Asc/Ent - T. C. Lacefield		<u>WHEELS STOP:</u> 218:19:46:21Z		LONG:		lropped agai	nst	DISCIPLINES:	SIGNIFICANT ANOMALIES:
	вил	O1-G.A. Pennington	MECO:	218:19:46:21Z	X CG: 1081.3	159.0°E		bya/Tunisia		ATMOSPHERIC.	- ROMS primary pitch TVC failed to respond properly to
		Ld/O 2 - J. T. Cox	9:41.24 MET	12282 FT			Medit	erranean co	ast.	PLASMA, HIGH-	cmds on 7/10/85.
		O 3 - A. L. Briscoe	ET OF D	ROLLOUT:						ENERGY ASTRO-	- EXP computer failed prelaunch, ECOS loaded in B/U
		MOD - E. F. Kranz	<u>ET SEP:</u> 9:59.29 MET	8569 FT						ASTRONOMY,	computer.
	STS-51F F	light Crew	9:39.29 IVIE I	55 SEC						TECHNOLOGY	- SSME #1 auto shut down at 5:43 MET. (HPFTP discharge temp B Xducer failed at 3:31 MET & Xducer A failed at
	510 511 1		ABORT-TO-ORBIT	WINDC.			-			DISCIPLINES: SOLAR, ATMOSPHERIC, PLASMA, HIGH- ENERGY ASTRO- PHYSICS, IR ASTRONÓMY, TECHNOLOGY RESEARCH, AND LIFE SCIENCES PDP, VCAP, IRT, CRNE, XRT, SOUP CHASE, HRTS, SUSIM, PGU, SUPERFLUID HELIUM, PLASMA DEPLETION PDP PROX OPS SAREX, SLSTP,	5:43) resulting in an ATO call. OMS dump (burn) of 106
				<u>WINDS</u> : 10H, 1L KNOTS			Property of			PDP, VCAP, IRT,	seconds (4134 lbs. Prop).
		The second	<u>OMS-1:</u>	OFFICIAL: 9H, 3L			-			CHASE HRTS	- SSME #3 HPFTP temp B failed at 8:12 MET, inhibited
126-	and the		11:41 MET				0			SUSIM, PGU,	limits and accomplished ATO.
			106.4 Seconds	<u>DENS ALT:</u> 5610 FT				1 Bees	-	SUPERFLUID	- Recycled SSME 2020 at pad.
	N L		100.1 0000103						1.20	DEPLETION	- RMS tile scan to check for ET SOFI damage to Orbiter
	AT ELE		OMS-2:	FLT DURATION: 7:22:45:26			1926	Contraction of the second	1000	PDP PROX OPS	bottom TPS (100 tiles scrapped)
		a loka toka a	33:00 MET	190:45:26		41	-		72.8	SAREX, SLSTP, CBDE	- GPC body rate data transfer incompatible with Spacelab.
	S LOSA º	6 8 . 8 .	121.8 Seconds					11-1-10	1	PROX OPS WITH	- Left SRB yaw axis rate Gyro assy 3 failed hardover
				<u>S/T</u> : 121:10:49:14	and the second second			1		PROX OPS WITH FREE FLYING PDP	prelaunch (GMEM patch).
6.0	6 6 6	the set		01/ 000	and the second			A		4 CRYO TANK	- BFS logged "Stored Protect" after TMBU uplinked.
	E PIZE			<u>OV-099</u> : 55:07:10:16	13 6 N.	1		4		SETS	- SSME 2 GH ₂ Pressure Xducer failed.
	2				1 12 22	net	IT I I				- No damage to brakes (runway inspection).
	MEASA	A CAR		<u>DISTANCE</u> : 2,850,000 sm	A Start	A CONTRACT	100			KIVIS 14 (S.N. 302) Used for PDP deploy	
	10 mar			2,850,000 sm	1202	AN AL	10.0			RMS 14 (S.N. 302) Used for PDP deploy and retrieve, waste	RADIATORS DEPLOYED #9 - (port side stowed 3 hours
	14 · 14 Co				-	1. 200	Stort.			water dump monitor, and belly tile survey	for tile survey).
										and beily the survey	

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		CREW		LANDING SITE/	SSME-TL						
гі т	ORBITER	(5)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT	FCW	PAYLOAD	MISSION HIGHLIGHTS
FLT NO.	ORBITER		LIFTOFF TIME, LANDING SITES,	CROSSRANGE LANDING TIMES	EMERG THROTTLE	RSRM AND	INC	HA/HP	FSW	WEIGHTS, PAYLOADS/	(LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS,
NO.		TITLE, NAMES	ABORT TIMES	FLT DURATION,	PROFILE	ET	INC	ПАЛПР		EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S	Aborti Himeo	WINDS	ENG. S.N.						
STS 51-I	OV-103	CDR:	KSC-39A	EDW 23, LAKEBED	104/104	BI-020	28.541°	DIRECT	016-27	CARGO:	KSC W/D: OPF 27, VAB 7, PAD 22 = 56
(STS-27)	Discovery	Joe H. Engle	239:10:58:01Z	(EDW 14, LKBD 10)	109%	MTR:	(13)	INSERTION	(2)	43988 lbs	
(010 27)	(Flight 6)	(Flt 2 - STS-2)	6:55:00 AM EDT (P)	6:15:43 AM PDT		HPM				CHARGEABLE:	LAUNCH POSTPONEMENTS: None.
SEQ FLT 20		P94/R3/V20/M3	6:58:01 AM EDT (A)	Tuesday 5	100/104/			POST OMS-2		38884 lbs	
		DI T	Tuesday 2	9/3/85 (3)	70/67/	CASE:		190.51 X		DEPLOYED:	LAUNCH SCRUBS:
KSC-20		PLT: Dishard O. Cayoy	8/27/85 (3)	XRANGE:692 NM	104/103/ 73/67	LWC ET-21		190.2 NM		30289 lbs	- 8/24/85 launch scheduled for 8:38 AM EDT scrubbed
DAD	<u>OMS PODS</u> LPO4 - 2	Richard O. Covey P95/R73/M67	LAUNCH WINDOW:	ARANGE.072 NW	/ 3/0 /	LWT-14		AUSSAT		NON-DEPLOY:	because of thunderstorms in launch area and ship in LDA. - 8/25/85 launch scrubbed because of GPC-5 failure. Re-
<u>PAD</u> 39A-20	RP03 - 6	1 75/107	54 Minutes	<u>ORB DIR</u> : DL 13	1 = 2109 (8)			DEPLOY		8221 lbs	IPL's GPC-5 and fault repeated 11 minutes later. Replaced
39A-20	FRC3 - 6	M/S:	(PLANAR/ET	AIM PT: NOM	2 = 2018(7)	ET		190.23 NM			GPC-5.
		James D. Van Hoften	IMPACT AREA)	AINTET. NOW	3 = 2012 (10)	RPT				MIDDECK: 374 lbs	- 3-day total slip.
	DUNGE-E	(Flt 2-STS 41-C)		<u>MLGTD</u> : 2101 FT		232K		ASC DEPLOY			
COVE	FISHA	P96/R36/V21/M35	PLS-EDW	246:13:15:43Z VEL: 175 KGS	BI-STABLE	1:19:03		191.6 NM		RETURNED: 13478 lbs	LAUNCH DELAYS: - 3M1S delay awaiting clearing in cloud cover and ship in SRB recovery area.
14 ******	The Part	110	SLS-KSC	191 KEAS	HPOTP (1)	MET		0.0000			cover and ship in SKB recovery area.
	A N	<u>M/S</u> : John M. Lounge	ALS-NOR AOA-EDW	HDOT: -0.5 FPS	M 3 EOM	<u>et</u> <u>BR/UP</u>		SYNCOM-F4 DEPLOY		<u>SHUTTLE</u> ACCUMULATED	TAL WX: Dakar no go - clouds, Moron go.
- M		P97/R74/M68	AOA-EDW AOA WX-NOR,KSC	TO NODU 105	WEIGHT:	216K		194.6 NM		WEIGHTS:	
		1 77/10/4/1000	TAL-DAKAR	<u>TD NORM 195</u> : 1741 FT	196856	1:19:29		194.0 1000		DEPLOYED:	FLIGHT DURATION CHANGES: - Shortened flight 1 day because AUSSAT was deployed
		M/S:	TAL WX-MORON		X CG: 1092.4	MET		DEORBIT		244595 lbs	early.
The Article Logical		William F. Fisher	(SELECTED)	NLGTD: 4384 FT		ET		242 X		NON-DEPLOYED: 306375 lbs	earry.
		P98/R75/M69		246:13:15:51Z VEL: 144 KGS	LANDING	IMPACT		178 NM		CARGO TOTAL:	EVENTS:
T2	S-51I Flig	ht Crew	MAX Q = 735 PSF	HDOT: -5.6 FPS	WEIGHT:	<u>LAT</u> :		VELOCITY		634775 lbs	- Deployed AUSSAT-1 on orbit 5 instead of 17 because of
01	O JITT IIg		M = 1.61		196674	11.5°N		25829 FPS		PERFORMANCE	sunshield damage by RMS camera.
	ALT.		SRB SEP:	<u>BRK INIT</u> : 114 KGS	X CG: 1094.2	<u>LONG</u> : 157.6°W		RANGE 4004 NM		MARGINS (LBS):	- Deployed ASC-1 on orbit 7 at 239:22:07:32Z. - Deployed SYNCOM IV-4 on orbit 32 at 241:10:47:55z.
11 12			2:01 MET	AVE BRK DECEL		1				FPR: 4983	(Failed to operate after achieving operational altitude.)
1			2.01 ME1	7.3 FPS/S	51I-S-237	: Syncom	ו IV <mark>-</mark> 3 af	ter shove-of	f	FUEL BIAS: 839 FINAL TDDP: 176	- Rendezvous and EVA repair of LEASAT salvage
			MECO:	WHEELS STOP:	by Hofton					RECON: -1145	(SYNCOM IV-3) on days 5 and 6. (Deployed on STS 51-
1-12 -1			8:27.59 MET	246:13:16:30Z	earlier ca	ptured & I	repaired	by Shuttle.			D.)
	A612 3			8201 FT	12 SW	12.19.19	1 19.8	5.16.9700	1	<u>PRIMARY:</u> ASC-1/PAM-D	- Bi-Stable Pump - HPOTP minimum throttle of 67 percent
			ET SEP:	ROLLOUT:	Star J		1. A.			DEPLOYED	(first flight.)
			8:45.77 MET	6100 FT			-	The sha	r-	AUSSAT-1/PAM-D	RENDEZVOUS 7: To repair SYNCOM IV-3 .
	-0-25	9/	<u>OMS-1</u> :	47 SEC	2.57			Æ		DEPLOYED	
			NONE	WINDS:		A Charge				SYNCOM IV-4	SIGNIFICANT ANOMALIES:
				19H, 0 X KNOTS			AV			UNQ (LEASAT) DEPLOYED	- Tank A water flow rate to galley low.
		EMU/TETHERED EVA'S:	<u>OMS-2</u> :	OFFICIAL: 18H, 0X		1 21		A STA	14	DEPLOYED	 Hydraulic System 3 accumulator bootstrap pressure low. RMS elbow joint failed to respond to computer commands
		EV1 - Van Hoften EV2- Fisher	40:28 MET	DENS ALT: 2982 FT			= 1/3		A.	MIDDECK:	in primary.
			183.2 Seconds	DEINS ALT. 2902 FT				1 AC		PVTOS	- Potable water nozzle temp dropped to 58°F during supply
		EVA1 = 8/31/85		<u>FLT DURATION</u> : 7:02:17:42			1100	XX		PFR/APC MFR	water dump.
		7:20/7:07		7:02:17:42	18		1				- BFS OMS 2 out-of-plane velocity
MCC FCR-2	2 (12)	SS EVA #10		170:17:42		Ser A				4 CRYO TK SETS	computation 12.5 FPS higher than PASS.
				<u>S/T</u> : 128:13:06:56	and the	alette	2.0	and the second		RMS 15 (S.N. 301)	- FES topping duct zone H heater B failed.
FLIGHT DIR		EVA2 = 9/1/85		01/ 102		Stor Ball			-	Used for LEASAT	- FRCS thruster FIF chamber pressure failure.
Asc/Ent - G. Ld/O 1 - J. F		EV1 = 4:31/4:12		<u>OV-103</u> : 38:06:06:20		Mar.		North H	-	capture, repair, and release, waste water	 - Rt OMS fuel tank isol vlv A barber pole. - Galley water flow did not shut off.
0 2 - W. D. I		EV2 = 4:31/4:28 SS EVA #11				P. C.	Ser.	UL I		dump monitor, and to	- Right OMS pod AFRSI strip loose.
Plng - C. R.		CAPTURE, REPAIR, AND		DISTANCE:				20 - 10 - 10 2	N. C.	open AUSSAT	- Right Owo pou Ai Roi stilp loose.
MOD - E. F.		RELEASE OF		2,500,000 sm					an like	sunshield	RADIATORS DEPLOYED #10 (one sleep period for DTO)
		LEASAT/SYNCOM IV-4					-		Holes		

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FLT NO.	ORBITER	CREW (5) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE ENG. S.N.	SRB RSRM AND ET	INC	orbit Ha/Hp	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS 51-J (STS-28) SEQ. FLT # 21 KSC-21 <u>PAD</u> 39A-21	Atlantis (Flight 1) <u>OMS PODS</u> LPO3 - 6 RPO1 - 7 - 1	CDR: Karol J. Bobko (Flt 3 - STS-6 & STS 51-D) P99/R14/V11/M14 PLT: Ronald J. Grabe P100/R76/M70 <u>M/S</u> : Robert L. Stewart (Flt 2 - STS 41-B) P101/R73/V22/M32 <u>M/S</u> : David C. Hilmers P102/R77/M71 <u>P/S</u> : William A. Pailes (USAF) P103/R78/M72 MCC FCR-2 MCC FCR-2 MCC FCR-2 P103/R78/M72 MCC FCR-2 MCU FOR COMPANANCE Asc/Ent - G. E. Coen O 1 - C. W. Shaw Ld/O 2 - B. R. Stone Ping - J. M. Heflin MOD - T. W. Holloway	KSC-39A 276:15:15:30Z 11:15:30 AM EDT Thursday 6 10/3/85 (2) PLS - EDW SLS - KSC TAL - Dakar TAL WX - Moron (SELECTED) TAL WX - Zaragoza	EDW 23, LAKEBED (EDW 15, LKBD 11) 10:00:08 AM PDT Monday 4 10/7/85 (2) <u>XRANGE</u> : 432 NM <u>ORB DIR</u> : DL 14 <u>A/IM PT</u> : CLOSE IN <u>MLGTD</u> : 2476 FT 280:17:00:08Z VEL: 187 KGS 192 KEAS HDOT: -2 FPS <u>TD NORM 195</u> : 2206 FT <u>NLGTD</u> : 4873 FT 280:17:00:15Z VEL: 155 KGS HDOT: -5.6 FPS <u>BRK INIT</u> : 117 KGS <u>AVE BRK DECEL</u> : 7.3FPS/S	104/104 109 100/104/ 68/65/ 104/102/ 74/65 1 = 2011 (2) 2 = 2019 (2) 3 = 2017 (4) <u>M 3 EOM</u> WEIGHT: X CG: <u>LANDING</u> WEIGHT: 190765 X CG: 1101.2	BI-021 <u>MTR</u> : HPM <u>CASE</u> : LWC ET-25 LWT-18 <u>ET</u> <u>RPT</u> 230K 1:23:04 MET <u>BR/UP</u> 215K 1:23:25 MET <u>ET</u> <u>IMPACT</u> <u>LAT</u> : 20.6°N <u>LONG</u> : 148.26°W		<u>DEORBIT</u> 254 X 254 NM <u>VELOCITY</u> 26023 FPS <u>RANGE</u> 3986 NM		DOD NO RMS OASIS-2 CLOUDS RME MARC-DN RTPA OCEANS VFT-1 VFT-2 CST AMOS WINCON	 <u>KSC W/D</u>: OPF 84, VAB 14 PAD 34 = 132 <u>LAUNCH POSTPONEMENTS</u>: None. <u>LAUNCH SCRUBS</u>: None. <u>FLIGHT DURATION CHANGES</u>: None. <u>LAUNCH DELAY</u>: Launch delayed because of MPS PV# 6 RPCA erratic. (LH₂ prevalve close indicator.) <u>SIGNIFICANT ANOMALIES</u>: Port MPM shoulder "A" pyro initiator circuit failed self test. APU Exhaust Gas temp 2 failed. WSB 2 regulator pressure decayed. OPS Recorder 2 tracks 7,8, & 9 intermittent. ROMS fuel total quantity reading offset. TPS damage on left inboard elevon leading edge and in nose cap area. Fuel Cell 3 O₂ flowmeter failed. SSME 1 and 2 pitch and yaw actuator secondary delta pressures high. PLB camera "B" difficult to focus and camera "C" Azimuth and elevation failed. Airlock hatch "A" tapered pin did not latch in open position. Side hatch "T" handle difficult for crew to operate.
(**** ********************************		CDR Bobko PLT Gr	abe	WHEELS STOP: 280:17:01:13Z 10532 FT 8056 FT 65 SEC WINDS: 14H, 1R KNOTS OFFICIAL: 11H, 4R DENS ALT: 3622 FT FLT DURATION: 4:01:44:38 97:44:38 S/T: 132:14:51:34 OV-104: 4:01:44:38 DISTANCE: 1,682,641 sm							51J-143-126: Atlantis' vertical stabilizer (North side of photo) partially frames over-flight scene of Metropolitan Houston, muddy Galveston & Trinity Bays, Galveston Island, & Coastline of Gulf of Mexico.

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FLT	ORBITER	CREW (8)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM	(ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP	1.500	PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS 61-A (STS-30) SEQ FLT # 22 KSC-22 PAD 39A-22 MCC FCR-1 FLIGHT DIRE Asc/Ent - G. R MOD - D. R. 1 Image: Second S	CTORS: E. Coen Bourgeois ennington harr		ABORT TIMES KSC 39A 303:17:00:00Z 12:00:00 PM EST (P) 12:00:00 PM EST (A) Wednesday 1 10/30/85 (3) LAUNCH WINDOW: 180 Minutes (CREW WORKDAY) PLS - EDW SLS - KSC ALS - NOR AOA - NOR AOA - NOR AOA WX - NONE TAL - ZARAGOZA (SELECTED) TAL WX - MORON MANUAL TAL - KOLN/BONN MAX Q = 665 PSF M = 1.25 SRB SEP: 2:05 MET MECO: 8:34.96 MET ET SEP: 8:53.05 MET OMS-1: 10:35 MET 12.14 Seconds OMS-2: 44.40 MET 132.7 Seconds		ENG. S.N. 104/104 109% 100/89/ 65/104/ 102/73/ 67 1 = 2023 (4) 2 = 2020 (5) 3 = 2021 (5) <u>M 3 EOM</u> WEIGHT: 214325 X CG: 1083.8 <u>LANDING</u> WEIGHT: 214171	EI BI-022 <u>MTR:</u> HPM <u>CASE:</u> LWC ET-24 LWT-17 <u>ET</u> <u>BR/UP</u> 188K 1:00:57 MET <u>ET</u> <u>IMPACT</u> LAT: 59.97°S <u>LONG:</u> 147.96°E First 8-M	56.998° (4)	STANDARD INSERTION POST OMS-2 178.99 X 175.51 NM GLOMR DEPLOY 179.62 NM DEORBIT 180 X 174 NM VELOCITY 25829 FPS RANGE 4353 NM		EXPERIMENTS CARGO: 319111bs CHARGEABLE: 305191bs DEPLOYABLE: 150 lbs GLOMR GAS NON-DEPLOY: 27330 lbs MIDDECK: 2164 lbs RETURNED: 30732 lbs SHUTTLE ACCUMULATED WEIGHIS: SHUTTLE ACCUMULATED SHUTTLE ACCUMULATED WEIGHIS: SHUTTLE ACCUMULATED STORES SHUTTLE ACCUMULATED SHUTTLE ACCUMULATED STORES SHUTTLE ACCUMULATED SHUTTLE ACCUMULATED STORES SHUTTLE ACCUMULATED SHUTTLE ACCUMULATED STORES SHUTTLE ACCUMULATED SHUTTLE ACCUMULATED STORES SHUTTLE ACCUMULATED SHUTTLE	HRSTS, SIGNIFICANT ANOMALIES, ETC.) KSC W/D: OPF 35, VAB 4, PAD 14 = 53 LAUNCH POSTPONEMENTS: None. LAUNCH SCRUBS: None. LAUNCH DELAYS: None. TAL WX: Zaragoza, Moron, and Ben Guerir go. FLIGHT DURATION CHANGES: None. FIRSTS: - First flight with redesigned MPS 17" disconnect primary seal. - First flight with full nosewheel steering. - First flight with POCC overseas (Munich). Spacelab D-1 flight with objective science and implications of microgravity. EVENTS: - GLOMR deployed at 12:34:00 MET (rev 9). - Long-duration gravity gradient attitude (9 - 12 hours per day). SIGNIFICANT ANOMALIES: - Fuel cell 1 condenser exit temperature oscillated. - Cryo hydrogen tank 1 control pressure failed. - RCCS helium leg A operated on secondary. - RRCS helium leg A operated on secondary. - RRCS helium leg A operated losed. - APU 1 gearbox GN ₂ P high. - Smoke detector B in avionics bay triggered false alarms. - S-Band antenna switched late. - Primary L RCS thruster L2L injector heater failed on. - RMS deploy microswitches for shoulder manipulator positioning pedestal went to zero. - Stream of particulate matter hit Orbiter. - WCS
Lake Krono (Russia) ar	otskaya on th nd nearby vol	of many Earh views: e Kamchatka Peninsula canic mountains in the og of Fire' - 30 are still		168:44:51 <u>S/T</u> : 139:15:36:25 <u>OV-099</u> : 62:07:55:07 <u>DISTANCE</u> : 2,501,290 sm	Furrer/PS Buchli/M3 (left to rig	(German S, & CDF ht) PLT I	y), Dun R Hartsf Nagel, E	left to right) bar/MS, ield. Back 1 Bluford/MS, 1), & Ockels	ow	BR - Biorack NAVES - (Nav Exp) ME - Materials Exp GLOMR (DPLY) 4 CRYO TANK SETS RMS 16 (S.N. 302) Used for waste water dump monitor	RADIATORS DEPLOYED #11 (stowed for 23 hours in -ZLV +YVV)

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		CREW		LANDING SITE/	SSME-TL						
FI T		(7)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB	(ORBIT	FOW	PAYLOAD	MISSION HIGHLIGHTS
FLT NO.	ORBITER		LIFTOFF TIME, LANDING SITES,	CROSSRANGE LANDING TIMES	EMERG THROTTLE	RSRM AND	INC	HA/HP	FSW	WEIGHTS, PAYLOADS/	(LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS,
NO.		TITLE, NAMES	ABORT TIMES	FLT DURATION,	PROFILE	ET	INC			EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S		WINDS	ENG. S.N.	<u> </u>					
STS 61-B	OV-104	<u>CDR</u> :	KSC 39A	EDW 22, Concrete (EDW 17, CONC 5)	104/104	BI-023	28.454°	DIRECT		<u>CARGO</u> : 47509 lbs	KSC W/D: OPF 27, VAB 4, PAD 14 = 46
(STS-31)	Atlantis	Brewster H. Shaw, Jr. (Flt 2 - STS-9)	331:00:29:00Z 7:29:00 PM EST (P)		109%	MTD.	(15)	INSERTION	(5)		
SEQ FLT #23	(Flight 2)	P112/R25/V26/M24	7:29:00 PM EST (P) 7:29:00 PM EST (A)	1:33:49 PM PST	100/104/	<u>mtr</u> : HPM		POST		CHARGEABLE: 42788 lbs	LAUNCH POSTPONEMENTS: None.
SEQ FLI #23		<u>PLT</u> :	Tuesday 3	Tuesday 6 12/03/85 (2)	65/104/	CASE:		<u>OMS-2</u>			
KSC-23		Bryan D. O'Connor	11/26/85 (5)		103/74/	LWC		191.33 X		DEPLOYABLE: 27465 lbs	LAUNCH SCRUBS: None.
	OMS PODS	P113/R83/M76 M/S:		<u>XRANGE</u> : 533 NM	65	FT 22		190.12 NM			LAUNCH DELAYS: None.
PAD	LPO3 - 7 RPO1 - 8		LAUNCH WINDOW: 9 Minutes	<u>ORB DIR</u> :AL 4	1 = 2011 (3)	ET-22 LWT- 15		MORELOS		NON-DEPLOY: 13986 lbs	
39A-23	FRC4 - 2	P114/R84/M77	KU-SAT B/U DPLY-	AIM PT: NOM	2 = 2019(3)			DEPLOY			NIGHT LAUNCH: Shuttle #2
		<u>M/S</u> :	AUSSAT SUN	AINTET. NOW	3 = 2017 (5)	<u>ET</u>		192.71 NM		MIDDECK: 1337 lbs	
		Mary L. Cleave P115/R85/F8	SHIELD FAIL	MLGTD: 2386 FT		<u>RPT</u>		ALICOAT		RETURNED:	TAL WX: Dakar go, Moron no-go - clouds.
		<u>M/S</u> :	PLS - EDW	337:21:33:49Z VEL: 201 KGS		231 K 1:19:20		<u>AUSSAT</u> DEPLOY		20074 lbs	FLIGHT DURATION CHANGES:
OR CL	EAVE	Jerry L. Ross	SLS - KSC	191 KEAS		MET		196.43 NM		SHUTTLE	- EDW lakebed wet, changed to EDW 22 and landed one
		P116/R86/M78 <u>P/S</u> :	ALS - NOR	HDOT: -1.0 FPS						ACCUMULATED	rev early due to lighting conditions on EDW 22.
		Charles Walker	AOA - EDW	TD NORM 195:	M 3 EOM	ET		SATCOM		<u>WEIGHTS:</u> DEPLOYED:	- Shortened flight by one rev.
		(Flt 3 - STS 41-D	AOA WX - NOR, KSC	2026 FT	WEIGHT: 205880	<u>BR/UP</u> 207 K		<u>DEPLOY</u> 197.17 NM		272210 lbs	EVENTS:
- 100		& STS 51-D) P117/R42/V12/M40	TAL - DAKAR	<u>NLGTD</u> : 5909 FT	203000	1:19:56		177.17 11111		NON-DEPLOYED: 351192 lbs	- OMS-1 not performed.
WALKER	NERI	P/S:	(SELECTED)	337:21:34:00Z VEL: 160 KGS	X CG: 1084.4	MET		DEORBIT		CARGO TOTAL:	- MORELOS deployed 331:07:46:50Z (rev 6).
		Rudolpho Neri Vela (Mexico)	TAL WX - MORON	HDOT: -3.6 FPS				209 X		714195 lbs	- AUSSAT deployed 332:01:21Z (rev 17). - SATCOM deployed 332:21:57:31Z (rev 31).
		P118/R87/M79	MAX Q = 723 PSF	BRK INIT: 126 KGS	LANDING: WEIGHT:	<u>et</u> IMPACT		172 NM VELOCITY		PERFORMANCE	- <u>EVA 1</u> - Assembled/disassembled - ACCESS ten bays
MCC FCR-2	(14)	EMU/TETHERED EVA'S:	M = 1.16	BRK INT: 120 KGS	205732	LAT:		25882 FPS		<u>MARGINS (LBS)</u> : FPR: 5284	and six EASE assembly/disassembly cycles.
MOOT ON 2	(1)	EV1 - Jerry Ross		AVE BRK DECEL: 7 FPS/S		17.31°N		RANGE		FUEL BIAS: 849	- EVA 2 - Completed all tasks.
FLIGHT DIRE		EV2 - Woody Spring	SRB SEP:	7 FPS/S	X CG: 1085.9	LONG:		4099 NM		FINAL TDDP: 874 RECON: 2332	SIGNIFICANT ANOMALIES:
Asc/Ent - G. E 0 1 - W. D. Re		<u>EVA 1</u> - 11/29/85 5:34 -SS EVA#12	2:03.56 MET	WHEELS STOP:		156.69°W				4	- Excess helium in cryo 02 fans 1 and 2.
Ld/O 2 - J. T.		EVA 2 - 12/1/85	MECO:	337:21:35:07Z 13145 FT				A.	No.	<u>PAYLOADS</u> : SATCOM KU-2/	- Fuel cell 2 performance degraded and CPM hung up.
Plng - C. W. S		6:46 - SS EVA #13	8:31.29 MET				14		17	PAM D-2	- OMS XFD OX Center Heater failed.
MOD - D. R. F	Puddy	DEMO SPACE		ROLLOUT: 10759 FT			· ····	XA		DEPLOYED	- WSB #3 Reg. pressure decay. - Port PLS R-T-L CLOSE A failed.
		STATION ASSEMBLY TECHNIQUES	<u>ET SEP</u> : 8:49.45 MET	78 SEC	- Contraction			VA		MORELOS-B/	- Port PLBD aft.
			0.47.43 IVIE I	WINDS:		0		XI		PAM-D DEPLOYED	- NLG Strut 3" low.
**	-		<u>OMS-1</u> :	8T, 2R KNOTS		No.	1	X		AUSSAT-2/PAM-D DEPLOYED	- Volume H locker had to be pried open.
		0 0 1	NONE	OFFICIAL:4T, 4R		100	-	XI		SKT	- GSE side hatch "T" handle broke. - Gas leaks and erosion to both nozzle-to-case joints
	-9.		<u>OMS-2</u> :	<u>DENS ALT</u> : 2551 FT		21	1			EASE/ACCESS/MP	(blowby on LH SRM).
Eel	- FI	601	<u>01013-2</u> : 40:25 MET			T	7	Er-		ESSIMAX CFES	- Radiators deployed #12 (deployed for 10-hour DTO)
	0		180.4 Seconds	FLT DURATION: 6:21:04:49		Li.				DMOS	
				165:04:49		4			Į.	DMOS GAS(1)	
	012			<u>S/T</u> : 146:12:41:14				a press	A	MPSÉ	
					4			41	1	4 CRYO TANK SETS	
23				<u>OV-104</u> : 10:22:49:27		and the state	Tra la		12	RMS 17 (S.N. 303)	
				DISTANCE:	61B-41-019): During 2		Ross (above)	&	Used for	
100					61B-41-019: During 2nd EVA Ross (above) & Spring erected a Tower known as Assembly					EASE/ACCESS	
005.00		61 P. Crow Portroit	2,466,956 sm	Concept for Construction of Erectable Space					assembly, PKM monitors, waste		
585-3	0020 515	-61-B Crew Portrait			Concept for Construction of Erectable Space Structures.					water dump monitor	

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FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL Nom-Abort Emerg	SRB RSRM	(ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS 61-C (STS-32) SEQ FLT #24 KSC-24 <u>PAD</u> 39A-24		CDR: Robert L. Gibson (Flt 2 - STS 41-B) P119/R30/V27/M29 PLT: Charles F. Bolden P120/R88/M80 M/S: George D. Nelson (Flt 2 - STS 41-C) P121/R37/V28/M36 M/S: Steven A. Hawley (Flt 2 STS 41-DR) P122/R39/V29/M38 M/S: Franklin Chang-Diaz P123/R89/M81 P/S: C. W. Nelson (Congressman) P124/R90/M82 P/S: R. J. Cenker (RCA) P125/R91/M83 MCC FCR-1 (10) <u>FLIGHT DIRECTORS</u> : AscEnt - G. E. Coen Ld/O 1 - J. H. Greene O 2 - J. M. Heflin Plng - G. A. Pennington MOD - T. W. Holloway	KSC 39A 12:11:55:00Z 6:55:00 AM EST (P) 6:55:00 AM EST (A) Sunday 3 1/12/86 (2) LAUNCH WINDOW: 49 mins SATCOM KU THERMAL CONSTR ORBIT 8A PLS - KSC SLS - EDW ALS - NOR AOA - EDW AOA WX - NOR,KSC TAL - DAKAR TAL WX - MORON (SELECTED) MAX Q = 696 PSF M = 1.13 <u>SRB SEP</u> : 2:07.23 MET <u>MECO</u> : 8:21.29 MET <u>ET SEP</u> : 8:39.77 MET <u>OMS-1</u> : 10:51 MET 164.03 Seconds $\Delta V = 265.8$ FPS <u>OMS-2</u> : 46.05 MET 136.38 Seconds $\Delta V = 216.9$ FPS	EDW 22, Concrete (EDW 18, CONC 6) 5:58:51 AM PST Saturday 5 1/18/86 (2) <u>XRANGE</u> : 661 NM <u>ORB DIR</u> : DL 15 <u>AIM PT</u> : NOM <u>MLGTD</u> : 1530 FT 18:13:58:512 VEL: 217 KGS 212 KEAS HDOT: -2 FPS <u>TD NORM 195</u> : 2970 FT <u>NLGTD</u> : 6300 FT 18:13:59:07Z VEL: 160 KGS HDOT: -3.1 FPS <u>BRK INIT</u> : 138 KGS <u>AVE BRK DECEL</u> : 7.2 FPS/S <u>WHEELS STOP</u> : 18:13:59:50Z 11727 FT <u>ROLLOUT</u> : 10202 FT 59 SEC <u>WINDS</u> : 2T, 0X KNOTS OFFICIAL: 1H, 1R <u>DENS ALT</u> : 1088 FT <u>FLT DURATION</u> : 6:02:03:51 146:03:51 <u>S/T</u> : 152:14:45:05 <u>OV-102</u> : 41:01:54:11 <u>DISTANCE</u> : 2,197,305 sm	109% 100/104/ 85/69/ 104 1 = 2015 (5) 2 = 2018 (8) 3 = 2109 (9) BI-STABLE HPOTP (2) M 3 EOM WEIGHT: 210325 X CG: 1083.6 LANDING: WEIGHT:	BI-024 MTR: HPM CASE: LWC ET-30 LWT-23 EI RPT 239K 46:25 MET EI BR/UP 192K 47:41 MET EI MPACT LAT: 28.3°S LONG: 81.3°E	28.448° (16)	STANDARD INSERTION POST OMS-2 176.13 X 175.14 NM SAT COM DEPLOY 182.63 NM DEORBIT 184 X 173 NM VELOCITY 25815 FPS RANGE 4154 NM	017-32	CARGO: 32733 lbs PAYLOAD CHARGEABLE: 28625 lbs DEPLOYABLE: 12351 lbs NON-DEPLOY: 15837 lbs MIDDECK: 437 lbs RETURNED: 20111 lbs SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 284561 lbs CARGO TOTAL: 746928 lbs PERFORMANCE MARGINS (LBS): FPR: 5407 FVEL BIAS: 840 FINAL TDDP: 10754 RECON: 11127 PAYLOADS : SATCOM KU- 1/ PAM D2 DEPLOYED MSL-2 HITCHHIKER INFRARED - IMAGINING EXP 13 GAS CANS CHAMP IBSE HPCG STUDENT EXP (3) NORMS ACIP AADS 4 CRYO TK SETS NO RMS	 <u>KSC W/D</u>: OPF 101, VAB 8, PAD 34 = 143 <u>LAUNCH POSTPONEMENTS</u>: None. <u>LAUNCH SCRUBS</u>: 12/18/85 launch scrubbed to complete RCS crossfeed work in aft compartment (rescheduled before PRSD loading). 12/19/85 launch scrubbed after autohold at T-14 seconds due to RH SRB tilt HPU exceeding RPM redline (oversensitivity in control circuit). Launch rescheduled after holidays for 1/6/86. 18-43 yslip. 1/6/86 launch scrubbed at T-31 seconds when GSE LO2 replenish valve failed to close. Wrong manual command sequence resulted in TSM vent and drain valves opening without closing Orbiter fill/drain valve causing off-loading of approximately 18,000 lbs LO2 via F/D valve. LO2 SSME temperature dropped below redline limit and count recycled to T-20 minutes. Did an IMU alignment; however, launch was scrubbed when SATCOM launch window expired. Detanked and found a broken GSE LOX temperature probe lodged in SSME #2 prevalve (would have precluded full prevalve closure). Launch rescheduled for 1/7/86. 1/7/86 launch was scrubbed at T-9 hold due to bad weather at TAL sites (Dakar & Moron) and marginal KSC weather. Forty-eight hour turnaround for ovality check on MPS low pressure fuel duct. Rescheduled launch for 1/9/86. 2/day slip. 1/9/86 launch was scrubbed on 1/8/86 because of predicted bad weather at KSC. and temperature GSE probe found in SSME #2 prevalve. Rescheduled launch for 1/10/86. 1/10/86 launch was scrubbed due to rain showers at KSC with 45 minutes remaining in window. Rescheduled launch for 1/12/86). 2/10/86 launch scrubbed due to rain showers at KSC with 45 minutes remaining in window. Rescheduled launch for 1/12/86). 2-day slip. 2-day slip. 2-day total slip. LAUNCH DELAYS: None. TAL WX: Dakar n

Page 2-26 - STS 61-C

		JFAU			22101	3 201011	VIAR	K T	Page 2-26 - 515 61-0
FLT ORBITER NO.	CREW (7) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	EMERG F	SRB RSRM AND INC ET	ORBIT HA/HP	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
corner), others count Bolden, U.S. Repres	middeck; CDR Gibse er-clockwise from upp entative C.W. Nelson/ wley/MS, Chang-Diaz	per right: PLT PS,	ABOVE: 6 deployed fi BELOW: 6 landing. V	1C-005-0036 rom Columbia. 1C-S-050 (18 Si iew is of the Sh streams of ligh	January 19 nuttle's mai	86) Second n landing gear	Shuttle	e night	Continued FLIGHT DURATION CHANGES: - Management decision made to change flight duration to 4 days from 5 days. - Extended flight from 4 to 5 days due to bad weather at KSC (was 1/16/86). - Extended flight from 5 to 6 days due to bad weather at KSC (was 1/17/86). - Waved off KSC landing on 1/18/86 due to bad weather and landed at EDW (one rev extension). - Flight extensions, 2 days + 1 rev. LANDING SITE CHANGE: - KSC to EDW. <u>NIGHT LANDING</u> : - Second Shuttle night landing. <u>EVENTS</u> : - SATCOM deployed at 9:32 MET (REV 7). - Bi-stable Pump - HPOTP required minimum throttle of 67 percent (second flight). <u>SIGNIFICANT ANOMALIES</u> : - Fuel cell power source to essential bus 1 BC erratic. - APU 1 gearbox GN ₂ pressure high . - APU 3 fuel line system B heater failed . Muscine DOC bit for deversion for the system B heater failed .
	AT LEFT. 61C-13-00 - The crew having received excellent service fro the Waste Manageme System, showed th	m ent					1		 Vernier RCS jets fired excessively . S-band U/L and L/R antenna performance erratic. ECLSS pressure control system 2 oxygen flow transducer read low. WSB 3 System "A" heater operation erratic. Left RCS Helium Reg "B" leaked. WSB 1 system "A" cooling water use high. Gas leak in LH SRM nozzle-to-case joint (blowby). Gas leak and erosion in RH SRM nozzle-to-case joint.

photo at their Jan. 23, 1986 Post-Flight Press Conference.



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		CREW		LANDING SITE/	SSME-TL						
		(7)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT	50.00	PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(· /	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW		(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION,	THROTTLE PROFILE	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S	ADURT HIVES	WINDS	ENG. S.N.	EI				EAPERIMENTS	FIRSTS, SIGNIFICANT ANOWALIES, ETC.)
STS 51-L	OV-099	CDR:	KSC 39B	Wind bo	104/104	BI-026	28.45°	PLANNED	017-26	CARGO:	KSC W/D: OPF 30, VAB 5, PAD 28 = 63
STS-33)	(Flight 10)	Francis R. Scobee	28:16:38:00.1Z		109%	MTR:		STANDARD	(2)	52685 lbs	<u></u> ,
515 55)	Challenger	(Flt 2 - STS 41-C)	9:38:00 AM EST (P)			HPM		INSERTION	.,		LAUNCH POSTPONEMENTS:
SEQ FLT #25	OMS PODS	P126/R34/V30/M33	11:38:00 AM EST (A)		1 = 2023 (5)					CHARGEABLE:	- On 12/23/85, the 1/22/86 launch was postponed 1 day
(SC-25	LVO1 - 7	<u>PLT</u> :	Tuesday 4		2 = 2020 (6)	CASE:		153.5 NM		48633 lbs	to 1/23/86 to accommodate an integrated simulation
PAD	RV01 - 7	Michael J. Smith	1/28/86		3 = 2021 (6)	LWC					(STS 61-C launch delay impact). 1-day slip.
9B-1	FRC9 - 10	P127/R92/M84	LAUNCH WINDOW:			ET-26 LWT-19				DEPLOYABLE: 37636 lbs	- On 1/22/86, the 1/23/86 launch was postponed 2 days
		M/S: Judith A. Resnik	3 Hours			LVVI-19				3/030 IDS	to 1/25/86 because of KSC work schedule being impacted by STS 61-C landing delays. 2-day slip.
MCNAIR	ONIZUK	(Flt 2 - STS 41-D)	TAL SUNSET							NON-DEPLOYED:	impacted by 313 01-C randing delays. 2-day slip.
		P128/R41/V31/F2	(CASABLANCA)							10167 lbs	LAUNCH SCRUBS:
1. 19	a sub-	<u>M/S</u> :								10107 100	- 1/25/86 launch scrubbed early in count by MMT due to
	×	Ronald E. McNair	PLS - KSC	FLT DURATION:	STS 541 C	row pho	to with (Commander		MIDDECK:	forecast of unacceptable weather at KSC throughout
	00	(Flt 2 - STS 41-B)	SLS - EDW	00:00:01:14				ichael J. Sm		830 lbs	launch window. Launch rescheduled for 1/27/86.
Sco	ALL TH	P129/R32/V32/M31	TAL - CASABLANCA		Mission Sp				nu i,		- 1/27/86 launch scrubbed. Countdown halted at T-9
MCAULIFFE	JARVIS	<u>M/S</u> :	TAL WX - DAKAR	<u>S/T</u> : 152:14:46:19				E. McNair a	and	PRIMARY:	minutes when a GSE hatch fixture could not be removed
		Ellison S. Onizuka	MAN 0 700 DCF	01/ 000				ry B. Jarvis		TDRS-B/IUS-3	from exterior of side hatch, followed by a problem with a
		(Flt 2 STS 51-C) P130/R51/V33/M47	MAX Q = 720 PSF M = 1.35	<u>OV-099:</u> 62:07:56:21				S85-44253)		SPARTAN - HALLEY/MPESS	portable drill. Handling tool attach screw was drilled out. One hour and 20 minutes later, when the hatch problem
MCC FCR-2		P/S:	101 = 1.55	02.07.30.21	Sharon Ch		Auline. (365-44255)		TALLE MINIPESS	was resolved, the winds at KSC RTLS runway had
FLIGHT DIRE		Gregory Jarvis								ANCILLARY:	increased and exceeded the maximum allowable
Asc - J. H. Gre Ent - A. L. Bris		(HAC)								CHAMP	crosswind velocity. Launch rescheduled for 1/28/86.
Ld/O 1 - B. R.		P/131/R93/M85			IN MEMOR	KIAIVI				FDE	6-day total slip.
0 2 - C. W. Sł		<u>P/S</u> :								RME	- During the night, the temperature at KSC dropped to the
Plng - C. R. Ki		Christa McAulliffe	****							TISP	low twenties. Ice had accumulated in the pad area and
MOD - D. R. F		(Civilian Teacher)				0				PPE	ice inspections were made during night and morning of
		P132/R94/F9	** * * *		943A	Vac		2756		SSIP (3) ACIP	1/28.
Shuttle	Legacy Mu	Iral - In KSC LCC Firing R	coom		100	ASA.	- 2	0101		ACIP	LAUNCH DELAYS:
	- J - J - J	J	* ***		SE 1		51. 1			3 CRYO TANK	- 1H00M delay during T-3 hour hold due to late ET
	Sa		4 · *	MAY	NY AN			ALT TO SAL		SETS	tanking start caused by a GSE H ₂ fire alarm detector
and the second s				Y Y				and party			problem in LH ₂ ground storage tank.
See 14	2NAS		Part H			5			2	RMS 18 (S.N. 302)	- 1H00M additional delay after ice team inspection of ice
	1 3 1 1 1				Tel Part		20		22		formed by leaking H ₂ O hoses. The decision was made to
	1100					Y			/		allow additional time for ice on pad to melt.
- · · · · · · · · · · · · · · · · · · ·				Tural Pre	PAR A	1-0	A FIL	A MARINA			- 2H00M launch delay total.
							1 59	A CONTRACTOR			
	122			1	ARV	14		10			LAUNCH: - Launch occurred at 11:38:00.010 a.m. EST on
	9	and the second s			514						January 28, 1986.
	in the second	United States			115 - Sh		200				- Explosive burn at MET of 74 seconds.
	СПУПЕ										
	UTALLE	NGER TRIBUTE		the second second	A THE A		and the second	Contraction of the local division of the loc			FIRSTS:
KSC 2010 4	1451 (http://m	nediaarchive.ksc.nasa.g	index cfm) TH	is Tribute Display foot	ures Challonger	which blog	od a trail fo	r other vehicles	with		- First Shuttle launch from pad 39B.
		nd also the first landing at Kenn									- First flight to use Casablanca as TAL site.
snace shu	ittle mission (STS-8) a	-6) and the first untethered space	ewalk (STS-41R) Crew-	designed natches for a	each of Challenge	nenger s fo	ne in the lif	n earth toward or	nny a ur		- First flight to use DIAL-A-TAL site.
		crew. Other significant accompl									- First Shuttle failure in flight. Destroyed Vehicle and Crew.
		11C; the first American woman i									
		ice (Kathryn Sullivan during STS									

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FLT	ORBITER	CREW (5)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM	(ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.	ONDITER	TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP	1300	PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-26 (STS-26R) SEQ FLT #26	OV-103 (Flight 7) Discovery	CDR: Frederick H. Hauck (Flt 3 - STS-7 & STS 51-A) P133/R17/V7/M17	Thursday 7	EDW 17L (EDW 19, LKBD 13) 9:37:11 AM PDT Monday 5 10/3/88 (3)	109% 104/102/ 65/104/	BI-029 RSRM 1 360L 001	28.46° (17)	DIRECT INSERTION POST OMS-2	OI-8B (1)	<u>CARGO:</u> 46448 lbs PAYLOAD <u>CHARGEABLE</u> : 44601 lbs	<u>KSC W/D</u> : OPF 221, VAB 13, PAD 88 = 322 <u>LAUNCH POSTPONEMENTS</u> : - 9/26/88 launch postponed 3 days to 9/29/88 for Orbiter aft critical path. 3-day slip.
KSC-26 <u>PAD</u> 39B-2	<u>OMS PODS</u> LPO4 - 4 RPO3 - 8 FRC3 - 7	PLT: Richard O. Covey (Flt 2 - STS 51-I) P134/R73/V34/M67 <u>M/S 1:</u> John M. Lounge	9/29/88 (1) <u>DURATION</u> : 3 HOURS (CREW CONSTRAINT) PLS - EDW		1 = 2019 (4) 2 = 2022 (1) 3 = 2028 (1) <u>M 3 EOM</u>	ET-28 LWT-21 <u>ET RPT</u> 231K 1:17:18 MET ETBR/UP		162.61 X 169.02 NM <u>TDRS-C</u> <u>DEPLOY</u> 165.88 NM		DEPLOYABLE: 37514 lbs NON-DEPLOYED: 5928 lbs MIDDECK: T159 lbs RETURNED:	LAUNCH SCRUBS: None. LAUNCH DELAYS: - 1H38M delay from 9:59 a.m. EDT due to: (1) winds aloft differed from planned autumn winds with exceedences of WLE-14R and WLE-14L, and (2) PLT and M/S 1 suit fan fuses blew (replaced with 10A fuses but intended 5 amp
Stree WILL	HERIS AND SHA	(Flt 2 - STS 51-l) P135/R74/V35/M68 <u>M/S 2</u> : George D. Nelson (Flt 3 - STS 41-C & STS 61-C) P136/R37/V28/M36 <u>M/S 3</u> :	SLS - NOR AOA - EDW - NOR TAL - BEN GUERIR TAL WX - MORON (SELECTED) AUGMENTED CTG: BANJUL MAX Q = 707	<u>MLGTD</u> : 2569 FT 277:16:37:11Z VEL: 196 KGS 187 KEAS HDOT: -0.5 FPS (SR + 11 MIN) <u>TD NORM 195</u> : 1849 FT	194347 X CG: 1096.6 <u>LANDING</u> : WEIGHT: 194184	<u>ETBNOF</u> 211K 1:17:51 MET <u>ET</u> <u>IMPACT</u> <u>LAT</u> : 12:58°N <u>LONG</u> : 164.04°W		DEORBIT 177 X 163 NM <u>VELOCITY</u> 25790 FPS <u>RANGE</u> 4117 NM		RETURNED: 8964 Ibs SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 322075 Ibs NON-DEPLOYED: 374553 Ibs CARGO TOTAL: 793376 Ibs PERFORMANCE.	fuses). <u>FLIGHT DURATION CHANGES</u> : None. <u>TAL WX:</u> - Alternate TAL Moron selected due to rain showers and crosswind violations at Ben Guerir (Prime). <u>FIRSTS</u> : - Return to flight 2 yrs 8 mos after STS 51-L.
MUCK		David C. Hilmers (Flt 2 - STS 51-J) P137/R77/V36/M71 MCC FCR-1 (11) FLIGHT DIRECTORS: Asc/Ent - G. E. Coen O 1 - J. M. Heflin	M = 1.16 <u>SRB SEP</u> : 2:04.8 MET <u>MECO</u> : 8:33.43 MET	VEL: 150 KGS HDOT: -5.8 FPS <u>BRK INIT</u> : 127 KGS <u>AVE BRK DECEL</u> : 7.2 FPS/S <u>WHEELS STOP</u> : 277:16:37:57Z		Return -	To - Fli	ght	2	MARGINS (LBS): FPR: 5169 FUEL BIAS: 949 FINAL TDDP: 1546 RECON: 624 PAYLOADS: PLB: TDRS-C/IUS DEPLOYED	EVENTS: - TDRS-C deployed at 06:13:05 MET (rev 3). - Two engines OMS SEP burn at 06:28:03 MET (16.6 sec, 30.85 FPS). - Deorbit burn 168 secs, 324.86 FPS. - ET Reentry (tumble) - CAST GLANCE violent rupture. SIGNIFICANT ANOMALIES:
S26-09-00 Crew (No available) who you r from list a	08 caption - see ecognize	0 2 - C. W. Shaw Ld/Plg - L.S.Bourgeois MOD - T. W. Holloway MDR - B. R. Stone MDR - R. M. Kelso	<u>ET SEP</u> : 8:50.5 MET <u>OMS-1:</u> NONE OMS-2:	10020 FT <u>ROLLOUT:</u> 7451 FEET 50 SECONDS <u>WINDS:</u> 3T, 0X KNOTS						OASIS-1 MIDDECK: PVTOS-2 ADSF, IRCFE PCG IEF PPE ARC MLE ELRAD	 Prelaunch H₂ leak at 4"disc. RCS dynatube repair early in flow using clamshell. OMS gimbal standby enable 1 fail. FES high load evap freezing during ascent. FES shutdown during entry after OMS deorbit burn (rust/contamination). Ku-Band failed self test. Antenna would not follow
	OMS-2: 39.55 MET 141.6 Seco 222 FPS			OFFICIAL: 5H, 1L <u>DENS ALT</u> : 3445 FT <u>FLT DURATION</u> : 4:01:00:11 97:00:11 <u>S/T</u> : 156:15:46:30 <u>OV-103</u> : 42:07:06:31 <u>DISTANCE</u> : 1,430,505 sm	In MCC: G. Kranz, T. Holloway, A. Coher & unidentified.					MLE ELRAD SSIP(2) SE84-4 SE84-5 3 CRYO TANK SETS NO RMS	 pointing commands. (Had to use alternate stow procedure.) GOX flow control valves 1 and 2 operated sluggish on first cycle. WCS fan separator 1 flooded exhibiting stall currents for 80 secs. STBD PLBD Forward R-T-L "A" Talkback failed to function. APU#3 chamber pressure low. Rt wing TPS damage. 4" LH₂ ET/Orbiter disconnect leak. Radar altimeter failed at 50 feet. Video cassette tapes jammed (4 tapes).

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		00514		LANDING SITE/	SSME-TL						
		CREW (5)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB	(Orbit		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(3)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
070.07	01/ 104		KCO 200	WINDS EDW 17L	ENG. S.N.	DI 020	F7 0				
STS-27	OV-104	CDR:	KSC 39B	(EDW 20, LKBD 14)	100/104/ 96/65/	BI-030	57°			<u>DOD FLIGHT</u>	<u>KSC W/D</u> : OPF 196, VAB 10, PAD 30 = 236
(STS-27R)	(Flight 3) Atlantis	Robert L. Gibson (Flt 3 - STS 41-B	337:14:30:34Z 9:30:34 AM EST		96/65/ 104/65	RSRM 2	(5)		(2)	PERFORMANCE	
050 5LT #07	Alianus	(FIL 3 - STS 41-В & STS 61-С)	Friday 5	3:36:11 PM PST	104/00	360L				MARGINS (LBS):	LAUNCH POSTPONEMENTS: None.
SEQ FLT #27		P138/R30/V27/M29	12/2/88 (1)	Tuesday 7 12/6/88 (3)	1 = 2027 (1)	002				FPR: 4698	LAUNCH SCRUBS:
KSC-27		PLT:	12/2/00 (1)		2 = 2027 (1) 2 = 2030 (1)	002				FUEL BIAS: 968	- 12/1/88 launch scrubbed due to winds aloft exceedences.
K3C-27	OMS PODS	Guy S. Gardner	PLS - EDW	DEORBIT BURN: 341:22:29:347	3 = 2029(1)	ET-23				FINAL TDDP: 2905 *	Launch rescheduled for 12/2/88. 1-day slip.
PAD	LPO1 - 9	P139/R95/M86		341:22:29:34Z		LWT-16				RECON: -286	
39B-3	RPO1 - 9	M/S 1:	AOA - NOR	CROSSRANGE:		-					LAUNCH DELAYS:
0700	FRC4 - 3	Richard M. Mullane		520 NM		<u>et</u>				SECONDARY	- Countdown held at T-9 due to winds aloft and at T-31
		(Flt 2 - STS 41-DR)	AOA WX:	ORBIT DIR: DR 4		<u>RPT</u>				PAYLOADS:	seconds for TAL weather.
		P140/R40/V37/M39				236K				OASIS-II	
		<u>M/S 2</u> :	TAL - ZARAGOZA	<u>AIM PT</u> : NOM		1:24:30				AMOS	TAL WX:
		Jerry L. Ross	(SELECTED)	MLGTD: 1469 FT		MET				APE	- Zaragoza (prime) selected, alternate sites were no go -
		(Flt 2 - STS 61-B) P141/R86/V38/M78	TAL WX - MORON	341:23:36:11Z		ст				CLOUDS CRUX	low ceilings at Moron and Ben Guerir.
	C	M/S 3:	BEN GUERIR	VEL: 204 KGS 194 KEAS		<u>et</u> Br/UP				RME-III	ALTERNATE ASCENT I-LOADS:
EROS	SHED	William M. Shephard	DEN GOLKIK	HDOT: -1.0 FPS		216K				VFT-2	- LSEAT selected nominal ascent I-loads, no uplink
3 7	+ 1	P142/R96/M87		TD NORM 195:		1:25:03		DEORBIT		VI 1-2	required.
E F	1++ 8	1 142/10/00/		1523 FT		MET		244 X		RMS 19 (S.N. 201)	
Σ		MCC FCR-2 (16)						239 NM		Used for belly tile	FIRSTS:
8+05		. ,		<u>NLGTD</u> : 4423 FT 341:23:36:18Z		<u>et</u>				damage survey	- First flight with alternate ascent I-loads capability.
Son.	-	FLIGHT DIRECTORS:		VEL:164 KGS		<u>IMPACT</u>		<u>VELOCITY</u>			- First flight using East and West TDRS.
		Asc - G. E. Coen		HDOT: -4.9 FPS		<u>LAT</u> :		25956 FPS			- First flight with no communications blackout during entry
		O1/Ent - A. L. Briscoe		<u>BRK INIT</u> : 132 KGS		2.86°S		D. MOE			(due to favorable comm look angle to West TDRS).
		Ld/O 2 - B. R. Stone				LONG:		RANGE			- First flight of PDRS console position.
		Plng - C. R. Knarr		AVE BRK DECEL: 9.8 FPS/S		123.48°W		4220 NM			
		MOD - T. W. Holloway									SIGNIFICANT ANOMALIES: - Left inboard tire leaking since OPF (over-inflation plug
				WHEELS STOP: 341:23:36:52Z			Acres	19000		· Kan	seal).
		OR MER		341:23:36:522 8592 FEET		12	the second		-	· · ·	- APU #2 GG heater system malfunction.
			-			三 一句	- 1	and the second		Martin Prove	- Humidity separator B flooded.
THE PROPERTY.	AND DRAW IN	U.C. Pressent	Pu	ROLLOUT: 7123 FEET					1	- Methodal	- TAGS paper jam.
1	La tanget	the transferrer		41 SECONDS			-			274 110M	- TPS damage worst to date (707 hits, 298 hits > 1", most
0	111 ml (11)	III ITTIN' 1111				THE PARTY		2	Sec.	1	on right side bottom of wing and fuselage).
	- Company	Bech C A Book	• <u>•</u>	<u>WINDS</u> : 0H, 2L KNOTS			-				- Tile survey conducted using RMS end effector camera.
	2 00			OFFICIAL: 0H, 0X	M 3 EOM	- fill fill the		6	16		- R RCS Oxidizer B He regulator slow response.
2. 3. 112 Mar	A THE	GOEVA X			WEIGHT:		1980 Mar 1980	er, Eac 0	-lh		 Cabin temp controller #2 non-responsive. L OMS GN₂ Isolation valve coil failure.
1 Charles	+ n			<u>DENS ALT</u> : 3047 FT		- 1	-	C	12	15 3	- Engine #3 HPOTP #3 bearing inner race crack due to
CTGU D	7 h			FLT DURATION: 4:09:05:37	X CG:		20 ×				stress corrosion. Liquid stains, pitting, spalling - chlorine
100	A		37	4:09:05:37 105:05:37					1 C		contaminant.
1		A HANDA	20		LANDING:		Contraction of		-0		
W. Inc.	YA			<u>S/T</u> : 161:00:52:05	WEIGHT:	-	and and and	and the second second	1		
ST2027 4	1 012	Crew on flight deck: Left	to	OV-104:	190956	NAME OF TAXABLE	and press light	and the second se			
		ullane/MS, Ross/MS,	10	<u>OV-104</u> : 15:07:55:04							
		Gardner. Floating		DISTANCE	X CG: 1095.1			ooth land			
			or	DISTANCE: 1,812,075 sm		Gibso	n and	others we	ere as	stonished	
Bowl in Mi		d to the NFL at the Sup				at sev	verity o	of tile dam	nade.		
BOWI IT IVI	aiii.										

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HI ORBITER 0.9 Description plate Description plate <thdescription plate<="" th=""> <t< th=""><th></th><th></th><th>CREW</th><th></th><th>LANDING SITE/</th><th>SSME-TL</th><th></th><th></th><th></th><th></th><th></th><th></th></t<></thdescription>			CREW		LANDING SITE/	SSME-TL						
NO THE LANSE LANDING STESS LANDING STESS <thlanding stess<="" th=""> LANDING STESS</thlanding>	FLT						SRB		ORBII	FSW		
STS 269 (S15:269) (S15:		ORDITER		LANDING SITES,	LANDING TIMES FLT DURATION,	THROTTLE PROFILE	AND	INC	HA/HP	1.5W	PAYLOADS/	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
MOD - T. W. Holloway DISTANCE: STS029-71-000AEIUS/TDRS-D CHIX MDR - B. R. Stone DISTANCE: deployment from Discovery payload 3 CRYO TK SETS MDR - R. M. Kelso NO RMS	(STS-29R) SEQ FLT #28 KSC-28 PAD	(Flight 8) Discovery <u>OMS PODS</u> LPO4 - 5 RPO3 - 9	& EVA'S CDR: Michael L. Coats (Fit 2 - STS 41-DR) P143/R38/V39/M37 PLT: John E. Blaha P144/R97/M88 M/S: James F. Buchli (Fit 3 - STS 51-C & STS 61-A) P145/R52/V24/M48 M/S: Robert C. Springer P146/R98/M89 M/S: James P. Bagian P147/R99/M90 MS: Lames P. Bagian P147/R99/M90 MCC FCR-1 (12) FLIGHT DIRECTORS: Asc/Ent - A. L. Briscoe 01 - G. A. Pennington Ld/0 2 - C. W. Shaw Plng - R. D. Dittemore MOD - T. W. Holloway MDR - B. R. Stone	KSC 39B 72:14:57:00Z 8:07:00 AM EST (P) 9:57:00 AM EST (A) Monday 7 3/13/89 (2) PLS - EDW AOA - NOR TAL - BEN GUERIR (Selected) TAL WX - MORON CLS - BANJUL LAUNCH WINDOW: 2.5 HOURS (CREW TIME ON BACK) MAX Q =710 M = 1.44 SRB SEP: 2:04.5 MET MECO: 8:30.8 MET ET SEP: 8:50 MET OMS-1: NONE OMS-2: 39:58 MET 141.4 Seconds	WINDS EDW 22 (EDW 21, CONC 7) 6:35:50 AM PST Saturday 6 3/18/89 (2) DEORBIT BURN: 77:13:35:15Z XRANGE: 384 NM ORB DIR: AL 5, ORBIT 79, REV 80 AIM PT: NOM MLGTD: 1195 FT 77:14:35:50Z VEL: 204 KGS 205 KEAS HDOT: -3 FPS ID NORM 195: 2085 FT NLGTD: 5027 FT 77:14:36:01Z VEL: 162 KGS HDOT: -1.9 FPS BRK INIT: 129 KGS AVE BRK DECEL: 8 FPS/S WHEELS STOP: 77:14:36:41Z 10534 FT 77:14:36:41Z 10534 FT 9339 FEET 51 SECONDS WINDS: 4.4H,4.1L KNOTS OFFICIAL: 6H, 1L DENS ALT: 1853 FT FLI DURATION: 4:23:38:50 119:38:50 S/T: 166:00:30:57 OV-103: 47:06:45:21 DISTANCE:	ENG. S.N. 104/104 109% 100/104/ 66/104/ 65 1 = 2031 (1) 2 = 2022 (2) 3 = 2028 (2) M 3 EOM WEIGHT: 194940 X CG: 1093.7 LANDING: WEIGHT: 194790 X CG: 1095.3 STS029- deploym	BI-031 RSRM 3 360L 003 ET-38 LWT- 29 ET <u>RPT</u> 240K 1:17:11 MET ET <u>BR/UP</u> 217K 1:17:50 MET ET <u>IMPACT</u> LAT: 13.20°N LONG: 162.65°W	(18)	INSERTION POST OMS-2 162.59 X 160.27 NM TDRS-D DEPLOY 162.63 NM DEORBIT 178 X 164 NM VELOCITY 25787 FPS RANGE 4163 NM OUTION S/TDRS-D		CARGO: 47394 lbs PAYLOAD CHARGEABLE: 45316 lbs DEPLOYABLE: 37640 lbs NON-DEPLOYED: 6727 lbs MIDDECK: 949 lbs RETURNED: 9784 lbs SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 359715 lbs NON-DEPLOYED: 359715 lbs NON-DEPLOYED: 359715 lbs NON-DEPLOYED: 359715 lbs NON-DEPLOYED: 382229 lbs CARGO TOTAL: 840770 lbs PERFORMANCE MARGINS (LBS): FPR: 4698 FURAL TDDP: 3772 RECON: 2995 PAYLOADS: PLB: DEPLOYED SHARE OASIS-1 MIDDECK: IMAX PCG AMOS CHROMEX SSIP (2): SE 82-08 GAS: SE 82-08 CHIX 3 CRYO TK SETS	 KSC W/D: OPF 94, VAB 11, PAD 39 = 144 LAUNCH POSTPONEMENTS: 3/11/89 launch postponed 1 day to 3/12/89 to replace MEC #2. 3/12/89 launch postponed 1 day to 3/13/89 to replace FPOV actuator. 2-day total slip. LAUNCH SCRUBS: None. LAUNCH DELAYS: 1H50M launch delay due to winds aloft and ground fog at KSC. TAL WX: Ben Guerir (prime) selected - weather good throughout. ALTERNATE ASCENT I-LOADS: LSEAT selected YAW negative which was uplinked (first uplink). FLIGHT DURATION CHANGES: None. FIRSTS: First flight with corner alternate I-load capability. First flight alternate ascent I-load uplinked. EVENTS: TDRS-D/IUS deployed at 06:12:48 MET (rev 5). SEP burn at 06:27:48 MET, 16.48 seconds, 31.1 FPS OASIS-1 performed nominally. DTO 0517 NWS Runway Evaluation. DTO 0518 Revised System Braking Test. Deorbit burn 162 seconds, 31.3 2 FPS. ET ENTRY (TUMBLE) CAST GLANCE: Tumble rate 62 deg/sec prior to rupture, max DV - 552 FPS, number of pieces-30.

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											0
FLT NO.	ORBITER	CREW (5) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE ENG. S.N.	SRB RSRM AND ET	INC	orbit Ha/HP	FSW	Payload Weights, Payloads/ Experiments	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-29											Continued
Continued				STS029-78 deploymen			S-D aft	er			SIGNIFICANT ANOMALIES: - RCS jet R1U failed off at ET Sep. - Excessive vapor at H ₂ ET/Orbiter umbilical area prelaunch and tower clear. - TAGS developer overtemp; however, best TAGS performance with more than 660 pages processed. - Sluggish GOX FCV'S system 1 and 3. - LH2 disconnect slow to close. - FES shutdown during deorbit prep switch reconfiguration. - Unable to dump ops 2 track 4. - R OMS regulator "A" anomaly (OX & FU tank pressures approx 245 psi). - SHARE operations had problems due to vapor bubbles in liquid channels. - IMAX camera drive mechanism problem (belt jumped off track). - CHROMEX not cooling properly. - PLBD PORT B CLOSED indicator failed. - TPS 132 debris hits, 23 greater than 1"

ABOVE: S89-28089 & KSC-89PC-26---OV-103, suspended by overhead crane hooked to support structure attached at four points, is lowered for mating to ET & SRBs at KSC VAB Bay 1. SSMEs are covered with protective red shields BELOW: STS029-04-029---CDR Coats on OV-103's forward flight deck BELOW: STS029-S-066--- Post Landing: Crew pose with NASA officials. Left to right: PLT Blaha, Bagian/MS, Rear Adm. Richard H. Truly/NASA Associate Administrator for Space Flight, Dr. James C. Fletcher/NASA Administrator, CDR Coats, Buchli/MS and Springer/MS.

s29-s-0041 -- Flight Directors Lee Briscoe and Ron Dittemore on console in MCC Flight Control Room.







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		CREW (5)	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB	(ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(5)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-30	OV-104	<u>CDR</u> :	KSC 39B	EDW 22, CONC	104/104	BI-027	28.871°	STANDARD	OI-8B	CARGO:	KSC W/D: OPF 79, VAB 11, PAD 43 = 133
(STS-30R)	(Flight 4)	David M. Walker	124:18:46:58.975Z	(EDW 22, CONC 8) 12:43:26 PM PDT	109%	DODIA	(1)	INSERTION	(4)	47783 lbs	LAUNCH POSTPONEMENTS: None.
050 517 400	Atlantis	(Flt 2 - STS 51-A) P148/R48/V40/M45	1:48:00 PM EDT (P) 2:46:59 PM EDT (A)	Monday 6	100/104/	RSRM 4 360L		POST		CHARGEABLE:	
SEQ FLT #29		F 140/K40/V40/W43	Thursday 8	5/8/89 (2)	100/104/	004		OMS-2		45823 lbs	LAUNCH SCRUBS: 4/28/89 Launch scrubbed at T-31 seconds due to an
KSC-29		PLT:	5/4/89 (1)	DEORBIT BURN:	104/65			160.98 X		10020100	SSME 1 LH2 recirc pump failure at T-55 seconds. Launch rescheduled for 5/4/89. 6-day total slip.
10027	OMS PODS	Ronald J. Grabe		128:18:40:49Z 165.7, DV 326		ET-39		159.35 NM		<u>DEPLOYABLE</u> :	rescheduled for 5/4/89. 6-day total slip.
PAD	LPO1 - 10	(Flt 2 - STS 51-J)	WINDOW		1 = 2027 (2)	LWT-22				40118 lbs	LAUNCH DELAYS:
39B-5	RPO1 - 10 FRC4 - 4	P149/R76/V41/M70	DURATION: 64 Minutes	XRANGE: 350 NM	2 = 2030 (2) 3 = 2029 (2)	<u>et</u>		MAGELLAN DEPLOY		NON-DEPLOYED:	-00H43M delay with hold at L-16 minutes due to RTLS ceiling violation. (1:48 PM EDT planned launch). Picked up at 2:15 PM EDT, counted down to T-5 minutes and held. Picked up count at 2:42 PM EDT when RTLS runway 15 was go (33 was no go due to broken ceiling and excessive
	1104-4	M/S 1:	(TAL LIGHTING)	<u>ORB DIR</u> : AL6,	5 - 2027 (2)	RPT		161.84 NM		5540 lbs	up at 2:15 PM EDT, counted down to T-5 minutes and held.
		Mark C. Lee	````	<u>AIM PT: NOM</u>		243K					was go (33 was no go due to broken ceiling and excessive
	l	R150/R100/M91	PLS - EDW	MLGTD: 1314 FT		46:50		DEORBIT		MIDDECK:	tailwind). Total launch delay: 58M59S.
	EE TO	<u>M/S 2</u> :	AOA - EDW TAL - BEN GUERIR	128:19:43:26Z	M 3 EOM	MET		176 X 160 NM		165 lbs	,
Je :	1777	Norman E. Thagard	(SELECTED)	VEL: 204 KGS 196 KEAS		ET				RETURNED:	TAL WX: - Ben Guerir (prime) selected - Good weather at Ben Guerir
15		(Flt 3 - STS-7 &	TAL WX - MÓRON	HDOT: -1.5 FPS	WEIGHT:	BR/UP		VELOCITY		7724 lbs	and Moron.
de cle	9 / 2	STS 51-B)	CTG - BANJUL	TD NORM 195:	192558	212K		25788 FPS			I-LOADS: LSEAT selected nominal ascent I-loads - no
		P151/R20/V14/M19	RTLS 15	1354 FT	X CG: 1097.4	47:40 MET		RANGE		<u>SHUTTLE</u> ACCUMULATED	uplink required.
1		<u>M/S 3</u> :	MAX Q = 676	<u>NLGTD</u> : 5088 FT	A CG. 1097.4			4147 NM		WEIGHTS:	FLIGHT DURATION CHANGE: None.
		Mary L. Cleave	M = 1.07	128:19:43:38Z VEL:163 KGS	LANDING	T/V				DEPLOYED:	
	All and a state	(Flt 2 - STS 61-B)	000.050	HDOT: -1.7 FPS						399833 lbs	FIRSTS: - First interplanetary payload launch by Shuttle. First
TER	GRI	P152/R85/V42/F8	<u>SRB SEP</u> : 2:05.26 MET	BRK INIT: 128 KGS	WEIGHT: 192460	<u>et</u> Impact				<u>NON-DEPLOYED</u> : 387934 lbs	crosswind landing test.
and the second se		MCC FCR-1 (13)	2.03.20 IVIL I		192400	LAT:				CARGO TOTAL:	EVENTS:
			MECO:	AVE BRK DECEL: 6.2 FPS/S	X CG: 1099.1	28.85°S				888553 lbs	Uplinked launch targeting command load ly and del Psi (inertial plane and first stage yaw steering).
		FLIGHT DIRECTORS:	8:29.37 MET	WHEELS STOP:		LONG:				DEDEODMANOE	- Uplinked OMS targeting command load for OMS-1 and
		Asc - A. L. Briscoe O 1/E - R. D. Dittemore	ET SEP:	128:19:44:30Z		86.89°E				<u>PERFORMANCE</u> MARGINS (LBS):	OMS-2. - IUS/Magellan deployed at 6:14:33 MET (rev 5)
STS030-72		Ld/O 2 - J. M. Heflin	<u>8:46.67 MET</u>	11609 FEET						FPR: 4698	- IUS/Magellan deployed at 6:14:33 MET (rev 5). - Sep burn at 6:27:22 MET, 16 secs, 31.6 FPS.
046 1989-		Plng - W. D. Reeves		ROLLOUT:						FUEL BIAS: 968	ET REENTRY (NO TUMBLE)
First interpl		MOD - L. S. Bourgeois	<u>OMS-1</u> :	10295 FEET 64 SECONDS					NEX.	FINAL TDDP:	- CAST GLANCE, poor quality, tumble rate not discernible.
-launched b		MDR - C. W. Shaw	10:29 MET 141.72 Seconds		105					4709 RECON: 2650	SIGNIFICANT ANOMALIES:
			226.29 FPS	<u>WINDS</u> : VARIABLE	The N	1 30			VAL		 SSME 1 LH2 Recirc pump failure. GPC 4 quit (poll fail on SM CRT when GPC was taken to standby). IFM replaced GPC. Cabin P Xducer test port left on during first launch
	A	·····································		290/12G20			2-6		10	PAYLOADS:	standby). IFM replaced GPC.
They	N.		<u>OMS-2:</u> 44:27 MET	11 TO 19 KNOTS RIGHT XWIND	and a		0	P 10	100	<u>PLB</u> : MAGELLAN/IUS	- Cabin P Xducer test port left on during first launch attempt.
	1.11		44:27 ME 1 125.32 Seconds	OFFICIAL: 5H, 11R		3			TAN	(VENUS PROBE)	- Excess water from galley H ₂ O dispenser.
1	17A	2.1	197.03 FPS	DENS ALT: 4900 FT	M South		The Party	J	131	DEPLOYED	 Excess water from galley H₂O dispenser. TAGS jam on 19th page. Teleprinter character tops illegible.
				FLT DURATION:			- Kab				- Camera A spots on image. - ARRIFLEX 16MM camera operate lever failure (crew
				4:00:56:27 96:56:27	20000	-	-	11		<u>MID-DECK</u> : AMOS	performed IFM)
	11/				A BOARD	(AN)				FEA	- Thruster R1U failed off at ET Sep. - R RCS OX Helium P A valve failed open.
	Les Les			<u>S/T</u> : 170:01:27:24						MLE	- FEA problems.
11/1		Aur		<u>OV-104</u> : 19:08:51:31	STS030-21	-013	Crew: Clo	ockwise from			- WONG dilemma.
		The second se			upper right					CRYO TK SETS - 3	
1				DISTANCE: 1,477,500 sm	Lee/MS, Tł	nagard/N	IS & PLT	Grabe.		NO RMS	
4											I

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				LANDING SITE/	SSME-TL						
		CREW (5)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB	(ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(3)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
070.00	OV-102	CDR:	KSC 39B	WINDS EDW 17 LEFT	ENG. S.N. 104/104	BI-028	57°		OI-8B		KSC W/D: OPF 190, VAB 11, PAD 25 = 227
STS-28	(Flight 8)	Brewster H. Shaw, Jr.	220:12:37:00Z	(EDW 23, LKBD 15)	104/104	DI-020	(6)		(5)	000	KSC W/D. OPF 190, VAB 11, PAD 25 = 227
(STS-28R)	Columbia	(Flt 3 - STS-9 &	8:37:00 AM EDT	6:37:09 AM PDT		RSRM 5	(0)		(0)	PERFORMANCE	LAUNCH POSTPONEMENTS:
SEQ FLT #30		STS 61-B)	Tuesday 5	Sunday 3	100/104/	360L				MARGINS (LBS):	- 8/7/89 launch postponed to 8/8/89 due to MPS He
		P153/R25/V26/M24	8/8/89 (4)	8/13/89 (2)	97/65/ 104/65	005				FPR: 4698 FUEL BIAS: 968	system. 1-day slip.
KSC-30	OMS PODS	PLT:	LANDING SITE	DEORBIT BURN:	104/05	ET-31				FINAL TDDP: 409	LAUNCH SCRUBS: None.
PAD	LPO3 - 8	Richard N. Richards	PRIORITIES:	225:12:36:57Z	1 = 2019 (5)	LWT-24				RECON: 158	
<u>PAD</u> 39B-6	RPO4- 4 FRC2 - 8	P154/R101/M92	1. EDW LAKEBED 2. EDW CONC	XRANGE: 186 NM	2 = 2022 (3) 3 = 2028 (3)	гт				3 CRYO TK SETS	LAUNCH DELAYS: - Launch delay at T-9 due to an NSP frame sync error and
	FRG2 - 8	M/S 1:	3. NOR LAKEBED	ORB DIR: AL 7	3 = 2028 (3)	<u>et</u> BR/UP				3 CRIUIN SEIS	MMU 1 read problem during G9 to OPS 101 transition.
		James C. Adamson	4. KSC		M 3 EOM	220K				AMOS	- Launch delay due to KSC ground fog.
STMA	BROWN	P155/R102/M93	TAL 7	<u>aim pt</u> : Nom		1:11:44		DEODDIT		HEIN-LO	, , , , , , , , , , , , , , , , , , , ,
TEES		<u>M/S 2</u> :	TAL: Zaragoza TAL WX: Moron	<u>MLGTD</u> : 5311 FT	WEIGHT:	MET		<u>DEORBIT</u> 166 X		IOCM/APM CLOUDS	TAL WX: - Zaragoza (prime) NO GO - thundershowers, Ben Guerir
3		David C. Leestma	(Selected)	225:13:37:09Z		ET		160 NM		CRUX	NO GO - crosswinds.
3		(Flt 2 - STS 41-G) P156/R45/V43/M42	CLS: Banjul	VEL: 157 KGS 155 KEAS	X CG:	IMPACT				RME-III	- Moron (selected) - GO throughout.
2	See 19	P156/R45/V43/M42	RTLS: KSC 33	HDOT: -1 FPS		LAT:		VELOCITY 25803 FPS		LLL SAM	I-LOADS:
		M/S 3:	AOA: NOR			36.64°S		23003 FF3		VFT-2	- LSEAT selected nominal ascent I-loads - no uplink
CONT OF	E 21	Mark N. Brown		TD NORM 195: 2545 FT	<u>LANDING</u>	LONG:		<u>RANGE</u> 4332 NM			required.
	SHAW	P157/R103/M94	MAX Q = 679		WEIGHT:	149.65°W		4332 NM			
The second second	-		M = 1.12 00:59.3 MET	NLGTD: 7393 FT	200214						EVENTS: - No blackout during entry, comm via TDRS-W.
		MCC FCR-2 (17)	00.07.0 WE I	225:13:37:14Z VEL:125 KGS	X CG: 1089.4						- No blackout during chiry, comm via TDKS-w.
			SRB SEP:	HDOT: -9.5 FPS							SIGNIFICANT ANOMALIES:
		FLIGHT DIRECTORS: Asc/Ent-R. D. Dittemore	2:04 MET	BRK INIT: 79 KGS							- Prelaunch problem, one of nose gear WOW proximity
		O 1 - G. A. Pennington	MECO:				13th				sensors began indicating weight on nose gear. Indication went away after insertion but returned later in flight causing
		Ld/O 2 - C. R. Knarr	8:15 MET	AVE BRK DECEL: 6.3 FPS/S							a WOW dilemma during landing. NWS was enabled by crew by depressing SRB SEP pushbutton.
		Plng - N. W. Hale MOD - T. W. Holloway	ET SEP:	0.3 FPS/S		1	Alter				crew by depressing SRB SEP pushbutton. - MMU input/output error on OPS-1 transition.
		IVIOD - T. W. HUIIUWAY	8:53 MET	WHEELS STOP:			23		4		- Pilot's seat moved aft during ascent.
				225:13:37:52Z 11326 FEET			KOAKK.		i		 Pilot's seat moved aft during ascent. Vernier thruster F5R annunciated "fail leak."
	Jer /	200	<u>OMS-1</u> : NONE						-	Contra Const	- NLG WOW indication failed off.
			NONE	ROLLOUT: 6015 FEET	11년 및 공급						 Forward RCS F5L thruster heater failed on. S-band PA2 power output degraded to 60 watts.
			OMS-2:	46 SECONDS							- Potable water dump valve failed open.
	S / A anipo		37:52:23 MET			10					- Teleprinter cable shorted causing a 1.5-second short
			106 Seconds	WINDS: 160° @ 6 KTS		The second second	SER IN	-11	A		of 51Å. - Freon coolant loop 2 flow degraded about 100 lbs/hr &
	- 16			5.8H, 1.6 L KTS		R HINK					FCL 1 about 50 lb/hr.
R.F.	60.0			OFFICIAL: 1H, 6L		AASA	المراجع المراجع		1 24		- Radar altimeter 1 and 2 lost attitude reading at 26 feet.
		8 4		DENS ALT: 3670 FT				THE REAL PROPERTY OF	1		 Hydraulic system 2 unloader valve operation out-of-spec. Body flap excessive deflection during ascent.
							Manager	فسف المحود والسا			- NSP frame sync errors prelaunch.
				FLT DURATION: 5:01:00:09		070	The real		DEL THE		- SSME 1 GH ₂ flow control valve sluggish.
				121:00:09			in the second second	Contract of the second	5.07		
	-	une -		<u>S/T</u> : 175:02:27:33		INCE IEIN	NY .	0 00000000000	C String		
	AL.								and the second second		
		middeck: Clockwise		<u>OV-102</u> : 46:02:54:20	S89-4109	6,1989-0	8-09 5	STS-28 Colu	mbia.	OV-102, is	
		AS (mustache) are						crawler tran			
		S, PLT Richards, and		DISTANCE: 2,070,943 sm						her platform.	
		tail end of stuffed toy		2,070,943 sm						KSC-89PC-	
animal.					<u>684.</u>						
				1							

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		CREW	LAUNCH SITE.	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(5)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		ORDIT	FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
(holding miss	G-DIAZ	PLT: Michael J. McCulley P159/R104/M95 M/S 1: Shannon W. Lucid (Fl 2 - STS 51-G) P160/R65/V45/F6 M/S 2: Franklin Chang-Diaz (Fl 2 - STS 61-C) P161/R89/V46/M81 M/S 3: Ellen S. Baker P162/R105/F10 MCC FCR-1 (14) FLIGHT DIRECTORS: A/E/O1 - R. D. Dittemore Ld/O 2 - J. M. Heflin Plng - R. E. Castle MOD - G. E. Coen MDR - C. W. Shaw	AUSIAN CONCEPTION Wednesday 2 10/18/89 (4) 27 Minutes (GALILEO RAAN) <u>LANDING SITE PRIORITIES:</u> 1. EDW LAKEBED 2. EDW CONCRETE 3. NOR 4. KSC <u>EOM RUNWAY:</u> Based on DTO priority: 1. Xwind DTO 2. NWS DTO	WINDS EDW 23L, LKBD EDW 24, LKBD 16) 296:16:33:00Z 9:33:00 AM PDT Monday 7 10/23/89 (4) XRANGE: 496 NM DEORBIT BURN: 296:15:31:45Z 166.4 secs, 321.48 FPS ORB DIR: AL8 AIM PT: CLOSEIN MLGTD: 1871 FT 296:16:33:00Z VEL: 206 KGS 195 KEAS HDOT: -2 FPS TD NORM 195: 1880 FT NLGTD: 5355 FT 296:16:33:11Z VEL:158 KGS HDOT: -3.9 FPS BRK INIT: 77 KGS AVE BRK DECEL: 5.8 FPS/S WHEELS STOP: 296:16:34:01Z 11548 FEET ROLLOUT: 9677 FEE 61 SECONDS WINDS: 190° @ 8 KTS 1H, 4L KTS OFFICIAL: 2H, 3L DENS ALT: 2680 FT FLT DURATION: 4:23:39:20 S/T: 180:02:06:53	104/104 109% 100/104/ 100/65/ 104/65 1 = 2027 (3) 2 = 2030 (3) 3 = 2029 (3) M 3 EOM WEIGHT: 196112 X CG: 1093.1 LANDING WEIGHT: 195954 X G: 1094.7 S92-52043, 1992-12-30 days after it: views the M The Moon is Antarctica is Moon's far s	Three yes s encounter foon and Es s in the fore s visible thro ide is seen	ears after r with Earl arth from ground, m ough cloud ; the shac	DIRECT INSERTION POST OMS-2 161.73 X 161.35 NM GALILEO DEPLOY 163.61 NM DEPLOY 163.61 NM VELOCITY 25784 FPS RANGE 4156 NM VELOCITY 25784 FPS RANGE 4156 NM	ht o S. ht. e n in	CARGO: 48613 lbs PAYLOAD CHARGEABLE: 45905 lbs DEPLOYABLE: 38323 lbs NON-DEPLOYED: 6696 lbs MIDDECK: 886 lbs RETURNED: 10320 lbs SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 438156 lbs NON-DEPLOYED: 438156 lbs NON-DEPLOYED: 438156 lbs NON-DEPLOYED: 438156 lbs NON-DEPLOYED: 438156 lbs PERFORMANCE MARGINS (LBS): FPR: 4698 FUEL BIAS: 968 FINAL TDDP: 2103 RECON: -132 PAYLOADS: PLB: GALILEO/IUS (JUPITER PROBE) (DEPLOYED) SSBUV MID-DECK: SSP (1) PM MLE GHCO STEX AMOS IMAX 3 CRYO TANKS NO RMS	 <u>KSC W/D</u>: OPF 95, VAB 8, PAD 50 = 153 <u>LAUNCH POSTPONEMENTS</u>: None. <u>LAUNCH SCRUBS</u>: 10/12/89 launch scrubbed during T-19 hold to replace SSME #2 controller. 5-day slip. 10/17/89 launch scrubbed while holding at T-5 minutes due to bad RTLS weather when 27-minute window expired. Rescheduled launch for 10/18/89. 6-day total slip. <u>LAUNCH DELAYS</u>: -3M40S delay into 27-minute window after reconfiguration to Zaragoza for TAL at T-5 minutes (Ben Guerir had rain showers). <u>TAL WX</u>: Ben Guerir (prime) - NO GO - rain showers -Zaragoza 30 (alt) selected. <u>LOADS</u>: LSEAT selected nominal ascent I-loads, no uplink required. <u>FLIGHT DURATION CHANGE</u>: None. <u>EVENTS</u>: Galileo/IUS deployed on rev 5. Sep burn 06:36:23, 16.64 secs, 31.31 FPS No blackout during entry, comm via TDRS-W. <u>ET TRACKING DTO (NO TUMBLE)</u>: CAST GLANCE, daylight entry, unsuccessful track. <u>SIGNIFICANT ANOMALIES</u>: SRB C-Band transponders first flight. APU Heater GG/Fuel Pump 2-A failure. WSB #2 Steam Vent Heater A failure. MDM FA1 Primary Port failure. MDM FA1 Primary Port failure. MDM FA1 Primary Port failure. HSD minat antenna elect. 1 failed to close. Erratic waste water quantity transducer. HSI primary miles erroneous indication. TAGS overtemp indication. S-Band beam control assy failed to select URF antenna. S-Band beam control assy failed to select URF antenna. S-Band beam control assy failed to select URF antenna.

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	CREW		LANDING SITE/	SSME-TL						
	(=)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB	(ORBIT		PAYLOAD	MISSION HIGHLIGHTS
ORBITER	(5)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
	TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG_S N	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
DV-103		KSC 39B	EDW 04, CONC	104/104	BI-034	28.45°			<u>DOD</u>	KSC W/D: OPF 114, VAB 21, PAD 27 = 162
Discovery	(Flt 2 - STS 51-B) P163/R59/V47/M54	327:00:23:29.98Z 7:23:30 PM EST Wednesday 3	(04 - 1ST FLIGHT) 4:30:19 PM PST Monday 8	100/104/ 97/65/	RSRM 7 ET-38	(19)		(6)	PERFORMANCE MARGINS (LBS):	LAUNCH POSTPONEMENTS: - 11/21/89 launch postponed to 11/22/89 due to SRB IEA cable replacement. 1-day total slip.
MS PODS	John E. Blaha	11/22/89 (6)	11/27/89 (5)	104/65					FUEL BIAS: 968	LAUNCH SCRUBS: None.
PO4 - 6 RPO1- 11 RC3 - 9	P164/R97/V48/M88	LANDING SITE PRIORITIES: 1. EDW LAKEBED	DEORBIT BURN: 331:23:10:51Z 181.9 Seconds	$\begin{array}{l} 1 = 2011 \ (4) \\ 2 = 2031 \ (2) \\ 3 = 2107 \end{array}$	<u>ET</u> <u>RPT</u> 237K				FINAL TDDP:1157 RECON: 653	LAUNCH DELAYS: Launch held at T-5 because of a ground purge problem
	<u>M/S 1</u> : Manley L. Carter, Jr. P165/R106/M96	2. EDW CONCRETE 3. NOR 4. KSC	<u>XRANGE</u> :226 NM ORB DIR: AL 9		46:55 MET				3 CRYO TK SETS	for GLS confirmation of Shuttle purge flow rate and completion of APU prestart.
	<u>M/S 2</u> : F. Story Musgrave (FIt 3 - STS-6 &	RTLS: KSC 15 TAL: Ben Guerir 36 (Selected)	<u>AIM PT</u> : CLOSEIN MLGTD: 740 FT	<u>M 3 EOM</u>	47:26		DEORBIT 302 X		AMOS VFT-1 APE-B	TAL WX: - Ben Guerir 36 (prime selected - good weather after marginal ceiling earlier in day. - Banjul contingency site.
	P166/R15/V19/M15 <u>M/S 3</u> :	AOA: EDW 22 MAX Q = 729.3	332:00:30:192 VEL: 196 KGS 199 KEAS HDOT: -1 FPS	X CG:	T/V OFF		VELOCITY 25998 FPS		CLOUDS-1A	I-LOADS: - LSEAT selected nominal ascent I-loads, no uplink required.
BLAHA	Kathryn C. Thornton P167/R107/F11	1:02.1 MET	<u>TD NORM 195:</u> 1042 FT	LANDING	<u>ET</u> IMPACT		<u>RANGE</u> 4068 NM			NIGHT LAUNCH: Third Shuttle night launch.
	MCC FCR-2 (18)	2:06.77 MET	<u>NLGTD</u> : 3982 FT 332:00:30:26Z VEL:161 KGS	WEIGHT: 194282	<u>LAT</u> : 28.57°S					WAVEOFFS: - Waved off landing on fourth day due to high winds at EDW and landed one day later.
CUT ON	Asc/Ent - A. L. Briscoe O 1 - N. W. Hale		HDOT: -2.2 FPS <u>BRK INIT</u> : 145 KGS	X CG: 1094.8	86.4°E		an markan ta an ta an ta an	******	Naci da fazi en esta	FIRST SHUTTLE CREWMEMBER REPLACEMENT: - David Griggs died in private aircraft accident while in training in June 1989. He was replaced by Blaha. (This
THOM	Plng - R. M. Kelso MOD - T. W. Holloway	8:44 MET	AVE BRK DECEL: 8.5 FPS/S				n an			was first US spaceflight crewmember changeout since Ken Mattingly was exposed to measles 3 days before Apollo 13 launch on April 11, 970. Jack Swigert was his replacement.)
10		66 Seconds	<u>WHEELS STOP:</u> 332:00:30:02Z 8504 FT							EVENTS: - No entry blackout, comm via TDRS-W.
	1	<u>OMS-2</u> : 35:16 MET 95.2 Seconds	<u>ROLLOUT</u> : 7764 FEET 46 SECONDS				-			SIGNIFICANT ANOMALIES: - APU 1 lube oil outlet pressure high during ascent. - Cabin leak through WCS.
14	PL		<u>WINDS</u> : 070° @ 8 KTS GUSTS TO 19 KTS			ANCLE		فمتعميط		 TAGS jam (did not work during flight). Galley rehydration station failed to dispense hot or cold water.
			7.2H, 3.5R KTS OFFICIAL: 8H, 2R		and the	y	Deres.			 FES primary B shut down (overtemped during deorbit prep). +X COAS line of sight shift. CDR AMI M/VEL error.
TE			<u>DENS ALT</u> : 2302 FT <u>FLT DURATION</u> : 5:00:06:49 120:06:49	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1					and a second	 CDR AWI W/VEL effor. MSBLS BITE indication. WCCS short battery life. Ku-Band radar self test failure. Hydraulic system 1 and 2 accumulator pressure locked up
			<u>S/T</u> : 185:02:13:42 OV-103:							low. - Cryo oxygen tank 2 check valve stuck twice.
LT Blaha, Carl			DISTANCE:	Indonesia. T	he linear	alignmen	t of the volcand			IFM: - Broken shear pin on WCS so crew used vice grips to drive valve linkage.
	Flight 9) iscovery MS PODS PO4 - 6 PO1- 11 RC3 - 9	& EVA'S V-103 Flight 9) iscovery MS PODS P04 - 6 P01-11 RC3 - 9 MS PODS P163/R59/V47/M54 PLT: John E. Blaha (Fit 2 - STS-29) P164/R97/V48/M88 MS 1: Manley L. Carter, Jr. P165/R106/M96 MS 2: F. Story Musgrave (Fit 3 - STS-6 & STS 51-F) P166/R15/V19/M15 MS 3: Kathryn C. Thornton P167/R107/F11 MCC FCR-2 (18) FLIGHT DIRECTORS: Asc/Ent - A. L. Briscoe O 1 - N. W. Hale Ld/O 2 - C. W. Shaw Ping - R. M. Kelso	ITTLE, IVANES & EVA'SABORT TIMESV-103 Tight 9) iscoveryCDR: Frederick D. Gregory (FI12 - STS 51-B) P163/R59/V47/M54KSC 39BMS PODS PO4 - 6 PO1-11 RC3 - 9PIT: John E. Blaha (FI12 - STS-29) P164/R97/V48/M88KSC 39BMS PODS PO4 - 6 PO1-11 RC3 - 9MS 1: Manley L. Carter, Jr. P165/R106/M96LANDING SITE PRIORITIES: 1. EDW LAKEBED 2. EDW CONCRETE 3. NOR 4. KSCMS 2: F. Story Musgrave (FI13 - STS-6 & STS 51-F) P166/R15/V19/M15RTLS: KSC 15 TAL: Ben Guerir 36 (Selected) CTGY: Banjul AOA: EDW 22MS 3: Kathryn C. Thornton P167/R107/F11MAX 0 = 729.3 Max 0 = 729.3 Max 15MC F CR-2 (18) FLIGHT DIRECTORS: Asc/Ent - A. L. Briscoe O1 - N. W. Hale Ld/0 2 - C. W. Shaw Pi0 - T. W. HollowayMAX 0 = 729.3 M = 1.5 S2.69 METFLIGHT DIRECTORS: Asc/Ent - A. L. Briscoe O1 - N. W. Hale Ld/0 2 - C. W. Shaw Pi0 - T. W. HollowayMECO: 8:26.9 METFLIGHT DIRECTORS: Asc/Ent - A. L. Briscoe O1 - N. W. Hale Ld/0 2 - C. W. Shaw Pi0 - T. W. HollowayMECO: 8:26.9 METFLIGHT DIRECTORS: Asc/Ent - A. L. Briscoe O1 - N. W. Hale Ld/0 2 - C. W. Shaw Pi0 - T. W. HollowayMECO: 8:26.9 METState Additionary and the file are CDR Gregory, for a left) are CDR Gregory,MS 2: State and the file are CDR Gregory,	ITTLE, NAMELS & EVAS ABORT TIMES FLT DURATION, WINDS V-103 Fight 9) (scovery CDR: Frederick D. Gregory (FL2 - STS 51-B) P163/R59/V47/M54 KSC 39B EDW 04, CONC (EDW 25, CONC9) (EDW 25, CONC9) (EDW 32, CONC 9, EDW 04, CONC (EDW 25, CONC9) (EDW 19, CONC (EDW 22, CONC9) (EDW 19, CONC (EDW 1	NITCL: NAMES ABORT TIMES FLT DURATION. PERFILE W103 CDR: FREderick D. Gregory FREderick D. Gregory FREderick D. Gregory 104/104 Scovery FREDERIC S. ST. ST. B1 27:00.23.29.98Z 7:32:30 PM EST 104/104 WS PODS PLT: John E. Blaha FREDERIC S. ST. ST. ST. ST. ST. ST. ST. ST. ST.	ABORT TIMES FLT DURATION, WINDS PROF.LE ET V-103 CDR: Frederick D. Gregory (F12 - ST5 51-B) KSC 39B EDW 04, CONC (FW 25 CONCO) (FW 25 C	ABORT TIMES ABORT TIMES FLT DURATION. WINDS PROFILE FT V-103 (scovery CDR: Frederick D. Gregory (F12 - STS 51-B) P163/R59/V47/M54 KSC 39B SC 39B 104/104 B1034 28.45° MS PODS P163/R59/V47/M54 PLT: John E. Blaha P112/289 (6) 327:00:23:29:98Z 104/104 B1034 28.45° MS PODS P016/R57/W47/M54 PLT: John E. Blaha P102/R97/W48/M88 Image L. Carter, Jr. P163/R5106/M96 RTLS: KSC 15 TAL: Ben Gueri 26 CTGY: Banjul AOA: EDW 22 Image L. Carter, Jr. P163/R150019/M15 Image L. Carter, Jr. P163/R150019	ABORT TIMES FLI DURATION PROFILE ET A LUXS ABORT TIMES FLI DURATION PROFILE ET V-103 CDR: Finderick D. Gregory Fil2 STS 51-B KSC 398 EDW 46, CONC (EDW 25, CONC9) EDW 46, CONC (EDW 25, CONC9) B-D34 28, 45' MS PODS P01-11 PLT Join E. Blaha TO/104 B-D34 28, 45' (1) MS PODS P01-11 PLT Join E. Blaha TO/104 FLS STS 51-B FLS STS 51-B (1) (1) FLS STS 51-B (1)	ABORT TIMES FLT DURATION, WINDS PROFILE ET ET Control ENG.SN. PROFILE ET Control PROFILE <	Interview ABORT TIMES FIT DUIRATION. PROPEILE FT EXPERIMENTS EXPERIMENTS V103 Strive? CDE Fraderick D. Groupry (FIZ-STS16) CSC 398 Forderick D. Groupry (FIZ-STS17) For

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		CREW (5)	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB	(ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(3)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION,	THROTTLE PROFILE	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S	ADOICT HIMES	WINDS	ENG. S.N.						HIGTS, SIGNIFICANT ANOMALIES, ETC.)
STS-32	OV-102	<u>CDR</u> :	KSC 39A	EDW 22, CONC (EDW 26,CONC 10) 20:09:35:36.2Z	104/104	BI-035	28.5°	<u>DIRECT</u>	0I-8C	<u>CARGO:</u> 26458 lbs	KSC W/D: OPF 86, VAB 10, PAD 33 = 129
(STS-32R)	(Flight 9) Columbia	Daniel C. Brandenstein (Flt 3 - STS-8	09:12:35:00Z	20:09:35:36.2Z	109%	RSRM 8	(20)	INSERTION	(2)		LAUNCH POSTPONEMENTS:
SEQ FLT #33	Columbia	& STS 51-G)	7:35:00 AM EST (P)	1:35:36 AM PST	100/104/			POST		PAYLOAD CHARGEABLE:	- 12/18/89 launch postponed 21 days to 1/8/90 due to
		P168/R21/V16/M20	7:35:00 AM EST (A)	Saturday 7	102/65/	ET-32		OMS-2		18317 lbs	delays in readiness of pad 39A after pad modification,
KSC-33	OMS PODS	PLT:	Tuesday 6 1/9/90 (4)	1/20/90 (3)	104/65	LWT-25		193.48 X 155.76 NM		DEPLOYABLE:	holidays, and Orbiter aft PCA R&R.
PAD	LPO3 - 9	James D. Wetherbee	.,	DEORBIT BURN:	1 = 2024 (1)	<u>et</u> <u>RPT</u> 228K				15316 lbs	LAUNCH SCRUBS:
<u>PAD</u> 39A-25	RPO4- 5 FRC2 - 9	P169/R108/M97	LAUNCH WINDOW: 62 Minutes	20:08:30:22Z 299.5 Seconds	2 = 2022 (4) 3 = 2028 (4)	<u>RPT</u> 228K		<u>SYNCOM</u> <u>DEPLOY</u>		NON-DEPLOYED:	- 1/8/90 launch scrubbed after holding at T-9 minutes, then
MLP-3	11(02)	<u>M/S 1</u> :	(PLANAR/PHASE/	DV 489.7 FPS	0 2020 (1)	1:18:32		169.09 NM		1962 lbs	counting down to T-5 minutes and holding until launch window expired when RTLS weather did not improve (low
MEI 3		Bonnie J. Dunbar (Flt 2 - STS 61-A)	ÈT IMPACT AREA)	XRANGE:372 NM		MET		<u>LDEF</u>		MIDDECK: 1039 lbs	celling/fog). Rescheduled launch for 1/9/90. - 22-day total slip.
		P170/R79/V49/F7	RUNWAY	ORB DIR: AL10		ET		<u>RETRIEVE</u>		1039 IDS	- zz-uay total slip.
		M/C D.	PRIORITIES:	AIM PT: NOM		<u>BR/UP</u> 189K		178.3NM		RETRIEVED (LDEF) 21393 lbs	LAUNCH DELAYS: None.
		M/S 2: Marsha S. Ivins	EDW (PLS)		M 3 EOM	1:19:35					TAL WX:
		P171/R109/F12	HEAVY WEIGHT/	MLGTD: 1804 FT 20:09:35:36.27		MET				RETURNED: 32565 lbs	- Ben Guerir 36 (prime) - selected - good weather.
AB WIN	s A	M/S 3:	FWD CG (LDEF RETURN)	20:09:35:36.2Z VEL: 209 KGS 207 KEAS	WEIGHT: 228523	T/V				SHUTTLE	I-LOADS:
S ³ + ⁺ + ∕	230.02	G. David Low	, ,	HDOT: -1 FPS		ÖFF		DEORBIT		ACCUMULATED	- LSEAT selected yaw positive I-Load - alternate I-Load
ANV A	/+ +°	P172/R110/M98	EOM: EDW 22/CONC	TD NORM 195:	X CG: 1078.2	ET		178 X 173 NM		WEIGHTS: DEPLOYED:	uplink 2.
		MCC FCR-1 (15)	NOR	3100 FT	LANDING	IMPACT				453472 lbs	LAUNCH TARGETING COMMAND LOAD:
		FLIGHT DIRECTORS:	KSC EDW LAKEBED	<u>NLGTD:</u> 6676 FT	WEIGHT:	LAT:		VELOCITY 25823 FPS		NON-DEPLOYED: 398517 lbs	- Uplinked load for inertial plane of LDEF.
VDENSTEIN	WETH	Asc/Ent - A. L. Briscoe		<u>NLGTD:</u> 6676 FT 20:09:35:51.5Z VEL:160 KGS HDOT: -2.7 FPS	228335	10.44°N				CARGO TOTAL: 963624 lbs	FLIGHT DURATION CHANGE:
CIN		L/O1 - G. A. Pennington O 2 - W. D. Reeves	RTLS: KSC 33 TAL: Ben Guerir 36	HDOT: -2.7 FPS	X CG: 1079.6	<u>LONG</u> : 157.2°W		<u>RANGE</u> 4317 NM			- Extended 1 day due to fog at PLS (EDW) and unacceptable weather at NOR and KSC.
L		PIng - R. E. Castle	AOA: EDW 22	BRK INIT: 141 KGS	X CG. 1079.0	107.2 11		4317 10101		PERFORMANCE MARGINS (LBS):	- Plus One rev to reload BFS into extended GPC2.
		MOD - B. R. Stone	X-WIND LIMIT >	AVE BRK DECEL:						FPR: 4698 FUEL BIAS: 968 FINAL TDDP: 1956	NICUT LANDING. Third Shuttle night landing
			9 DAYS, 12 KNOTS	6.3 FPS/S						FINAL TDDP: 1956	NIGHT LANDING: Third Shuttle night landing.
				WHEELS STOP: 20:09:35:39.32						RECON: 992	FIRSTS:
	20		MAX Q = 641.1 M = 1.05	20:09:35:39.3Z 12495 FEET						<u>Payloads</u> : PLB:	- First flight from pad 39A since STS 61-A.
	MA TO		00:52 MET							LONG DURATION	EVENTS:
	V = /		SRB SEP:	ROLLOUT: 10731 FEET			1			EDIG DURATION EXPOSURE FACILITY (LDEF) RETRIEVAL	- SYNCOM-IV-F5 deployed at 1:00:43:39 MET (rev 17). - Rendezvous with Long Duration Exposure Facility (LDEF)
	A	Contraction of the second	2:05 MET	64 SECONDS					-	RETRIEVAL AND RETURN	as planned, with grapple at 3:02:41:05 MET (rev 50). LDEF was deployed on STS 41-C.
- The second	and the second		MECO:	WINDS:				Y	1	SYNCOM IV-5	was deployed on STS 41-C. - No blackout during entry, comm via TDRS-W.
		A share a	8:33 MET	<u>1.9H, 3</u> .5R KTS OFFICIAL: 1H, 4R	and the second second		mitt	~	->-	(DEPLOYED)	- Deorbit burn O-O-P component of 51° with longest OMS
50			ET SEP:	DENS. ALT: 923 FT			1 Alexandre	Khan -	6	MIDDECK	burn time of 299.5 seconds.
	· ···		8:50 MET					and the	X	IOCM	RENDEZVOUS 8:
	-1 C	" Carton Contraction of the second se	OMS-1:	FLT DURATION: 10:21:00:36				Com	Con the second	IMAX CNCR, PCG (2) FEA, AFE, MLE	With LDEF for capture and return.
			NONE	261:00:36	-	500		AA		FEA, AFE, MLE L3 (LLL)	
		00-01-20 STS-32	<u>OMS-2</u> :	<u>S/T</u> : 195:23:14:18	200	and the state		ST.	30 - F	L3 (LLL) AMOS ACIP	Continued
		SNOOPY stuffed toy: right, rear), PLT	40:25.6 MET	<u>OV-102</u> : 56:23:54:56			1	New Sector		AADS	
), & front row (I to r)	140 Seconds 218 FPS					100		5 CRYO TK SETS	
		r, andMS/Low during	210113	DISTANCE: 4,509,972 sm	STS-32 Li	ftoff (Wik	kipedia, t	the free			
	a record setting 11-day stay in Earth-orbit			4,307,772 311	encyclopedia) First flight from pad 39A					RMS 20 (S.N. 201) Used for LDEF	
	<u> </u>				since STS	61-A on	10/30/8	5.		capture and berth, and PKM burn	
					_					monitor	

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										1 age 2-57 - 51 5-52
FLT NO.	ORBITER	CREW (5) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE ENG. S.N.	SRB RSRM AND ET	ORBIT INC HA/HP	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-32 Continued				Gaada				Continued <u>SIGNIFICANT ANOMALIES</u> : - GPC 5 (BFS) registered illegal engage input/output term B during final entry checks. BFS <u>was</u> loaded into GPC2, GPC set restrung and GPC5 powered off. (Landing was delayed one revolution.) - FM transmitter failed. - APU 3 lubrication oil outlet pressure high (90 psi) - TAGS paper jammed. - GO ₂ FCV 2 open cycle sluggish. - Humidity separator water bypass anomalies (free water from SEP B and SEP A). - Waste water dump line blockage at 18:13:29:00Z, no dumps performed subsequently. - FES topping duct B string heater failure. - IMU 1 RM failed (transient 4-axis accel-bias. - Hydraulic systems 1 and 2 circ pump unloader valves excessive leakage. - BFS GPC errors. - At 17:23:46:51Z during sleep period, a bad state vector		
		-030,1990-01-20 SY abia's payload bay.	NCOM IV-5 is de	ployed		DEF prop	90-01-20LDEF bosed by NASA LF 984.			 At 17:23:46:512 during sleep period, a bad state vector was uplinked just prior to LOS, Orbiter rotated 3°/sec. WSB sys 2 and 3 excessive regulator pressure decay. RMS was used to conduct external survey (TPS). Multiple S-Band dropouts. Smoke detector 3A transient alarm. WBS 3 controller A over controlling. Ku-band antenna feed heater erratic. MPS LH₂ F&D (outboard) relief valve leak. Pilot seat would not drive down. CCTV camera problems. Heaviest landing at 228,335 lbs.
		-022 STS032-15-022 in celebrates birthday o			standing in	front of th	-07 STS-32 Flight ne flight director's nvil A. Pennington	console	es are (l. to r.)	

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				LANDING SITE/	SSME-TL						
		CREW	LAUNCH SITE.	RUNWAY,	NOM-ABORT	SRB	C	ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(5)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.	<u>onbiren</u>	TIT: 5	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		TITLE, NAMES	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S		WINDS	ENG. S.N.						
STS-36	OV-104	CDR:	KSC 39A	EDW 23L, LKBD	104/104	BI-036	62°		0I-8C	<u>DOD</u>	<u>KSC W/D</u> : OPF 69, VAB 6, PAD 35 = 110
(STS-36R)	(Flight 6)	John O. Creighton (Flt 2 - STS 51-G)	59:07:50:22Z	(EDW 27, LKBD 17)	109%	RSRM 9	(1)		(3)		LAUNCH POSTPONEMENTS: None.
	Atlantis	P173/R63/V50/M58	2:50:22 AM EST	63:18:08:44Z 10:08:44 AM PST	100/104/					PERFORMANCE	LAUNCH POSTPONEMENTS. None.
SEQ FLT #34			Wednesday 4		98/75/	ET-36 LWT-26				MARGINS (LBS):	LAUNCH SCRUBS:
KSC-34		PLT: John H. Casper	2/28/90 (2)	Sunday 4 3/4/90 (3)	104/65					FPR: 4652 FUEL BIAS: 999	- 2/22/90 launch was scrubbed while counting from T-11
D 4D		P174/R111/M99			1 =2019 (6)	<u>et</u> RPT				FUEL BIAS: 999 FINAL TDDP: 881	hours to T-6 hours for CDR's health (48-hour slip). - 2/24/90 launch scrubbed because of predicted bad
PAD 39A-26	OMS PODS	M/S 1:	LANDING SITE	DEORBIT BURN: 63:17:11:17.24Z	2 =2030 (4)	228K				RECON: 930	weather at KSC.
37A-20	LPO1 - 12 RPO3- 11	David C. Hilmers	PRIORITIES:	125.48 Seconds	3 =2027 (4)	1:00:35					- 2/25/90 launch scrubbed due to a Range Safety backup computer problem. Count held at T-31 seconds, and
MLP-1	FRC4 - 6	(Flt 3 - STS 51-J	1. EDW LAKEBED 2. EDW CONCRETE	256.4 FPS		MET					during hold, the LO ₂ inlet temps on all 3 engines
		& STS-26)	3. NOR	XRANGE: 255 NM		ET					exceeded LCC lower limit. Rescheduled launch for
		P175/R77/V36/M71	4. KSC	ORB DIR: DR 5		BR/UP				MIDDECK	2/26/90.
		<u>M/S 2</u> :	1. X-WIND FIRST		M 3 EOM	217K 1:00:53				RME-III VFT-I	- 2/26/90 launch scrubbed at T-9 minutes due to bad RTLS weather (cloudy). Rescheduled launch for 2/28/90.
		Richard M. Mullane (Flt 3 - STS 41-DR	PRIORITY	<u>AIM PT</u> : CLOSEIN		1.00.55 MET				VFT-II	48-hour delay to allow launch team rest. 6 days total slip.
		& STS-27)	2. NWS SECOND	MLGTD: 1622 FT 63:18:08:44Z	WEIGHT:	T/V					5 5 1
		P176/R40/V37/M39	PRIORITY	63:18:08:44Z VEL: 193 KGS	X CG:	ACTIVE		<u>DEORBIT</u> 132 X			LAUNCH DELAYS: - Delay at T-9 minutes due to predicted rain in RTLS area.
		M/S 3:	RTLS: KSC 15	199 KEAS	X CG:	LAST		132 X 115 NM			Resumed count to T-5 minutes, held for launch pad, RTLS,
GHIOR		Pierre J. Thuot	TAL: Zaragoza 30	HDOT: -1 FPS	LANDING	FLIGHT					and TAL weather.
S		P177/R112/M100	(Selected)	<u>TD NORM 195</u> : 1959 FT	WEIGHT	ET		VELOCITY 25713 FPS			
A STATE		MCC FCR-2 (19)	TAL WX: Moron AOA: NOR 17	1959 FT	WEIGHT: 187200	IMPACT		25/13 FPS			TAL WX: - Zaragoza 30 (prime) - Some delay waiting for STA go
E Sola		FLIGHT DIRECTORS:		<u>NLGTD</u> : 4862 FT 63:18:09:37.32Z		LAT:		<u>RANGE</u> 4338 NM			(until STA could see landing strip).
CA		A/E - R. D. Dittemore	MAX Q = 743.9	63:18:09:37.32Z VEL:145 KGS	X CG: 1096.4	61.40°S		4338 NM			- Moron - NO GO - ceiling.
4100		Ld/O 1 - L. S. Bourgeois	M = 1.49 00:53 MET	HDOT: -4.4 FPS		LONG:					I-LOADS:
LANE	HILMERS	O 2 - R. M. Kelso Plng - C. R. Knarr		<u>BRK INIT</u> : 99 KGS		145.1°E					- LSEAT selected yaw positive, alternate I-load uplink 3.
		MOD - T. W. Holloway	SRB SEP:						-		
In contrast of the second second		· · · · · · · · · · · · · · · · · · ·	2:05.8 MET	AVE BRK DECEL: 5.5 FPS/S		1	1		5		NIGHT LAUNCH: Fourth Shuttle night launch.
	4		MECO:			-					EVENTS:
Carl and the			8:30 MET	WHEELS STOP: 63:18:09:37.3Z		9			1		- No entry blackout - comm via TDRS-W. - Last flight with ET tumble valve active.
1 2 4 M	a isi		ET SED.	9522 FEET	= 2 2				1		- Last flight with ET tumble valve active.
Carlos and		c N	<u>ET SEP</u> : 8:48 MET	ROLLOUT:				Run Sa	N.V.	2	SIGNIFICANT ANOMALIES:
ALK 36				7900 FEET		11.00	-	12 14	221		- AC2 Phase 2 Inverter failure.
1 ale		A	<u>OMS-1</u> : NONE	53 SECONDS		1 Ace	37 10-	AND THE REAL	1		 RCS valve position indications intermittent. WSB 2 Vent System A heater failed.
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	9 AL			WINDS:			Long the	4			- CRT 4 screen went blank.
THE STATE OF	ALL		<u>OMS-2</u> : 32:58.1 MET	15.9H, 1.6R KTS OFFICIAL: 16H, 3R	3.			A Call C			- SSME post powerdown hard failure ID.
64	Constant of the		32:58.1 ME I 105.4 Seconds			19	100	ANDRON	1.1		- O2 leak into cabin. - FES overtemp shutdown.
and a			103.4 3000103	<u>DENS ALT</u> : 3017 FT	De-				1		- Humidity separator A degraded operation (found 1 quart
and the second s				FLT DURATION: 4:10:18:22			-		A.M.		of water below middeck floor).
Pilar	ims first stepped a	ashore November 1620		4:10:18:22 106:18:22		1111	1			1.11 .	- Supply H2O tank A-B check valve failure. - PLB floodlight failure (2).
- Ingr	and mot stopped t					-111	50				- PLB floodight failure (2). - SPOC H/W and S/W problems.
STS036-1	51-225 199	0-03-04Cape Cod, I	MA (42.0N,	<u>S/T</u> : 200:09:32:40	STS036-	21-024	1990-0	3-03 Atlant	is crev	v, pose	- Volume H latch jammed.
		Shuttle. Geologically, th		<u>OV-104</u> : 28:18:49:13						Mullane/MS,	- TAGS paper folding. - WSB 2 vent temp heater A failure.
deposit of	earth and sto	one called a terminal m	oraine, left by	28:18:49:13						e conducting	- Hyd system leak into aft compartment.
		laciers of about 20,000		DISTANCE:	a DOD-o					Ŭ	- R3D fail-off at ET SEP.
, , , , , , , , , , , , , , , , , , ,	,			1,837,962 sm							- R4R jet fail-off during RCS hot fire.

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				LANDING SITE/	SSME-TL						
		CREW (5)	LAUNCH SITE,	RUNWAY,	NOM-ABORT		(ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(3)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION, WINDS	PROFILE ENG. S.N.	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-31	OV-103	CDR:	KSC 39B	EDW 22, CONC (EDW 28,CONC 11)	104/104	BI-037	28.453°	DIRECT	OI-8C	CARGO:	KSC W/D: OPF 78, VAB 9, PAD 39 = 126
(STS-31R)	(Flight 10)	Loren J. Shriver		(EDW 28,CONC 11) 119:13:49:57Z	109%		(21)	INSERTION	(4)	28643 lbs	
	Discovery	(Flt 2 - STS 51-C) P178/R50/V51/M46	114:12:33:51Z 8:31:00 AM EDT (P)		100/104/97/	RSRM 10		POST		PAYLOAD	LAUNCH POSTPONEMENTS: None.
SEQ FLT #35		1 170/100/031/10140	8:33:51 AM EDT (A)	6:49:57 AM PDT Sunday 5	67/104/65			OMS-2		CHARGEABLE:	LAUNCH SCRUBS:
KSC-35		PLT:	Tuesday 7	Sunday 5 4/29/90 (5)	1 0011 (5)	ET-34		330.63 X		25517 lbs	- 4/10/90 launch scrubbed during hold at T-4 minutes due to APU anomalies. Rescheduled launch for
DAD	OMS PODS LPO4 - 7	Charles F. Bolden (Flt 2 - STS 61-C)	4/24/90 (6)		1 = 2011 (5) 2 = 2031 (3)	LWT-27		310.80 NM		DEPLOYABLE:	4/24/90 (APU 1 R&R). 14 days total slip.
PAD 39B-9	RPO1-12	P179/R88/V52/M80	LAUNCH WINDOW:	DEORBIT BURN: 119:12:37:36Z	3 = 2107 (2)	<u>et</u> RPT		<u>HST DEPLOY</u>		23095 lbs	
	FRC3 - 10	M/S 1:	2H30M (CREW TIME			<u>RPT</u> 251K		333.06 NM		NON-DEPLOYED:	LAUNCH DELAYS: - 2M51S delay during hold at T-31 seconds to manually
MLP-2		Steven A. Hawley	ON BACK)	XRANGE: 420 NM		1:24:18		DEORBIT		960 lbs	close F&D valve after failure to close by GLS (procedural
(WAS		(Flt 3 - STS 41-DR		ORB DIR: DL 17		MET		333 X			enhancement problem).
STS 61-J)		& STS 61-C) P180/R39/V29/M38	LANDING SITE PRIORITIES:	AIM PT: NOM		ET		327 NM		<u>MIDDECK</u> : 652 lbs	TAL WX:
		1 100/103 // 12 //1030	NOEM:			BR/UP		VELOCITY			- Banjul (prime) - NO GO because redundant TACAN's
		<u>M/S 2</u> : Kathryn D. Sullivan	EDW LKBD - Prime	MLGTD: 1176 FT 119:13:49:57Z		215K 1:25:14		26120 FPS		<u>RETURNED</u> : 4768 lbs	down, WX marginal but acceptable. - Ben Guerir 36 (alternate) selected - marginal but GO.
		(Flt 2 - STS 41-G)	RTLS: KSC 15	VEL: 180 KGS 177 KEAS		MET		RANGE		4700 IDS	- Ben Guerri so (alternate) selected - marginal but GO.
URIVER +	BOLDEN	P181/R44/V53/F3		HDOT: -4 FPS				4121 NM		SHUTTLE	I-LOADS:
		M/S 3:	TAL: Banjul (PRI) (Planned)	TD NORM 195:	<u>M 3 EOM</u>	T/V OFF				ACCUMULATED WEIGHTS:	- LSEAT selected nominal I-loads, no uplink required.
NEW		Bruce McCandless II	, , ,	- 130 F I	WEIGHT:	ON				DEPLOYED:	FLIGHT DURATION CHANGE: None.
THEIS Y	CULLIVA.	(Flt 2 - STS 41-B) P182/R31/V54/M30	ALT TAL: Ben Guerir 36	NLGTD: 4560 FT	189309	ALL SUBS				476567 lbs NON-DEPLOYED:	FIRSTS/RECORDS:
MCAND	LESS	F 102/K31/V34/WI30	(Selected)	<u>NLGTD</u> : 4560 FT 119:13:50:09Z VEL:144 KGS HDOT: -3.3 FPS	X CG: 1087.9	ILIJ		-		400129 lbs	- First planned use of Banjul at primary TAL.
		MCC FCR-1 (16)		HDOT: -3.3 FPS		<u>et</u>			2	CARGO TOTAL:	- First flight with carbon brakes.
		FLIGHT DIRECTORS:	AOA or P/L Return: 1. EDW 22/04	BRK INIT: 120 KGS	<u>LANDING</u>	IMPACT	On			992267 lbs	- Highest Shuttle altitude to date - 333 NM. - Longest OMS burn - 305 seconds.
		Asc - R. D. Dittemore	2. EDW LKBD		WEIGHT:	<u>LAT</u> : 19.95°N				PERFORMANCE	о С
		Ent - N. W. Hale Ld/O 1 - W. D. Reeves	3. NOR 4. KSC	AVE BRK DECEL: 5.9 FPS/S	189118	LONG:		r l		<u>MARGINS (LBS)</u> : FPR: 4652	EVENTS: - HST deployed on rev 20 (1 rev later than planned.
		O 2 - J. M. Heflin	4. NJU		X CG: 1089.7	150.0°W	//			FUEL BIAS: 994	- No entry blackout.
		Plng - A. L. Briscoe	<u>AOA</u> : NOR 23	<u>WHEELS STOP:</u> 119:13:50:58Z 10065 FEET						FINAL TDDP: 2861 *	
		MOD - B. R. Stone	MAX Q = 656.3	10065 FEE I				ll Reeves, L	ead	RECON: 1352	ET REENTRY (NO TUMBLE): - ARGUS - Rupture altitude 246K feet.
			M = 1.08	ROLLOUT: 8874 FEET	Orbit Fligh			nedia at			- AMOS/MOTIF - Tumble rate 7 deg/second.
			00:52 MET	61 SECONDS	preflight c			1990-04-2	a	<u>Payloads</u> : PLB:	- KPTC RADAR - Max. DV 670 FPŠ. - VHF RADAR:
		HST HERE	SRB SEP:		HST is gra					HUBBLE SPACE	 Number of pieces > 3 feet - 68. Debris scatter: 200 NM (UR/DR) 40 NM CR.
		LOB CONTRACTOR	2:05.75 MET	WINDS: 180° @ 7 KTS GUSTS TO 10 KTS	predeploy					TELESCOPE (HST) (DEPLOYED)	- Debris scatter: 200 NM (UR/DR) 40 NM CR.
			MECO:	GUSTS TO 10 KTS 4.1H, 5.7L KTS						. ,	SIGNIFICANT ANOMALIES:
			8:30 MET							ICBC (IMAX) APM	- Cabin depressed to 10.2 PSIA for approximately 72 hours.
	00	S BALLEY	ET SEP:	OFFICIAL: 7H, 5L		A BU	1:18				- Supply water tank C bellows stuck.
			8:48 MET	<u>DENS. ALT</u> :2993 FT	(t)	A. /	33			MIDDECK: SE-82-16	- Fuel cell 2 purge anomaly. - SPOC failures.
	10-	THE THE	<u>OMS-1</u> :	FLT DURATION:	4					(ION ARC)	- ADTA 3 CB contamination. - TAGS problems.
			NONE	5:01:16:06 121:16:06		all -	-1			IMAX RME-III	- WSB 2 steam vent heater A failure.
						16 V A.		And		AMOS	- 70 mm camera jam.
	12 5		<u>OMS-2:</u> 42.36 MET	<u>S/T</u> : 205:10:48:46				1		IPMP	- L3A jet failed off, L3A fail leak. - Erratic ROMS fuel engine inlet pressure.
			305 Seconds	<u>OV-103:</u> 57:08:08:16				7 3		PCG-III	- HST solar array deploy problem.
		0-04-29 STS-31			and the second s		NA	No.		3 CRYO TK SETS	
		olden (top left), CDR		DISTANCE: 2,068,213 sm	the second		Such 1	and the second		RMS 21 (S.N. 301)	
and Hawle		McCandless/MS,					N.Ser	1 Capatra		USED FOR	
					治产 不利用。					HST DEPLOY	

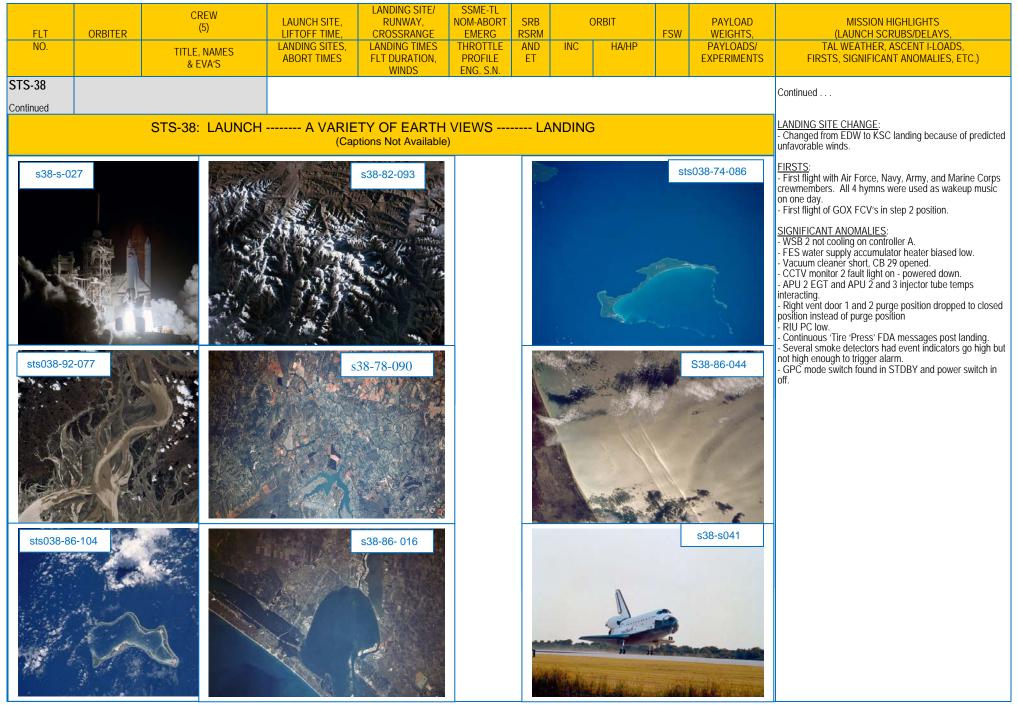
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		CREW	LAUNCH SITE.	LANDING SITE/ RUNWAY.	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(5)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM	, in the second s		FSW	WEIGHTS.	(LAUNCH SCRUBS/DELAYS,
NO.	<u>onbirzit</u>		LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		TITLE, NAMES & EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
				WINDS	ENG. S.N.						
STS-41	OV-103 (Flight 11)	CDR: Richard N. Richards	KSC 39B	EDW 22, CONC (EDW 29,CONC 12)	100/100/ 109%	BI-040	28.45° (22)	<u>DIRECT</u> INSERTION	OI-8D (1)	<u>CARGO</u> : 49969 LBS	<u>KSC W/D</u> : OPF 109, VAB 8, PAD 32 = 149
SEQ FLT #36	Discovery	(Flt 2 - STS-28)	279:11:47:14.98Z	283:13:57:19Z	10970	RSRM	(22)	INSERTION	(1)		LAUNCH POSTPONEMENTS: Launch postponed from
SEQ FLI #30		P183/R101/V55/M92	7:35:00 AM EDT (P)	6:57:19 AM PDT	ACTUAL:	13		POST		<u>PAYLOAD</u> CHARGEABLE:	10/5/90 to 10/6/90 in late September.
KSC-36	OMS PODS	PLT:	7:47:15 AM EDT (Å) Saturday 2	6:57:19 AM PDT Wednesday 3 10/10/90 (5)	100/104/ 101/67/	ET-39		<u>OMS-2</u> 160.2 X		46173 LBS	LAUNCH SCRUBS: None.
	LPO4 - 8	Robert D. Cabana	10/6/90 (5)		104/65	L1-37		159.5 NM			LAUNCH SCROBS. None.
PAD 39B-10	RPO1- 13	P184/R113/M101		DEORBIT BURN: 283:13:00:05Z (150 Seconds DV 286.6)	1 0011 (1)	ET				DEPLOYABLE: 38604 LBS	LAUNCH DELAYS:
	FR C3 - 11	<u>M/S 1</u> :	LAUNCH WINDOW: 2H17M	(150 Seconds	1 = 2011 (6) 2 = 2031 (4)	<u>RPT</u> 239K		<u>ULYSSES</u> DEPLOY			- 10M43S delay at T-9 minutes due to rain showers 14 miles porth of RTLS runway
MLP-2	03-11	Bruce E. Melnick	(ULYSSES		3 = 2107 (3)	1:16:20		160 X		<u>NON-DEPLOYED</u> : 6732 LBS	miles north of RTLS runway. - Countdown held at T-5 minutes for 10 seconds to mask
(Was STS 61-F))	P185/R114/R102	UPPER STAGE	XRANGE: 492 NM		MET		159 NM			GLS WSB 2 indication.
		M/S 2:	PERFORMANCE)	492 INIVI	M 3 EOM	FT		POST SEP		<u>MIDDECK</u> : 837 LBS	- 1M22S delay at T-31 seconds due to P/L- Orbiter I/F and duct pressures out of limits.
		Thomas D. Akers	LANDING SITE	<u>ORB DIR</u> : DL 18		<u>et</u> BR/UP		BURN			- 12M15S total delay.
		P186/R115/M103	PRIORITIES: NOEM:	<u>AIM PT</u> : NOM	WEIGHT: 196982	177K 1:17:50		177.9 X 160 NM		<u>SHUTTLE</u> ACCUMULATED	TAL WX:
		M/S 3:	EDW Lakebed -	<u>MLGTD</u> : 2295 FT 283:13:57:19Z	190902	MET				WEIGHTS:	- Baniul (prime) - Marginal WX, recent rain.
		William M. Shepherd	Prime	283:13:57:19Z VEL: 193 KGS	X CG: 1089.4			DEORBIT		DEPLOYED: 515171 LBS	- Banjul (prime) - Marginal WX, recent rain. - Ben Guerir (alt) selected - solid GO WX.
		(Flt 2 STS-27) P187/R96/V56/M87	RTLS: KSC 33	192 KFAS	LANDING	ET		162.4 X 151.4 NM		NON-DEPLOYED:	I-LOADS: LSEAT selected nominal I-loads, no uplink
R	S * Ca	1 107/10/030/1007	<u>INTES</u> . NOC 55	HDOT: -1 FPS		IMPACT LAT:				407698 LBS	required.
CHAN	A BA		<u>TAL</u> : Banjul	TD NORM 195:	WEIGHT:	<u>LAT</u> . 12.52°N		VELOCITY		CARGO TOTAL: 1042236 LBS	
SSY/	T	MCC FCR-1 (17)	TAL WX :	2315 FT	196869	LONG:		25762 FPS			FIRSTS: - First flight with all 3 Orbiters in vertical; OV-103/STS-41
		FLIGHT DIRECTORS:	Ben Guerir 36	<u>NLGTD</u> : 6359 FT 283:13:57:31Z VEL: 154 KGS	X CG: 1091.2	164.1°W		RANGE		PERFORMANCE MARGINS (LBS):	on pad B, OV-102/STS-35 on pad A, OV-104/STS-38 in
E		A/E/O1 - R. D. Dittemore Ld/O 2 - J. M. Heflin	(Selected)	VEL: 154 KGS				4147 NM		FPR: 4652	VAB. - First flight after MPS LH2 leaks found in STS-35 and
2 110	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Plng - G. E. Coen	AOA: NOR 17	HDOT: -2.7FPS	STS041-	<mark>61-009 Ul</mark> y	<mark>/sses De</mark>	ployed		FUEL BIAS: 994 FINAL TDDP: 1270	STS-38.
		MOD - T. W. Holloway		<u>BRK INIT</u> : 135 KGS						RECON: -152	- First flight using fixed (shimmed) GOX FCV's (step 1).
SH	EPHERD	MDR - R. M. Kelso	MAX Q = 665 M = 00:49 MET	AVE BRK DECEL: 9 FPS/S							 First flight with SRB using redesigned field joint protection system.
										<u>PAYLOADS</u> : PLB:	5
			SRB SEP:	WHEELS STOP: 283:13:58:08Z			-			ULYSSES/IUS/	EVENTS:
			2:06 MET	10827 FEET			W.			PAM-S (SOLAR ORBIT)	- RMS parked at 1:03:35 MET with INTELSAT solar array coupon in velocity vector to witness potential solar array
			MECO:							DEPLOYED	damage.
	and and	Company and the second second second	8:28 MET	8478 FEET 49 SECONDS						SSBUV	- ULYŠSES deployed at 06:01:06 MET. - No entry blackout.
	0103		ET SEP:							ISAC	- Conducted RCS Hot Fire using extended firing durations
26 .	- (P) (A)		8:46 MET	WINDS: Light & Variable		SSE-				MID-DECK:	(640 msecs) to attempt nitrate removal.
	12 ANN		OMS-1:	Peak 3 Kts				2.4		CHROMEX	SIGNIFICANT ANOMALIES:
2	P		None	Peak 3 Kts 2.3H, 2 R KNOTS OFFICIAL: 2H, 2R	1211		-NY	and a state of the		VCS	- MC4 (SM2) NBAT had GPC 2 assigned to FC string 3.
A			OMS-2:	DENS. ALT:1308 FT						SSCE	- IMU 1 RM fail (experiencing transient 2 axis accelerometer shifts).
	~~ ~		<u>39:53.3</u> MET				17	Statement of the local division of the local		PSE	- APU 1 GG/fuel pump heater B failed on
	1		144 Seconds	FLT DURATION: 4.02.10.04		-	*			RME-III AMOS	- Ammonia boiler PRI A controlled low, 31.6° evap out
	-		(223.3 FPS)	4:02:10:04 98:10:04							temp. - Hydraulic Sys #2 priority valve sluggish at startup
OTO MARK	007 0000			<u>S/T</u> : 209:12:58:50			1	A STATE		3 CRYO TK SETS	 Hydraulic Sys #2 priority valve sluggish at startup. Debris plunger (EO-2) fail to seat/ ordnance pieces found
		0-10 Crew in middeck					1 -			RMS 22 (S.N. 301)	on runway.
(front, It. to r	rt.) CDR Richa	rds & PLT Cabana; (rear		<u>OV-103:</u> 61:10:18:20	S90-4761	5 FLT DIF	R's: left_M	ilt Heflin &		Used for INTELSAT	- Crescent shaped debris (22") in video camera views during Ulysses deploy.
,It. to rt.) Ake	ers/IVIS, Melnio	ck/MS, & Shepherd/MS.		DISTANCE:		Dittemore				solar array coupon (witness plate)	- Haz gas grab bottles indicated max 37,000 SCIM's during
				1,707,445 sm						exposure	ascent (upward trend).

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FLT	ORBITER	CREW (5)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM	(ORBIT	FSW	PAYLOAD WEIGHTS,	
NO.	URBITER	TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP	FSW	PAYLOADS/ EXPERIMENTS	(LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-38 SEQ FLT #37 KSC-37 PAD 39A-27 MLP-1	OV-104 (Flight 7) Atlantis	CDR: Richard O. Covey (Fit 3 - STS 51-1 & STS-26) P188/R73/V34/M67 PLT: Frank L. Culbertson P189/R116/M104 <u>M/S 1</u> : Carle J. Meade P190/R114/M105 <u>M/S 2</u> : Robert C. Springer (Fit 2 - STS-29) P191/R98/V57/M89 <u>M/S 3</u> : Charles D. Gemar P192/R118/M106 M/S 3: Charles D. Gemar P192/R118/M106	KSC 39A 319:23:48:15Z 6:48:15 PM EST Thursday 9 11/15/90 (7) PLS: EDW RTLS: KSC TAL: Banjul (Selected) TAL: WX: Ben Guerir SELECTED: RTLS: KSC TAL: BYD 32 AOA: EDW 22 MAX Q: 00:49 MET SRB SEP: 2:03 MET MECO: 8:29 MET ET SEP: 8:47 MET OMS-1: 10:30 MET OMS-2: 47:43 MET	KSC 33 (KSC 6) 324:21:42:42Z 4:42:42 PM EST Tuesday 8 11/20/90 (6) <u>DEORBIT BURN</u> : 324:20:46:15Z <u>XRANGE</u> :3 NM <u>ORB DIR</u> : DL 19 <u>AIM PT</u> : CLOSEIN <u>MLGTD</u> : 1414 FT 324:21:42:42Z VEL: 195 KGS 199 KEAS HDOT: -1 FPS <u>TD NORM 195</u> : 1850 FT <u>NLGTD</u> : 4600 FT 324:21:42:52Z VEL: 162 KGS HDOT: -3.1 FPS <u>BRK INIT</u> : 127 KGS <u>AVE BRK DECEL</u> : 7 FPS/S <u>WHEELS STOP</u> : 324:21:43:39Z 10417 FEET <u>ROLLOUT</u> : 9003 Feet 57 Seconds <u>WINDS</u> : <u>4H</u> , 4.4 R KTS OFFICIAL: 4H, 4R <u>DENS. ALT</u> : 387 FT <u>FLT DURATION</u> : 4:21:54:27 <u>S/T</u> : 214:10:53:17 <u>OV-104</u> : 33:16:43:40 <u>DISTANCE</u> : 2,045,056 sm	104/104/ 109% ACTUAL: 100/104/ 104/72/ 104/65 1 = 2019 (7) 2 = 2022 (5) 3 = 2027 (5) M 3 EOM WEIGHT: X CG: LANDING WEIGHT: 191091 X CG: 1098.6 STS038- middeck: Culbertsc Meade/M	(right t on, CDI 1S. Firs	(23)	STANDARD INSERTION	S, PL [*] ⁄/S, ai rce, N	PERFORMANCE MARGINS (LBS): FPR: 4652 FPR: 4652 FPR: 4652 APE VFT-1 RME-III AMOS APM S-BAND XPONDERS ON SRB'S	KSC W/D: OPF 134 (2), VAB 26 (3), PAD 85 (2) = 245 LAUNCH POSTPONEMENTS: - As of Jan 1990, launch date was 7/9/90. On 5/29/90, OV-102/STS-35 launch was scrubbed because of excessive H ₂ leak in aft compartment. Special H ₂ tanking tests were performed on OV-104/STS-38. - 6/18/90 - LH ₂ Tanking Test #1 - Excessive H ₂ leak detected in umbilical area. - 7/13/90 - LH ₂ Tanking Test #1 - Excessive H ₂ leak detected in umbilical area. - 7/13/90 - LH ₂ Tanking Test #2 - Excessive H ₂ leak detected in umbilical area. - 7/13/90 - LH ₂ Tanking Test #3 - Excessive H ₂ leak detected in umbilical and plate gap areas. - 7/13/90 - LH ₂ Tanking Test #3 - Excessive H ₂ leak detected in umbilical and plate gap areas. - 7/13/90 - LH ₂ Tanking Test #3 - Excessive H ₂ leak the test. - 8/9/90 - Rolled stack back to VAB. - 8/15/90 - OV-104 to OPF. Umbilical removed from ET-37 and sent to MSFC and RI-D for tests. Subsequently, found follower arm seal and shaft seal leaks in tests. Decision to use ET-40 after replacing LH2 umbilical. - 10/13/90 - Rolled out to Pad A. - 10/13/90 - Rolled out to Pad A. - 10/13/90 - Chle tests. Subsequently, found follower arm seal and shaft seal leaks in tests. Decision to use ET-40 after replacing LH2 umbilical. - 10/13/90 - Rolled out to Pad A. - 10/13/90 - Rolled out

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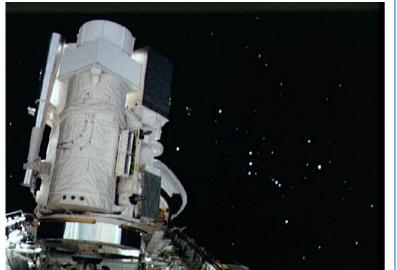
				LANDING SITE/	SSME-TL						
		CREW	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB	(ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(7)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM	,	SILDIT	FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.	UNDITEN		LANDING SITES.	LANDING TIMES	THROTTLE	AND	INC	HA/HP	1300	PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
NO.		TITLE, NAMES					INC	па/пр			
		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
	01/ 100	0.5.5	KCO 204 D	WINDS	ENG. S.N.	D1 000		DIDEAT	01.05	01000	
515 55		<u>CDR</u> :	KSC 39AB	EDW 22 CONC (EDW 30,CONC 13)	104/104/	BI-038	28.457°	DIRECT	OI-8D	CARGO:	KSC W/D: OPF 126 (2), VAB 16 (3), PAD 153 (3) = 295
(STS 61-E)	(Flight 10)	Vance D. Brand	336:06:49:01Z	345:05:54:09Z	109%		(24)	INSERTION	(3)	33037 LBS	
	Columbia	(Flt 3 - STS-5 & STS 41B)	1:28:00 AM EST (P)	J4J.0J.J4.07Z		RSRM					LAUNCH POSTPONEMENT:
SEQ FLT #38		P193/R9/V4/M9	1:49:01 AM EST (A)	9:54:09 PM PST	100/104/	11		I <u>NSERTION</u>		CHARGEABLE:	- As of 1/90, launch date was 5/9/90. Post-poned to
	Fifth	PLT:	Sunday 4	Monday 9	71/104/65			<u>ALTITUDE</u> :		27760 LBS	5/30/90 due to P/L argon servicing, LO2 system leak, and
KSC-38	Spacelab		12/02/90 (2)	12/10/90 (4)		ET-35		190.4 X			FCL coolant valve contamination (low flow). 21-day slip.
100000	Flight	Guy S. Gardner (Flt 2 - STS-27)			1 = 2024 (2)	LWT-27		188.2 NM		DEPLOYED:	
PAD		(FIL 2 - 51 5-27) P194/R95/V58/M86	LAUNCH WINDOW	DEORBIT BURN:	2 = 2012 (11)					0 LBS	LAUNCH SCRUBS:
39B-11	ASTRO-1	P194/R95/V58/IVI86	2H30M	345:04:48:31Z 230.5 SECS,383 FPS	3 = 2028 (5)	<u>et</u> RPT					- Scrubbed 5/29/90 launch during tanking due to
24D-11	IGLOO +	M/S 1:	(CTOB)	230.5 SECS,383 FPS		RPT				NON-DEPLOYED:	excessive H ₂ leak in aft compartment.
	2 PALLETS	John M. Lounge		XRANGE: 426 NM		233K				25968 LBS	- Failed 6/6/90 special LH2 tanking test, excessive H ₂
MLP-3	(2nd IGLOO)	(Flt 3 - STS 51-I & STS-26)	RTLS: KSC-15			1:18:39					leak in aft compartment.
	· · ·	P195/R74/V35/M68	<u>Inteo</u> rneos no	<u>ORB DIR</u> : DL 20		MET				MIDDECK:	- 6/13/90 - Rolled back from Pad A to VAB.
	OMS PODS	1 175/10/4/055/1000	TAL: Banjul 32	AIM PT: CLOSEIN	M 3 EOM					1792 LBS	- 6/15/90 - OV-102 to OPF. Both OV-102 and ET-35 LH ₂
		M/S 2:	<u>-1712</u> . Duriju 02			ET					umbilicals sent to RI-D for special LH2 leak tests.
	RPO4 - 6	Jeffrey A. Hoffman	TAL WX:	<u>MLGTD</u> : 1535 FT	WEIGHT:	BR/UP				RETURNED:	R&R'ed ET-35 and OV-102 umbilicals (used OV-105
	FRC2 - 10	(Flt 2 - STS 51-D)	Ben Guerir	345:05:54:09Z	225531	203K		DEORBIT			umbilical).
		P196/R57/V59/M52	Moron	VEL: 208 KGS		1:19:27		195.2 X		SHUTTLE	- 8/2/90 - Rolled out to VAB for restacking.
				201 KEAS	X CG: 1079.1	MET		180.3 NM		ACCUMULATED	- 8/9/90 - Rolled to Pad A.
		<u>M/S 3</u> :	SELECTED:	HDOT: -1 FPS						WEIGHTS:	- Scheduled launch for 9/1/90.
		Robert A. R. Parker	TAL: BYD 32	TD NORM 195:	LANDING	<u>et</u>		VELOCITY		DEPLOYED:	- Scrubbed 9/1/90 launch before tanking because of
		(Flt 2 - STS-9)	RTLS: KSC 15	2247 FT	LINUDING	IMPACT		25858 FPS		515171 LBS	BBXRT TLM problem. Rescheduled launch for 9/6/90.
		P197/R27/V60/M26	AOA: EDW 22	NULOTE FEED FT	WEIGHT:	LAT:		20000110		NON-DEPLOYED:	- Scrubbed 9/6/90 launch during tanking due to H_2 leak in
		5/2.4		NLGTD: 5559 FT	225329	<u>15.0</u> 9°N		ENTRY		435458 LBS	aft compartment. (Estimated 30,000 SCIM's/6000 PPM.)
		<u>P/S 1</u> :	PLS: EDW22	345:05:54:20Z VEL:168 KGS	223327	LONG:		RANGE		CARGO TOTAL:	Replaced crushed PV6 detent cover seal on SSME 3 and
		Ronald A. Parise		HDOT: -3.9 FPS	X CG: 1080.5	159.0°W		4266 NM		1075273 LBS	recirc pump package before 9/17/90 scheduled launch.
		(CSC)	AOA: EDW 22		X CO. 1000.3	137.0 W		4200 1110		1073273 LD3	- Scrubbed 9/17/90 launch during tanking at L-7 hrs due
		P198/R119/M107		<u>BRK INIT</u> : 136 KGS						PERFORMANCE	to H2 leak in aft compartment (4300 PPM).
		D/C 2:	MAX Q: 696 PSF							MARGINS (LBS):	- Rescheduled launch for 10/2/90.
		P/S 2:	00:50 MET	AVE BRK DECEL: 7.2 FPS/S						FPR: 4652	- 10/8/90 - Rolled to Pad B after STS-41 launch (did not
		Samuel T. Durrance	000.050	1.211 3/3						FUEL BIAS: 994	hard down).
		John Hopkins	SRB SEP:	WHEELS STOP:			and and	1 4		FINAL TDDP: 4131	- 10/8-9/90 - Rolled back to VAB because of Tropical
		University	2:06 MET	345:05:55:06Z		10-1	Kent	N-		RECON: 3812	
		P199/R120/M108		12101 FEET			in the			RECUN: 3812	Storm Klaus threat. Replaced crushed PV5 detent seal
			MECO:	ROLLOUT:			- All				in SSME 2.
			8:32 MET	10450 Feet	.11		the second	"mune"		PAYLOADS:	- 10/14/90 - Rolled to Pad B. MPS troubleshooting found
1/+				58 Seconds				dilla		PLB:	several small H ₂ leaks exceeding specs.
			ET SEP:		~ **	Cit	2 60			ASTRO-1: IPS,	- 10/30/90 - Instrumented LH ₂ Tanking Test, successful
-	T s			WINDS:	1 March	120	No.	-		HUT, WUPPE,	with only 150 PPM concentration in aft compartment.
₩ , 1	+			0.7 T, 0.7 R KTS	1.8	A. 12.	Secon	1		UIT, BBXRT	- 12/2/90 - Launch successful on fifth launch attempt.
	AND ST		<u>OMS-1</u> :	OFFICIAL: 1T, 1R		Alth C.	Care /	Man -		(ASTRONOMY)	170-day launch slip.
THEF LOU	NGE 2 Ph		NONE	DENS ALT: 1143 FT		All the	19/ 1	///		100000	- 207-day total slip.
						8				MIDDECK:	
			<u>OMS-2</u> :	FLT DURATION:						AMOS	
L		T ²	40:24.7 MET	8:23:05:08		- Ale				SAREX-II	
		MCC FCR-1 (18)	180.3 SECS	215:05:08						UVPI	Continued
			179.1 FPS	<u>S/T</u> : 223:09:58:25	STODE F	02 007 4	000 12	11 Crew in			
		FLIGHT DIRECTORS:								5 CRYO TK SETS	
		Asc/Ent - N. W. Hale		<u>OV-102</u> :	Columbia						
		Ld/O 1 - G. E. Coen		65:23:00:04				, Parker/MS,		NO RMS	
		O 2 - G. A. Pennington		DISTANCE:	Parise/PS	, Hoffmar	n/MS, PI	LT Gardner,			
		O 3 - R. E. Castle		3,728,636 sm	Lounge/M						
		MOD - T. W. Holloway		,	Loungo/W	o, a Dun					
		INOD - T. W. HUIIUWay									

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FLT NO.	ORBITER	CREW (7) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE ENG. S.N.	RSRM	INC	orbit Ha/HP	FSW	Payload Weights, Payloads/ Experiments	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-35			En Re					a binen anter ante			Continued



s35-13-008 -- Wisconsin Ultaviolet photo-Polarrimeter Experiment (WUPPE) on Spacelab pallet. The Broad Band X-Ray Telescope (BBXRT) is behind this pallet and is not visible.



STS035-28-022 1990-12-10 Astronomy Laboratory 1 (ASTRO-1) telescopes in the PL/Bay. At right is the Orion nebula. The three ultraviolet telescopes are mounted and coaligned on a common structure and attached to the Instrument Pointing System (IPS).



Continued

S88-54116 1988-11-30 Official insignia for the Johnson Space Center's (JSC's) Amateur Radio Club



S90-32048 1990-03-16 Shuttle Amateur Radio Experiment (SAREX) equipment held by R. Parise/PS at the JSC Full Fuselage Trainer. SAREX is used to conduct shortwave radio transmissions between ground amateur radio operators and a licensed onboard operator (in this case, Parise).



STS035-05-036 1990-12-11 STS-35 Commander Brand talks to family using SAREX on Columbia's middeck

LAUNCH DELAYS:

- 21M1S delay while Range Safety had helicopter verify 8000 foot minimum optical coverage.

<u>TAL WX</u>:

Weather good at Banjul and Ben Guerir.

I-LOADS:

- Launch delayed to new season and pitch negative became pitch nominal which LSEAT selected and was uplinked (uplink 5).

NIGHT LAUNCH: Space Shuttle #6.

NIGHT LANDING: Space Shuttle #4.

EVENTS: - Most people in Earth orbit at the same time - 12 (7 Americans and 5 Soviets).

SIGNIFICANT ANOMALIES:

FCL-1 degraded flowrate noticed before first launch attempt. Did not affect mission and performed as predicted. S/L DDS 1 (DDU) failed on FD1. Crew smelled smoke. S/L DDS 2 failed after 4 days. Crew smelled smoke. (Crew did IPS pointing and ground sent commands to operate experiments.) S/L subsystem computer failed due to a command problem caused by error in workstation program, recovered by IPL. Degraded waste water flow, virtual blockage at 152 hours. Filled CWC with 92 lbs, wastewater transferred to 15 female UCD's and 18 male UCD's. TAGS jam, TAGS tool broke. OPS 1 track 2 and OPS 2 track 5 problems. P/L recorder poor data quality. HDRR failed after 2 days of operations. Cameras B, C, & D problems. Several software patches were required to correct experiment/IPS target tracking. S-band UL and LR antenna problems. Several payload experiment problems. WSGT control computer failure. APU 2 lube oil pressure high during ascent & entry (wax formation caused by hydrazine contamination). No blackout during entry.

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		CREW	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB	(ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(5)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-37	OV-104 (Flight 8)	CDR: Steven R. Nagel	KSC 39B 95:14:22:44.98Z	EDW 33, LAKEBED (EDW 31, LKBD 18)	104/104/ 109%	BI-042	28.453° (25)	DIRECT INSERTION	OI-8F (1)	<u>CARGO</u> : 40561 LBS	KSC W/D: OPF 97, VAB 6, PAD 22 = 125 days
SEQ FLT #39 KSC-39	Atlantis	(Flt 3 - STS 51-G & STS 61-A) P200/R64/V23/M59 PLT:	9:18:00 AM EST (P) 9:22:45 AM EST (A) Friday 6 4/5/91 (7)	5:55:29 AM PST Thursday 2 4/11/91 (6)	<u>ACTUAL</u> : 100/104/ 87/67/	RSRM 14 ET-37		I <u>NSERTION</u> ALTITUDE: 244.2 X		<u>PAYLOAD</u> <u>CHARGEABLE</u> : 36800 LBS	LAUNCH POSTPONEMENT: - On 8/2/90, launch date was 3/27/91. - 4-day postponement prior to 10/90 (launch 4/1/91). - 7-day postponement in 11/90, STS-38 launch delay,
<u>PAD</u> 39B-12	OMS PODS	Kenneth D. Cameron P201/R121/M109	LAUNCH WINDOW: 2H30M (CTOB)	<u>XRANGE</u> : 375 NM	104/65	LWT-30		241.2 NM GRO DEPLOY		<u>NON-DEPLOYED</u> : 1615 LBS	launch date 4/8/91 (under review). - On 2/28/91, decision made to rollback STS-39 from pad
39B-12 MLP-1	LPO1 - 14 RPO1 - 14 FRC4 - 8	1 202/1(122/115	<u>PLS</u> : EDW LKBD <u>TAL</u> : BANJUL <u>TAL ALT</u> : BEN	<u>ORB DIR</u> : AL 11 <u>AIM PT</u> : CLOSEIN	1 = 2019 (8) 2 = 2031 (5) 3 = 2107 (4)	<u>ET</u> <u>RPT</u> 237K 1:22:20		HO = 246.6 NM		DEPLOYABLE: 34442 LBS	to repair ET door hinge cracks. OV-104 ET doors repaired before OPF rollout. OV-103 rollback caused STS-39 to be launched after STS-37. - At LSFR, launch date 4/4/91 (under review).
		<u>M/S 2</u> : Jerry L. Ross (Flt 3 - STS 61-B & STS-27)	<u>SELECTED</u> : <u>RTLS</u> : KSC 33 TAL: BEN 36	<u>MLGTD</u> :-623 FT 101:13:55:29Z VEL: 156 KGS 168 KEAS	<u>M 3 EOM</u>	MET ET				MIDDECK: 743 LBS	- Postponed 1 day to 4/5/91 (tile and FRT). - 9-day total slip from 8/90.
		P203/R86/V38/M78 M/S 3: Jay Apt	AOA: EDW 22 TDEL:	HDOT: -2 FPS	WEIGHT: 190266	<u>BR/UP</u> 195K		DEORBIT		<u>SHUTTLE</u> ACCUMULATED WEIGHTS: DEPLOYED:	LAUNCH SCRUBS: None.
		P204/R123/M110 EMU/TETHERED EVA:*		3 -2384 FT NLGTD: 1200 FT	X CG: 1087.4	1:23:25 MET		248 X 239 NM		549613 LBS NON-DEPLOYED: 437816 LBS	LAUNCH DELAYS: - 4M45S delay due to violation of RSO 8000-foot ceiling requirement at T-9 and range "B LAST" prediction
		EV1 - Jerry Ross EV2 - Jay Apt	676 68 ⁻		<u>Landing</u> Weight:	<u>ET</u> IMPACT LAT:		<u>VELOCITY</u> 24612 FPS		<u>CARGO TOTAL</u> : 1115834 LBS	(Counted to T-5 and held for waiver.) TAL WX:
		EVA 1 - 4/7/91 SS EVA #14 3:40/4:32	<u>SRB STG</u> : 2:04.8 <u>PERF</u> : NOM	<u>BRK INIT</u> : 93 KGS	190098	20.23°N <u>LONG</u> :		<u>ENTRY</u> <u>RANGE</u> 4175 NM		PERFORMANCE MARGINS (LBS): FPR: 4652	- Banjul no go because of tail winds (brake energy). - Ben Guerir 36 go (selected).
		SS UNSCHED EVA #2 RELEASE STUCK GRO HI GAIN ANTENNA	<u>2 ENG TAL (BEN)</u> 2:59 2:58		X CG: 1089.2	149.3°W	**	+175 NW		FUEL BIAS: 994 FINAL TDDP:1116 RECON: 525	RTLS: - Forecast NO GO RW & ceiling, observed NO GO at T- 22 mins. Selected KSC NOM 33.
		EVA 2 - 4/8/91 SS EVA #15 5:47/5:57	<u>NEG RETURN</u> : 4:04 4:07	<u>WHEELS STOP</u> : 101:13:56:25Z 5741 FT	-		***	20-		<u>Payloads</u> : <u>Plb</u> : Gamma Ray	I-LOADS:
		DEMO SPACE STATION (CREW & EQUIPMENT TRANSLATION AID)	<u>PTA</u> : 4:46 4:42	ROLLOUT: 6364 FEET 56 SECS						OBSERVATORY (GRO) DEPLOYED APM	- LSEAT select nominal I-loads, no uplink required. FLIGHT DURATION CHANGES:
AGEL	CANA		<u>PTM</u> : 5:51 5:4	5 <u>WINDS</u> : 14.1H, 9.6 R KTS	ACE RA	62 1.80 A D		A		CETA	 EDW 15 was first priority. Waved off one rev then extended flight 1 day due to winds/turbulence. Extended one rev due to winds at EDW. Extension
o Contraction			<u>MECO CMD</u> : 8:34 8:33.3	OFFICIAL: 15H, 8R	AD STS			ACE CO	10	<u>MIDDECK</u> : PCG, BLOCK II RME-III SAREX	total, 1 day + 1 rev. GRO DEPLOY: 2:08:14:02 MET
CELLE			<u>VI</u> : 26010 2600	5:23:32:44		-1		Ŷ		AMOS BIMDA	Unscheduled EVA to release GRO antenna.
	PT		<u>OMS-2</u> : Tig = DV=369 FPS	143:32:44 <u>S/T</u> : 229:09:31:09	Crew on /	Atlantis' m	iddeck:	-11 STS-37 Back row: C	DR	3 CRYO TK SETS RMS 23 (S.N. 303 USED FOR	FIRSTS: - First flight of new GPC's (AP-101S). - First flight of OI-8F.
				<u>OV-104</u> : 39:16:16:24	to right: R	oss/MS, (Godwin/	Front row, le MS, and ronauts' "AC		USED FÒR GRO DEPLOY)	- First EVA since STS 61-B on 12/01/85. Continued
		Continued		<u>DISTANCE</u> : 2,487,075 sm	Moving C	ompany".					
* TWO EVA TI	MES ARE PRO	VIDED: (1) OLD DEFINITION (2) NEW DEFINITION	I - STARTED WHEN E N - STARTS WHEN EM	MU WENT TO BAT PO IU GOES TO BAT POW	WER AND ENDE ER AND ENDS	D WHEN SW WHEN AIRLO	VITCHED DCK REPR	TO ORBITER PO ESS STARTS	WER		

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			<u>5PA</u>	CE SHUT		12210	<u> 7142 2014</u>		(Y	Page 2-46 - STS-
FLT NO.	ORBITER	CREW (7) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE ENG. S.N.	SRB RSRM AND ET	ORBIT INC HA/HP	FSW	Payload Weights, Payloads/ Experiments	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-37 Continued		Continued MCC FCR-1 (19) <u>FLIGHT DIRECTORS:</u> Asc/Ent - N. W. Hale Ld/O 1 - C. W. Shaw O 2 - J. M. Heflin Plng - P. L. Engelauf MOD - G. E. Coen								Continued SIGNIFICANT ANOMALIES: - Thruster R1U failed off 32 seconds after MECO. - WSB 2A temporary spray bar freeze up during ascent. - WSB 2A and 3A lube oil overcooling during entry. - PRSD 0 ₂ manifold valve failed to close. - EVA glove palm bar penetrated restraint and glove bladder. - Prelaunch BFS navigation anomaly. - Ku-band antenna erratic in ant mode. - EMU-1 failed to charge battery post EVA-1. - Abnormal 0 ₂ concentration in aft compartment (220 PF - Unscheduled EVA required to deploy GRO high gain antenna. - Scheduled EVA.
Ray Obse Mexico (3 Imperial V mouth of t Sea of Co At Right: 3	ervatory (GR0 31.5N, 113.0V /alley region the Colorado ortez are clea STS037-55	I-04-11 Deployed Gamm D) over Baja California, W), the Salton Sea and of California where the River empties into the rrly visible.	a ss/MS	OP: STS037-52-0 xtravehicular Mobi ranslation Aid (CE ay).	ility Unit (EM	U), tests	Crew and Equipm			

drifts outside P/L Bay as he attaches a tether to a port side guidewire during EVA.

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		CREW (7)	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB	(ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT NO.	ORBITER	TITLE, NAMES	LIFTOFF TIME, LANDING SITES,	CROSSRANGE LANDING TIMES	EMERG THROTTLE	RSRM AND	INC	HA/HP	FSW	WEIGHTS, PAYLOADS/	(LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS,
NO.		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET	INC	HAVITE		EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
				WINDS	ENG. S.N.				01.05		
STS-39	OV-103 Discovery	CDR: Michael L. Coats	KSC 39A 118:11:33:14Z	KSC 15 (KSC-7) 126:18:55:35Z	104/104/ 109%	BI-043	57.007° (7)	DIRECT INSERTION	OI-8F (2)	<u>CARGO:</u> 26294 LBS	<u>KSC W/D</u> : OPF 116 (2), VAB 17 (3), PAD 47 (2) = 180
SEQ FLT #40	(Flight 12)	(Flt 3 - STS 41-DR	7:01:00 AM EDT (P)			RSRM	(7)		(-/	PYLD CHARGABLE:	LAUNCH POSTPONEMENTS:
SEQ FLI #40	() /	& STS-29)	7:33:14 AM EDT (Á) Sunday 5	2:55:35 PM EDT Monday 10	ACTUAL: 100/100/	15K		I <u>NSERTION</u> ALTITUDE:		21413 LBS	- As of 8/21/90, launch date is 2/26/91. - 2/26/91 launch postponed to 3/9/91 due to OMS pod
KSC-40		P205/R38/V39/M37 PLT:	4/28/91 (8)	5/6/91 (3)	94/70/	ET-46		140.02 X		DEPLOYABLE:	work. (Swapped RP-03 from OV-104 for RP-01.) - On 2/15/91, cracks found in OV-103 ET door hinge
		L. Blaine Hammond	LAUNCH WINDOW	DEORBIT BURN:	104/67	LWT-39		138.22 NM		827 LBS	brackets. On 2/28/91, decision made to roll back and
<u>PAD</u> 39A-28	OMS PODS	P206/R124/M111	3H20M	126:17:53:34Z	1 = 2026 (1)	<u>et</u> RPT		SPAS		NON-DEPLOYED:	repair ET doors resulting in STS-39 launch being
MLP-2	LPO4 - 9 RPO3 - 13	<u>M/S 1</u> : Gregory J. Harbaugh	(AURORA CONSTR)	XRANGE: 616 NM	2 = 2030 (5) 3 = 2029 (4)	249K		<u>DEPLOY</u> : 137.37 X		16046 LBS	scheduled after STS-37. Launch rescheduled för 4/23/91.
	FRC3 - 12	P207/R125/M112	PLS: EDW LKBD			1:09:34		136.55 NM		RETURNED:	- 56 days total slip based on 8/21/90 schedule.
		<u>M/S 2</u> :	TAL: ZZA (P) TAL ALT:	ORB DIR: DL 21	M 3 EOM	MET		CRO-C		<u>MIDDECK:</u> 494 LBS	LAUNCH SCRUBS:
		Donald McMonagle P208/R126/M113	BEN GUERIR MORON	<u>AIM PT</u> : CLOSEIN	WEIGHT:	<u>et</u> BR/UP		<u>DEPLOY</u> : 136.4 X			- 4/23/91 launch scrubbed at L-6 hours due to SSME #3 HPOTP secondary seal pressure xducer problem and
		<u>M/S 3</u> :	WORON	<u>MLGTD</u> : 169 FT	211673	215K		130.4 × 134.7 NM		SHUTTLE ACCUM WEIGHTS:	P/L servicing. Rescheduled launch for 4/28/91.
		Guion S. Bluford	<u>SELECTED</u> : RTLS: KSC 33/CI	126:18:55:35 VEL: 210 KGS	X CG: 1080.3	1:10:34 MET		CRO-B		DEPLOYED:	- 5-day slip. (Total slip - 61 days.)
		(Flt 3 - STS-8 & STS 61-A)	TAL: BEN 36/CI	218 KEAS	X CG. 1000.5			<u>DEPLOY</u> :		550440 LBS NON-DEPLOYED:	LAUNCH DELAYS:
	\wedge	P209/R22/V25/M21	<u>AOA</u> : EDW 22	HDOT: - 2 FPS	LANDING	<u>et</u>		136.7 X 132.7 NM		454356 LBS	- 32M14S delay caused by review of OPS 2 recorder uncommanded switching of tracks and going to run at
2		<u>M/S 4</u> : Charles Lacy Veach	<u>TDEL</u> :	TD NORM 195:	WEIGHT:	IMPACT LAT:		-		CARGO TOTAL: 1142128 LBS	approximate time of BFS 101 PRO.
	in the second second	P210/R127/M114	-0.64 -0.55	2771 FT	211512	43.82°S		<u>SPAS RNDZ</u> : 135.5 X		PERFORMANCE	TAL WX:
10 · 2	E SA	<u>M/S 5</u> :	MAX Q:	<u>NLGTD</u> : 4700 FT	X CG: 1082.0	<u>LONG</u> : 156.3°W		132.8 NM		<u>MARGINS (LBS)</u> : FPR: 4653	- Zaragoza and Moron no go - ceilings (broken < 8000
and the second	COATS HAMIN	Richard J. Hieb P211/R128/M115	709 707	126:18:55:49 VEL: 157KGS		130.3 W		CRO-A		FUEL BIAS: 994	feet).
MCMONNES	MAMMOND	1211/10120/101113	SRB STG:	HDOT: - 2.9 FPS	DEODDIT			DEPLOY:		FINAL TDDP:1054 RECON: 2768	I-LOADS:
		MCC FCR-1 (20)	2:03.4 2:05	BRK INIT:136 KGS	DEORBIT 140 X			140.96 X 138.6 NM		PAYLOADS:	- LSEAT selected nominal, no uplink.
		FLIGHT DIRECTORS: Asc/Ent - A. L. Briscoe	PERF: Nominal	AVE BRK DECEL:	138 NM					PLB: Infrared Background	FLIGHT DURATION/LANDING SITE CHANGES:
		Ld/O2 - R. D. Dittemore	2 ENG TAL (BEN):	9.5 FPS/S	VELOCITY			<u>MPEC</u> DEPLOY:		Signature Survey	- Landed at KSC on same rev as planned for EDW because unfavorable winds predicted at EDW.
		01-R.E.Castle	2:49 2:55	WHEELS STOP:	25765 FPS			141.55 X 139.46 NM		(IBSS) (SPAS-II (IV + 3 GAS DEPLOY	EVENTS:
		O 3 - R. M. Kelso MOD - T. W. Holloway	NEG RETURN:	126.18.56.31	<u>ENTRY</u>	070000	47.047.4			CRO-A, CRO-B,	- SPAS deploy - rev 46, SPAS RNDZ - rev 72, MPEC
			4:06 4:08	9403 FT	RANGE 4502 NM			991-05-06, ellite II (SPAS	_	CRO-C, CIV)	deploy - rev 127. - 16 OMS burns.
039-07-017	7 STS-39 C	rew On-Orbit	<u> PTA: (ATO)</u>	ROLLOUT: 9234 FT	4002 INIVI			round Signatu		<u>AF-675</u> (CIRRIS, FAR-UV, URA, HUP,	
			4:56 5:10	56 Seconds		Survey (IBSS) rel	eased by RMS	5.	QINMS)	RENDEZVOUS 9: With Infrared Background Signature Survey (IBSS) (SPAS-II) for retrieval and return.
	1		PTM:	WINDS:	10 mm	ere con	and the second second	Contraction of the	i i	<u>STP-1</u> (ALFE, APM, SKIRT, UVIM, DSE)	
	1		6:09 6:22 VI:	12H, 1R KTS	a.n		2				FIRSTS: - First flight with 67% as standard 3g throttling.
			25804 25850	OFFICIAL: 14H, 2R	19 -20	and a				<u>MPEC</u> - GAS DPLY	5 5 5
-			OMS-2:	<u>DENS ALT</u> :1723FT	and the	Mice	and the second second			MIDDECK: CLOUDS-1A	SIGNIFICANT ANOMALIES: - ROB tire outboard shoulder damaged during landing
-	Dellar		Tig = 36:08	FLT DURATION:		1				RME-III	(3 cords).
	Ser Co	6600	DV=209.6 FPS	8:07:22:21 199:22:21		Vec		and the second	1	UVPI	- OPS 2 recorder uncommanded switching of tracks and tape speed prelaunch.
				S/T: 237:16:53:30						4 CRYO TK SETS	- FES feedline A system 2 heater failure. - APU 2 fuel pump/GGVM coolant sys A valve did not
a tak	117			OV-103:	All and the	1	-		82	RMS 24 (S.N. 301)	operate.
and the second second	S I			<u>69:17:40:41</u>	States States					USED FOR SPAS/IBSS DPLY,	- GFE tread mill excessive resistance.
				DISTANCE:	A CONTRACT OF	W	Mark I	Constant Provide State		CAPTURE, AND BERTH	
				3,475,000 sm							

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51.7	ODDITED	CREW (7)	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB	C	ORBIT	5014	PAYLOAD	MISSION HIGHLIGHTS
FLT NO.	ORBITER		LIFTOFF TIME, LANDING SITES,	CROSSRANGE LANDING TIMES	EMERG THROTTLE	RSRM AND	INC	HA/HP	FSW	WEIGHTS, PAYLOADS/	(LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS,
		TITLE, NAMES & EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-40	OV-102	<u>CDR</u> :	KSC 39B	WINDS EDW 22, CONC	ENG. S.N. 104/104/	BI-044	39.0156°	DIRECT	OI-8D	CARGO:	KSC W/D: OPF 74, VAB 6, PAD 34 = 114 days
	Columbia	Bryan D. O'Connor (Flt 2 - STS 61-B)	156:13:24:51Z	(EDW 32, CONC 14) 165:15:39:11Z	109%	RSRM	(1)	INSERTION	(4)	33707 LBS	LAUNCH POSTPONEMENT:
SEQ FLT #41	(Flight 11)	P212/R83/V61/M76	8:00:00 AM EDT (P)		PREDICTED:	16W		POST OMS-2:		PAYLOAD	- 1/9/91 launch date as of 8/21/90. Launch order was
KSC-41	Sixth Spacelab	PLT:		8:39:11 AM PDT Friday 5	100/100/ 92/67/	ET-41		161.16 X 149.84 NM		CHARGEABLE: 28114 LBS	STS-35, STS-41, STS-38, STS-40, STS-39, and STS-37. Launch postponed due to STS-35 and STS-38 H ₂ leaks.
PAD	Flight	Sidney M. Gutierrez	6/5/91 (4)	6/14/91 (3)	104/67	LWT-34		149.04 10101		DEPLOYED:	Program manifest in March set tentative schedule of 5/22/91 with STS-37 and STS-39 moved ahead of
39B-13	LM (4)	P213/R129/M116	LAUNCH WINDOW:	<u>XRANGE</u> : 211 NM	ACTUAL:	FT				0 LBS	STS-40.
MLP-3		<u>M/S 1</u> :	2H00M (MAND SLS-1 SCIENCE)	<u>ORB DIR</u> : DR 6		<u>ET</u> <u>RPT</u>				NON-DEPLOYED:	- 129-day slip.
IVILF-J	First Life Sciences	James P. Bagian (Flt 2 - STS-29)		<u>AIM PT</u> : NOMINAL	98/71/ 104/67	244K 1:19:40				26237 LBS	LAUNCH SCRUBS:
	Flight	P214/R99/V62/M90	<u>PLS</u> : EDW LKBD <u>TAL</u> : BEN GUERIR	<u>MLGTD</u> : 1485 FT		MET				<u>RETURNED</u> :	- 5/22/91 launch scrubbed at approximately L-1 day (during T-11 hr hold) due to (1) MDM FA2 problem, (2)
	OMS PODS	M/S 2:	TAL ALT: MORON	165:15:39:11Z VEL: 199 KGS	1 = 2015 (6) 2 = 2022 (6)	<u>ET</u>					GPC4 failure, and (3) SSME cryo temp probes analysis received stating probes could break and enter HP
	LPO3 - 11	Tamara E. Jernigan	ZARAGOZA	203 KEAS	3 = 2027 (6)	<u>BR/UP</u> 197K		D F O D D I T		1877 LBS	turbopumps. Changed LO ₂ and LH ₂ temperature
	RPO4 - 7 FRC2 - 11	P215/R130/F14	SELECTED:	HDOT: -2 FPS	M 3 EOM	1:20:52		<u>DEORBIT</u> 157 X		SHUTTLE	transducers. Launch rescheduled for 6/1/91. 10-day turnaround.
		<u>M/S 3</u> :	<u>RTLS:</u> KSC 33/CI/N TAL: BEN 36/N//N	<u>TD NORM 195</u> : 2202 FT	WEIGHT:	MET		146 NM		ACCUMULATED	- 6/1/91 launch scrubbed at T-20 minute hold due to IMU 2 failing calibration. 96-hour turnaround.
		Rhea Seddon (Flt 2 - STS 51-D)	AOA: EDW 22	NLGTD: 5914 FT	226737 X CG:	<u>et</u>		VELOCITY		DEPLOYED:	°
		P216/R55/V63/F5	<u>PLS</u> : EDW 22	165:15:39:25Z VEL: 153 KGS	1279.6	IMPACT LAT:		25772 FPS		550440 LBS <u>NON-DEPLOYED</u> :	LAUNCH DELAYS: - 1H24M51S delay at T-9 minute hold due to RSO no-go
AT LAND	AN COLOR	<u>P/S 1</u> :	<u>TDEL</u> : -0.32 +0.402	HDOT: -4 FPS	Ernitonito	1.05°N		<u>ENTRY</u>		482470 LBS CARGO TOTAL:	for ceiling at 12K. (Moisture in middle clouds and greater than 4500 feet thick.)
· · /	A REAL PROPERTY AND A REAL	F. Drew Gaffney P217/R131/M117		<u>BRK INIT</u> : 134 KGS	WEIGHT: 226535	<u>LONG</u> : 146.06°W		<u>RANGE</u> 4339 NM		1175835 LBS	
S15 8			MAX QNAV: 681 689	AVE BRK DECEL:	X CG:			1007 100		PERFORMANCE	TAL WX: - Ben Guerir (P) go throughout (selected).
TINT PUGN	TRUIS	P/S 2: Millie Hughes-Fulford		6.8 FPS/S	1080.9					<u>MARGINS (LBS)</u> : FPR: 4671	- Moron go throughout - Zaragoza go.
		U of Cal/VA Center	<u>SRB STG</u> : 2:04.2	WHEELS STOP: 165:15:40:06Z						FUEL BIAS: 983	RTLS:
		P218/R132/F15	PERF: NOMINAL	10923 FT		A CAR				FINAL TDDP:3037 RECON: 4212	- KSC 15/33 ceiling 12K with middle clouds thicker than 4500 ft caused delay.
		MCC FCR-1 (21) FLIGHT DIRECTORS:	<u>2 ENG TAL:</u>	ROLLOUT:	100	11 16		22.11		PAYLOADS:	,
STS040-6		Asc/Ent - N. W. Hale	2:57 3:01	9438 FT 55 SECONDS	13	206	CB 4			<u>PLB</u> : Spacelab Life	I-LOADS: - LSEAT selected nominal, no uplink required.
1991-06-1 Spacelab Li		Ld/O2 - G. A. Pennington O 1 - R. E. Castle	NEG RETURN:	WINDS			20			Sciences-1	SIGNIFICANT ANOMALIES:
Spacerab Li Sciences-1	(SLS-1 in	Plng - J. W. Bantle		10.4H, 6 L KTS OFFICIAL: 12H, 3L	<u>o</u> i		AL IN			<u>(SLS-1)/LM</u> Cardiovascular,	- Two ECOS failures.
P/L Bay	`	MOD - B. R. Stone	<u>PTA</u> : 5:15 5:18	DENS ALT: 3739 FT	YA.			4		Cardiopulmonary Metabolic,	 Hum sep A speed sensor wire break. PRSD H₂ tank 3 heater failure.
Barre	a). S	I am	PTM:	<u>FLT DURATION</u> :	1			N.		Musculoskeletal, and	 MECO velocity error (explained condition). KSC wind tower data false wind gusts.
1 miles	the season	and the second s	5:45 5:49	9:02:14:20		134ª	1			Neurovestibular Systems	 S-band degraded performance on lower antennas.
Sector with	1995	A CONTRACTOR	MECO CMD:	218:14:20		10-1				Experiments	 TAGS hardcopier jam. PLBD seal section missing and 1307 bulkhead blankets
			14.	<u>S/T</u> : 246:19:07:50						<u>GBA</u> With 12 GAS	unfastened. - LiOH door stuck closed (IFM freed door).
			<u>VI</u> : 25850 25868	<u>OV-102</u> : 75:01:14:24				14 STS-40	т		 Camcorder adapter cable failure.
	-		OMS-2:					affney/PS, Pl agian/MS.	-1	MIDDECK: MODE-0	- APU 1 fuel line heater failure. - Vernier jet L5L fail off.
	NOL.	10 me	Tig = 2:05 DV= 199 FPS	DISTANCE: 3,290,226 sm	Back row	(It to rt) C	DR O'C	onnor,		5 CRYO TK SETS	- S/L audio problem. - Orbiter freezer and L9I ref/freezer Freon freezeup.
and the second sec			5. 177110		Jernigan/I	MS, & Hu	ghes-Fu	llford/MS.		NO RMS	orbitor neezer and Extremedezer Freditireezeup.

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		CREW		LANDING SITE/	SSME-TL						
FLT	ORBITER	(5)	LAUNCH SITE, LIFTOFF TIME,	RUNWAY, CROSSRANGE	NOM-ABORT EMERG	SRB RSRM	(ORBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.	UKDITEK		LIFTOFF TIME, LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP	FSW	PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		TITLE, NAMES & EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
070.10	01/ 10/		KSC 39	WINDS	ENG. S.N.	BI-045	28.46°	DIDECT	01-20	CARGO:	
STS-43	OV-104 (Flight 9)	CDR: John E. Blaha	214:15:02:00Z	KSC-15 (KSC-8) 223:12:23:25Z	104/104/ 109%	BI-045	28.46 (26)	DIRECT INSERTION	(1)	<u>CARGO:</u> 49325 LBS	<u>KSC W/D</u> : OPF 60, VAB 6, PAD 35 = 101 days
SEQ FLT #42	Atlantis	(Flt 3 - STS-29	11:02:00 AM EDT (P)			RSRM	(20)		(.)	PAYLOAD	LAUNCH POSTPONEMENT:
		& STS-33)	11:02:00 AM EDT(A) Friday 7	6:23:25 AM EDT Sunday 6	PREDICTED: 100/104/	17W		158/35		CHARGABLE:	- 7/23/91 launch postponed on 7/19/91 to 7/24/91 due to
KSC-42		P219/R97/V48/M88	08/02/91 (5)	08/11/91 (3)	80/67/104	ET-47		POST OMS-2:		46712 LBS	SRB sep motor PIC wire replacement.
PAD		<u>PLT</u> :	LAUNCH WINDOW:	XRANGE: 180NM		LWT-40		161.3 X		DEPLOYED:	LAUNCH SCRUBS:
39A-29	OMS PODS LPO1 - 15	Michael A. Baker P220/R133/M118	2H30M (CTOB)	ARAINGE. TOUINIVI	ACTUAL: 100/104/	ET		160.3 NM		<u>DEPLOYED</u> : 37575 LBS	- 7/24/91 launch scrubbed at approximately L-6 hours
MLP-1	RPO1 - 15	P220/R133/IVI118	· · ·	<u>ORBIT DIR</u> : DL 22	84/67/104	<u>ET</u> RPT		TDRS_		NON-DEPLOYED:	(during tanking) due to SSME 3 MEC DCU "A" parity error, MCF was set. Launch rescheduled for 8/1/91.
	FRC4 - 9	<u>M/S 1</u> :	PLS: KSC TAL: BANJUL (P)	AIM PT: CLOSE IN		234K		DEPLOY:		8146 LBS	- 8/1/91 launch scrubbed at L+1H24M while holding at T-9
		Shannon W. Lucid	TAL WX:		1 = 2024(3)	1:17:35 MET		161.2 X		MIDDECK	min. Did not get cabin vent close indication but counted
. A		(Flt 3 - STS 51-G & STS-34)	BEN GUERIR MORON	<u>MLGTD</u> : 1986 FT 223:12:23:25Z	2 = 2012(12) 3 = 2028 (6)			159.8 NM		<u>MIDDECK</u> : 991 LBS	down to T-20 and ran cabin pressurization test (valve was closed) but by the time cabin was vented and cabin closed
		P221/R65/V45/F6	WORON	VEL: 202 KGS		ET		OMS SEP		SHUTTLE	out, WX at KSC was bad. Scrubbed because T-showers
		M/C D	SELECTED:	197 KEAS HDOT: -1 FPS	<u>M 3 EOM</u>	<u>BR/UP</u> 186K		<u>MAN</u> : 177.9 X		ACCUMULATED	within 20 nm, Xwinds > 15 kts @ SLF & convection
		<u>M/S 2</u> : G. David Low	<u>RTLS</u> : KSC 15/CI/N TAL: BEN 36/N/N		WEIGHT:	1:18:15		177.9 X 161.2 NM		WEIGHTS: DEPLOYED:	present. Rescheduled launch for 8/2/91. 10 days total slip.
		(Flt 2 - STS-32)	AOA: EDW 22/N/N	<u>TD NORM 195</u> : 2152 FT	196353	MET				588015 LBS	LAUNCH DELAYS: None.
BLAHA B	IAKER	P222/R110/V64/M98	<u>PLS</u> : EDW 22/N/N		X CG:	ET		<u>DEORBIT</u> 174 X		<u>NON-DEPLOYED</u> : 491607 LBS	TAL W/V. Den Cuerir and Moren as Deniul late as ofter
		M/S 3:	TDEL:	<u>NLGTD</u> :5517 FT 223:12:23:36Z	1087.4	IMPACT		174 X 161 NM		CARGO TOTAL:	TAL WX: Ben Guerir and Moron go, Banjul late go after T-showers and ceiling no go. Selected BEN 36.
		James C. Adamson	0.00 0.562	VEL: 165 KGS		LAT:				1225160LBS	
		(Flt 2 - STS-28) P223/R102/V615M93	MAX QNAV:	HDOT: -2.7 FPS	LANDING: WEIGHT:	13.47°N LONG:		<u>VELOCITY</u> 25794 FPS		PERFORMANCE	I-LOADS: LSEAT selected nominal, no uplink required (uplink 6).
Artist conce		mm Network	714 PSF 718PSF	<u>BRK INIT</u> : 132 KGS	196088	162.2°W		20/94 FPS		MARGINS (LBS):	(црштк о).
Artist conce			SRB STG:	AVE BRK DECEL:	X CG:			<u>ENTRY</u>		FPR: 4653 FUEL BIAS: 994	FIRSTS: First flight of OI-20.
			2:04.3 2:02.9	6.1 FPS/S	1089.7			<u>RANGE</u> 4312 NM		FINAL TDDP:2656	SIGNIFICANT ANOMALIES:
34			PERF: NOM	WHEELS STOP:				4312 10101		RECON: 2593	- Cabin vent valve failed to indicate "closed."
	S/ 0	*		223:12:24:24Z 11876 FT						PAYLOADS:	- No cooling on WSB2 during ascent.
13	Rep.		2 ENG TAL BEN: 3:13 3:12				-	Vac - Miller	145	PLB:	- PDI decom problems with SHARE data. - PRSD H ₂ tank 1 heater failed off.
	***		3:13 3:12	<u>ROLLOUT</u> : 9890 FT		-	5.7	571	1	TDRS-E/IUS SSBUV	- APU 1 FP/GGVM overcooling.
	- MAN	25	NEG RETURN:	59 SEC	1	G	1. P. P.		1	SHARE-II	- S-band power amp 2 degradation.
S90-4 ⁻	1340 1990-0	6-22	3:53 3:54	WINDS:	11 10 216	1				OCTW TCPE	- PPO ₂ sensor "C" failed. - APU 1 S/N 305 anomalous chamber pressure during
	<u> </u>		<u>PTA (U/S 245)</u> :	0.5T, 4R KTS OFFICIAL: 0T, 3R			Here a				entry.
1 I	1.00	MCC FCR-1 (22)	5:13 5:09		X			St/Lo	6	<u>MIDDECK</u> : SSCE	- PLB floodlight problems, mid-STBD RPC trip.
	134	FLIGHT DIRECTORS: Asc - R. D. Dittemore	<u>PTM (U/S 245)</u> :	<u>DENS ALT</u> : 1602 FT	51	5	14 1 2			SAMS	- BIMDA cell syringe problems. - PRSD tank H ₂ manifold valve failed to close.
		Ent - J. W. Bantle	5:50 5:49	FLT DURATION:		242		The start		BIMDA	_
No. State		Ld/O 1 - R. M. Kelso	MECO CMD:	8:21:21:25 213:21:25	1. 1.		A WE			IPMP PLG-III	DISCUSSION ITEM: - LIB MLG tire rib 2 tire wear (scuffing of two cords).
Sec. 1	¢'Q	O 2 - P. L. Engelauf Plng - G. E. Coen	8:27.7 8:27.6	<u>S/T</u> : 255:16:29:15	111-1		3 (2)			UVPI	
STS043-60	1- 033	Plng - J. M. Heflin	VI:			_			an.	AMOS APE-B	
1991-08-12		MOD - T. W. Holloway MOD - G. E. Coen	25875 25873	<u>OV-104</u> : 48:13:37:49	STS043-4	10-029.19	91-08-1	1 Crew on			
TDRS-E/IU	S deploy	MDR - B. R.Stone	OMS-2 TIG:	DISTANCE:	Middeck:	(Lt to Rt)	Low/MS	, Lucid/MS,		4 CRYO TK SETS	
over Pacific	Cocean.	MDR - J. M. Heflin	39:50.09 222.2 FPS	3,700,400 sm	Adamson	/MS, CDF	R Blaha,	& PLT Bake	er.	NO RMS	

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FLT	ORBITER	CREW (5)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM- ABORT	SRB RSRM	C	ORBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	EMERG THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-48 SEQ FLT #43 KSC-43	OV-103 (Flight 13) Discovery	CDR: John O. Creighton (Flt 3 - STS 51-G, & STS-36) P224/R63/V50/M58	KSC 39A 255:23:11:04Z 6:57:00 PM EDT (P) 7:11:04 PM EDT (A) Thursday 10 9/12/91 (2)	EDW 22 NOM (EDW 33,CONC 15) 261:07:38:42Z 00:38:42 AM PDT Wednesday 4 09/18/91 (4)	104/104/ 109% <u>PREDICTED</u> : 100/100/ 89/67/	BI-046 RSRM 18W ET-42	57.00° (8)	DIRECT INSERTION 288 X 36 NM	OI-20 (2)	<u>CARGO:</u> 21564 LBS <u>PAYLOAD CHARGABLE</u> : 17144 LBS	<u>KSC W/D</u> : OPF 78, VAB 8, PAD 27 = 101 days <u>LAUNCH ADVANCEMENT</u> : - Launch advanced 9 days from 9/21/91 to 9/12/91, which was the earliest date to complete crew training
<u>PAD</u> 39A-30 MLP-3	OMS PODS LPO4 - 10 RPO3 - 14 FRC3 - 13	PLT: Kenneth S. Reightler P225/R134/M119 <u>M/S 1</u> : James F. Buchli (Flt 4 - STS 51-C, STS 61-A, & STS-29) P226/R52/V24/M48 <u>M/S 2</u> : Mark N. Brown	2H57M (UARS RAAN & CTOB) <u>PLS:</u> KSC TAL: ZARAGOZA TAL ALT: MOR, BEN <u>SELECTED:</u> <u>RTLS:</u> KSC33/NOM NOM 2400 FT	<u>XRANGE</u> : 690 NM <u>ORBIT DIR</u> : DR 7 <u>AIM PT</u> : NOMINAL <u>MLGTD</u> : 1235 FT 261:07:38:42Z VEL: 213 KGS 203 KEAS HDOT: -1 FPS <u>TD NORM 195</u> : 2015 FT	104/67 <u>ACTUAL</u> : 100/100/ 89/67/ 104/67 1 = 2019 (9) 2 = 2031 (6) 3 = 2107 (5) M 3 EOM	ET <u>RPT</u> 229K 1:25:46 MET <u>ET</u> <u>BR/UP</u> 194K 1:26:47		POST OMS-2: 291.5 X 289.9 NM <u>RCS-1:</u> 306.9 X 290.9 NM <u>RCS-2</u> : 308.1 X 207.9 NM		DEPLOYED: 14388 LBS NON-DEPLOYED: 2066 LBS MIDDECK: 690 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 602403 LBS	LAUNCH SCRUBS: None. LAUNCH DELAYS: - 14M4S because of motor boating noise on A/G voice caused by glitch on RF to MILA resulting in Delta Modulation System (DMS) false frame lock. Counted to T-5 mins, held and cleared by CDR keying A/G voice. <u>TAL WX</u> : Zaragoza, Moron, and Ben Guerir - all go. <u>DOLILU/ALT I-LOADS</u> : - First availability of DOLILU which was uplinked and used (uplink 7).
CREIGH		Mark N. BIOWIT (Fit 2 - STS-28) P227/R103/V66/M94 <u>M/S 3</u> : Charles D. (Sam) Gemar (Fit 2 - STS-38) P228/R118/V67/M106 MCC FCR-1 (23) FLIGHT DIRECTORS: Asc/Ent - J. W. Bantle Ld/O1 - G. A. Pennington O 2 - R. M. Kelso Plng - P. L. Engelauf MOD - G. E. Coen	AOA:NOR 17/NOM/ NOM 2900 FT PLS: EDW22/NOM/ NOM 2700 FT TDEL: 0.162/0.2 MAX Q NAV: 670 708 SRB STG: 2:04 2:05.23 PERF: NOMINAL	NLGTD: 4882 FT 261:07:38:53Z VEL: 171 KGS HDOT: -2.1 FPS BRK INIT: 145 KGS AVE BRK DECEL: 8.2 FPS/S WHEELS STOP: 10619 FT ROLLOUT: 9384 FT 49 SECS	<u>WEIGHT:</u> 192925 X CG: 1096.0 <u>LANDING</u> : WEIGHT: 192780 X CG: 1097.8	MET <u>ET</u> <u>IMPACT</u> <u>LAT</u> : 0.26°N <u>LONG</u> : 121.9°W		UARS DEPLOY: 308.9 X 305.3 NM ENTRY: Ha/Hp: 313 X 302 NM VELOCITY 26077 FPS RANGE 4194 NM		NON-DEPLOYED: 494363 LBS CARGO TOTAL: 1246729 LBS PERFORMANCE MARGINS (LBS): FPR: 4671 FUEL BIAS: 983 FINAL TDDP: 510 RECON: - 562 PAYLOADS: PLB: Upper Atmosphere Research Satellite (UARS) with 10 experiments deployed:	DUSK LAUNCH: - Launch was planned during daylight but 14 minute delay slipped to dusk launch, RTLS would have been night. FLIGHT DURATION CHANGES: - Waved off planned rev at KSC because STA observed clouds developing south of SLF. - Flight extended one rev when STA spotted clouds forming south of SLF. - Flight extended one rev when STA spotted clouds forming south of SLF. - Flight extended one rev Men STA spotted clouds forming south of SLF. - Flight extended one rev Men STA spotted clouds forming south of SLF. - Flight extended one rev Men STA spotted clouds forming south of SLF. - Flight extended one rev Men STA spotted clouds forming south of SLF. - Flight extended one rev When STA spotted clouds forming south of SLF. - Flight extended one rev When STA spotted clouds forming south of SLF. - Clouds were not observed on radar. <u>FIRSTS:</u> - First flight of enhanced MDM (OA1 only). LANDING SITE CHANGE: - Changed from KSC to EDW because of the dynamic
		1-09-18 Upper ch Satellite (UARS)	NEG RETURN: 4:14 PTA (U/S 518): 4:23 4:23 4:23 PTM (U/S 1124): 6:50 6:44 6:50 MECO CMD: 8:36	<u>WINDS:</u> 2.9H, 0.8 L KTS OFFICIAL: 4H, 4L <u>DENS ALT</u> : 3503 FT <u>FLT DURATION</u> : 5:08:27: 38 128:27:38 <u>S/T</u> : 261:00:56:53 <u>OV-103</u> : 75:02:08:19 <u>DISTANCE</u> : 2,193,670 sm	middeck:	(front It to , Buchli/N	rt) PLT IS and (8 Crew on Reightler, C back It to rt)	DR	Appointents SUSIM, SOLSTICE, PEM, CLAES, ISAMS, MLS, HALOE, HRDI, WIND II, ,ACRIM-II, APM <u>MIDDECK:</u> PCG-II-2 RME-III MODE IPMP AMOS PARE SAM CREAM 4 CYRO TK SETS RMS 25 (S.N. 301) used for UARS	 conditions with clouds and convection observed by STA. One rev extension. <u>EVENTS</u>: UARS deployed at MET 2:05:12:09. SEP 1 burn at 2:05:12:40. <u>NIGHT LANDING</u>: Space Shuttle #5 <u>SIGNIFICANT ANOMALIES</u>: ET door centerline latch 1 motor 2 phase B failure. Fuel cell 1 O₂ reactant valve closed indication. Supply water dump valve leaking. Hydraulic system 2 unloader valve leakage. Supply water nozzle temperature temporary decrease. APU 1 seal cavity drain pressure delay. LINHOF camera failed.

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HI ORBITER 0 LARGEN Site, Information Description Pair Use 3 (Market Site, Market Site, Mark			CREW		LANDING SITE/	SSME-TL	0.000				2.1.4.0.15	
NO. TTLE HANDS & EVANS LANDING SITES. ABORT TURES LHROTTUE AND ET FUEL HANDS ET AND ET PATUOADS/ ET Into C HAMP PATUOADS/ ED Into LIMPRIERS, SIGNIFUCHADUS, ED Into LIMPRIERS, SUBJECT Into LIMPRIERS Into LIMPRIERS, SUBJECT STS-44 (Fight 10) COBE Fright 51 S3 (Fight 10) COBE Fright 51 S3 (Fight 10) COBE Fright 10) CSS 30, PAD A 328,2314402/ P22/RISF/W47/M54 SSS 30, PAD A 328,2314002/ P22/RISF/W47/M54 SSS 30, PAD A 328,231402/ P22/RISF/W47/M54 SSS 30, PAD A 328,231402/ P22/RISF/W47/M55 SSS 20, PAD A 328,221402/ P22/RISF/W47/M55 SSSS 20, PAD A 22, PAD A 22, PAD A 22,	FLT	ORBITER							ORBH	ESW		
Other Finderics Locacy Finderics Locacy Carbon Line Constraints				LANDING SITES,	LANDING TIMES FLT DURATION,	THROTTLE PROFILE	AND	INC	HA/HP	101	PAYLOADS/	
8+28.5 8+30 <u>DENS ALT</u> : 2284 FT VI: 25934 25928 FLT DURATION:	STS-44 SEQ FLT #44 KSC-44 <u>PAD</u> 39A-31	(Flight 10) Atlantis OMS PODS LPO1-16 RPO1-16	& EVA'S CDR: Frederick D. Gregory (Flt 3 - STS 51-B & STS-33) P229/R59/V47/M54 PLT: Terence (Tom) Henricks P23/0R135/M120 M/S 1: James S. Voss P231/R136/M121 M/S 2: F. Story Musgrave (Flt 4 - STS-6, STS 51-F & STS-33) P232/R15/V19/M15 M/S 3: Mario Runco, Jr P233/R137/M122 P/S: Thomas J. Hennen CWO-3, U.S. Army P234/R138/M123 MCC FCR-1 (24) FLIGHT DIRECTORS: Asc/Ent - R.D.Dittemore Ld/0 2 - J. M. Heflin O 1 - P. L. Engelauf Plng - C. W. Shaw	ABORT TIMES KSC 39, PAD A 328:23:44:00Z 6:31:00 PM EST (A) Sunday 6 11/24/91 (8) LAUNCH WINDOW TH59M (DSP RAAN) EOM PLS: KSC TAL: BYD 32 TAL WX: BEN , MRN SELECTED: RTLS: KSC 33/CI/N TAL: BYD 32/IN/SF AOA & PLS: EDW 22/N/N TDEL: -0.16 0.442/0.48 MAX QN: 719 PSF 728 PSF SRB STG: 2+05 2+05 PERF: NOM 2 2+41 2+41 2+40 NEG RETURN: 5+06 5+09 PTM (U/S 315): 5+57 6+00 MECO CMD: 8+28.5 8+30 VI: 25934 25928 OMS-2 TIG: 4+49 4+48	FLT DURATION, WINDS EDW 05 (EDW 34, LKBD 19) 335:22:34:432 2:34:43 PM PST Sunday 7 12/1/91 (5) XRANGE: 379 NM ORBIT DIR: AL 12 AIM PT: CLOSEIN MLGTD: 2607 FT 335:22:34:43Z VEL: 182 KGS 189 KEAS HDOT: -1 FPS TD NORM 195: 2127 FT NLGTD: 5077 FT 335:22:34:51Z VEL: 149 KGS HDOT: -5.2 FPS BRK INIT: 15 KGS AVE BRK DECEL: 1.8 FPS/S WHEELS STOP: 335:22:34:522 335:22:36:292 33798 FT ROLLOUT: 11191 FT 106 SEC WINDS: H12.8 KTS R2.2 KTS OFFICIAL: 13H, 0L DENS ALT: 2284 FT FLT DURATION: 6:22:0:43 166:50:43 S/T: 267:23:47:36	PROFILE ENG. S.N. 104/104/ 109% PREDICTED 100/104/ 104/70/ 104/70/ 104/67 ACTUAL 100/104/ 104/73/ 104/67 1 = 2015 (7) 2 = 2030 (6) 3 = 2029 (5) M 3 EOM WEIGHT: 195047 X CG: 1090.8 LANDING WEIGHT: 194818 X CG: 1092.5	ET BI-047 RSRM 19W ET-53 LWT-46 ET RPT 235K 1:19:55 MET ET BR/UP 207K 1:20:38 MET I:20:38 MET I:10:55 I:10:55 I:10	28.45° (27)	DIRECT INSERTION <u>POST OMS-2</u> 195.0 X 194.3 NM <u>DEPLOY:</u> 195.5 X 194.9 NM <u>SEP BURN:</u> 212.4 X 195.4 NM <u>RCS-2</u> 195.9 X 195.3 NM <u>COLLISION</u> <u>AVOIDANCE</u> 195.9 X 195.0 NM <u>DEORBIT</u> 197.X 194.NM <u>VELOCITY</u> 25868 FPS <u>ENTRY</u> <u>RANGE</u> 4195 NM		CARGO: 47235 LBS PAYLOAD CHARGEABLE: 44637 LBS DEPLOYED: 37588 LBS NON-DEPLOYED: 5809 LBS MIDDECK: 1240 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 639991 LBS NON-DEPLOYED: 501412 LBS CARGO TOTAL: 1293964 LBS PERFORMANCE MARGINS (LBS): FPR: 4356 FUEL BIAS: 1337 FINAL TDDP: 565 RECON: 1025 PAYLOADS: PLB: DEFENSE SUPPORT PROGRAM (DSP)/IUS (DEPLOYED) IOCM MIDDECK: MSS-1 AMOS CREAM SAM RME-III VFT-1 TERRA-SCOUT UVPI	FIRSTS, SIGNIFICANT ANOMALIES, ETC.) SSC W/D: OPF 67, VAB 5, PAD 31 = 103 days LAUNCH POSTPONEMENTS: - As of 8/21/90, launch date was 7/5/91. - Postponed launch date to 11/15/91 caused by STS-38 and STS-35 H ₂ leaks. Postponed to 11/19/91 due to STS-43 delays impacted MLP availability and WLE tee splice replacement. LAUNCH SCRUB: - Scrubbed 11/19/91 launch at T-9 hours because one IMU in IUS RIMU experienced BITE indications. Rescheduled launch for 11/24/91 to replace IUS RIMU. 5-day site and the set of the se

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		CREW		LANDING SITE/	SSME-TL						
FLT	ORBITER	(7)	LAUNCH SITE, LIFTOFF TIME,	RUNWAY, CROSSRANGE	NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-42 SEQ FLT #45 KSC-45 PAD 39A-32 MLP-3		& EVA'S <u>CDR:</u> Ronald J. Grabe (Flt 3 - STS 51-J & STS-30) P235/R76/V41/M70 <u>PLT:</u> Sleven S. Oswald P236/R139/M124 <u>M/S 1 (P/L CDR):</u> Norman E. Thagard (Flt 4 - STS-7, STS 51-B, STS-30) P237/R20/V14/M19 <u>M/S 2:</u> William F. Readdy P238/R140/M125 <u>M/S 3:</u> David C. Hilmers (Flt 4 - STS 51-J, STS-26, STS-36) P239/R77/V36/M71 <u>P/S 1:</u> Roberta L. Bondar (Canada) P240/R141/F16 <u>P/S 2:</u> UIf D. Merbold (Germany) (Flt 2 - STS-9) P241/R29/V68/M28 MCC FCR-1 (25) <u>FLIGHT DIRECTORS:</u> Asc/Ent - N. W. Hale Ld/O 2 - R. E. Castle O 1 - J. W. Bantle O 3 - C. W. Shaw	KSC 39, PAD A 22:14:52:33Z 8:53:00 AM EST (P) 9:52:33 AM EST (A) Wednesday 6 01/22/92 (5) LAUNCH WINDOW 2H49M (EOM/ TAL LIGHTING) PLS: EDW TAL LIGHTING) PLS: EDW TAL LIGHTING) PLS: EDW TAL: ZZA (P) TAL WX: MRN, BEN SELECTED: RTLS: KSC 33/N/N TAL: ZZA 30/CI/N QA: N/A PLS: EDW 22/N/N (REV 3) EDW 04/CI/N (REV 7) TDEL: 0.00 0.562/0.6 MAX ON: 692 PSF 708 PSF SRB STG: 2+08 2+06.6 2+08 PERF: NOMINAL 2 ENG TAL ZZA: 2+51 2+48 NEG RETURN: 4+05 4+05 4+05 PTA (U/S 290): 5+10	WINDS EDW 22 (EDW 35,CONC 16) 30:16:07:17Z 8:07:17 AM PST Thursday 3 01/30/92 (4) XRANGE: 536 NM ORBIT DIR: AR 3 AIM PT: NOMINAL MLGTD: 2835 FT 30:16:07:17Z VEL: 198 KGS 196 KEAS HDOT: -1.5 FPS TD NORM 195: 2868 FT 2016:07:27Z VEL: 168 KGS HDOT: -4.3 FPS BRK INIT: 133 KGS AVE BRK DECEL: 6.3 FPS/S WHEELS STOP: 30:16:08:16Z 12676 FT ROLLOUT: 9841 FT 59 SEC	ENG. S.N. 104/104/ 109% PREDICTED 100/100/ 100/70/ 104/67 ACTUAL 100/100/ 100/75/ 104/67 1 = 2026 (2) 2 = 2022 (7)	EI BI-048 RSRM 20W ET-52 LWT-45 ET RPT 2243K 1:09:33 MET ET BR/UP 222K 1:10:08 MET EI IMPACT LAT: 44.7°S LONG: 157.9°W	57° (9)	DIRECT INSERTION POST OMS-2 T62 NM X T60 NM DEORBIT T60 X 157 NM VELOCITY 25785 FPS ENTRY RANGE 4358 NM	OI-20 (4)	CARGO: 32364 LBS PAYLOAD CHARGEABLE: 28663 LBS DEPLOYED: 0 LBS NON-DEPLOYED: 26453 LBS MIDDECK: 2210 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 639991 LBS NON-DEPLOYED: 530075 LBS CARGO TOTAL: 1326328 LBS PERFORMANCE MARGINS (LBS): FPR: 4339 FERE 4339 FERE 4339 FERE ABS: 1394 FINAL TDDP:2511 RECON: 2716 PAYLOADS: PLB: INTERNATIONAL MICROGRAVITY LABORATORY MATERIALS SCIENCE AND LIFE SCIENCES EXPERIMENTS (IML-1/LM) GBA (12 GAS) MIDDECK: GOSAMR-1 SE 83-02	KSC W/D: OPF 75, VAB 6, PAD 24 = 105 days LAUNCH POSTPONEMENTS: - As of 12/19/90, launch date was 11/15/91. - Postponed to 1/13/92 as of 3/15/91. 26-day slip. - Postponed to 1/22/92 as of 8/21/91. 9-day slip. - 35 days total launch slip. LAUNCH SCRUB: None. LAUNCH DELAYS: - 1/22/92 launch was delayed 59M33S at T-9 minutes caused by: (1) Paper closure of FC2 H ₂ Pump/AC ₂ Bus anomaly, (2) KSC field mills read >1 KVOLT/meter (determined to be caused by salt fog), (3) Excessive O ₂ in mid-body, (4) "BLAST" program violation, and (5) KSC field mills read >1 KVOLT/meter (GtAconfirmed moisture in cloud passing over field mills). TAL WX: Zaragoza (prime), Moron, and Ben Guerir forecast and observed GO. LAKEBEDS: EDW and NOR lakebeds NO GO (WET for L&L). ALT 1-LOADS: - Nominal selected. No uplink required. FLIGHT DURATION CHANGE: - Flight extended 1 day from 7 to 8 days to get additional Spacelab science data. LANDING SITE CHANGE: - MIDDS computer not transferring all winds data to FDCF. - FC2 H ₂ motor status/AC glitch prelaunch. - WVCS commode control valve linkage failure. (IFM to use vice grips to open/close.) - WASte water dump rate degraded. - White Sands central computer failure. - WCS Sjam/imaging failure: - GAS can G-609 motorized door did not open. - WCCSfailur
			<u>VI:</u> 25934 25928 <u>OMS-2 TIG:</u> 36+12.8 36+08	193:14:44 <u>S/T</u> : 276:01:02:20 <u>OV-103</u> : 83:03:23:03	in IML-1: CDR Gra	Top row (be, Thag m row (It t	lt to rt) I ard/MS, to rt) PL	0 Crew portr Merbold/PS, & Bondar/P T Oswald,		SE 81-9 IPMP RME-111 UVPI 4 CRYO TK SETS NO RMS	FA4 and confirmed R4U oxidizer leak. - SRB - Gas path in RH & LH nozzle-to-case joint polysulfide with eroded wiper O-ring. - ET - two large TPS divots on the ET intertank. Radiators Deployed #13

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							0110			<u> </u>	
		CREW	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB	(ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(7)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM	Ì	ORDIT	FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.	ORDITER		LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP	1.51	PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
NO.		TITLE, NAMES	ABORT TIMES	FLT DURATION,	PROFILE	ET	INC			EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S	ADURT HIVES	WINDS	ENG. S.N.	EI				EAPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
CTC 45	OV-104	CDR:	KSC 39, PAD A	KSC 33 (KSC-9)	104/104/	BI-049	57.02°	DIRECT	01-20	CARGO:	KSC W/D: OPF 55, VAB 6, PAD 27 = 88 days
STS-45	(Flight 11)	Charles F. Bolden, Jr.	84:13:13:39.96Z	93:11:23:06Z	109%	DI-047	(10)	INSERTION	(5)	20341 LBS	$\frac{1}{1000}$ OTT 55, VAD 0, TAD 27 = 00 days
	Atlantis	(Flt 3 - STS 61-C	8:00:00 AM EST (P)	JOINTEOROE	10770	RSRM	()				LAUNCH POSTPONEMENTS:
SEQ FLT #46		& STS-31)	8:13:40 AM EST (A)	6:23:06 AM EST	PREDICTED	21W		POST OMS-2		<u>PAYLOAD</u> CHARGABLE:	- Launch date was 3/10/92 as of 3/15/91. Postponed to
	Eighth	P242/R88/V52/M80	Tuesday 8	Thursday 4	100/100/			159.8 X		17683 LBS	3/14/92 on 8/21/91. 4 days slip.
KSC-46	Spacelab		3/24/92 (3)	4/2/92 (Ť)	89/74/	ET-44		153.0 NM			- Postponed to 3/23/92 on 1/23/92. 9 days slip with
	Flight	PLT: Drian Duffu		<u>XRANGE</u> : 679 NM	104/67	LWT-37				DEPLOYED:	decision made to launch during a full moon.
PAD	(2 Pallets) IGLOO (3)	Brian Duffy P243/R142/M126	LAUNCH WINDOW 2H30M (CTOB)		ACTUAL:	FT		OMS-3:		0 LBS	LAUNCH SCRUB:
39A-33	10200 (3)	1243/1142/10120	21130101 (0100)	<u>ORBIT DIR</u> : AR 4	100/100/	RPT		(CIRC BURN)		NON-DEPLOYED:	- 3/23/92 launch was scrubbed at L-5.5 hours (fast fill +
MLP-1	OMS PODS	M/S 1:	EOM PLS: KSC	AIM PT: CLOSE IN	89/74/	<u>et</u> <u>RPT</u> 249K		12.5 FPS @		15538 LBS	3.5 minutes) because of H ₂ and O ₂ concentrations in aft compartment exceeding LCC limits (LH ₂ =750 PPM &
	LP01-17	Kathryn D. Sullivan	EOM PLS: KSC TAL: ZZA (P)		104/67	1:10:00		2:50:13 MET		MIDDECK	compartment exceeding LCC limits (LH ₂ =750 PPM &
	RP01-17	(Flt 3 - STS 41-G	TAL WX: MRN, BEN	MLGTD: 1765 FT		MET		160.5 X		MIDDECK: 2145 LBS	LO ₂ =850 PPM). Could not repeat leaks during
	FRC4-11	& STS-31)	SELECTED.	93:11:23:06Z	1 = 2024 (4)	гт		159.3 NM			troubleshooting but scrubbed launch because could not
		P244/R44/V53/F3	SELECTED: RTLS: KSC 33/CI/N	VEL: 186 KGS 192 KEAS	2 = 2012(13) 3 = 2028 (7)	<u>et</u> BR/UP				<u>SHUTTLE</u> ACCUMULATED	make launch window.
		<u>M/S 2</u> :	TAL: 77A 30/ CI/N	HDOT: -1.9 FPS	5 - 2020 (7)	219K		DEORBIT		WEIGHTS	LAUNCH DELAYS:
A SULLIVAN	N = FORM	David C. Leestma	AOA: NOR 17/N/N		M 3 EOM	1:10:50		159.5 X		DEPLOYED:	- 13M40S delay at T-9 minutes because of RTLS ceiling
A STORE		(Flt 3 - STS 41-G	PLS: EDW 22/N/N	TD NORM 195:	WEIGHT:	MET		151.8 NM		639991LBS	violations (cloud deck at approximately 6K feet). BLAST
19		& STS-28)		1481 FT	205672 LBS					NON-DEPLOYED: 547758 LBS	violations occurred during hold period.
		P245/R45/V43/M42	TDEL:	NLGTD: 4393 FT	X CG:	<u>ET</u>		VELOCITY		CARGO TOTAL:	
		<u>M/S 3</u> :	0.64 0.882/0.92	<u>NLGTD</u> : 4393 FT 93:11:23:14Z	1085.4	IMPACT		25785 FPS		1346669 LBS	TAL WX: Zaragoza and Moron weather was GO, Moron was NO GO for runway margins, and Ben Guerir NO GO
	DUIT 2	C. Michael Foale	MAX Q NAV:	VEL: 161 KGS	LANDING	LAT:		ENTRY		PERFORMANCE	for weather (ceiling).
	57	P246/R143/M127	671 PSF 678 PSF	HDOT: -4.1 FPS	WEIGHT:	42.7°		RANGE		MARGINS (LBS):	
An n rates				BRK INIT: 134 KGS	205588 LBS	<u>LONG</u> : 155.0°W		4231 NM		FPR: 4671	ALT I-LOADS:
		<u>P/S 1</u> :	SRB STG:		X CG:	155.0 W				FPR: 4671 FUEL BIAS: 983 FINAL TDDP:11017	- LSEAT selected YAW NEG, which was uplinked (uplink
1010		Dirk Frimout	2:07.7 2:07.9	AVE BRK DECEL: 5.6 FPS/S	1087.2					RECON: 10427	8). DOLILU was NO GO because of greenline
6		(Belgium) P247/R144/M128	PERF: NOMINAL	J.0 FF3/3							exceedance.
1	240	1247/10144/10120		WHEELS STOP:						<u>PAYLOADS</u> : PLB:	FLIGHT DURATION CHANGE:
	ANALIS	<u>P/S 2</u> :	2 ENG TAL ZZA: 2:23 2:22	10992 FT					L	<u>PLB</u> : ATLAS-1:	- 3/29/92 MMT made decision that consumables
		Bryon Lichtenberg	2:23 2:22	93:11:24:04Z	THE OWNER WATER		00/200/0000		-	ΔΤΜΟΡΗΕΡΕ	supported an extension from 8+2 days to 9+2 days to get
	11-10-	(Flt 2 - STS-9)		ROLLOUT:		- 40		C BOSTAN TO A		SCIENCE: ALAE, MAS, ISO,	more science.
	1 30	P248/R28/V69/M27	NEG RETURN: 4:11 4:13	9227 FT	13.113		W Lat.			ALAE, MAS, ISO,	FIRSTS:
and the		MCC FCR-1 (26)	4.13	56 SECS	11-13-13		111			ATMÓS, GRILLE, SSBUV/A	- First flight of an improved APU (APU 2 only).
		FLIGHT DIRECTORS:	PTA (U/S 285):	WINDS:							- First flight with a female flight director (Linda J. Ham).
		Asc/Ent - J. W. Bantle	4:16 4:13	H 5.1 KTS	Sol . Sol	41	1	Year Vage	P*	SOLAR SCIENCE:	
	4	Ld/O 2 - R. M. Kelso	PTM (U/S 285):	L 3.2 KTS		- 1788 B			1	ACR, SOLCON, SOLSPEC, SUSIM	SIGNIFICANT ANOMALIES: - Fuel Cell 3 cell performance monitor D volts remained
Linda Ham -		O 1 - R. E. Castle O 3 - L. J. Ham	4:48 4:51	OFFICIAL: 5H, 3L		A Part		1	2		at self test value.
Flight Directo	Dr	MOD - T. W. Holloway	4.01	<u>DENS ALT</u> : 224 FT	NET .	- C		r ll		SPACE PLASMA	- Ku-Bd power output TLM intermittent fail.
CTC 4			MECO CMD:		and the second		2	11	1	<u>SCIENCE:</u> AEPI, SEPAC,	- Ku-Bd auto track problem similar to STS-37.
515-4	5 ATLAS-1 in	P/L Bay	8:30.9 8:31	FLT DURATION: 8:22:09:26	The Sale	1	Die	-147°	5.0%	ENAP	- CCTV cameras A & C degraded.
			VII.	8:22:09:26 214:09:26	A STATE	EE -	Carlos -		1		- CCTV cameras A & C degraded. - TAGS OHC jam, cleared by crew. - APU 1 GG bed heater B intermittent.
		and the second sec			Tab				3	<u>ASTRONOMY</u> : FAUST	- APU I GG bed heater B intermittent. - Arriflex camera operate lever intermittent.
			20000 20020	<u>S/T</u> : 284:23:11:46						GAS G-229	- SEPAC electron beam accelerator operations were
The state of the same		and the second s			STS045-38	3-004 1992	-04-02 C	rew on Forwa			terminated on day 2 because 30 amp fuse between
		Contraction of the second	<u>OMS-2</u> : 37:08 36:20	<u>OV-104</u> : 64:10:37:58				an/MS/PLC (le		MIDDECK: STL-01, RME-III,	SEPAC battery and charger blew.
7/10		the state	253.5 252.8		& ČDR Bo				· ·	VPT-2, CLOUDS-1A,	- Lost all power to FAUST.
SA SIG	0	Carlo and a second		DISTANCE: 3,274,946 sm				enberg/PS,		SAREX-2, IPMP,	
	22 14	1 Tom		3,274,940 SIII	Frimout/MS	S, & Foale/	MS. (The	e "headpieces	"	UVPI	
	the second	13 Mar 19 19 19			worn by Su	Illivan and				4 CRYO TK SETS	
STS04	5-15-003 1992	-04-02			shadows.)						
0.001										NO RMS	

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		CREW		LANDING SITE/	SSME-TL						
51 7	0001750	(7)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB	(ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER		LIFTOFF TIME,		EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION,	THROTTLE PROFILE	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		Q EVAS	ADUKT HIVES	WINDS	ENG. S.N.	E I				EAPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-49	OV-105	CDR:	KSC 39, PAD B	EDW 22 CONC	104/104/	BI-050	28.32°	DIRECT	01-21	CARGO:	KSC W/D: OPF 217, VAB 6, PAD 49=272 days
	(Flight 1)	Daniel C. Brandenstein	128:23:39:59.98Z	(EDW 36,CONC 17)	109%		(1)	INSERTION	(1)	37444 LBS	
SEQ FLT #47	Endeavour	(Flt 4 - STS-8, STS 51-G & STS-32)	7:06:00 PM EDT (P) 7:40:00 PM EDT (A)	137:20:57:39Z 1:57:39 PM PDT	PREDICTED	RSRM 22K		POST OMS-2		PAYLOAD	LAUNCH POSTPONEMENTS: - Launch date was 4/16/92 as of 3/21/91.
KSC-47		P249/R21/V16/M20	Thursday 11	Saturday 8	100/104/			182.5 X		CHARGEABLE:	- Postponed launch to 4/30/92, then 5/4/92 on 4/23/92 at
		PLT:	5/7/92 (Ź)	5/16/92 (4)	89/72/	ET-43		139.8 NM		32809 LBS	FRR because of sheer volume of work including aft ET
<u>PAD</u> 39B-14	OMS PODS	Kevin P. Chilton	LAUNCH WINDOW	DEORBIT BURN:	104/67	LWT-36		INTELSAT		<u>DEPLOYED</u> : 23346 LBS	attach point liner repair. - Postponed launch to 5/7/92 to allow a daylight launch.
MLP-2	LPO3-12	P250/R145/M129	47 Minutes	137:19:55:15Z	ACTUAL	<u>et</u> RPT		RNDZ:		23346 LBS	- 21-day total slip.
	RPO4-8	M/S 1, EV2:	(in 2 panes)		100/104/	RPT		198 X 194 NM		NON-DEPLOYED:	
	FRC5-1	Richard J. Hieb	EOM PLS: EDW	XRANGE: 411 NM	89/73/ 104/67	238K 1:16:47		194 INIVI		8766 LBS	LAUNCH SCRUB: None.
		(Flt 2 - STS-39) P251/R128/V70/M115	TAL: BYD	ORBIT DIR: AL 14		MET		<u>ORBITS</u> : 46, 62, & 95			LAUNCH DELAYS:
ON BRAND	ENSTEIN		TAL WX: BEN		1 = 2030 (7) 2 = 2015 (8)	ET		46, 62, & 95		MIDDECK: 697 LBS	- Launch delayed because of RTLS ceiling violations (5K-
ALL A		M/S 2: Bruce E. Melnick	SELECTED:	<u>aim pt</u> : Nominal	2 = 2015(8) 3 = 2017(6)	<u>ET</u> BR/UP				SHUTTLE	7K bkn), then TAL WX (BYD NO GO visibility/haze, BEN NO GO occasional 4K bkn and rain). MEC BITE indication
	PAN &	(Flt 2 - STS-41)	<u>SELECTED</u> : <u>RTLS</u> : KSC 33/CI/N	<u>MLGTD</u> : 2156 FT		206K		<u>DEORBIT</u>		ACCUMULATED	and an aircraft in launch area. Counted to 1-9 minutes then
E C		P252/R114/V71/M102	TAL: BEN 36/CI/N AOA: EDW 22/N/N	137:20:57:39Z VEL: 209 KGS		1:17:45 MET		195 X 184 NM		WEIGHTS:	T-5 minutes. Switched to second pane of launch window and uplinked new launch and OMS target loads.
9 Ceavol	- S	M/S 3, EV1:	<u>PLS</u> : EDW 22/N/N	194 KEAS	M 3 EOM WEIGHT:					DEPLOYED: 636337 LBS	- 34-minute total delay.
HIEB THO	ONTON AT	Pierre J. Thuot		HDOT: -1.0 FPS	201400 LBS	<u>ET</u> IMPACT		VELOCITY		NON-DEPLOYED:	-
		(Flt 2 - STS-36) P253/R112/V72/M100	TDEL: 0.64 0.782/0.800	TD NORM 195:	X CG: 1084.4	IMPACT LAT:		25841 FPS		557221 LBS	TAL WX: - Banjul was NO GO - visibility, Ben Guerir late GO after
			0.04 0.702/0.000	2329 FT	1004.4	12.17°S		ENTRY		CARGO TOTAL: 1384113 LBS	occasional ceiling violation and rain.
		M/S 4, EV3: Kathryn C. Thornton	MAX Q NAV: 716 PSF 712 PSF		LANDING	LONG:		RANGE			Ŭ
		(Flt 2 - STS-33)	716 PSF 712 PSF	<u>NLGTD</u> : 5770 FT 137:20:57:48Z	WEIGHT: 201235 LBS	163.6°W		4162 NM		PERFORMANCE	ASCENT I-LOADS: - Nominal I-loads were NO GO and DOLILU was uplinked
		P254/R107/V73/F11	<u>SRB STG</u> : 2:00.64 2:08	VEL: 173 KGS	X CG:					<u>MARGINS (LBS)</u> : FPR: 4671	(second DOLILU uplink and 9th total uplink). Launch and
		M/S 5, EV4:	2:00.64 2:08	HDOT: -3.5 FPS	1086.2					FUEL BIAS: 983	OMS targets loads uplinked for both window panes.
Below: Re	plicas of	Thomas D. Akers	PERF: NOMINAL	DRAG CHUTE						FINAL TDDP:3351 RECON: 3206	FLIGHT DURATION CHANGE:
Christophe		(Flt 2 - STS-41) P255/R115/V74/M103		<u>DRAG CHUTE</u> <u>DEPLOY:</u> 165 KEAS							- Flight was extended 2 days to allow the third EVA for the
Columbus			2 ENG TAL BEN: 2:52 2:52	137:20:57:49Z	1					PAYLOADS:	hand grab of INTELSAT after capture bar failed on two EVA's.
ships San		MCC FCR-1 (27)		<u>BRK INIT</u> : 94 KGS	127				120	<u>PLB:</u> INTELSAT	
Nina, and		FLIGHT DIRECTORS:	NEG RETURN:		-					REBOOST	RENDEZVOUS 10, 11, AND 12:
sail by Pa	d 39B in	Asc/Ent - N. W. Hale Ld/O 1 - G. A. Pennington	4:00 4:03	<u>DRAG CHUTE</u> JETTISON: 48 KGS	TA EL		and al	NA CO		(CRADLE & PERIGEE STAGE)	 With INTELSAT for capture, berthing, AKM mounting, and deploy.
honor of		O 2 - P. L. Engelauf	PTA (U/S 285):	137:20:58:17Z			A PP			,	
Endeavou	r's	Plng - J. M. Heflin	4:39 4:40	AVE BRK DECEL:	* Y*	I SE		* AT+	1	PERIGEE STAGE ATTACHED TO	FIRSTS:
maiden vo	yage.	MOD - B. R. Stone	PTM (U/S 285):	<u>AVE BRK DECEL</u> : 8.0 FPS/S	· · ·	A AL	2 X XY :		1	INTELSAT	 First flight with drag chute. First flight with Improved Nose Wheel Steering.
			5:53 5:43		1 1		** *	A at		WHICH WAS	 First flight with Improved Nose Wheel Steering. First flight of Collins TACAN, SS STAR-TRACKER, redesigned MPS 750 PSIG He Reg, MPS 850 PSIG He relief valve redesign, IAPU iso valve, redundant WOW det.
			MECO CMD:	WHEELS STOP: 137:20:58:34Z		+				REDEPLOYED	redesigned MPS 750 PSIG He Reg, MPS 850 PSIG He
		the state of the s		11646 FT			ALZ.			MIDDECK:	brake press iso valve, improved RA antennas, deletion of
						1 10		- Fin		CPCG BLOCK II	brake press iso valve, improved RA antennas, deletion of vent doors 4 & 7, fourth EMU stowage, and improved PPO ₂
			<u>VI</u> : 25906 25900	<u>ROLLOUT</u> : 9490 FT		an P	N'	A Ber		AMOS UVPI	sensor and 3 IAPU's. - First flight with 4 EVA's and first flight with 3
	int			55 SECS	STS040	1 005 10	02.05.1	6 Middeck ci	row	-	crewmemebers on same EVA. First flight with 4 different
			<u>OMS-2</u> :		portrait - f				ew	4 CRYO TK SETS	EVA crewmen.
111	THEP		39:58.2 39:57.6 186.2FPS187.97FPS	<u>WINDS</u> : H2.0 KTS, X0.0 KTS				niddlle row, l	eft	RMS 26 (S.N. 303)	 First hand capture of satellite by EVA crewmen (Hieb, Thuot, and Akers), then RMS grapple of INTELSAT on
Marine Star				OFFICIAL: 4H, 0L				MS, back ro		Used to berth, repair,	- First flight of Ol-21.
		and the second se		Continued	left to righ				,	& deploy INTELSAT & monitor simulta-	- First flight of OI-21. - First flight of Block II SSME Controller.
502 2007	1/KSC- 02DC 0	67 1992-06-18		Continued	Chilton &					neous waste and	- I II SU HIYITU ULDIUCK II SSIVIE CUTITUUIRI.
372-37072	1									supply water dump	Continued

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FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM	(ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		Payloads/ Experiments	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
TS-49 ontinued		Continued EMU/TETHERED EVA'S: EVA 1 - $5/10/92$ SS EVA #16 BY EV1 & EV2 INTELSAT CAPTURE BAR - NO GO 3H43M EVA 2 - $5/11/92$ SS EVA #17 UNSCHEDULED EVA #3 BY EV1 & EV2 INTELSAT CAPTURE BAR - NO GO 5H30M EVA3 - $5/13/92$ SS EVA #18 UNSCHEDULED EVA #4 BY EV1, EV2 & EV4 INTELSAT HAND CAPTURE, REPLACED UPPER STAGE AND RELEASED 8H29M EVA4 - $5/14/92$ SS EVA #19 BY EV3 AND EV4 ASEM - 7H45M		Continued <u>DENS ALT</u> : 4664 FT <u>FLIGHT DURATION</u> : 8:21:17:39 <u>S/T</u> : 293:20:29:35 <u>OV-105 TOTAL</u> : 8:21:17:39 <u>DISTANCE</u> : 3,969,019 sm	complete s Telecomm VI) during Thuot/MS, prepare to	uccess unicatio EVA3. on RMS attach o ople atte	ful capt ns Org Left to S, have capture	Andholds of bar (tethereon two-perso	ternation tellite (1S, Ake on the ed to Hi	onal INTELSAT ers/MS, & satellite and eb). Two	Continued <u>RECORDS:</u> - Longest ever EVA (8H29M), second longest EVA (7H45M), - Longest EVA by female astronaut (7H45M). - Four EVA's on one flight. <u>SIGNIFICANT ANOMALIES:</u> - Av Bay 3 high delta pressure. - O2 manifold valve 1 failed open (failed to close) - TDRSS state vector propagation errors in MCC. - Orbit Target Terminal Initiation Computation failure on third rendezvous (used D/L state vectors in Ground Computations). - WCS fan sep 1 failure. - Four floodlights failed. - RCS jet L4L fail leak. - Ku-band beta gimbal failure - IFM EVA stow of antenna similar to STS 41-G. - PLBD port aft bulkhead latch failed to reach latch position. - SSME 2 HPFT TD temp sensor failed offscale high. - GPC AP101S microcode error.



S92-36605 1992-05-20 STS-49 Orbit Team 1 (O1) poses in JSC FCR with O1 Lead FD AI Pennington (left of model of James Cook's ship Endeavour) and CAPCOM, John Casper (right of model).



S93-36604 1993-06-18 Oribt 2 (O2) Flight Control Team in JSC FCR poses with O2 FD Philip Engelauf (center front, right of Endeavour model).



S92-36606 1992-05-20 Milt Heflin/FD (front right next to ship model) with STS-49 Planning Team in JSC Flight Control Room.

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		00514									
FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME.	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM	(ORBIT	FSW	Payload Weights.	
NO.	URBITER	TITLE, NAMES	LIFTOFF TIME,	LANDING TIMES	THROTTLE	AND	INC	HA/HP	FSW	PAYLOADS/	(LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS,
NU.		& EVA'S	ABORT TIMES		PROFILE	ET	INC	ПА/ПР		EXPERIMENTS	
		& EVA S	ABURT TIMES	FLT DURATION, WINDS	ENG. S.N.	EI				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
	OV-102	CDR:	KSC 39, PAD A	KSC 33 (KSC 10)	104/104/	BI-051	28.46°	DIRECT	01-21	CARGO:	KSC W/D: OPF 108, VAB 5, PAD 23=136 days
STS-50	(Flight 12)	Richard N. Richards	177:16:12:23Z	191:11:42:27Z	109%	DI-001	(28)	INSERTION	(2)	32447 LBS	<u>K3C W/D</u> . OFT 100, VAD 3, FAD 23=130 udys
SEQ FLT #48	Columbia	(Flt 3 - STS-28	12:07:00 PM EDT (P)	7:42:27 AM EDT	10770	RSRM	(20)		(4)		LAUNCH POSTPONEMENTS:
560161 #40		& STS-41)	12:12:23 PM EDT (A)	Thursday 5	PREDICTED:	24W		POST OMS-2		PAYLOAD	- Launch date was 5/11/92 as of 7/10/91.
KSC-48	9th Spacelab	P256/R101/V55/M92	Thursday 12	7/9/92 (Í)	100/104/			163.5 X		CHARGEABLE:	- Launch postponed to 6/3/92. Weather delayed OV-102
	Flight		6/25/92 (5)		104/72/104	ET-50		159.7 NM		24305 LBS	delivery to KSC after major mod period at Palmdale.
	Long Module (6)	Kenneth D. Bowersox		DEORBIT BURN: 191:10:41:38Z	ACTUAL:	LWT-43		ORBIT			- Launch postponed to 6/25/92 because of Ku-Band comm work, RSB corrosion repair, and LiOH canister locker
	(0)	P257/R146/M130	LAUNCH WINDOW 2H 30M CTOB	171.10.41.JOZ	100/104/	FT		ADJ 1:		<u>DEPLOYED</u> : 0 LBS	interference.
PAD 39A-34	EDO 1	1 201111 10111100	211001110100	XRANGE: 389 NM	104/74/104	<u>et</u> RPT		159.9 X		0 200	
MLP-3		<u>M/S 1 (PYLD CDR)</u> :	EOM PLS: EDW			247K		159.2 NM		NON-DEPLOYED:	LAUNCH SCRUB: None.
	OMS PODS	Bonnie J. Dunbar	TAL: BYD	<u>ORBIT DIR</u> : DL 23	1 = 2019 (10)	1:17:12		04/00:23:18		22126 LBS	
	LP05-1 RP05-1	(Flt 3 - STS 61-A & STS-32)	TAL WX: BEN, ROTA	AIM PT: NOMINAL	2 = 2031 (7) 3 = 2011 (7)	MET		ORBIT		MIDDECK:	LAUNCH DELAYS:
	FRC2-12	P258/R79/V49/F7	SELECTED.	AIIVI PT. NOMINAL	5 = 2011(7)	ET		ADJ 2:		2179 LBS	- 5M 23S delay during T-9 hold due to a concern about a cirrus layer at 28K-33K with a detached anvil (potential
	11(02-12	1230/10/ // 4//17	<u>SELECTED</u> : <u>RTLS</u> : KSC 15/CI/N	<u>MLGTD</u> : 2321 FT		BR/UP		<u>163.0 X</u>		2177 LDJ	lightning in launch area). WX STA PLT reported it was not
		M/S 2:	TAL: BEN 36/N/N	191:11:42:27Z		216K		129.1 NM		SHUTTLE	a problem because he could see through it.
		Ellen S. Baker	AOA: EDW 22/N/N	VEL: 208 KGS	<u>M 3 EOM</u>	1:18:03				ACCUMULATED	· · ·
		(Flt 2 - STS-34)	<u>PLS</u> : EDW 22/N/N	203 KEAS	WEIGHT:	MET		DEORBIT		WEIGHTS:	TAL WX:
		P259/R105/V75/F10	TDEL:	HDOT: -2 FPS	225865 LBS X CG:	гт		163 X 130 NM		<u>DEPLOYED</u> : 663337 LBS	- Banjul forecast and observed NO GO - ceiling. Ben Guerir forecast and observed GO (selected). Rota forecast
		M/S 3:	0.48 0.682/0.72	TD NORM 205:	1077.7	<u>ET</u> IMPACT		130 INIVI		NON-DEPLOYED:	NO GO - Vis (Haze), observed GO.
		Carl J. Meade	0.40 0.002/0.72	2122 FT	1077.7	LAT:		VELOCITY		581526 LBS	
		(Flt 2 - STS-38)	MAX Q NAV:		LANDING	13.28°N		25786 FPS		CARGO TOTAL:	ASCENT I-LOADS:
		P260/R117/V76/M105	688 PSF 690 PSF	<u>NLGTD</u> : 7832 FT	WEIGHT:	LONG:				1416560 LBS	 Nominal selected, no uplink required.
		D/C 1.	CDD CTC	191:11:42:45Z	225615 LBS	162.64°W		ENTRY RANGE			
AR RICHA	AHDS BO	P/S 1: Larry DeLucas	<u>SRB STG</u> : 2:05.9 2:05.9	VEL: 149 KGS HDOT: -5.1 FPS	X CG: 1079.1			4347 NM		PERFORMANCE MARGINS (LBS):	FLIGHT DURATION/LANDING SITE CHANGE: - Extended 1 day because of forecasted rain at EDW.
STAR - FE		P261/R147/M131	2.03.7 2.03.7	11001. 5.111.5	1077.1			4347 10101		FPR: 4671	- Changed landing site to KSC and landed one rev early
	i je š	(U OF ALA, BIRM)	PERF: NOMINAL	DRAG CHUTE						FUEL BIAS: 983	because EDW had forecast of rain in clouds.
in the				DEPLOY: 136 KEAS						FINAL TDDP:2940	
		<u>P/S 2</u> :	2 ENG TAL (BEN):	191:11:42:47Z						RECON: 3276	FIRSTS:
P TO	CP2	Gene Trinh P262/R148/M132	3:01 3:00	<u>BRK INIT</u> : 111 KGS						PAYLOADS:	- First flight of OV-102 after OMDP (Major Mods at Palmdale).
MEA	DE DELO	(JPL)	NEG RETURN:	DIKK IIMT. TTT KOS						PLB:	- First EDO flight and EDO nallet
		(0. 2)	3:57 4:00	DRAG CHUTE						UNITED STATES	- First flight of RCRS (Regenerable CO2 Removal System). - First flight of OV-102 with drag chute, INWS, etc. (Second
				<u>JETTISON</u> : 55 KGS		NATION	Non-American Tra	The Learning of the local		MICROGRAVITY	- First flight of OV-102 with drag chute, INWS, etc. (Second
			PTA (U/S 235):	191:11:43:11Z	1 Alt	Ken-					flight of drag chute - deployed after NLGTD). - First flight to exceed GEMINI VII flight duration (by 54:33).
			4:57 4:54	AVE BRK DECEL:		AN	S-Com		2	(USML-1/LM) MATERIALS	- First flight to exceed GEMINI VII flight duration (by 54:33). Only 3 SKYLAB flights exceed STS-50 duration.
			PTM (U/S 235):	6.6 FPS/S	The second second	1 - 000	SUF		1	SCIENCE,	oniy 5 SKTEND nights exceed 515-50 duiation.
		MCC FCR-1 (28)	5:58 5:40			N.	10010	17 17		FLUID PHYSICS.	DRAG CHUTE STRATEGY: Second drag chute deploy
		. ,		WHEELS STOP:		A DESIGNA	111		- 1	COMBUSTION	with NLG on ground.
		FLIGHT DIRECTORS:	MECO CMD:	191:11:43:25Z	ALTER A	Estantia			5	SCIENCE, BIO-	
		Asc/Ent - J. W. Bantle Ld/O 2 - R. E. Castle	8:26.9 8:27.6	12996 FT						TECHNOLOGY	Continued
		01 - R. D. Jackson	VI:	ROLLOUT:	T	ET	\$ \$			MIDDECK:	
		0 3 - G. E. Coen	25875 25870	10675 FT	Part	elool (The of	3 17 5		IPMP	
		Team 4 - R. M. Kelso		58 SECS					5	UVPI	
		MOD - A. L. Briscoe	<u>OMS-2</u> :			- A	-Y		the second	SAREX-II	
			39:56 39:51 222.3 FPS222.6 FPS	<u>WINDS:</u> H 1.6 KTS		101 10 h			17	4 + 4 EDO	
			222.3 FF 3222.0 FPS	H 1.6 KTS L 4.8 KTS	Barris La Contra		211		M	4 + 4 EDO CRYO TK SETS	
				OFFICIAL 1H, 5L						SKIU IN JEIJ	
					STS050-2	91-006 1	992-07-	09 In orbit cr	ew	NO RMS	
				Continued	portrait in	the spac	elab (US	SML-1/LM.			
					_						

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FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	Throttle Profile Eng. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-50 Continued	Dunbar/MS DeLucas/P	A1-027 1992-07-09 VPYLD CDR (rt) and S in SL with Lower tive Pressure Study.		Continued <u>DENS ALT</u> : 1423 FT <u>FLT DURATION</u> : 13:19:30:04 331:30:04 <u>S/T</u> : 307:15:59:29 <u>OV-102</u> : 88:20:44:28 <u>DISTANCE</u> : 5,758,332 sm							Continued <u>SIGNIFICANT ANOMALIES</u> : - RCRS shutdown due to a short in the controller, hence LiOH canisters used until IFM required use at 5 days MET. - SL/Orbiter air not mixing properly. Found a removable inline redundant seal was not removed from tunnel air ducting as should be for on-orbit operations. - Waste water dump line blockage causing reduction in dump rate. - Cryo O ₂ tank 2 had a 1 lb/hr leak. - Cryo O ₂ tank 2 heater A2 experienced intermittent power dropouls. - Fuel cell 3 O ₂ purge valve did not close completely. Manually closed, did not purge again for remainder of flight. - Cryo O ₂ tank 7 check valve failed in open position. - SS inverter overvolt shut down when SL H ₂ O loop was turned on.
Storm, Re Pinatubo	ed Sea, & Sau Volcano - Pos	EARTH VIEWS ands & ocean wakes (S idi Arabia (STS050-85-0 st Eruption, Luzon, Philip hile and Argentina (ST	37). Bottom Lt to pines (STS050-	to Rt: Mt. 52-026) and	Laboratory this scene	/ (USML over th	1) mo e south	ern two-thirc	red in t Is of th	he P/L Bay in	 FWD starboard floodlight did not come on. R OMS yaw TVC excessive movement during ascent. Aileron trim deflected to 2.2° at M=10.1, preflight predicted was maximum of 0.80 deflection. TAGS jam on day 2, used teleprinter. Flight deck Canon A1, Mark II camcorder failure. ROB brake pressure low. APU 1 gearbox № pressure decay/ transducer erratic. L1U jet heater fail on. F2F jet fail off.
	A A	Add		A A		(C.				
					STS050-S	-106 - F	First flight	nt of OV-102	2 with d	Irag chute, ployed after	STS50-s-084 Unidentified Flight
1000	11	ALC HOLD BY	- The	16.1	NLGTD).	. (0000	na night				Controller hangs mission plaque in FCR.

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		CREW		LANDING SITE/	SSME-TL						
		(7)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER		LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
	01/ 40/	0.5.5	1/00.00 DAD D	WINDS	ENG. S.N.	DI 050	0.0.1/0	DIDEOT	01.01		
STS-46	OV-104 (Flight 12)	CDR: Loren J. Shriver	KSC 39, PAD B 213:13:56:48Z	KSC 33 (KSC 11) 221:13:11:50Z	104/104/ 109%	BI-052	28.46° (29)	DIRECT INSERTION	OI-21 (3)	<u>CARGO</u> : 34060 LBS	KSC W/D: OPF 61, VAB 5, PAD 45=111 days
SEO	Atlantis	(Flt 3 - STS 51-C	9.56.00 AM FDT (P)	9:11:50 AM EDT	10970	RSRM	(29)	INSERTION	(3)		LAUNCH POSTPONEMENTS
SEQ FLT #49	/ duantio	& STS-31)	9:56:00 AM EDT (P) 9:56:48 AM EDT (A)	Saturday 9	PREDICTED:	RSRM 25W		POST OMS-2		<u>PAYLOAD</u> CHARGEABLE:	LAUNCH POSTPONEMENTS: - Launch date 6/26/92 as of 6/5/91.
		P263/R50/V51/M46	Friday 8	8/8/92 (4)	100/104/			230.4 X		<u>CHARGEABLE</u> : 28585 LBS	- Launch postponed to 7/2/92 because of STS-45 launch
KSC-49	OMS PODS	PLT:	7/31/92 (2)	DEORBIT BURN:	80/67/104	ET-48 LWT-41		228.3 NM			and landing delays. - Launch postponed to 7/21/92 because of MOD STS-50
PAD	LP01-18	Andrew M. Allen	LAUNCH WINDOW	221:12:17:10Z	ACTUAL:			EURECA		DEPLOYED: 9901 LBS	landing to launch 8-day constraint and range interference.
39B-15	RPO1-18	P264/R149/M133	2H 30M CTOB		100/104/	<u>et</u>		DEPLOY:		4401 FR2	- Launch postponed to 7/31/92 to allow additional flightcrew
MLP-1	FRC4-12	M/C 1.		<u>XRANGE</u> : 499 NM	82/67/104	RPT		231.3 X		NON-DEPLOYED:	and flight controller training.
		M/S 1: Claude Nicollier	EOM PLS: KSC TAL: BYD	ORBIT DIR: DL 24	1 = 2032 (1)	239K 1:21:02		227.8 NM		16094 LBS	LAUNCH SCRUB: None.
		(Switzerland)	TAL WX: BEN, ROTA	ORDIT DIR. DE 24	2 = 2032 (1) 2 = 2033 (1)	MET		TSS DEPLOY:		MIDDECK:	<u>Enteriori Serteb</u> . None.
		P265/R150/M134		<u>aim pt</u> : Nominal	3 = 2027 (8)			161.0 X		1104 LBS	LAUNCH DELAYS:
		M/S 2:	<u>SELECTED</u> : <u>RTLS</u> : KSC 15/CI/N	<u>MLGTD</u> : 1866 FT		<u>ET</u> BR/UP		158.5 NM		SHUTTLE	- 0M 48S delay at APU startup (approxi-mately L-5 minutes). Crew did not open APU #3 fuel isolation valve
		Marsha S. Ivins	TAL: BEN 36/N/N	221:13:11:50Z	M 3 EOM	217 K		TSS DOCK:		ACCUMULATED	within GLS window. KSC cleared hold and count
		(Flt 2 - STS-32)	AOA: FDW 22/CI/N	VEL: 202 KGS	WEIGHT:	1:21:39		161.0 X		WEIGHTS:	continued.
		P266/R109/V77/F12	PLS: EDW 22/CI/N	195 KEAS	209851 LBS	MET		157.8 NM		DEPLOYED: 673238 LBS	
		PYLD CDR, M/S 3:	TDEL:	HDOT: -1 FPS	X CG: 1078.2	FT				NON-DEPLOYED:	TAL WX: - Banjul (prime) NO GO - ceiling, Ben Guerir GO
		Jeffrey A. Hoffman	0.0 0.332/0.36	TD NORM 195:	1070.2	<u>ET</u> IMPACT		<u>DEORBIT</u> 121 X		598724 LBS	(selected), Rota (2nd flight as substitute for Moron) NO GO
		(Flt 3 - STS 51-D		1891 FT	LANDING	LAT:		121 NM		CARGO TOTAL:	- visibility (haze).
		& STS-35)) P267/R57/V59/M52	MAX Q NAV: 709 PSF 718 PSF		WEIGHT: 209532 LBS	17.86°N				1450620 LBS	
		P20//K3//V39/IVI32	109 PSF / 18 PSF	<u>NLGTD</u> : 6501 FT 221:13:12:05Z	Z09532 LBS X CG:	<u>LONG:</u> 153.0°W		VELOCITY 25698 FPS		PERFORMANCE	ASCENT I-LOADS: - DOLILU I-Load uplinked to increase margin for green
		M/S 4:	SRB STG:	VEL: 154 KGS	1179.6	100.0 11		20070110		MARGINS (LBS): FPR: 4671	squatcheloid at M=1.53. Third DOLILU uplink, total uplink
		Franklin R. Chang-Diaz	2:04.2 2:06	HDOT: -4.3 FPS				ENTRY		FUEL BIAS: 983	#10.
		(Flt 3 - STS 61-C & STS-34)	PERF: NOMINAL	BRK INIT: 131 KGS				<u>RANGE</u> 4397 NM		FINAL TDDP:2825	FLIGHT DURATION/LANDING SITE CHANGE:
		P268/R89/V46/M81		DICK INT. 131 KOS				4377 10101		RECON: 1942	- Extended 1 day because of TSS deploy problems
			2 ENG TAL (BEN):	AVE BRK DECEL:				Internet all		PAYLOADS:	Waved off first landing opportunity at KSC because of scattered showers within 30 miles. Total extension, 1 day
		P/S 1:	2:51 2:54	5.9 FPS/S						PLB:	scattered showers within 30 miles. Total extension, 1 day plus 1 rev.
		Franco Malerba (Italy)	NEG RETURN:	WHEELS STOP:	a contraction of the	(Dis)				European Retrievable Carrier	pius riev.
		P269/R151/M135	3:59 4:02	221:13:12:55Z	2	1 21	29			(EURECA)	FIRSTS:
				12726 FT		200				(Deployed)	- First flight of a deployment and retrieval of a tethered
JER Y	ALLE		PTA (U/S 285): 4:23 4:22	ROLLOUT:		- Star	STOR A	st.	372	Tethered Satellite	satellite.
30	11		4.22	10840 FT		20	20FA		1	System (TSS-1)	NOTE: TSS deployed weight of 1040 lbs plus 90 lbs prop is
	S.		PTM (U/S 285):	55 SECS	1 3	Gy b	a No	201		(Deployed and	NOTE: TSS deployed weight of 1040 lbs plus 90 lbs prop is not included in 9901 lbs deployed.
			5:29 5:29	WINDS:		The state	1 Ales			Retrieved)	LASTS:
4			MECO CMD:	T 0.4, L 0.9 KTS OFFICIAL 3H, 1R	No.			-	51 1	EOIM-III	- Last flight of fleet without drag chute, INWS, and other
SIFP	a aut		8:29 8:29.8			-	4.50			TEMP 2A-3	improvements first used on STS-49. These modifications
			VII.	<u>DENS ALT</u> : 1834 FT	0700		1000			icbc, Concap-II	will be made before the next flight of OV-104.
			<u>VI</u> : 25987 25985	FLT DURATION:				8-08 Crew		CONCAP-III	THIRD SHUTTLE CREWMEMBER REPLACEMENT:
				7:23:15:02	poses in	middecl	<. In rea	ar (It to rt)		LDCE	- Robert "Hoot " Gibson was replaced by Shriver in 1990.
			<u>OMS-2</u> :	191:15:02	CDR Sh	river, PL	T Allen	& Chang-		MIDDECK:	(Second Shuttle crewmember replacement occurred on
		MCC FCR-1 (29)	41:23.6 41:23.6 351.2 FPS351.4 FPS	<u>S/T</u> : 315:15:14:31) Nicollier/M	1S	PHCF	STS-44.)
		FLIGHT DIRECTORS:	301.2 FPS351.4 FPS					, Ivins/MS,		UVPI	EVENTS:
		A/E/O 1 - R. D. Dittemore		<u>OV-104</u> : 72:09:53:00				Note the cr		4 CRYO TK SETS	- EURECA deploy at 1/17:10 MET.
		Ld/O 2 - C. W. Shaw							ew		- TSS deploy at 4/08:57:22 MET.
		O 3 - P. L. Engelauf MOD - B. R. Stone		DISTANCE: 3,321,007 sm				o middeck		RMS 27 (S.N. 201) USED FOR	- TSS dock at 5/08:56:12 MET.
		NOD - D. N. SIUNE		3,321,007 311	Tioor with	i sieep s	tation I	n backgrour	nd.	EURECA DEPLOY	Continued
			- 1	1							

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SPACE SHUTTLE MISSIONS SUMMARY

FLT NO.	ORBITER	CREW (7) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL NOM-ABORT SR EMERG RSF THROTTLE AN PROFILE ET ENG. S.N.	M INC HA/HP	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		At left: STS046-17- lvins/MS (left) and are conducting the Phenomena (TOP)	017 1992-08-08 Hoffman/MS and Tether Optical experiment.	B WINDS HPLC HPL	ENG. S.N.	Antipication Antipication	the bla	satellite is ckness of	Continued SIGNIFICANT ANOMALIES: - MPS GH2 FCV erratic pressure. - Fan Sep 1 flooded, indicated stall currents and CB opened. Fan Sep 2 temporarily flooded. - P/L EURECA RF data handling problem (PSP lost lock due to excessive zeros in payload bit stream). - Flight deck speaker failed. - TSS U2 umbilical retractions failed when commanded by crew. - TSS deployer reel stalling at 179 and 251 meters. - TSS upper tether control mechanism jam at 224 meters. - Postflight investigation found the TSS level wind mechanism was jammed by a structural reinforcement bolt which was added based on late loads analysis.

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		CREW		LANDING SITE/	SSME-TL						
		(7)	LAUNCH SITE.	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(7)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM	l l	JKDH	FSW	WEIGHTS.	
NO	UKDITEK	TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP	1300	PAYLOADS/	(LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS,
NU.		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET	INC	ПА/ПР		EXPERIMENTS	
		α EVA S	ADURT HIVES	WINDS	ENG. S.N.	E1				EAPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-47	OV-105	CDR:	KSC 39, PAD B	KSC 33 (KSC 12)	104/104/	BI-053	57.02°	DIRECT	01-21	CARGO:	KSC W/D: OPF 77, VAB 5, PAD 17=99 days
515-47	(Flight 2)	Robert L. Gibson	256:14:23:00Z	264:12:53:22Z	109%	DI-033	(11)	INSERTION	(4)	32480 LBS	<u>K3C WD</u> . OTT 11, VAD 3, TAD 17-77 days
SEQ FLT #50	Endeavour	(Elt 4 - STS 41B	10:23:00 AM EDT (P) 10:23:00 AM EDT (A)	8:53:22 AM EDT		RSRM	()		(.)		LAUNCH POSTPONEMENTS:
520121 #30		STS 61-C, STS-27)	10:23:00 AM EDT (A)	Sunday 8	PREDICTED:	26W		POST OMS-2		PAYLOAD	- Launch date 8/12/92 as of 8/21/91.
KSC-50	Spacelab-J	P270/R30/V27/M29	Saturday 3	9/20/92 (5)	100/100/			163.1 X		CHARGEABLE:	- Launch postponed to 9/1/92 due to STS-49, STS-50, and
	(Japan)	PLT:	9/12/92 (3)	DEORBIT BURN:	100/67/104	ET-45 LWT-38		162.7 NM		28092 LBS	STS-46 delays. - Launch postponed to 9/11/92 because of DFRF work and
PAD 39B-16	Tenth	Curtis L. Brown	LAUNCH WINDOW:	264:11:52:20Z	ACTUAL:	LVV1-30				DEPLOYED:	ferry to KSC being delayed.
MLP-2	Spacelab	P271/R152/M136	2H 30M CTOB	XRANGE: 669 NM	100/100/	ET				0 LBS	ieny to reso being delayed.
	Flight				100/67/104	RPT					LAUNCH SCRUB: None.
	Long Module		EOM PLS: KSC	<u>ORBIT DIR</u> : AR 5				<u>DEORBIT</u>		NON-DEPLOYED:	
	(7)	Mark C. Lee	TAL: ZZA	AIM PT: CLOSEIN	1 = 2026 (3)	ET DD/UD		166 X 161 NM		26247 LBS	LAUNCH DELAYS: None.
	OMS PODS:	Payload CDR (Flt 2 - STS-30)	TAL WX: ROTA, BEN	MLCTD: 2458 FT	2 = 2022 (8) 3 = 2029 (6)	<u>BR/UP</u>				MIDDECK:	TAL WX:
	LPO3 - 13	P272/R100/V78/M91	SELECTED:	<u>MLGTD:</u> 2458 FT 264:12:53:22Z VEL: 209 KGS 202 KEAS	5 – 2029 (0)	ET		VELOCITY		1845 LBS	- Zaragoza (prime) - GO (selected), Rota - GO.
	RPO4 - 9		RTLS: KSC 33/CI/N	VEL: 209 KGS		IMPACT		25803 FPS			Ben Guerir - GO.
	FR5 - 2	<u>M/S 2</u> :	TAL: ZZA 30/N/SF	202 KEAS HDOT: 0 FPS	<u>M 3 EOM</u>	LAT:				<u>SHUTTLE</u> ACCUMULATED	
		Jay Apt	AOA: NOR 17/N/N		WEIGHT:	43.99°S		ENTRY		ACCUMULATED	DOLILU/NOMINAL I-LOADS:
		(Flť 2 - STS-37) P273/R123/V79/M110	PLS: EDW 22/CI/N	<u>TD NORM 205</u> : 2367 FT	220325 LBS X CG:	<u>LONG:</u> 158.8°W		RANGE 4341 NM		WEIGHTS: DEPLOYED:	 Nominal I-loads selected, no uplink required.
		F 27 3/K 123/ V 7 9/ WITTO	TDEL:		1083.7	150.0 W		4341 10101		673238 LBS	FLIGHT DURATION CHANGE:
		M/S 3:	-0.16 -0.118/-0.08	DRAG CHUTE DEPLOY: 176 KEAS 264:12:53:30.9Z	1000.7					NON-DEPLOYED:	- Extended one day for science gain/enhancement.
		N. Jan Davis		DEPLOY: 1/6 KEAS	LANDING					626816 LBS	- Extended one rev because rain forecast within 30 nm at
		P274/R153/F17	MAX Q NAV:		WEIGHT:					CARGO TOTAL:	KSC.
		M/S 4:	679 PSF ~682 PSF	<u>NLGTD</u> : 7651 FT 264:12:53:39Z VEL: 135 KGS HDOT: -2.2 FPS	220195 LBS X CG:					1483100LBS	FIRSTS:
		Mae C. Jemison	SRB STG:	VFL: 135 KGS	1085.3					PERFORMANCE	- First flight with married couple as crew members (M/S 1
		P275/R154/F18	2:04	HDOT: -2.2 FPS	1000.0					MARGINS (LBS):	and M/S 3)
				BRK INIT: 114 KGS						FPR: 4671	- First flight to deploy drag chute with nose in air. Deploy was at 185 KGS at 8 seconds after MLGTD. Chute pulled
		<u>P/S 1</u> :	<u>PERF</u> : NOMINAL			ANCAN		- show -	-10	FUEL BIAS: 983	was at 185 KGS at 8 seconds after MLGTD. Chute pulled
		Mamoru Mohri	2 ENG TAL (ZZA):	AVE BRK DECEL: 6.9 FPS/S					· N	FINAL TDDP: 1348 RECON: 2887	right 8°± 2° causing nose to move left 27 feet.
		(Japan) P276/R155/M137	<u>2 ENG TAL (ZZA)</u> . 3:05 3:07			20		RAN		RECON. 2007	SIGNIFICANT ANOMALIES:
			0.00	<u>CHUTE JETTISON</u> : 264:12:53:57Z 55 KGS	/	11150			17	PAYLOADS:	- RCS JET L3A failed off.
		·	NEG RETURN:	204.12.55.57Z 55 KGS	A	150	-10	Steel to Ut	11	PLB:	- L5D low chamber pressure.
			4:04 4:04			APA N	215	San Charles		SPACELAB-JAPAN	- DDS 1 H/W transient, screen blank and display
IRS	ON APT BR	Our	DTA (11/S 20E).	<u>WHEELS STOP:</u> 264:12:54:11Z 11025 FT	1		An			MATERIALS SCIENCE AND	overwrites.
s Gitter +		A WE	<u>PTA (U/S 285)</u> : 5:22 5:22	11025 FT			- MAG		10 and	LIFE SCIENCES	- Condensation on H2O loop lines. - Transient WCS fan separator stall currents.
	480	4 2	0.22		7	12	P -			EXPERIMENTS	- Cryo O ₂ tank 4 controller problem.
	acces 1	1	<u>PTM (N/A):</u>	ROLLOUT: 8567 FT 49 SECS			1	0		(SL-J/LM)	- H ₂ O relief line temperature problem.
TA TA	int the	AS A	SE PTM (U/S 476) 7:07 7:08	49 SECS	125	4	201			GBA-12 GAS	- Ku-band range rate /Azimuth display failure.
DAV	S IENICON	MO	/:0/ /:08	WINDS:		15	-	-		MIDDECK:	- APU 1 and 3 drain line temps cycling low. - RMLG line temperature high.
	JEMISON		MECO CMD:	H 0.9, L 1.8 KTS OFFICIAL: H2, L3	100		15			ISAIAH	- Loss of MCC power buses B1 and B2.
			8:31 8:34	OFFICIAL: H2, L3		Contraction of the	904	Rel P	ho).	SSCE	
		MCC FCR-1 (30)		<u>DENS ALT</u> : 1805 FT	<u> </u>					SAREX-II	
			MECO VI:	FLT DURATION:	STS047	-09-009	1992-09	9-20 Crew i	n		1000 A
		FLIGHT DIRECTORS: Asc/Ent - N. W. Hale	25830 25827	7:22:30:22				cience mo		4 CRYO TK SETS	Contraction Contraction Contraction
		Ld/O 2 - J. M. Heflin	OMS-2:	7:22:30:22 190:30:22						RMS 28 (S.N. 303)	C TORYO
		O 1 - G. A. Pennington	<u>36:11</u> 36:12	<u>S/T</u> : 323:13:44:53				t, back row		(NOT USED	
		O 3 - L. J. Ham	262 FPS 262 FPS					wn; middle		PER PLAN))	
		MOD - G. E. Coen		<u>OV-105:</u> 16:19:48:01	row, Da	vis/MS, /	Apt/MS	, &			
								ow, Lee/M	S		
				DISTANCE: 3,310,922 sm		· · · · ·) NASDA.			STS047-76-078
				3,310,722 5111		10111/23	Japan	ANAODA.			

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		CREW (6)	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER		LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
				WINDS	ENG. S.N.						
STS-52	OV-102	CDR:	KSC 39, PAD B	KSC 33 (KSC 13)	104/104/	BI-055	28.46°	DIRECT		CARGO:	KSC W/D: OPF 72, VAB 5, PAD 27=104 days
	(Flight 13)	James D. Wetherbee	296:17:09:38.97Z	306:14:05:53Z	109%	DODU	(30)	INSERTION	(5)	26862 LBS	
SEQ FLT	Columbia	(Flt 2 - STS-32) P277/R108/V80/M97	11:16:00 AM EDT (P) 01:09:39 PM EDT (A)	9:05:53 AM EST Sunday 9	PREDICTED	RSRM 27K		POST OMS-2		PAYLOAD	LAUNCH POSTPONEMENTS: - Launch date was 9/24/92 on 8/21/91.
#51		P277/R100/V00/WI97	Thursday 13	11/1/92 (7)	100/100/	2/1		162.7 X		CHARGEABLE:	- Launch postponed to 10/15/92 on 6/10/92.
KSC-51		PLT: Michael A. Baker	10/22/92 (6)		100/67/104	ET-55		160.2 NM		20132 LBS	- Launch postponed to 10/22/92 on 10/10/92 due to engine
K3C-01		(Flt 2 - STS-43)		DEORBIT BURN:		LWT-48					3 steerhorn weld anomaly.
PAD		P278/R133/V81/M118	LAUNCH WINDOW	306:13:11:59Z	ACTUAL			LAGEOS		DEPLOYED: 5577 LBS	
39B-17	OMS PODS		2H 30M CTOB	XRANGE: 223 NM	100/100/	ET		DEPLOY:			LAUNCH SCRUB: None.
MLP-3	LPO5 - 2 RPO5 - 2	M/S 1:	EOM PLS: KSC	ORBIT DIR: DL 25	95/67/104	<u>RPT</u>		169.5 X 161.1 NM		<u>NON-DEPLOYED</u> : 12475 LBS	LAUNCH DELAYS:
	FRC2 - 13	Charles (Lacy) Veach (Flt 2 - STS-39)	TAL: BYD		1 = 2030 (8)	ET		0/20:47:45		12475 LD5	- Delayed for 1H53M39S because of RTLS crosswind
	11102 10	P279/R127/V82/M114	TAL WX: MOR, BEN	<u>aim pt</u> : Nominal	2 = 2015(9)	BR/UP		0/20.17.10		MIDDECK: 2080 LBS	exceedance (15-knot limit). A range safety warning
				<u>MLGTD</u> : 1080 FT	3 = 2034 (1)			<u>OMS-6</u> : 154.2 X			exceedance (15-knot limit). A range safety warning (BLAST) existed for part of launch hold. MMT waived
		<u>M/S 2</u> :	SELECTED:	306:14:05:53Z VEL: 219 KGS		ET				SHUTTLE	crosswind exceedance (0613G21 on center tower).
		William M. Shepherd	RTLS: KSC 15/N/N	211 KEAS		IMPACT		114 NM		ACCUMULATED	
		(Flt 3 - STS-27, STS-41) P280/R96/V56/M87	TAL: BYD 32/N/SF AOA: EDW 22/N/N	HDOT: -0.3 FPS	M <u>3 EOM</u> WEIGHT:	<u>LAT</u> : 12.9°S		7/19:59:55		<u>WEIGHTS:</u> <u>DEPLOYED</u> :	TAL WX: - Prime TAL Banjul had reduced short range visibility but
		1 200/10/0/030/1007	PLS: EDW 04/CI/N	TD NORM 195:	216043 LBS	LONG:		OMS-7:		678815 LBS	was forecast and observed GO and selected. Moron was
		<u>M/S 3</u> :		2819 F I	X CG:	163.4°W		<u>OMS-7:</u> 114.1 X			forecast and observed NO GO because of low ceiling. Ben
		Tamara E. Jernigan	TDEL:		1082.6			113.9 NM		641371 LBS CARGO TOTAL:	Guerir was NO GO during most of prelaunch period
		(Flt 2 - STS-40) P281/R130/V83/F14	- 0.16 - 0.438/0.4	DRAG CHUTE DEPLOY: 169 KEAS	LANDING			7/20:46:26		1500062 LBS	because of ceilings and threat of rain, but was observed GO when rain moved away from runway.
		P201/R130/V03/F14	MAX Q NAV:	306:14:06:06Z	WEIGHT:			DEORBIT		PERFORMANCE	GO when failt moved away non fully ay.
		P/S 1:	717 PSF 708 PSF	<u>NLGTD</u> : 6949 FT	215935 LBS			113 X		MARGINS (LBS):	DOLILU/I-LOADS:
		Steven MacLean		<u>306:14:</u> 06:11Z	X CG:			110 NM		MARGINS (LBS): FPR: 4671	- Both nominal and DOLILU (Q-Alpha-4000) for aero DTO.
RB	EE BAKE	(Canada)	SRB STG:	VEL: 151 KGS HDOT: - 3.5 FPS	1084.					FUEL BIAS: 983 FINAL TDDP:11107	Alternate (Q-Alpha-3250) to backout DTO. Selected
ETHE	· 🔼 · 🤺	P282/R156/M138	2:03.8 2:05					VELOCITY 25666 FPS		RECON: 9801	DOLILU, DOLILU uplink #4, total uplink #11).
0 .		AN	PERF: NOMINAL	<u>BRK INIT</u> : 101 KGS				2000113			FLIGHT DURATION CHANGE: None.
4		MCC FCR-1 (31)		DRAG CHUTE JETTISON: 51 KGS				ENTRY		PAYLOADS: PLB:	
E D			2 ENG TAL (BYD):	JETTISON: 51 KGS				RANGE		PLB: LASER	LANDING SITE CHANGE: None.
HS .	L用.N	FLIGHT DIRECTORS: Asc/Ent - J. W. Bantle	2:23 2:26	306:14:06:36Z				4454 NM		GEODYNAMICS SATELLITE	
HO :		Ld/O 1 - R. E. Castle	NEG RETURN:	AVE BRK DECEL:						(LAGEOS-II)	DRAG CHUTE STRATEGY: - Deploy nose in air at 175 kgs/derotation if
47		0 2 - R. D. Jackson	4:05 4:09	5.7 FPS/S						(DEPLOYEĎ)	crosswinds < 5 kts steady state and nose within ± 10
		Planning - C. W. Shaw		WHEELS STOP:			1			CTA DEPLOYED	of center line. Dis-reef would occur at touchdown.
		MOD - A. L. Briscoe	PTA (U/S 235):	306:14:06:55Z 11788 FT			£			CTA DEPLOYED (CANADIAN TARGET ASSY)	Drag chute was deployed at 170 KGS (chute deploy
THE REAL PROPERTY OF	Contraction of the local division of the loc	NY TATANA MANAGAMBANA MANAGAMBANA MANAGAMBANA	4:22 4:25					1		TARGET ASSY)	#4), chute pulled left and nose went to right.
Charles	dunia al or about	A CARLEND CARLEND	PTM (U/S 235):	ROLLOUT: 10708 F I			1			CANEX-2/TPCE,	SIGNIFICANT ANOMALIES:
				63 SECS						USMP-01	- WCS fan separator 1 failed to operate FD 10.
19/1	20		-	WINDS:		2	N. N.			ASP	- Fuel cell 1 cell performance monitor hangup.
5020	-		MECO CMD:	1-4, R 5 KTS		100	1 3			MIDDECK:	- F3L failed off (oxidizer leak).
	6		8:29.82 8:32	T-4, R ⁻ 5 KTS OFFICIAL: H3, L8	1	57- 5-0	STA SPA	Martin		PSE	 PRSD O₂ tank 2 heater A2 erratic. TAGS hard jam, no developer motor motion.
THE S.			VI:	DENS ALT: 1643 FT	50	A N	1	K-		PSE HPP CPCB BLOCK II	- Intermittent surface position indicator (SPI) power.
		24 G TO 4	25875 25874			1	ST/	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		ISPIE	- S-band PM low frequency forward link loss of lock.
S	<u>.</u>			FLT DURATION: 9:20:56:13		1 Angles	¥ ()	Contra St		CMIX CVTE	- S-band FM transmitter RF power output erratic.
		···· · · · · · · · · · · · · · · · · ·	<u>OMS-2</u> : 39:56 39:56	236:56:13						CANEX	- Window 3 internal "void" or "bruise" (R&R).
	114		215 FPS	<u>S/T</u> : 333:10:41:06	STS052-	80-024 19	92-11-0	1 Italian		5 CRYO TK SETS	
								RIS), a spinni	na		
OTCOTO	0.05 4000			<u>OV-102:</u> 98:17:40:41	solid fuel				J	RMS 29 (S.N. 301)	
		-01 In orbit crew portrait.						AGEOS II) OL	it of	RMS 29 (S.N. 301) USED FOR CTA DEPLOY	
Caption una	vallable, see	names above.		DISTANCE: 4,129,028 sm	its suppo						

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		CREW		LANDING SITE/	SSME-TL						
EL T		(5)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB	(ORBIT	FCM	PAYLOAD	MISSION HIGHLIGHTS
FLT NO.	ORBITER	TITLE, NAMES	LIFTOFF TIME, LANDING SITES,	CROSSRANGE LANDING TIMES	EMERG THROTTLE	RSRM AND	INC	HA/HP	FSW	WEIGHTS, PAYLOADS/	(LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS,
NO.		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET	INC			EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
				WINDS	ENG. S.N.						
STS-53	OV-103 (Flight 15)	CDR: David M. Walker	KSC 39, PAD A 337:13:24:00Z	EDW 22, CONC (EDW 37,CONC 18)	104/104/ 109%	BI-055	57° (12)	DIRECT INSERTION	OI-21 (6)	<u>CARGO</u> : 28316 LBS	<u>KSC W/D</u> : OPF 247, VAB 5, PAD 24 = 276 days
SEQ FLT	Discovery	(Flt 3 - STS 51-A	6:59:00 AM EST (P)	344:20:43:477		RSRM	(12)		(0)		LAUNCH POSTPONEMENTS:
#52		& STS-30) P283/R48/V40/M45	8:24:00 AM EST (A)	12:43:47 PM PST	PREDICTED: 100/100/	28W		<u>POST OMS-2</u> 200 X		<u>PAYLOAD</u> CHARGEABLE:	- Launch date was 10/9/92 on 3/15/91. - Launch postponed to 11/5/92 on 6/10/92 when decision
KSC-52	OMS PODS	P283/R48/V40/IVI45	Wednesday 7 12/2/92 (3)	Wednesday 5 12/9/92 (6)	100/100/	ET-49		200 X 199 NM		26118 LBS	made to fly STS-52 before STS-53.
	LPO4-12	PLT:		DEORBIT BURN:	104/67	LWT-42		0004			- Postponed launch to 12/2/92 due to LP04 replacing LP01, engine steerhorn Xrays, and NWS anomaly.
PAD 39A-35	RPO3-16 FRC3-15	Robert D. Cabana (Flt 2 - STS-41)	LAUNCH WINDOW 2H 30M CTOB	344:19:43:20Z	ACTUAL:	FT		<u>DOD-1</u> DEPLOY:		DEPLOYED: 20789 LBS	5 5.
MLP-1		P284/R113/V84/M101		<u>XRANGE</u> : 791 NM	100/100/	<u>et</u> RPT		00/05:54 MET		(NO ODERACS	LAUNCH SCRUB: None.
		M/S 1:	EOM PLS: KSC TAL: ZZA	<u>ORBIT DIR</u> : DR 8	100/73/ 104/67	FT		200 X 199 NM		DEPLOY)	LAUNCH DELAYS:
		Guion S. Bluford	TAL WX: MRN, BEN	<u>AIM PT</u> : CLOSE IN		<u>et</u> Br/up				<u>NON-DEPLOYED</u> : 4299 LBS	- Delayed 1H25M at T-9 minutes because of acreage ice on ET which ice team confirmed melted approx. 35
		(Flt 4 - STS-8, STS 61-A & STS-39)	SELECTED:	<u>MLGTD: 1108</u> FT	1 = 2024 (5) 2 = 2012 (14)	ET		<u>SEP BURN</u> : 00/06:14MET		4299 LBS (INCLUDES	minutes after sunrise. Addi-tional delay caused by wing
		P285/R22/V25/M21	RTLS: KSC 33/CI/N	MLGTD: 1108 FT 344:20:43:47Z VEL: 209 KGS	3 = 2012 (14) 3 = 2017 (7)	IMPACT		204 X		ODERACS)	LA16 exceedance of 102% based on L-70 minutes and DOLILU I-loads.
		M/S 2:	TAL: BEN 36/N/N AOA: NOR 17/N/N	212 KEAS HDOT: -2.5 FPS		<u>LAT</u> : 40.95°S		200 NM			DULILU HUAUS.
		James S. Voss	PLS: NOR 17/CI/N	<u>TD NORM 195</u> :	M 3 EOM	LONG:		<u>OMS-3</u> :		MIDDECK: 1030 LBS	TAL WX:
		(Flt 2 - STS-44)		2682 F I	WEIGHT:	152.6°W		01/06:19:12		SHUTTLE	- Zaragoza was prime but forecast intermittent GO (ceiling and rain) but observed GO. Moron forecast NO GO -
		P286/R136/V85/M121	<u>TDEL</u> : 0.32 0.722/0.766	DRAG CHUTE	194028 LBS			202 X 175 NM		ACCUMULATED	ceiling, observed marginal GO. Ben Guerir forecast and
		M/S 3:		DEPLOY: 167 KEAS 344:20:44:00Z	N OC			0146.4		WEIGHTS:	observed GO (selected).
		Michael R. Clifford P287/R157/M139	MAX Q NAV: 692 PSF 705 PSF	NLGTD: 6329 FT	X CG: 1089.5			<u>OMS-4</u> : 01/07:02:03		DEPLOYED: 699604 LBS	DOLILU/I-LOADS: - Nominal and DOLILU I-loads were GO on L-4.25 balloon.
				344:20:44:03.6Z VEL: 145 KGS				176 X		NON-DEPLOYED:	DOLILU was selected and uplinked. DOLILU uplink #5,
TER	A CAN	MCC FCR-2 (21)	<u>SRB STG</u> : 2:05.6 2:06	HDOT: -2.2 FPS	LANDING WEIGHT:			175 NM (ODERACS		646700 LBS CARGO TOTAL:	total 12.
WALL	1- Carla			<u>BRK INIT</u> : 106 KGS	193851 LBS			DEPLOY ALT)		1538278 LBS	FLIGHT DURATION CHANGES:
		FLIGHT DIRECTORS: Asc/Ent - N. W. Hale	PERF: NOMINAL	DRAG CHUTE	X CG: 1091.3			OMS-5:		PERFORMANCE	- Planned extension of flight from 6 to 7 days, if launch was delayed, to provide night passes for GLO experiment.
Ë S		Ld/O 2 - R. M. Kelso	2 ENG TAL (MRN):	<u>JETTISON:</u> 60 KGS 344:20:44:25Z				05/05:51		MARGINS (LBS):	- Extended one rev because forecast 3.5K broken on first
BHAR		O 1 - J. M. Heflin Planning - L. J. Ham	2:32 2:33		<u>DEORBIT</u> 174 X			174.9 X 170.3 NM		FPR: 3934 FUEL BIAS: 1055	KSC landing opportunity.
B L		MOD - B. R. Stone	NEG RETURN:	AVE BRK DECEL: 3.5 FPS/S	169 NM			(2ND KSC		FINAL TDDP:1368	LANDING SITE CHANGES:
V	OSS		4:04 4:06	WHEELS STOP:	VELOCITY			LANDING EOM +1)		RECON: 2844	- Changed landing site to EDW after waving off first opportunity at KSC and forecast NO GO (ceiling on second
070050 4	0.004.4000		<u>PTA (U/S 350)</u> :	344:20:44:59Z 11273 FT	25813 EDS			, , ,		PAYLOADS:	landing opportunity at KSC).
		2-12-09 In orbit crew	4:56 4:52	ROLLOUT:	<u>ENTRY</u>	STSU53-09-0 Resumply Fa	121 FIUIO Liipment (F	Acquisition & ARE) middeck		<u>PLB</u> : DOD-1 (DPLY)	FIRSTS/LASTS:
		aft flight deck see names above).	<u>PTM (U/S 350)</u> : 5:48	10165 F I 82 SECS	RANGE			s the fluid mixtur		GCP	- First flight of OV-103 after OMDP-1 with drag chute,
(Caption d			5:48 5:41	WINDS:	4237 NM	and transfer	process in	transparent sphe	re.	ODERACS (FAILED TO DEPLOY)	INWS, etc. - Last flight from FCR-2.
		1 2	MECO CMD:	IH9, R11						,	, and the second s
			8:33.48 8:34	2614P19 <u>OFFICIAL:</u> H15, R8		16		C.F.S.		MIDDECK: HERCULES,	SIGNIFICANT ANOMALIES: - HPOT secondary seal transducer failure.
1			<u>VI</u> :	DENS ALT: 2961 FT	1	1-1	A STA		1	STL,	- Humidity separator B water deposits.
	1		25 885 25885	FLT DURATION:	A 1	· > //	in the	P		BLAST, RME III.	- Supply water dump valve water leaks. - Couldn't deploy ODERACS space spheres because logic
3			<u>OMS-2</u> :	7:07:19:47 175:19:47				A		CLOUDS-1A.	battery was discharged (160 lbs).
			37:03 36:53.6	<u>S/T</u> : 340:18:00:53		Star.		1		CREAM,	- Speedbrake FCS channel 3 position feedback anomaly. - F1L jet fail leak post FRCS dump (O ₂ leak).
			337.3 FPS337.5 FPS							FARE	- PPO ₂ C transducer shift.
	66			<u>OV-103:</u> 90:10:42:50			a service	1 1 2 1 -	1	4 CRYO TK SETS	- Water spray boiler 1 steam vent heater anomalous cycles.
	CO'			<u>DISTANCE</u> : 3,034,680 sm		1 1 10			Set 1	NO RMS	EVENTS:
	1			3,034,680 SM	1			- inter		-	- DOD-1 deployed at 00/05:54 MET. - Lowered orbit to 176 nm for ODERACS deploy.
I			11								- LOWERED UDIT TO THITTOL ODERACS UPPLOY.

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		CREW		LANDING SITE/	SSME-TL						
		(5)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB	(ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER		LIFTOFF TIME,		EMERG	RSRM	INC		FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION,	THROTTLE PROFILE	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		Q LVAS	ADOICT HIMES	WINDS	ENG. S.N.	L 1					TIKSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-54	OV-105	<u>CDR</u> :	KSC 39, PAD B	KSC 33 (KSC-14)	104/104/	BI-056	28.45°	DIRECT	01-21	CARGO:	KSC W/D: OPF 55, VAB 6, PAD 27 = 88 days
	(Flight 3)	John H. Casper	13:13:59:29.95Z	19:13:37:47Z 8:37:47 AM EST	109%	RSRM	(31)	INSERTION	(7)	49039 LBS	
SEQ FLT #53	Endeavour	(Flt 2 - STS-36) P288/R111/V86/M99	8:52:00 AM EST (P) 8:59:30 AM EST (A)	Tuesday 9	PREDICTED:	29W		POST OMS-2		PAYLOAD	LAUNCH POSTPONEMENTS: - Baselined launch date of 11/19/92 on 4/4/91.
			Wednesday 8	1/19/93 (5)	100/104/			164 X		CHARGEABLE:	- Postponed launch date to 12/15/92 on 5/8/92.
KSC-53		PLT: Donald McMonagle	1/13/93 (6)	DEORBIT BURN:	99/70/ 104/67	ET-51 LWT-44		160 NM		46540 LBS	- Postponed launch date to 1/13/93, after holi-days, to allow the required OPF processing time.
PAD		(Flt 2 - STS-39)	LAUNCH WINDOW	19:12:38:10Z						DEPLOYED:	
39B-18	OMS PODS LPO3-14	P289/R126/V87/M113	2H30M, CTOB	<u>XRANGE</u> : 320 NM	ACTUAL: 100/104/	<u>et</u> RPT		SEP BURN:		37497 LBS	LAUNCH SCRUB: None.
MLP-2	RPO4-10	<u>M/S 1</u> :	EOM PLS: KSC	<u>ORBIT DIR</u> : DL 26	104/72/	<u>KPI</u>		<u>OMS-3:</u> 173 X		NON-DEPLOYED:	LAUNCH DELAYS:
	FRC5-3	Gregory J. Harbaugh	TAL: BEN	AIM PT: CLOSE IN	104/67	ET		160 NM		7991 LBS	- Delayed 7M30S while holding at T-9 minutes while
		(Flt 2 - STS-39) P290/R125/V88/M112	TAL ALT: BYD, MRN		1 = 2019(11)	BR/UP		<u>OMS-4</u> :		MIDDECK	discussing load indicator A16 Q-plane exceedance (101%) at M=1.55. Approved a waiver.
			SELECTED:	MLGTD: 1536 FT 19:13:37:47Z	2 = 2033 (2)	<u>et</u>		14:16:08:42Z		MIDDECK: 1052 LBS	
SPER MC	MONAGI	M/S 2: Mario Runco	RTLS: KSC 33/N/N TAL: BEN 36/N/N	VEL: 205 KGS 212 KEAS HDOT: -1 FPS	3 = 2018 (9)	IMPACT LAT:		164 X 163 NM		SHUTTLE	TAL WX: - Ben Guerir and Moron forecast and observed GO. Banjul
		(Flt 2 - STS-44)		HDOT: -1 FPS	(2018 WAS	<u>LAT</u> . 12.92°N				ACCUMULATED	forecast and observe NO GO - VIS (haze).
	1	P291/R137/V89/M122	PLS: NOR 17/N/N	<u>TD NORM 195</u> :	REBUILT)	LONG		MET		WEIGHTS:	
		M/S 3:	TDEL:	2710 F I	M 3 EOM	163.3°W		1:02:08:42		DEPLOYED: 737101 LBS	DOLILU/I-LOADS: - DOLILU selected and uplinked. DOLILU #6, total uplink
	Martin State	Susan J. Helms	-0.32 0.322/0.36	DRAG CHUTE DEPLOY: 166 KEAS	WEIGHT:			<u>DEORBIT</u>		NON-DEPLOYED:	#13.
* 115	HARBA	P292/R158/F19	MAX Q NAV:	19:13:38:00Z	197481 LBS X CG:			165 X 159 NM		655743 LBS CARGO TOTAL:	FLIGHT DURATION CHANGES: None.
MEL	MS	EMU/TETHERED EVA:	709 PSF 715 PSF	<u>NLGTD</u> : 6247 FT	1091.6					1587317 LBS	TEIGHT DOILATION CHANGES. None.
MCC FCR-1	(32)	EV1 - Greg Harbaugh EV2 - Mario Runco		19:13:38:02Z VEL: 150 KGS HDOT: -3.1 FPS				VELOCITY 25780 FPS			FIRSTS: - First flight with a planned fuel cell shut-down/restart. FC2
FLIGHT DIRE		1/17/93	<u>SRB STG</u> : 2:05.1 2:06	HDOT: -3.1 FPS	LANDING WEIGHT:			25780 FPS		PERFORMANCE MARGINS (LBS):	shut down for 10 hours per DTO 412 at 04/20:00
Ascent - J. W.	. Bantle	4:27:50 Duration		BRK INIT: 107 KGS	197353 LBS			ENTRY		FPR: 3934	- First flight of EDO Waste Collection System (WCS).
Entry - R. D. J Ld/O2 - P. L. I		SS EVA #20	<u>PERF</u> : NOMINAL	DRAG CHUTE	X CG: 1093.4			RANGE 4213 NM		FUEL BIAS: 1055 FINAL TDDP:2659	- First Military Woman in Space - Susan J. Helms
01-C.W.St	haw	REFINE TRAINING	2 ENG TAL (BEN):	<u>JETTISON</u> : 52 KGS	10,0.1			12101111		RECON: 3421	SIGNIFICANT ANOMALIES:
Plan - J. W. M		METHODS FOR SPACE STATION EVA'S	3:00 3:06	19:13:38:23Z			12	XXXX X		PAYLOADS:	- EDO WCS commode, urinal, and compactor microswitch problem.
MOD - A. L. B	riscoe	STATION LVAS	NEG RETURN:	AVE BRK DECEL: 7.3 FPS/S	3.7		19	STELLE -		PLB:	- PLB floodlights problems: Both mids and fwd starboard.
	0.000 lm	arbit arouv partrait	3:57 4:00	WHEELS STOP:			. 2000	and a		TDRS-F/IUS (DEPLOYED)	 R1R jet failed off during RCS hot fire. Rudder speedbrake secondary hydraulic switching valve
		orbit crew portrait	PTA (U/S 235):	19:13:38:36Z						DXS	indication.
		ole) Susam Helms,	5:12 5:14	10259 FT		100	110 mil	EN A		MIDDECK	- Hydraulic sys 3 residual pressure post APU shutdown. - APU 3 overheat during ascent (WSB 3 not cooling).
ist winta	ry womar	in space, at top.	PTM (U/S 235):	<u>ROLLOUT:</u> 8723 F I		-	1	43		MIDDECK: CHROMEX	- DOLILU GPC dump display format error.
			5:54 5:56	49 SECS		6	N.C.			CGBA	- EVA - No hitch pin in PFR pip-pin.
		0	MECO CMD:	<u>WINDS:</u> 4H, R2		A		6	4	PARE SSCE	- R RSRM had 18 psi chamber pressure spike at 67 seconds.
-		M PAR	8:28.66 8:30.6	4H, R2 OFFICIAL:		ALE	No. V				
	7010		VI	H3, R2		1990 - 1990		Sand Land		4 CRYO TK SETS	EVENTS: - TDRS-F deployed at 06:12:57 MET.
1			25876 25872	<u>DENS ALT</u> : -151 FT		1 Store		and the second		NO RMS	 OMS4 to bring in additional ldg opportunities.
45-19	10 50	and seal and						- ALCONDON			- EVA started at 03:20:50:25 MĚT. - Deorbit burn on rev 95, landing rev 96.
L.		E 6 1.	<u>OMS-2</u> : 39:53 39:53	<u>FLT DURATION</u> : 5:23:38:17 143:38:17							ů
								1			NOTE: SSME 2018 was rebuilt to new engine status.
				<u>S/T</u> : 346:17:39:10						Top: STSOF4	80-000U DTO 1210 EVA : Harbaugh
	No.			<u>OV-105</u> : 22:19:26:18		and the	Min D	1 and		carries Runco	CO-0000 DTO 1210 EVA . Haibaugi
		- Mar Not			51 c		1	SALE			54-71-025 TDRS/IUS Deploy
			J	DISTANCE: 2,501,277 sm		# 1					

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FLT	ORBITER	CREW (5)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM	(Orbit	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES.	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		a E mo	ABORT HIMES	WINDS	ENG. S.N.	<u> </u>					
STS-56	OV-103	CDR:	KSC 39, PAD B	KSC 33 (KSC-15)	104/104/	BI-058	57°	DIRECT	01-21	CARGO:	KSC W/D: OPF 63, VAB 10, PAD 22 = 95 days
515-50 ([Flight 16)	Kenneth D. Cameron	98:05:28:59.95Z	107:11:37:19Z	109%		(13)	INSERTION	(8)	21000 LBS	<u>······</u> ······························
SEQ FLT D	Discovery	(Flt 2 - STS-37)	1:29:00 AM EDT (P)	7:37:19 AM EST		RSRM				PAYLOAD	LAUNCH POSTPONEMENTS:
#54		P293/R121/V90/M109	1:29:00 AM EDT (A)	0 1 1 10	PREDICTED:	31KM		POST OMS-2		CHARGEABLE:	- Launch date of 3/23/93 was postponed to 4/6/93 because
	Eleventh Spacelab	PLT:	Thursday 14 4/8/93 (9)	Saturday 10 4/17/93 (8)	100/100/ 89/67/104	ET-54		159.8 X 159.1 NM		16439 LBS	of STS-55 launch delays which were caused by SSME HPOTP tip seal retainer problems, hydraulic flex hoses,
	-light	Stephen S. Oswald	4/0/95 (9)	.,	09/07/104	LWT-47				DEPLOYED:	and range conflicts with Delta and Atlas launches.
	gloo (4)	(Flt 2 - STS-42)	LAUNCH WINDOW	DEORBIT BURN:	ACTUAL:			DEPLOY:		0 LBS	5
39B-19	,	P294/R139/V91/M124	Closes on ATMOS	107:10:34:25Z	100/100/	<u>et</u> RPT		161.1 X		NON-DEPLOYED:	LAUNCH SCRUB: - Launch on 4/6/93 was scrubbed after an RSLS breakout
MI P-1 C	OMS PODS		Tangent Ray Constraint - 2H28M	XRANGE: 6 NM	89/69/104	<u>RPT</u>		158.2 NM		12568 LBS	- Launch on 4/6/93 was scrubbed after an RSLS breakout
	_PO1-19 RPO3-17	<u>M/S 1</u> : C. Michael Foale	Constraint - 2H28IVI	<u>ORBIT DIR</u> : DL 27	1 = 2024 (6)	<u>et</u>		RNDZ:			at T-11 seconds caused by failure to get "close" indication when LH_2 high point bleed valve closed.
	-RC3-17	(Flt 2 - STS-45)	EOM PLS: KSC		2 = 2033 (3)	BR/UP		<u>160.5</u> X		MIDDECK: 1031 LBS	when Eng high point bleed valve closed.
	1100 10	P295/R143/V92/M127	TAL: ZZA	<u>AIM PT</u> : CLOSE IN	3 = 2018 (10)			156.9 NM		SHUTTLE	LAUNCH DELAYS: None.
			TAL ALT: MRN, BEN	<u>MLGTD:</u> 1074 FT	. ,	<u>ET</u> IMPACT				ACCUMULATED	
		<u>M/S 2</u> :		107:11:37:19Z	M 3 EOM	IMPACT				WEIGHTS:	TAL WX: All three TAL sites (ZZA, MOR, and BEN) were forecast and observed GO. ZZA selected.
		Kenneth D. Cockrell P296/R159/M140	<u>SELECTED</u> : <u>RTLS</u> : KSC 33/N/N	VEL: 196 KGS 206 KEAS HDOT: -2.5 FPS	WEIGHT: 208052 LBS	<u>LAT</u> : 42.4°N		<u>DEORBIT</u> 160 X		DEPLOYED:	IDIECASI AND ODSEIVED GO. ZZA SEIECIEU.
		1 270/1(137/10140	TAL: ZZA 30/CI/N	HDOT: -2.5 FPS	X CG:	<u>LONG:</u>		150 NM		737101 LBS NON-DEPLOYED:	DOLILU/I-LOADS:
		<u>M/S 3</u> :	AOA: NOR 17/N/N	TD NORM 195:	1084.6	154.36°W				669342 LBS	- Nominal I-loads were selected (were uplinked because
		Ellen Ochoa	<u>PLS</u> : EDW 22/N/N	<u>TD NORM 195</u> : 1948 FT				<u>VELOCITY</u>		CARGO TOTAL:	DOLILU I-loads had been uplinked for 4/6/93 launch
		P297/R160/F20	(ORBIT 7) EDW 04/CI/N	DRAG CHUTE	LANDING			25797 FPS		1608317 LBS	attempt).
CAMERON	OSWAL		(ORBIT 3)	DEPLOY: 169 KEAS	WEIGHT: 207946 LBS			ENTRY		PERFORMANCE MARGINS (LBS):	NIGHT LAUNCH: Shuttle night launch #8.
			(ORDIT 3)	107:11:37:30Z	X CG:			RANGE		MARGINS (LBS):	ÿ
4711	So .	MCC FCR-1 (33)	<u>TDEL</u> :	NLGTD: 5587 FT 107:11:37:34Z	1086.3			4375 NM		FPR: 3934 FUEL BIAS: 1055 FINAL TDDP: 9521	FLIGHT DURATION CHANGES:
OAL	KRE		0.00 0.24	107:11:37:34Z						FINAL TDDP: 9521	- Waved off two landing opportunities at KSC because of forecast low ceiling at KSC.
"DS	F	FLIGHT DIRECTORS: Ascent - J. W. Bantle	MAX Q NAV:	VEL: 144 KGS HDOT: -3.4 FPS		0				RECON: 10718	- Extended 1 day because WX forecast NO GO at KSC.
STA A	A D Sto	Entry - R. D. Jackson	675 PSF 676 PSF							PAYLOADS:	,
		Ld/O1 - C. W. Shaw		<u>BRK INIT</u> : 92 KGS	1000					PLB:	FIRSTS:
~		O 2 - J. W. Muratore	<u>SRB STG</u> :	DRAG CHUTE				100		ATMOSPHERE LABORATORY FOR	- First flight with 90% reefed drag chute (same deploy strategy). 90% more stable than baseline.
		O 3 - R. E. Castle	2:05.3 2:06	<u>JETTISON:</u> 55 KGS 107:11:37:59Z				1		APPLICATIONS	- First TV uplink to American Spacecraft via SAREX-II (UHF
		MOD - A. L. Briscoe	PERF: NOMINAL			A COLOR		all p		APPLICATIONS AND SCIENCE (ATLAS-2) SSBUV/A	fast scan TV).
				AVE BRK DECEL: 4.9 FPS/S						(ATLAS-2)	
1100000	10/1	1 30 . 2's / W/ A AV	<u>2 ENG TAL (MRN)</u> :			The state	1 56	*		SSBUV/A SPARTAN 201	SIGNIFICANT ANOMALIES: RSRM 7 to 8 psi pressure spike at 74 seconds
A 1 2 2 2 2 2			2:24 2:26	WHEELS STOP:		Sugar		De Start		(DEPLOYED &	- RSRM 7 to 8 psi pressure spike at 74 seconds. - Loose thermal blanket on aft (1307) bulkhead.
A MATERICE	R In C		NEG RETURN:	107:11:38:22Z 10603 FT		A set		298		RETRIEVED)	 FC1 O₂ reactant valve falsely indicated closed.
1111111			4:10 4:13				Seller.	-		GBP SUVE	- EC1 substack 3 delta voltage increased during nurges
and		W W W		ROLLOUT: 9529 FT							- ATVC Channel 4 power failure. - Ku-band singed processor problem - Spacelab data
			<u>PTA (U/S 280)</u> :	I63 SECS	Top: STS056-					MIDDECK: CMIX	exceeding 2 MPS were degraded.
			4:22 4:23	WINDS:	Bottom: STS0	56-90-034	treeflying	9 SPARTAN-2		STL	- S-band low frequency interference problem.
	100 m		PTM (U/S 280):	IH6. 1L –		Constant and the		STREET,		PARE	- TAGS iam.
		1 10	<u>5:09</u> 5:12	OFFICIAL: H6, 1L	100	-	and a set			SAREX-II HERCULES	- TIPS on first flight worked OK on S-band, bad on Ku-band (TAGS master switch was turned off).
	2	Star and			C.M.	- Ata	No. Sol	and a state		RME-III	- LSD injector temps high indicated htr failed on.
		- 🥠	MECO CMD:	<u>DENS ALT</u> : -74 FT	8	NAS -	1			AMOS	
The state	100		8:28.8 8:35	FLT DURATION:		ACCEPTE	1			CREAM	RNDZ: Rendezvous #13 with SPARTAN for retrieval and
			VI:	FLT DURATION: 9:06:08:19 222:08:19		Carrier of	-	100 A		4 CRYO TK SETS	return.
One inter	let en ente		25829 25825			THE .		44			EVENTS:
		it: In front are CDR		<u>S/T</u> : 355:23:47:29	0.5					RMS 30 (S.N. 301) USED FOR	- SAREX contact with Russian Space Station, MIR, at
		Foal/MS1. In back	<u>OMS-2</u> : 37:08 37:07	OV-103:		Contraction		alle -		SPARTAN DEPLOY.	2:17:55 MET.
are (left to	right) Oc	choa/MS3, PLT	37:08 37:07 252 FPS 254 FPS	<u>OV-103:</u> 99:16:51:09		E. Carlos	-			CAPIURE & BERTH	- SPARTAN was deployed at 3:00:42 MET on orbit 49, grapple was at 05:01:51 MET, and berthed at 05:02:32
Oswald an	nd Cockre	ell/MS2.	202110 201110	DISTANCE:			Sec. Y				MET
				DISTANCE: 3,853,997 sm			- ALARTAN	2			

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FLT ORBITER LIFTOFF TIME CROSSRANGE EMRG PSRM FSW PROUND TAIL CAUNCH STREE NO. THE RAMES LANDIG STRES LANDIG STRES LANDIG STRES ANDIG TIMES HANP PAL PAL PAL PAL FIGURATION, PROFILE ET NO. HAHP PROFILE ET PAL <	MENTS
A EVAS ABORT TIMES FLT DURATION PROFILE ET EXPERIMENTS FIRSTS, SIGNED STS-55 OK-102 (Flight 14) Columbia Spacebb CDR: Columbia Fight CDR: Siscencebb KSC-39, PAD A 116:1449:59:92 KSC-39, PAD A 116:1449:59:92 Ibmed 2 (BW 38:CONC-19) 100:50:00 AM EDT (P) 10:50:00 AM EDT (P) 100:50:00 AM EDT (P) 100:70:10 A Ibmed 2 (BW 32:CONC 100:70:10 A Ibmed 2 (BW 32:CONC-19) 100:70:10 A Ibmed 2 (BW 72:CONC-19) 100:70:10 A Ibmed 7 (BW 72:CONC-19) 100:70:10 A Ibmed 7 (BW 72:CONC-19) 100:70:10 A Ibmed 7 (BW 72:CONC-19) 100:70:10 A Ibm	IFICANT ANOMALIES, ETC.) B 5, PAD 73 = 155 days
STS-55 OV-102 (Filight 14) CDR: Siteware R. Nagel (Filight 4) Control (Filight 4) CDR: Siteware R. Nagel (Filight 4) Control (Filight 4) <th< td=""><td>MENTS</td></th<>	MENTS
P/S.2: Hans W. Schlegel (Germany) P/S.2: Hans W. Schlegel (Germany) P/S.2: P304/R164/M144 P/S.2: Hans W. Schlegel (Germany) P/S.2: P304/R164/M144 P/S.2: Hans W. Schlegel (Germany) P/S.2: P304/R164/M144 P/S.2: P304/R164/M12 P/S.2: P304/R164/M12 P/S.2: P304/R164/M12 P/S.2: P304/R164/M12 P/S.2: P304/R164/M12 P/S.2: P304/R164/M12 P/S.2: P304/R164/M12 P/S.2: P304/R164/M12 P/S.2: P304/R164/M12 P/S.2: P/S.2: P304/R164/M12 P/S.2: P/S.2: P304/R164/R12 P/S.2: P/S.2: P/S.2: P/S.2: P/S.2: P/S.2: P/S.2: P/S.2: P/S.2: P/S.2: P/S.2: P/S.2: P/S.2: P/S.2: P/S.2: P/S.2: P/S.2: P/S.2: P/S.2: P/S.2: P/S.2: P/	vas scrubbed on 3/18/93 shortly after ause of Delta launch scrub due to crubbed with a pad abort at T-3 3 (S.N. 2011) oxidizer preburner ure exceeded 50 psi limit. Oxidizer neckvalve (N9) failed to close due to on was made to replace all three rS-56 ahead of STS-55 (PAD abort es at pad. bed after tanking at L-6.5 hours due it test. ane. ALLU were go. DOLILU selected 2-plane margin at Mach 1.55. I I-load uplink #14. HANGES: dditional science. cause of forecast variable broken nding site to EDW concrete. <u>GE</u> : KSC to EDW. operational TIPS. with strategy to deploy at derotation <u>KLIES</u> : e spike at 69 seconds MET. ssure spike at 71 seconds. olems. tt fail transient. aft CRT), CRT-1 dim. er shell punctured. Used CWC for own (ice in core). ncorrect during first launch attempt.

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				LANDING SITE/	SSME-TL						
		CREW	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(6)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		ORDIT	FSW	WEIGHTS.	(LAUNCH SCRUBS/DELAYS,
	UNDITLK								1300		
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
				WINDS	ENG. S.N.						
STS-57	OV-105	<u>CDR</u> :	KSC 39B	KSC 33 (KSC 16)	104/104/	BI-059	28.45°	DIRECT		CARGO:	KSC W/D: OPF 52, VAB 16, PAD 51 = 119 days total.
	(Flight 4)	Ronald J. Grabe	172:13:07:21.95Z	182:12:52:16Z	109%	DCDM	(33)	INSERTION	(1)	29119 LBS	
SEQ FLT #56	Endeavour	(Flt 4 - STS 51-J, STS-30 & STS-42)	9:07:00 AM EDT (P) 9:07:22 AM EDT (A)	8:52:16 AM EDT	PREDICTED:	RSRM 32 KM		POST OMS-2:		PAYLOAD	LAUNCH POSTPONEMENTS: - Launch date was 5/10/93 then postponed to 5/18/93.
	Spacehab 1	P305/R76/V41/M70	Monday 9	Thursday 7	100/100/100/	JZ KIVI		252 X 212 NM		CHARGEABLE:	- Launch date was postponed from 5/18/93 to 6/3/93 because
KSC-56	Spacenab	1 303/10/04 1/10/10	6/21/93 (6)	7/1/93 (6)	67/104	ET-58		252 7 212 10101		19630 LBS	of STS-55 and STS-56 launch delays.
PAD	OMS PODS	PLT:	0/21/73 (0)	// // // (0)	0//104	21 30		NC3 BURN:		17030 203	- Launch date was postponed from 6/3/93 to 6/20/93 because
39B-20	LPO3-15	Brian Duffy	LAUNCH WINDOW:	DEORBIT BURN:	ACTUAL:	LWT		56 FPS		DEPLOYED:	SSME 3 HPOTP required changeout (QA electrochemical etch
MLP-2	RPO4-11	(Flt 2 - STŚ-45)	71M48S PLANAR/	182:11:41:42Z	100/100/100/	51		2:04:00:35 MET		132 LBS	marking found in a high stress area of HPOTP turbine bearing
	FRC5-4	P306/R142/V94/M126	PHASE WINDOW		72/104			257/251 NM			preload spring).
				<u>XRANGE</u> : 587 NM		<u>ET</u> _				NON-DEPLOYED:	
		M/S 1 (PAYLOAD CDR):	EOM PLS: KSC		1 = 2019(12)	<u>RPT</u>		<u>TI BURN</u> : 258 X 255 NM		18244 LBS	LAUNCH SCRUBS:
		G. David Low	TAL: BYD	ORBIT DIR: DL 29	2 = 2034 (2) 3 = 2017 (8)	ET		258 X 255 NM			 - 6/20/93 launch was scrubbed during hold at T-5 minutes when 71 minute 48 second launch window expired. All three TAL sites
		(Flt 3 - STS-32 & STS-43) P307/R110/V64/M98	TAL WX: BEIN, WRIN	AIM PT: CLOSE IN	3 = 2017(8)	<u>e i</u> BR/UP		ORB ADJ 3:		MIDDECK: 1254 LBS	were NO-GO (Banjul for thunderstorms and Ben Guerir and
		P307/R110/V04/10190	SELECTED:	AINTPT. CLUSE IN	M 3 EOM:	DR/UP		<u>3:19:01 MET</u>		1204 LD3	Moron for crosswind exceedences.)
		M/S 2:	RTLS: KSC15/CI/N	MLGTD [,] 2296 FT	WEIGHT:	ET		256 X 209 NM		SHUTTI F	woron for crosswing exceedences.
		Nancy J. Sherlock	TAL: BEN36/N/N	<u>MLGTD</u> : 2296 FT 182:12:52:16Z	224752 LBS	IMPACT		2007(207)		<u>SHUTTLE</u> ACCUMULATED	LAUNCH DELAYS:
		P308/R165/F21	AOA: EDW22/CI/N	VEL: 202 KGS	X CG:	LAT:		DEORBIT:		WEIGHTS:	- Launch delayed 22 seconds because of an intruder aircraft.
			PLS: EDW22/CI/N	207 KEAS	1081.1	16.09°N		256 X 208 NM		DEPLOYED:	Countdown was at T-5 minutes awaiting a GO for RTLS weather
		<u>M/S 3:</u>		HDOT: -1.0 FPS		LONG:				737233 LBS	when the aircraft entered KSC airspace (Launch danger area).
		Peter J. K. (Jeff) Wisoff	TDEL:	75 10514 005	LANDING:	142.90°W		VELOCITY:		NON-DEPLOYED:	T 11 110/
		P309/R166/M145	0.00 0.722/0.76	TD NORM 205:	WEIGHT:			25988 FPS		715721 LBS	TAL WX:
		M/S 4:	MAX Q NAV:	2461 FT	224468 LBS X CG:			ENTRY		CARGO TOTAL: 1670852 LBS	- Banjul was forecast and observed NO GO for ceiling and rain. Ben Guerir (selected) was forecast and observed GO. Moron
		Janice E. Voss	695 PSF 722 PSF	DRAG CHUTE	1082.5			RANGE:		1070032 LD3	was forecast NO GO for ceiling, rain, and crosswinds but was
		P310/R167/F22	075151 722151	DEPLOY: 175 KEAS	1002.5			4210 NM		PERFORMANCE	observed GO.
		1 310/110//1 22	SRB STG:	182:12:52:25Z				1210100		MARGINS (LBS)	
		EMU/TETHERED EVA:	<u>SRB STG</u> : 2:04 2:06							FPR: 3934	DOLILU/I-LOADS:
		EV 1: G. David Low		<u>NLGTD</u> : 7498 FT						FUEL BIAS: 1055	- Nominal I-loads were GO and selected because of better
		EV 2: Jeff Wisoff	<u>PERF</u> : NOMINAL	182:12:52:34Z						FINAL TDDP: 2030	Q-plane than DOLILU. No uplink required.
				VEL: 135 KGS	D		44/	E-	1	RECON: 2162	
		EVA 1 - 6/25/93	2 ENG TAL (BEN):	HDOT: -3.4 FPS	-		5 Million		1		FLIGHT DURATION CHANGES: 3 days extension
		5:50 Duration	2:33 2:37	BRK INIT: 101 KGS			1 0	DOPUK		PAYLOADS:	 Extended 1 day for additional science. Extended 1 day because of forecast low ceiling on rev 124 and
			NEG RETURN:	<u>DRK INT</u> . 101 KG3	in 😂					<u>PLB:</u> SPACEHAB-1	convective development and potential thunderstorms on rev
			3:45 4:07	DRAG CHUTE		Y				EURECA CAPTURE	
			1.07	JETTISON:				-2-1-	100	AND	- Extended 1 day because of forecast thunderstorms on revs
100			<u>PTA (U/S 395)</u> :	56 KGS	PT -			-		RETURN	139 and 140.
A A	* 200		4:10 4:12	182:12:52:57Z	the second secon	120	TIEN	and the second	24	SHOOT, GBA,	
e e	1	(A)					(S)		13	CONCAP-IV	FIRSTS/LASTS:
E	X	T	PTM (U/S 427):	AVE BRK DECEL:							 Last flight of TAGS, next to last flight of teleprinter. First flight of the improved APU controller (APU #2).
SF			5:32 5:31	4.4 FPS/S				And Andrew		MIDDECK: FARE	- First flight of the improved APU controller (APU #2). - Last flight of drag chute without ribbons removed. (Was
<	18 3		MECO CMD:	WHEELS STOP:		AL-JA		CONSULT.		AMOS	second flight with 90 percent reefed).
8	100		8:32.47 8:33	182:12:53:21Z		14 Color				SAREX-II	scona myrit with zo percent recied).
			0.00	12251 FT			and the second			5E/(II	EVENTS:
GR	ARE		<u>VI</u> :	-						4 CRYO TK SETS	- Started EVA at 3:23:59:51 MET (planned 4 hours). David Low pushed on EURECA antenna and ESOC commanded latches.
	DU.		26028 26025					7-01 Front			pushed on EURECA antenna and ESOC commanded latches.
				9955 FT	left to rig	ht: Wiso	ff/MS3	, PLT_Duffy	<i>'</i> .	RMS 31	David had to move antennas in "z" to get them latched Both
			<u>OMS-2</u> :	65 SEC				to right): CD		(S.N. 303)	antennas confirmed latched at EVA time of 2:25, when they
		Continued	42:11.7 42:13	Continued						RMS used to grapple	started the scheduled EVA DTO 1210. (EURECA deployed on
		Continued	318 FPS 316 FPS	Continued	Grabe, S		INIS2 a	nd		and berth EUŘECA and EVA DTO	STS-46
					Low/MS	1/PLC.					Continued
				1							OUTRITINOUT

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FLT NO.	ORBITER	CREW (6) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE ENG. S.N.	SRB RSRM AND ET	INC	orbit Ha/Hp	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-57 Continued	Earth Obs	Continued SPACE SHUTTLE EVA #21 SCHEDULED EVA #17 REFINE EVA TRAINING CONCEPTS AND DEMON- STRATE EVA TECHNIQUES FOR FUTURE EVA'S. ADDED UNSCHEDULED MANUAL LATCHING OF EURECA ANTENNAS MCC FCR-1 (35) FLIGHT DIRECTORS: A/E - J. W. Bantle LD/O 1 - G. A. Pennington O 2 - P. L. Engelauf PLNG - R. M. Kelso MOD - G. E. Coen		Continued <u>WINDS</u> : H6, L2 KTS OFFICIAL: H10, L2 <u>DENS ALT</u> : 1571 FT <u>FLT DURATION</u> : 9:23:44:54 <u>S/T</u> : 375:23:12:22 <u>OV-105</u> : 32:19:11:12 <u>DISTANCE</u> : 4,118,037 sm				1993-07-01 in OV-105's			Continued <u>RENDEZVOUS #14</u> : - Rendezvous with EURECA for capture, retrieval, and return. <u>SIGNIFICANT ANOMALIES</u> : - O ₂ manifold valve tank 1 failed to close. - Fuel cell 3 H ₂ reactant valve failed to close. - PPO2 sensor B is biased low. - MCA logic MCA power AC3 3-phase mid 4 CB anomaly. - AC3 phase-to-phase short/Spacehab PDU fuses blown and replaced (command error). - Mid starboard and aft port floodlights failure. - EVA waist tether small tether hook failure. - Leaking EMU 1200-series battery. - RMS grapple fixture/EURECA thermal control unit switch problem (installed reversed). - Jet RSD heater failed on. - EURECA antennas failed to latch (crew manually latched them during planned EVA). - S-band intermittent forward and return links on lower left quad antenna. - Ammonia boilers failed to cool post landing.



ABOVE: STS057-80-09 --- Agriculural development in Rio Bermejo, Argentina. BELOW: STS057-73-075 --- Eastern Mediterranean, Nile River, Asia Minor -

looking north over the Nile.

STS057-93-052 1993-07-01 EURECA is retrieved by RMS to be stowed in PLB for return to earth.



sts057-s-089 -- Post mission in the MCC are Greg Smith/FAO (Flight Activities Officer), holding mission plaque, and CAPCOM Curt Brown (right).

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		CREW		LANDING SITE/	SSME-TL	CDD		ODDIT			
FLT	ORBITER	(5)	LAUNCH SITE, LIFTOFF TIME,	RUNWAY, CROSSRANGE	NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-51	OV-103 (Flight 17)	CDR: Frank L. Culbertson	KSC 39B 255:11:44:59.97Z	KSC 15 (KSC 17) 265:07:56:06Z	104/104/ 109%	BI-060	28.45° (34)	DIRECT INSERTION	OI-22 (2)	<u>CARGO</u> : 46685 LBS	KSC W/D: OPF 57, VAB 8, PAD 69 = 134 days total.
SEQ FLT #57 KSC-57	OMS PODS LPO1-20	(Fit 2 - STS-38) P311/R116/V95/M104 PLT:	7:45:00 AM EDT (P) 7:45:00 AM EDT (A) Sunday 7 9/12/93 (4)	3:56:06 AM EDT Wednesday 6 9/22/93 (6)	<u>PREDICTED:</u> 100/104/104/ 67/104	RSRM 33 ET-59	(34)	POST OMS-2: 161.1 X 160.3 NM	(2)		LAUNCH POSTPONEMENTS: - Launch date was 2/22/93 as of 6/28/91 but was postponed to 6/30/93 on 7/32/92 to reflect changes in manifest. - 6/30/93 launch was postponed to 7/13/93 on 3/31/93 based on STS-55 STS-56, and STS-57 Jaunch delays
<u>PAD</u> 39B-21 MLP-3	RPO3-18 FRC3-17	William F. Readdy (Flt 2 - STS-42) P312/R140/V96/M125	LAUNCH WINDOW: 1H55M ACTS/TOS RAAN ORBIT 23A	DEORBIT BURN: 265:06:55:30Z XRANGE: 89 NM	<u>ACTUAL</u> : 100/104/104/ 69/104	LWT 52		ACTS/TOS DEPLOY: 0/7:58:09		<u>DEPLOYED</u> : 26889 LBS	LAUNCH POS1PONEMENTS: - Launch date was 2/22/93 as of 6/28/91 but was postponed to 6/30/93 on 7/32/92 to reflect changes in manifest. - 6/30/93 launch was postponed to 7/13/93 on 3/31/93 based on STS-55, STS-56, and STS-57 launch delays. - 7/13/93 launch was postponed to 7/17/93 because of STS-57 launch delays. (See 7/17/93 and 7/24/93 scrubs below.) - 8/4/93 launch date was postponed on 7/30/93 to avoid Perseid Meteoroid (Comet Swift-Tuttle) event on 8/11/93. Launch rescheduled for 8/12/93. (See 8/12/93 or 9/3/93 to allow ACTS/TOS to complete a review/analysis of transistor alert (suspected as potential cause of NOAA-1 and MARS Observer
		<u>M/S 1</u> : James H. Newman P313/R168/M146	<u>EOM PLS</u> : KSC <u>TAL</u> : BYD <u>TAL WX</u> : BEN	<u>ORBIT DIR</u> : DL 30 <u>AIM PT</u> : CLOSE IN	$\begin{array}{l} 1 = 2030 \ (9) \\ 2 = 2033 \ (4) \\ 3 = 2032 \ (2) \end{array}$	<u>et</u> <u>RPT</u> <u>ET</u> <u>BR/UP</u>		MET (P) 0/9:28:28 MET (A) 173.5 X 160.9		MIDDECK:	ACTS/TOS to complete a review/analysis of transistor alert (suspected as potential cause of NOAA-I and MARS Observer failures).
		<u>M/S 2</u> : Daniel W. Bursch P314/R169/M147 M/S 3:	<u>Selected</u> : <u>RTLS</u> : KSC15/CI/N <u>TAL</u> : BEN36/N/N AOA: EDW22/CI/N	MLGTD: 2099 FT 265:07:56:06Z VEL: 198 KGS 194 KEAS HDOT: -1.0 FPS	<u>M 3 EOM</u> : WEIGHT: 207043 LBS	<u>BR/UP</u> <u>ET</u> IMPACT LAT:		NM <u>ORFEUS-</u> SPAS_ DEPLOY:		1122 LBS <u>SHUTTLE</u> <u>ACCUMULATED</u> WEIGHTS:	LAUNCH SCRUBS/PAD ABORT #4: -7/17/93 launch was scrubbed at L-31 minutes. At approximately L-2 hours, nine "B" systems PIC's indicated they were charged (four on each SRB holddown post and one on ET
ERTSON	READDL	Carl E. Walz P315/R170/M148	<u>ADA</u> : EDW22/CI/N <u>PLS</u> : EDW22/CI/N <u>TDEL</u> : 0.16 0.322	<u>TD NORM 195</u> : 2080 FT DRAG CHUTE	X CG: 1084.8	<u>LAT</u> . 12.89°N <u>LONG</u> : 163.4°W		1/03:21:00 MET 164.6 X 147.2 NM		<u>DEPLOYED</u> : 764122 LBS <u>NON-DEPLOYED</u> : 724148 LBS	vent arm). - 7/24/93 launch was scrubbed at T-19 seconds with an RSLS breakout caused by right SRB tilt HPU underspeed. - 8/12/93 launch aborted at T-3 seconds when SSME #2 (S.N. 2033) fuel flow sensor A2 miscompared with sensor A1. (Pad
WALZ CON	NEWIMAN	SPACE SHUTTLE EVA #22 SCHEDULED EVA #18 DTO 1210 EVA OPERATIONS/	<u>MAX Q NAV:</u> 700 PSF 707 PSF	DEPLOY: 165 KEAS 265:07:56:16Z NLGTD: 6539 FT	WEIGHT: 206932 LBS X CG: 1086.5			<u>ORFEUS-SPAS</u> GRAPPLE: 7/00:05 MET		<u>CARGO TOTAL</u> : 1717537 LBS PERFORMANCE	Abort #4.) Launch reset to 9/10/93. Replaced all 3 engines at pad. TAL WX: Banjul (prime) was forecast and observed NO-GO - ceiling. Ben Guerir (selected)was forecast and observed GO.
* * * * * But	RSCH	PROCEDURES/TRAINING FOR FUTURE EVA'S EMU/TETHERED EVA:	<u>SRB STG</u> : 2:04.6 2:05.0 <u>PERF</u> : NOMINAL	265:07:56:21Z VEL: 144 KGS HDOT: -3.9 FPS <u>BRK INIT</u> : 113 KGS	Top: STS Newman evaluate t	& Walz		<u>DEORBIT:</u> 166 X 141 NM <u>VELOCITY</u> : 25794 FPS		<u>MARGINS (LBS)</u> : FPR: 3934 FUEL BIAS: 1055 FINAL TDDP: 1358	DOLILU/I-LOADS: Both nominal and DOLILU I-loads were GO but DOLILU was selected and uplinked to provide a slight increase in performance and drainback time. DOLILU uplink #8, I-load uplink #15.
STS051-4	1 <mark>4-005</mark>	EV 1: Carl Walz EV 2: Jim Newman 9/16/93 7:05:28 Duration		DRAG CHUTE JETTISON: 47 KGS 265:07:56:43Z	servicing Bottom: S First nigh	mission. STS051(S	S)158	<u>ENTRY</u> RANGE:		RECON: 1273 <u>PAYLOADS</u> : <u>PLB</u> :	FLIGHT DURATION CHANGES: - Waved off rev 142 landing at KSC because of rain within 30 nm. Extended flight 1 day minus 1 rev. (Total extension
In-flight cr portrait (It	to rt):	MCC FCR-1 (36)	<u>NEG RETURN</u> : 3:56 3:59	AVE BRK DECEL: 6.9 FPS/S	KSC.			4250 NM		ACTS/TOS (DEPLOYED) ORFEUS-SPAS	15 revs.) FIRSTS: - First flight of drag chute with five ribbons removed.
PLT Read Bursch/M Culbertso	S, CDR	FLIGHT DIRECTORS: A/E - R. D. Jackson LD/O 1 - R. E. Castle O 2 - R. M. Kelso	<u>PTA (U/S 245)</u> : 5:15 5:07 PTM (U/S 245):	WHEELS STOP: 265:07:56:56Z 10370 FT ROLLOUT:			8.4			(DEPLOYED AND RETRIEVED) LDCE (2 CANS)	First flight of drag chute with five ribbons removed. First flight with night landing at KSC. First flight with wake up music (used Heartbreak Hotel by Carl Walz) sung by a crewmember. First flight with two U.S. and two Russian EVA's at same time.
Walz/MS Newman/		PLNG - N. W. Hale MOD - B. R. Stone	6:12 6:06	8271 FT 50 SEC				100 M		<u>MIDDECK</u> : IMAX	EVENTS: Fuel cell 1 shut down for 24 hours for DTO 412.
	ni= <u>jak</u> a		MECO CMD: 8:28.15 8:29.8	<u>WINDS:</u> T2, L1 KTS OFFICIAL:						CPCG - BLOCK-II CHROMEX, HRSGS-A, APE-B,	RENDEZVOUS #15: - Rendezvous with ORFEUS-SPAS for grapple, berth, and return.
				H2, L1 <u>DENS ALT</u> : 1049 FT			- 7			IPMP, RME-III, AMOS	NIGHT LANDING: Space Shuttle #6, first night landing at KSC. SIGNIFICANT ANOMALIES:
- F	(or de		<u>OMS-2</u> : 39:53.7 39:53.7 222 FPS 222 FPS	FLT DURATION: 9:20:11:06 236:11:06						4 CRYO TK SETS RMS 32 (S.N. 201)	Right SRB till HPU underspeed problem. (Scrub #2.) SSME #2 fuel flow sensor A2 failed low. (Scrub #3.) FA2 MDM BITE. ECOM-01 - Loose thermal blanket on aft bulkhead.
		State -		<u>S/T</u> : 385:19:23:28 <u>OV-105:</u> 109:13:02:15		5	1			RMS USED FOR SPAS DEPLOY,	- PSA slider door stuck open.
- 31				DISTANCE: 4,106,411 sm			iter bi	-		GRAPPLE AND REBERTH	Thruster R1R chamber pressure transducer failure (post-flight found fuel/oxidizer reaction products (FORP) in tube.) TOS SuperZip damage, both detonation cords fired simultaneously damaging 1307 bulkhead and PLB blankets. Humidity separator B water carryover.

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		CREW		LANDING SITE/	SSME-TL	CDD		ODDIT		DAVILOAD	
EL T	ODDITES	(7)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT	FOW	PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER		LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		114/115	FSW		(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
070	01/ 102			WINDS	ENG. S.N.		20.00	DIDECT		CARCO	
STS-58	OV-102 (Flight 15)	CDR: John E. Blaha	KSC 39, PAD B 291:14:53:09.97Z	EDW 22 CONC (EDW 39, CONC 20)	104/104/ 109%	BI-061	39.0°	DIRECT INSERTION		<u>CARGO</u> :	KSC W/D: OPF 82, VAB 17, PAD 28 = 127 days total.
	Columbia	(Flt 4 - STS-29,	291:14:53:09.97Z 10:53:00 AM EDT (D)	(EDW 39, CONC 20) 305-15-05-427	109%	RSRM	(2)	INSERTION	(3)	32011 LBS	
SEQ FLT #58	Columbia	STS-33 & STS-43)	10:53:00 AM EDT (P) 10:53:10 AM EDT (A)	7:05:42 AM PST	PREDICTED:	34		POST OMS-2:		PAYLOAD	LAUNCH POSTPONEMENTS: - Launch date was 8/25/93 as of 7/31/92.
KSC-58	SLS-2/LM	P316/R97/V48/M88	Monday 10	Monday 11	100/100/100/	0.		155 X 154 NM		CHARGEABLE:	- Postponed launch to 9/10/93, then 10/7/93 because of STS-55,
			10/18/93 (7)	11/1/93 (8)	67/104	ET-57				23127 LBS	STS-56, STS-57, and STS-51 launch delays.
<u>PAD</u> 39B-22	13th	PLT:		DEORBIT BURN	A OT1141						Postponed launch to 10/14/93 to replace two APU's.
39B-22	Spacelab	Richard A. Searfoss P317/R171/M149	LAUNCH WINDOW: 2H30M, CTOB	DEORBIT BURN: 305:14:05:30Z	<u>ACTUAL</u> : 100/100/100/	LWT 50				<u>DEPLOYED</u> : 0 LBS	
MLP-1	Flight	P317/R171/W1149	ZH30W, CTOB	XRANGE: 144 NM	69/104	วบ				U LBS	LAUNCH SCRUBS: Scrubbed 10/14/93 launch at 16:57:20Z while holding at T-
	Long	M/S 1 (PAYLOAD CDR):	EOM PLS: EDW			FT				NON-DEPLOYED:	31 seconds when drainback time expired with 25M40S left in
	Module 9	M. Rhea Seddon	TAL: BEN	<u>ORBIT DIR</u> : DR 9	1 = 2024 (7)	<u>et</u> Pred				23127 LBS	launch window. Scrub caused by range safety command
		(Flt 3 - STS 51-D	<u>TAL WX</u> : MRN, ZZA	<u>aim pt</u> : Nominal	2 = 2109 (11)	RPT		DEORBIT:			Jaunch window. Scrub caused by range safety command system problem, and KSC weather caused lengthy hold. - Scrubbed 10/15/93 launch caused by S-Band PM
	EDO 2	& STS-40)		MLGTD: 3380 FT 305:15:05:42Z VEL: 205 KGS 198 KEAS	3 = 2018 (11)	LH2		151 X 136 NM		MIDDECK:	- Scrubbed 10/15/93 launch caused by S-Band PM
	OMS PODS	P318/R55/V63/F5	<u>SELECTED</u> : <u>RTLS</u> : KSC33/N/N	305:15:05:42Z	M 3 EOM:	TK RPT		VELOCITY:		1373 LBS	transponder 2 problem. Rescheduled launch for 10/18/93 to change out transponder.
	LP05-4	<u>M/S 2</u> :	TAL: BEN36/N/N	VEL: 205 KGS 198 KEAS	<u>IVI 3 EUIVI</u> .	AT		25755 FPS		SHUTTLE	
	RP05-4	William S. McArthur	AOA: FDW22/N/N	HDOT: -2.2 FPS		285.2K		20/00/11/0		ACCUMULATED	LAUNCH DELAYS:
	FRC2-15	P319/R172/M150	PLS: EDW22/N/N	TD NORM 205:	229481 LBS			ENTRY		WEIGHTS:	- 10/18/93 launch delayed 10 seconds at T-5 minutes because
				2800 FT		LO2 TK		RANGE:		DEPLOYED:	of intruder aircraft in launch area.
BLAH	A	M/S 3:	TDEL: 0.00 0.82/0.12	DRAG CHUTE	X CG:	RPT		4378 NM		764122 LBS NON-DEPLOYED:	
5 00	a c	David A. Wolf P320/R173/M151	0.00 0.82/0.12	<u>DRAG CHUTE</u> <u>DEPLOY:</u> 173 KEAS	1078.8	AT 283K				<u>NON-DEPLOYED</u> : 747275 LBS	TAL WX: - Ben Guerir - prime and selected, Moron forecast and observed
S.C.G		1 320/10173/101131	MAX Q NAV:	305:15:05:51Z		FT				CARGO TOTAL:	GO, Zaragoza forecast and observed NO-GO - rain.
S. A. Ha	8	<u>M/S 4</u> :	687 PSF 684 PSF	<u>NLGTD</u> : 6948 FT 305:15:05:53Z VEL: 167 KGS HDOT: -3.7 FPS	LANDING:	<u>ET</u> IMPACT				1749548 LBS	
1 200		Shannon W. Lucid		305:15:05:53Z		1:25:22					DOLILU/I-LOADS:
SE CAR		(Flt 4 - STS 51-G,	<u>SRB STG</u> : 1:58.9 1:59	HDOT: -3.7 FPS	WEIGHT:	MET				PERFORMANCE	- Nominal I-loads were selected.
800	PE	STS-34 & STS-43) P321/R65/V45/F6	1:58.9 1:59	BRK INIT:	229369 LBS	<u>LAT</u> : 3.9°N				MARGINS (LBS): FPR: 3934	FLIGHT DURATION CHANGES: None.
LUCID	WOLF	F 32 1/R03/V43/1 0	PERF: NOMINAL	138 KGS	X CG:	LONG:				FUEL BIAS: 1055	TEIGHT DORATION CHANGES. None.
		P/S 1:		DRAG CHUTE	1080.4	173.8°W				FINAL TDDP: 767	EVENTS: Special attitude flown for OARE data on FD 12.
		Martin J. Fettman	<u>2 ENG TAL (BEN)</u> :	JETTISON:						RECON: 1114	
STS058-1	6-008	P322/R174/M152	2:50 2:53	47 KGS 305:15:06:25Z							RECORDS:
Clockwise	e from	Colorado State University								PAYLOADS:	- Longest Shuttle flight - 14:00:12:32 - exceeds STS-50 by
top: Sedd		MCC FCR-1 (37)	<u>NEG RETURN</u> : 4:02 4:06	AVE BRK DECEL: 5.5 FPS/S						<u>PLB:</u> SPACELAB	4H42M28S (only exceeded by SKYLAB flights). - Shannon Lucid set Shuttle flight time record - 34:22:52:09.
Lucid/MS			1.02 4.00							LIFE SCIENCES	Ŭ
McArthur/		FLIGHT DIRECTORS:	<u>PTA (U/S 218)</u> :	WHEELS STOP: 305:15:06:44Z						(SLS-2/LM)	SIGNIFICANT ANOMALIES:
Fettman/F		A/E - N. W Hale	5:30 5:30	13020 FT	OTOOLO C		000 40			Cardiovascular/	- S-band transponder 2 uplink failure on second launch attempt
		LD/O 1 - L. J. Ham	DTM (U/C 210).	ROLLOUT:				-30 SPACEL	LAR-	Cardiopulmonary,	(changed out for flight). - S-Band FM transmitter power output degraded.
Wolf/MS,		O 2 - P. L. Engelauf O 3 - G. E. Coen	<u>PTM (U/S 218)</u> : 6:19 6:18	9640 F I 62 SEC	2 in PLB f	lys over	northe	ast Egypt.		Neurovascular, and Regulatory	- S-Band FM transmitter power output degraded. - Engine 1 and 2 dome-mounted heat shield blanket damage.
Searfoss,	& CDR	O 4 - J. F. Muratore	0.17 0.10				1			Physiology	- External tank intertank acreage loss of TPS.
Blaha.		MOD - A. L. Briscoe	MECO CMD:	WINDS:				A BISTON		Experiments	- Water leak at WSC/odor/bacteria filter, switched to WCS fan
			8:33.5 8:36	T2, RT KTS OFFICIAL:	and a start			- Participant			sep 2 (low torque), performed IFM using wand to remove
	-		N/I	T2, R2	There are a second			1 and the		MIDDECK:	water.
			<u>VI</u> : 25867 25862	<u>DENS ALT:</u> 1827 FT		- Electron		all the second		SAREX-II	 False low battery beep from AIU. Payload recorder tape broke during track change.
acin in	All States		2007 20002	1827 FT		and the second	-	13.5		4 CRYO TK SETS	- Spacelab overhead container OH5 iammed.
	Al	à d'anna anna	<u>OMS-2</u> :	FLT DURATION:	Tarrante	A REAL PROPERTY AND INCOMENTS OF	- Company	and the		+ 4 EDO SETS	- LOMS PC failed off scale low.
1 254 - 11	A STAN		/1./1 /1.55	14.00.12.32		- Carlos	and the second	Color and			- RAHF-7 quad temps high - FCL FPV to P/L.
		A CONTRACTOR	200 FPS 198 FPS	336:12:32						NO RMS	
	MA ST			<u>S/T</u> : 399:19:36:00							
at a	41	Mar Mit Mark		<u>OV-102:</u>							
	Ser 1			122:17:33:12			N/R	N.			
	0	born and		DISTANCE: 5,840,450 sm		-	E & B	1000			
(A) The		Li ti Alita		3,040,430 311	5.0	AND CONTRACT					
L			1					· · · · · · · · · · · · · · · · · · ·			

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		CREW	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(7)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		ORDIT	FSW	WEIGHTS.	(LAUNCH SCRUBS/DELAYS,
NO.			LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		TITLE, NAMES & EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
				WINDS	ENG. S.N.						
STS-61	OV-105	CDR:	KSC 39, PAD B	KSC 33 (KSC 18)	104/104/	BI-063	28.45°	DIRECT		CARGO:	KSC W/D: OPF 103, VAB 6, PAD 33 = 142 days total.
	(Flight 5) Endeavour	Richard O. Covey (Flt 4 - STS 51-I,	336:09:26:59.95Z	347:05:25:33Z 00:25:33 AM EST	109%	RSRM	(35)	INSERTION	(4)	24363 LBS	
SEQ FLT #59	LINGAVOU	STS-26 & STS-38)	4:27:00 AM EST (P) 4:27:00 AM EST (A)	00.23.33 ANI L31	PREDICTED:	23		POST OMS-2:		PAYLOAD	LAUNCH POSTPONEMENTS: - Launch date was 12/2/93 as of 7/17/92.
	OMS PODS	P323/R73/V30/M67	Thursday 15	Monday 12	100/100/100/			308.4 X 214.4		CHARGEABLE:	- Launch date was changed to 12/7/93, then 12/2/94, then
KSC-59	LPO3-16 RPO4-12	<u>PLT</u> :	12/2/93 (4)	12/13/93 (7)	74/104	ET-60		NM		17401 LBS	12/1/93 on 10/25/93. - Moved from Pad A to Pad B to protect payload from
ΡΔΠ	FRC5-5	Kenneth D. Bowersox	LAUNCH WINDOW:	DEORBIT BURN:	ACTUAL:	LWT		RNDZ		DEPLOYED:	contamination caused by Pad A sandblasting.
PAD 39B-23		(Flt 2 - STS-50) P324/R146/V97/M130	67 MINUTES,	347:04:14:45Z	100/100/100/	53		BRAKING:		2308 LBS	, , , , , , , , , , , , , , , , , , , ,
MLP-2		P324/R146/V97/IVI130	PLANAR WINDOW	XRANGE: 3 NM	73/104	ст		1:22:34:49 MET 319.6 X 313.4		NON-DEPLOYED:	LAUNCH SCRUBS: - 12/1/93 launch was scrubbed while holding at T-5 minutes
		M/S 1 AND EV3:	<u>EOM PLS</u> : KSC	ARAINGE. S INIVI	1 = 2019 (13)	<u>et</u> Pred		NM		14428 LBS	when 67-minute window expired. Primary causes of delay were
		Kathryn C. Thornton (Flt 3 - STS-33 & STS-49)	TAL: BYD	ORBIT DIR: AR 6	2 = 2033(5)	RPT					RILS crosswind exceedence and rain within 20 nm. Other
		P325/R107/V73/F11	<u>TAL WX</u> : BEN,MRN		3 = 2017 (9)	285 K		ARRAY		MIDDECK: 665 LBS	factors were BLAST, COLA, ceiling violation (6.5K broken), and
		<u>M/S 2</u> :	SELECTED:	<u>AIM PT</u> : NOMINAL	<u>M 3 EOM</u> :	FT		<u>JETTISON</u> : 3:19:26:00 MET		005 LBS	intruder ship in SRB recovery area.
		Claude Nicollier	RTLS: KSC15/N/N	<u>MLGTD</u> : 2903 FT	WEIGHT:	<u>et</u> Br/up		320.5 X 313.2		<u>SHUTTLE</u>	LAUNCH DELAYS: None.
		(Flt 2 - STS-46)	<u>TAL</u> : BEN32/N/SF <u>AOA</u> : EDW04/N/N	347:05:25:33Z	212947 LBS	214 K		NM		ACCUMULATED	TAL WX:
		P326/R150/V98/M134	<u>AOA</u> : EDW04/N/N <u>PLS</u> : EDW04/N/N	VEL: 192 KGS 201 KEAS	X CG: 1078.9	ET		HST		WEIGHTS: DEPLOYED:	- Banjul, Ben Guerir, and Moron all forecast and observed GO.
		Switzerland		HDOT: -1.7 FPS		IMPACT		<u>REBOOST</u> : 6:16:59:23 MET		766430 LBS	
		M/S 3 AND EV 1:	<u>TDEL</u> : 0.32 0.402/.44		LANDING:	1:29:01		6:16:59:23 MET		NON-DEPLOYED:	DOLILU/I-LOADS: - DOLILU uplink #9, I-load uplink #15.
		Jeffrey A Hoffman (Flt 4 - STS 51-D,	0.32 0.402/.44	<u>TD NORM 195</u> : 3415 FT	WEIGHT: 212836 LBS	MET LAT:		321.7 X 320.8 NM		762368 LBS	
		STS-35 & STS-46)	<u>MAX Q NAV:</u> 701 PSF 705 PSF		X CG:	<u>16.4</u> °N				<u>CARGO TOTAL:</u> 1773911 LBS	NIGHT LAUNCH: Shuttle night launch #9.
		P327/R57/V59/M52	701 PSF 705 PSF	DRAG CHUTE	1080.6	<u>LONG</u> : 142.1°W		<u>DEORBIT</u> : 320.4 X 319.3		DEDEODMANOE	FLIGHT DURATION CHANGES:
		M/S 4, P/L CDR & EV 2:	<u>SRB STG</u> :	DEPLOY: 170 KEAS 347:05:25:41Z		142.1 VV		320.4 X 319.3 NM		PERFORMANCE MARGINS (LBS):	- Shortened flight one rev because cloud cover forecast to move
		F. Story Musgrave	2:05.6 2:07							FPR: 3981	in at nominal landing time.
		(Flt 5 - STS-6, STS 51-F, STS-33 & STS-44)		<u>NLGTD</u> : 6635 FT 347:05:25:45Z				VELOCITY: 26096 FPS		FUEL BIAS: 987 FINAL TDDP: 927	FIRSTS:
		(P328/R15/V19/M15	<u>PERF</u> : NOMINAL	VEL: 148 KGS				20090 FPS		RECON: 554	 First flight with four EVA crewmembers. First flight with five EVA's (alternating crew on alternating
		M/S 5 AND EV 4:	<u>2 ENG TAL (BYD)</u> : 2:08 2:07	HDOT: -3.5 FPS				<u>ENTRY</u>			days).
		Thomas D. Akers	2:08 2:07					RANGE: 4220 NM		PAYLOADS:	- Minimum shuttle crossrange (3 nm).
		(Flt 3 - STS-41 & STS-49)	NEG RETURN:	<u>BRK INIT</u> : 118 KGS						<u>PLB</u> : HUBBLE SPACE	RENDEZVOUS #16:
		È329/R115/V74/M103	4:04 4:07	DRAG CHUTE	STS061-0					TELESCOPE	- Rendezvous with HST for grapple, berth, repair, and deploy.
COVE	BOWED			JETTISON: 49 KTS				ey, Nicollier/M	IS,	(HST) SERVICING	
S.	1		<u>PTA (U/S 500)</u> : 4:02 4:07	347:05:26:08Z	Hoffman/N	VIS, PLT	Bowers	SOX,		MISSION (SM-1) (REPLACEMENT	<u>NIGHT LANDING</u> : Space Shuttle #7, second night landing at KSC.
g - :-				AVE BRK DECEL:	Thornton/	ivis, and	Akers/	WS.		HARDWARE)	
N .		35	<u>PTM (U/S 500)</u> : 5:24 5:18	6.6 FPS/S						ICBC	SIGNIFICANT ANOMALIES: - Aft mission timer circuit breaker popped.
	A ··	2	5:24 5:18	WHEELS STOP:	Do 1 4				17	MIDDECK:	- In-suit drink bags leaked.
2		7	MECO CMD:	347:05:26:26Z					10	IMAX	- Large in-suit drink bags not stowed.
	THO		8:32.8 8:31.9	10825 FT					N.	AMOS	- EMU 3 intermittent loss of 298.6 receive and all hardline comm. - HST power tool S.N. 1001 failed.
	COLLIER		VI:	ROLLOUT:		×. 1			15	5 CRYO TK SETS	- HST power tool S.N. Tool Talled. - EMU 2 failed 0.5 psi leak check.
L			<u>26</u> 123 26115	7922 FT	11	1 Ar	L'AND		11		Y star tracker temporary loss.
		MCC FCR-1 (38) FLIGHT DIRECTORS:	OMS 2	53 SEC	-EA		196		21	RMS 33	- APU 2 gas generator/fuél pump heater failure. - Right OMS helium tank pressure transducer P2 bias
		A/E - R. D. Jackson	<u>OMS-2</u> : 42:39 43:30	WINDS:				11	1	(S.N. 303)	- Aught Owis helium tank pressure transducer P2 bias
		LD/O 2-EVA - J. M. Heflin	322 FPS 324 FPS	6H, 0X KTS				11-12-1	Sec. 1	RMS USED FOR	- Loss of biomed data on EMU 2 during EVA #5.
		O 2-SYS - J. W. Bantle O 1 - R. E. Castle	TCO	OFFICIAL:		3 125	· ····	1000ad		HST GRAPPLE,	- +V2 solar array outer bi-stem bowed, hence jettisoned old
		PLNG - J. F. Muratore	<u>TGO</u> : 3:18 3:20	H7, L1		2.12	1 -		1	SERVICE, AND DEPLOY, AND EVA	array. - Missing TPS on forward edge of RSRM RH forward center
		MOD - B. R. Stone	5.10 5.20	Continued			21	10: - 1	1000	WORK PLATFORM	segment.
		Continued									
		oonandou		1	1	1				1	

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										1 age 2-71 - 010-01
FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM	ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-61		Continued		Continued	and the second s					
Continued		EMU/TETHERED EVA'S: EVA #1 - 12/4/93 SPACE SHUTTLE EVA #23 SCHEDULED EVA #19 BY EV 1 & EV 2 REPLACED RSU'S 2 & 3, ESU'S 1 & 3 AND RELATED GYRO FUSE PLUGS. 7H53M57S		<u>DENS ALT</u> : -1039 FT <u>FLT DURATION</u> : 10:19:58:33 259:58:33 <u>S/T</u> : 410:15:34:33						
		EVA #2 - 12/5/93 SPACE SHUTTLE EVA #24 SCHEDULED EVA #20 BY EV 3 & EV 4 REPLACED BOTH SOLAR ARRAYS, OLD +V2 ARRAY JETTISONED 6H35M3S		<u>OV-105:</u> 43:15:09:45 <u>DISTANCE</u> : 4,433,772 sm	STOCAR	C 020 C				
		EVA #3 - 12/6/93 SPACE SHUTTLE EVA #25 BY EV 1 & EV 2 SCHEDULED EVA #21 REPLACED WIDE				is bert		our's pay	/load (for EV/	S061-94-050 Thornton on end of RMS eground) and Akers install COSTAR during A for HST repair.
		FIELD/PLANETARY CAMERA AND INSTALLED TWO MSS'S 6H47M28S					1993	3-12-09	061-90-028 After servicing, H new "Solar Wings	
		EVA #4 - 12/7/93 SPACE SHUTTLE EVA #26 BY EV 3 & EV 4 SCHEDULED EVA #22 REPLACED HIGH SPEED PHOTOMETER WITH COSTAR AND INSTALLED NEW COPROCESSOR 6H50M55S					HST Ga Bottom	laxy phot right: m1()_wfpcHSTBefor o before repairs. 00_smalHSTAfte o after repairs.	
		EVA #5 - 12/8/93 SPACE SHUTTLE EVA #27 BY EV 1 & EV 2 SCHEDULED EVA #23 REPLACED SOLAR ARRAY DRIVE ELECTRONICS, GHRS REDUNDANCY KIT, MLI CONTAMINATION KITS FOR MSS'S, AND MANUALLY OPERATED BOTH SOLAR ARRAY PRIMARY DEPLOYMENT MECHANISMS			, Di					
		7H20M4S		46 Hoffman or stalling Wide Fig PC II).		ry			J.	

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					SSME-TL						
		CREW	LAUNCH SITE,	LANDING SITE/ RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(6)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		UKDIT	FSW		(LAUNCH SCRUBS/DELAYS,
NO.	ORDITER		LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP	1.500	PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
110.		TITLE, NAMES	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S		WINDS	ENG. S.N.						
STS-60	OV-103	<u>CDR</u> :	KSC 39, PAD B	KSC 15 (KSC 19)	104/104/	BI-062	57°	DIRECT		CARGO:	KSC W/D: OPF 81 VAB 5, PAD 22 = 108 days total.
	(Flight 18)	Charles F. Bolden	34:12:09:59.965Z	42:19:19:22Z	109%	DODU	(14)	INSERTION	(5)	28957 LBS	
SEQ FLT #60	Discovery	(Flt 4 - STS 61-C STS-31 & STS-45))	7:10:00 AM EST (P) 7:10:00 AM EST (A)	2:19:22 PM EST	PREDICTED:	RSRM 35		POST OMS-2:		PAYLOAD	LAUNCH POSTPONEMENTS: - 10/31/93 launch date baselined on 7/31/92, later changed to
KSC-60	Spacehab 2	P330/R88/V52/M80	Thursday 16	Friday 6	100/104/104/	30		191 X 189 NM		CHARGEABLE:	10/21/93 and 11/10/93.
K3C-00	opuconau 2		2/3/94 (3)	2/11/94 (2)	70/104	ET-61				22296 LBS	- Postponed STS-60 to 1/20/94 and moved STS-61 ahead on
<u>PAD</u> 39A-37	OMS PODS	<u>PLT</u> :			A OTU AL			ODERACS			9/2/93 (KSC work flows would not allow two flights before
39A-37	LPO1-21 RPO3-19	Kenneth S. Reightler (Flt 2 - STS-48)	LAUNCH WINDOW: 2H30M CTOB	<u>DEORBIT BURN</u> : 42:18:18:45Z	ACTUAL: 100/104/104/	LWT 54		DEPLOY: 6:02:43:24 MET		DEPLOYED: 171 LBS	holidays).
MLP-3	FRC3-19	P331/R134/V99/M119			70/104	04		0.02.43.24 IVIE I		1/1 LDS	LAUNCH SCRUBS: None.
			EOM PLS: KSC	<u>XRANGE</u> : 376 NM		ET		<u>BREMSAT</u> DEPLOY:		NON-DEPLOYED:	
		<u>M/S 1:</u>	TAL: 7AROGO7A	<u>ORBIT DIR</u> : DL 31	1 = 2012 (15)	PRED		DEPLOY:		21015 LBS	LAUNCH DELAYS: None.
		N. Jan Davis	TAL ALT: MORON, BEN GUERIR	<u>AIM PT</u> : NOMINAL	$2 = 2034 (4)^{2}$ $3 = 2032 (2)^{2}$	<u>RPT</u> 285 K		06:07:13:40 MET		MIDDECK	TAL WX:
		(Flt 2- STS-47) P332/R153/V100/F17	DEN GUERIK	MLGTD: 2324 FT	5 = 2052 (2)	200 N				MIDDECK: 1110 LBS	- Zarogoza was prime but forecast NO GO for visibility (rain/fog)
			SELECTED:	MLGTD: 2324 FT 42:19:19:22Z VEL: 192 KGS		<u>et</u>					and 4K ceiling; hence, Ben Guerir was selected. ZZA was
		<u>M/S 2</u> :	RTLS: KSC33/CI/ N	205 KEAS	<u>M 3 EOM</u> :	<u>BR/UP</u> 214 K				SHUTTLE	observed GO.
		Ronald M. Sega P333/R175/M153	TAL: BEN36/N/N AOA: NOR17/N/N	HDOT: -2.3FPS	WEIGHT: 216663 LBS	214 K		<u>DEORBIT</u> : 194.4 X 189.1		ACCUMULATED WEIGHTS:	Moron forecast NO GO (headwinds and ceiling), observed NO GO (headwinds).
		P333/R173/W133	PLS: EDW04/N/N	TD NORM 195:	X CG:	FT		NM		DEPLOYED:	NO GO (Heauwinus).
		M/S 3:		3016 F I	1079.6	<u>ET</u> IMPACT				766601 LBS	DOLILU/I-LOADS:
1.000		Franklin R. Chang-Diaz	<u>TDEL</u> : 0.00 0.081/0.12	DRAG CHUTE DEPLOY: 172 KEAS		1:27:21		VELOCITY: 25858 FPS		NON-DEPLOYED:	- Both DOLILU and Nominal I-loads were GO. DOLILU was
* SEC	A * AD	(Flt 4 - STS 61-C,	0.00 0.081/0.12	DEPLOY: 172 KEAS 42:19:19:32Z	LANDING: WEIGHT:	MET		25858 FPS		784493 LBS	selected because they provided approx. 300 lbs performance
Ser 1	E TYPE	STS-34 & STS-46) P334/R89/V46/M81	MAX O NAV		216595 LBS	<u>LAT</u> : 2.69°N		ENTRY		CARGO TOTAL: 1802868 LBS	and 1.1-minute additional hold time. DOLILU uplink #10, total I- load uplink #16.
õ.		1 334/107/140/001	<u>MAX Q NAV:</u> 708 PSF 717 PSF	<u>NLGTD</u> : 7522 FT 42:19:19:41Z	X CG:	LONG:		ENTRY RANGE:		1002000 EDS	
		<u>M/S 4:</u>		VEL: 118 KGS	1081.3	123.2°W		4349 NM		PERFORMANCE	FLIGHT DURATION CHANGES:
		Sergei Krikalev	<u>SRB STG</u> : 2:05.3 2:06	HDOT: -4.1 FPS						MARGINS (LBS): FPR: 3981	- Extended flight one orbit because KSC was forecast NO GO
6	A STATE	(FIt 3 SOYUZ TM-7, MIR SOYUZ TM-12/MIR)	2:05.3 2:06	<u>BRK INIT</u> : 97 KGS						FUEL BIAS: 987	for ceiling and crosswinds
192 * 1	AVIS * the	Russian Cosmonaut	PERF: NOMINAL	DRAG CHUTE						FINAL TDDP: 110	FIRSTS:
		(P335/R176/M154		JETTISON:						RECON: 306	- First flight of Russian Cosmonaut on U.S. spacecraft (Krikalev's previous flights were Soyuz TM-7 and Soyuz TM-12
			<u>2 ENG TAL (BEN)</u> : 2:49 2:49	52 KGS 42:19:19:55Z	TA INC	-			-	PAYLOADS:	(Krikalev's previous flights were Soyuz TM-7 and Soyuz TM-12 with more than 1 year 3 months aboard Mir.)
		MCC FCR-1 (39)	2.47 2.47	AVE BRK DECEL:	. 6	20	1-0	245		PLB:	with more than 1 year 5 months aboard with.
			NEG RETURN:	6.2 FPS/S					1	PLB: WSF-1	SIGNIFICANT ANOMALIES:
		FLIGHT DIRECTORS:	4:03 4:06	WHEELS STOP:		, UL	1			SPACEHAB-2	- Supply H20 dump valve leak (several burps after water
STS060-1	15-003	A/E - J. W. Bantle LD/O 2/C. W. Shaw	PTA (U/S 350):	42:19:20:13Z	-6-	15		- In		CAPL-1 ODERACS/	dumps). - Unable to place diffuser cap into tunnel adapter.
SPACEH		O 1 - G. A. Pennington	<u>5:06</u> 5:12	10144 FT		AL SH	- many			BREMSAT	- O ₂ tank 2 quantity transducer erratic.
Payload E		PLNG - R. E Castle		ROLLOUT:		1.35	Sec. 1			GBA	- ARD nominal margin showed major thrust/mass difference with
- ayload L	y	MOD - G. E. Coen	<u>PTM</u> : N/A	7820FT 51 SEC	1920	de la	-m H			(WITH 4 GAS CANS)	on-board data. - Pilot HIU failed.
			IN/A			1 - 1	211-			CANS)	- Both MCC DVIS CPU's (A and B) went down).
313 120			MECO CMD:	WINDS: H11, R1					100	MIDDECK:	- Tunnel adapter stowage net, not stowed.
11 23	1 10	1 Martines	8:33.1 8:32.7	OFFICIAL: H20, R0				¥ /		SAREX-II	- Hassleblad shutter failed.
A A	1. 1.	and the second second	VI:							APE-B	 Payload retention latch SW 2 position indicated release instead of off.
12. A.	Che Martin in	At a large in T	25924 25916	<u>DENS ALT</u> : 1377FT	STSORO	31-028	Crew	squeezes		4 CRYO TK SETS	- Air/ground crosstalk from ICOM to A/G loop.
11月度。	12 Martin										- Air/ground crosstalk from ICOM to A/G loop. - Wakeshield horizon sensor signals bad, hence, did not deploy
State State State	S	a	<u>OMS-2</u> : 42:17 42:17	FLT DURATION: 8:07:09:22 199:09:22				CEHAB in		RMS 34	WSF resulting in limited scientific data.
· Sent 2		and the second	42:17 42:17 268 FPS 268 FPS	199:09:22				t upper right	•	(S. N. 201)	- WOW WONG anomaly.
1 Store		10 - 10 - 10	200110 200110	<u>S/T</u> : 418:07:43:55				him are:		RMS used for WSF	
				OV-103:	Sega/MS					deberth but did not	
	SPACE IN SAL			<u>OV-103:</u> 117:20:12:37	Diaz/PL0	C, Krika	alev/M	S & first		deploy because of WSF problems	
				DISTANCE:				ecraft, and P	۲LY	Wor provients	
				3,439,704 sm							

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		CREW		LANDING SITE/	SSME-TL						
FLT	ORBITER	(5)	LAUNCH SITE, LIFTOFF TIME,	RUNWAY, CROSSRANGE	NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS.
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION,	THROTTLE PROFILE	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
SEQ FLT #61 KSC-61 PAD 39B-24 MLP-1	s End Effec	CDR: John H. Casper (Fit 3 - STS-36 & STS-54) P336/R111/V86/M99 PLT: Andrew M. Allen (Fit 2 - STS-46) P337/R149/V101/M133 M/S 1 (PAYLOAD CDR): Pierre J. Thuot (Fit 3 - STS-36 & STS-49) P338/R112/V72/M100 M/S 2: Charles D. (Sam) Gemar (Fit 3 - STS-38 & STS-48) P339/R118/V67/M106 M/S 3: Marsha S. Ivins (Fit 3 - STS-32 & STS-46) P340/R109/V77/F12 MCC FCR-1 (40) FLIGHT DIRECTORS: A/E/T 1 - N. W. Hale LD/T 2 - P. L. Engelauf T 3 - C. W. Shaw T 4 - J. M. Heflin MOD - A. L. Briscoe tures activity with ctor (DEE) on RMS. Alcrogravity Payload	KSC 39, PAD B 63:13:52:59,97Z 8:53:00 AM EDT (P) 8:53:00 AM EDT (A) Friday 9 3/4/94 (4) LAUNCH WINDOW: 2H30M, CTOB EOM PLS: KSC TAL BEN TAL WX: MRN, ZZA SELECTED: RTLS: KSC33/CI/N TAL: BEN36/N/N AOA: KSC33/CI/N PLS: EDW04/N/N TDEL: 0:00 0.162/0.20 MAX Q NAV: 709 -708 SRB STG: 2:05 PERF: NOMINAL 2 ENG TAL (BEN): 2:41 2:44 NEG RETURN: <td>WINDS KSC 33 (KSC 20) 77:13:09:41Z 08:09:41 AM EST Friday 7 3/18/94 (4) DEORBIT BURN: 77:12:16:50Z XRANGE: 116 NM ORBIT DIR: DR 10 AIM PT: NOMINAL MLGTD: 2905 FT 77:13:09:41Z VEL: 210 KGS 207 KEAS HDOT: -3.4 FPS TD NORM 205: 2974 FT DRAG CHUTE DEPLOY: 166 KEAS 77:13:09:55Z NLGTD: 8764 FT 77:13:00:00Z VEL: 148 KGS HDOT: -3.7 FPS BRK INIT: 123 KGS DRAG CHUTE JETISON: 57 KGS 77:13:10:32Z AVE BRK DECEL: 7FPS/S WHEELS STOP: 77:13:10:35Z 13071 FT ROLLOUT: 10166 FT 54 SEC WINDS: 14, L3 KTS OFFICIAL: 1905P08 14, L</td> <td>ENG. S.N. 104/104/ 109% PREDICTED: 100/104/104/ 67/104 ACTUAL: 100/104/104/ 67/104 1 = 2031 (9) 2 = 2109 (12) 3 = 2029 (8) M 3 EOM: WEIGHT: 228360 LBS X CG: 1082.6 LANDING: WEIGHT: 228250 LBS X CG: 1084.1</td> <td>BI-064 RSRM 36 KM ET-62 LWT 55 ET <u>PRED</u> <u>RPT</u> 271K ET <u>BKUP</u> 214K ET <u>IMPACT</u> 1:27:04 MET LAT: 8.1°N LONG: 132.9°W</td> <td>39° (3)</td> <td>DIRECT INSERTION POST OMS-2: 163 X 161 NM OMS-3: 9:17:09:39 MET 33.4 FPS 161 X 180 NM OMS-4: 9:17:50:30 MET 37.6 FPS 140 X 140 NM OMS-5: 11:18:15:34 MET 37.6 FPS 140 X 105 NM DEORBIT: 138 X 105 NM VELOCITY: 25708 FPS ENTRY RANGE: 4391 NM</td> <td>(6)</td> <td>CARGO: 30016 LBS PAYLOAD CHARGEABLE: 19792 LBS DEPLOYED: 0 LBS NON-DEPLOYED: 0 LBS NON-DEPLOYED: 18512 LBS MIDDECK: 1280 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 766601 LBS NON-DEPLOYED: 766601 LBS NON-DEPLOYED: 766601 LBS NON-DEPLOYED: 766601 LBS NON-DEPLOYED: 766601 LBS NON-DEPLOYED: 766601 LBS NON-DEPLOYED: 804285 LBS CARGO TOTAL: 1832884 LBS PERFORMANCE MARGINS (LBS): FPR: 3981 FUEL BIAS: 987 FINAL TDDP: 871 RECON: 1795 PAYLOADS: PLB: U. S. Microgravity Payload (USMP-2) Solidification of metals and semiconductors dendritic growth OAST-2 Technology experiments DEE SSBUV/A LDCE MIDDECK: APCG, PSE, CPCG, CGBA, MODE,</td> <td> <u>KSC W/D</u>: OPF 62, VAB 5, PAD 19 = 86 days total. <u>LAUNCH POSTPONEMENTS</u>: 2/8/94 launch date baselined on 10/2/92. Postponed launch to 2/24/94 on 9/2/93. Postponed launch to 3/3/94 on 10/20/93. <u>LAUNCH SCRUBS</u>: Scrubbed 3/3/94 launch at L-16 hours because excessive RTLS winds were forecast. <u>LAUNCH DELAYS</u>: None. <u>TAL WX</u>: Ben Guerir, Moron, and Zaragoza were forecast and observed GO, Ben Guerir was prime and selected. <u>NOMINAL/DOLILU/I-LOADS</u>: Nominal Hoads were NO-GO with PLB torque box indicator at 102 percent. DOLILU was selected and uplinked. DOLILU #11, total Hoad uplink #17. <u>FLIGHT DURATION CHANGES</u>: None. <u>FIRSTS</u>: First flight of DC vacuum cleaner. First flight of DC vacuum cleaner. First flight of DC vacuum cleaner. SignifiCANT ANOMALIES: Galley overdispensed hot water. Excessive gas bubbles in food containers. WCS Fan Sep 1 stalled and popped all three circuit breakers. Water Coolant Loop 1 accumulator quantity transducer drift. Supply Water Tank B transducer dropout. Cryo H₂ Tank A heater failure. Mid-port and Mid-starboard PLB floodlight failures. Op Tank 7 quantity measurement failure. TV Cameras A, D, and end effector problems. Ops Recorder poor quality data on several tracks. APU 3 high fuel pump inlet pressure (line froze). LBN fuse blew when vacuum cleaner operated., caused by a 20-volt peak-to-peak ripple PDIP power failure. KCA comm link anomaly. </td>	WINDS KSC 33 (KSC 20) 77:13:09:41Z 08:09:41 AM EST Friday 7 3/18/94 (4) DEORBIT BURN: 77:12:16:50Z XRANGE: 116 NM ORBIT DIR: DR 10 AIM PT: NOMINAL MLGTD: 2905 FT 77:13:09:41Z VEL: 210 KGS 207 KEAS HDOT: -3.4 FPS TD NORM 205: 2974 FT DRAG CHUTE DEPLOY: 166 KEAS 77:13:09:55Z NLGTD: 8764 FT 77:13:00:00Z VEL: 148 KGS HDOT: -3.7 FPS BRK INIT: 123 KGS DRAG CHUTE JETISON: 57 KGS 77:13:10:32Z AVE BRK DECEL: 7FPS/S WHEELS STOP: 77:13:10:35Z 13071 FT ROLLOUT: 10166 FT 54 SEC WINDS: 14, L3 KTS OFFICIAL: 1905P08 14, L	ENG. S.N. 104/104/ 109% PREDICTED: 100/104/104/ 67/104 ACTUAL: 100/104/104/ 67/104 1 = 2031 (9) 2 = 2109 (12) 3 = 2029 (8) M 3 EOM: WEIGHT: 228360 LBS X CG: 1082.6 LANDING: WEIGHT: 228250 LBS X CG: 1084.1	BI-064 RSRM 36 KM ET-62 LWT 55 ET <u>PRED</u> <u>RPT</u> 271K ET <u>BKUP</u> 214K ET <u>IMPACT</u> 1:27:04 MET LAT: 8.1°N LONG: 132.9°W	39° (3)	DIRECT INSERTION POST OMS-2: 163 X 161 NM OMS-3: 9:17:09:39 MET 33.4 FPS 161 X 180 NM OMS-4: 9:17:50:30 MET 37.6 FPS 140 X 140 NM OMS-5: 11:18:15:34 MET 37.6 FPS 140 X 105 NM DEORBIT: 138 X 105 NM VELOCITY: 25708 FPS ENTRY RANGE: 4391 NM	(6)	CARGO: 30016 LBS PAYLOAD CHARGEABLE: 19792 LBS DEPLOYED: 0 LBS NON-DEPLOYED: 0 LBS NON-DEPLOYED: 18512 LBS MIDDECK: 1280 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 766601 LBS NON-DEPLOYED: 766601 LBS NON-DEPLOYED: 766601 LBS NON-DEPLOYED: 766601 LBS NON-DEPLOYED: 766601 LBS NON-DEPLOYED: 766601 LBS NON-DEPLOYED: 804285 LBS CARGO TOTAL: 1832884 LBS PERFORMANCE MARGINS (LBS): FPR: 3981 FUEL BIAS: 987 FINAL TDDP: 871 RECON: 1795 PAYLOADS: PLB: U. S. Microgravity Payload (USMP-2) Solidification of metals and semiconductors dendritic growth OAST-2 Technology experiments DEE SSBUV/A LDCE MIDDECK: APCG, PSE, CPCG, CGBA, MODE,	 <u>KSC W/D</u>: OPF 62, VAB 5, PAD 19 = 86 days total. <u>LAUNCH POSTPONEMENTS</u>: 2/8/94 launch date baselined on 10/2/92. Postponed launch to 2/24/94 on 9/2/93. Postponed launch to 3/3/94 on 10/20/93. <u>LAUNCH SCRUBS</u>: Scrubbed 3/3/94 launch at L-16 hours because excessive RTLS winds were forecast. <u>LAUNCH DELAYS</u>: None. <u>TAL WX</u>: Ben Guerir, Moron, and Zaragoza were forecast and observed GO, Ben Guerir was prime and selected. <u>NOMINAL/DOLILU/I-LOADS</u>: Nominal Hoads were NO-GO with PLB torque box indicator at 102 percent. DOLILU was selected and uplinked. DOLILU #11, total Hoad uplink #17. <u>FLIGHT DURATION CHANGES</u>: None. <u>FIRSTS</u>: First flight of DC vacuum cleaner. First flight of DC vacuum cleaner. First flight of DC vacuum cleaner. SignifiCANT ANOMALIES: Galley overdispensed hot water. Excessive gas bubbles in food containers. WCS Fan Sep 1 stalled and popped all three circuit breakers. Water Coolant Loop 1 accumulator quantity transducer drift. Supply Water Tank B transducer dropout. Cryo H₂ Tank A heater failure. Mid-port and Mid-starboard PLB floodlight failures. Op Tank 7 quantity measurement failure. TV Cameras A, D, and end effector problems. Ops Recorder poor quality data on several tracks. APU 3 high fuel pump inlet pressure (line froze). LBN fuse blew when vacuum cleaner operated., caused by a 20-volt peak-to-peak ripple PDIP power failure. KCA comm link anomaly.
				FLT DURATION: 13:23:16:41 335:16:41 5/T: 432:22:00:36 OV-102: 136:16:49:53 DISTANCE: 5,820,146 sm		R Caspe t to right)	er (left), are PL		: 3.	AMOS, APE-B 4 CRYO TK SETS + 4 EDO RMS 35 (S.N. 301) RMS used for DEE tests	

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		CREW	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(6)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		ORDIT	FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION.	THROTTLE PROFILE	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, FTC.)
070 50	01/ 105			WINDS	ENG. S.N.		F7 0	DIDEAT	01.00		
	OV-105 (Flight 6) Endeavour OMS PODS: LPO4-5 RPO1-19 FRC5-6		LANDING SITES, ABORT TIMES KSC 39, PAD A 99:11:04:59,997 7:05:00 AM EDT (P) 7:05:00 AM EDT (P) 7:05:00 AM EDT (P) Saturday 4 4/9/94 (11) LAUNCH WINDOW: 2H30M (CTOB) EOM PLS: KSC TAL: ZZA TAL WX: BEN, MRN SELECTED: RTLS: KSC15/CI/N TAL: ZZA30/CI/N AOA: NOR23/N/N PLS: NOR23/N/N PLS: NOR23/N/N PLS: NOR23/N/N TDEL: .16 .042/.08 MAX Q NAV: 701 >694 SRB STG: 2:04 2:05 PERF: NOMINAL 2 ENG TAL (MRN): 2:57 2:56 NEG RETURN: 4:04 4:04 PTA (U/S 190): 5:47 5:38	LANDING TIMES FLT DURATION, WINDS EDW 22, CONC EDW 40, CONC 21 110:16:54:30Z 9:54:30 AM PDT Wednesday 7 4/20/94 (9) <u>DEORBIT BURN:</u> 110:16:00:35Z <u>XRANGE</u> : 721 NM <u>ORBIT DIR:</u> DR 11 <u>AIM PT</u> : NOMINAL <u>MLGTD:</u> 1619 FT 110:16:54:30Z VEL: 228 KGS 215 KEAS HDOT: -3.7 FPS <u>TD NORM 205</u> : 2636 FT <u>DRAG CHUTE</u> <u>DEPLOY:</u> 180 KEAS 110:16:54:41Z <u>NLGTD:</u> 7115 FT TT0:T6:54:45Z VEL: 171 KGS HDOT: -4.4 FPS <u>BRK INIT</u> : TI8 KGS 10:16:55:12Z <u>AVE BRK DECEL</u> : 7.6 FPS/S <u>WHEELS STOP</u> : 110:16:55:23Z 12255 FT	THROTTLE PROFILE		INC 57° (15)	HA/HP DIRECT INSERTION POST OMS-2: 121 X 121 NM DEORBIT: 112 X 110 NM VELOCITY: 25660 FPS ENTRY RANGE: 4468 NM	OI-22 (7)	PAYLOADS/ EXPERIMENTS CARGO: 33758 LBS PAYLOAD CHARGEABLE: 27447 LBS DEPLOYED: 0 LBS NON-DEPLOYED: 27447 LBS MIDDECK: 1445 LBS MIDDECK: 1445 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 766601 LBS NON-DEPLOYED: 766601 LBS NON-DEPLOYED: 766601 LBS MON-DEPLOYED: 766601 LBS NON-DEPLOYED: 766601 LBS NON-DEPLOYED: 766601 LBS NON-DEPLOYED: 831732 LBS CARGO TOTAL: 1866642 LBS PERFORMANCE MARGINS (LBS): FPR: 3981 FUEL BIAS: 987 FINAL TDDP: 2856 RECON: 1731 PAYLOADS: PLB: SPACE RADAR LABORATORY (SRL-1) SIR-C/X-SAR IMAGING OF	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.) KSC W/D: OPF 67, VAB 5, PAD 21 = 93 days total. LAUNCH POSTPONEMENTS: Baselined 9/30/93 launch date on 3/11/92. - Postponed launch date to 4/14/94 on 12/21/92. - Advanced launch date to 3/31/94 on 4/2/93. - Postponed launch date to 4/17/94 on 11/5/93. LAUNCH SCRUBS: - Scrubbed 4/7/94 launch approximately 6 hours into count on 4/4/94 to borescope HPOTP preburner volute diffuser vane fillet for undersized radii. - Scrubbed 4/8/94 launch while holding at t-5 minutes. RTLS crosswinds exceeded limits. Decision made to count down to launch 1 hour earlier than nominal launch time on 4/9/94 to improve launch probability (11:05Z vs 12:05Z). LAUNCH DELAYS: None. - Launched 1 hour early as planned. TAL WX: - Zaragoza, Ben Guerir, and Moron forecast and observed GO. DOLILU/I-LOADS: - DOLILU selected because WINGAR18 10 percent more margin than nominal. DOLILU uplink #12, I-load uplink #18. FLIGHT DURATION CHANGES: - Changed from 9 to 10 days to acquire more science. - Waved off landing at KSC on orbits 182 due to observed ceiling violations and rain within 30 nm. Extended flight a second day. - Waved off landing on orbit 182 due to observed ceiling violations and forecast rain. Landed at EDW on orbit 183. - Flight extended 2 days plus one orbit.
	A S		DROOP (ZZA) 5:42 PTM (U/S 190): 5:56 MECO CMD: 8:33	ROLLOUT: 10636 FT 53 SEC WINDS: T1, R2 KTS OFFICIAL: 0204 T4, R2 DENS ALT: 3764 FT						IMAGING OF EARTH'S SURFACE CONCAP IV GAS (4) <u>MIDDECK:</u> STL (2) VFT-4 SAREX II 5 CRYO TK SETS6	 Right SSME HPOTP turbine discharge temp A biased low (200 degree delta to CH B). Bubbles in water from SORG ((caused by venturi effect). Defective (split) LiOH can casing, no LiOH spilled. FES Feedline A Heater 1 thermostat failure. H₂ Tank 5 check valve failed to seat. Sticky cryo H₂ Tank 2 check valve. GPS DTO status bit static. MADS recorder tape broke. Ku-band Channel 3 interferes with Channel 2. Ku-band range/elevation unit digit inoperative.
image of	Isla Isabela os Islands (e dimensional a in western Earth Surface	<u>VI</u> : 25778 25774 <u>OMS-2</u> : 35:09.2 35:10.3 163.5 FPS 163.7 FPS	FLT DURATION: T1:05:49:30 269:49:30 S/T: 444:03:50:06 OV-105: 54:20:59:15 DISTANCE: 4,704,835 sm	Gutierrez Apt/MS &	(front cer Jones/M nt) PLT C	nter) is IS On	middeck: CD flanked by back row are Godwin/PLC	R	RMS 36 (S.N. 303) RMS NOT USED PER PLAN	 Side hatch window impact crew reported. GO₂ vent arm on pad damaged, caused by shuttle plume effect.

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				LANDING SITE/	SSME-TL						
		CREW	LAUNCH SITE.	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(7)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		UKBII	FSW	WEIGHTS,	
NO	URBITER						INC		FSW		(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION, WINDS	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
	OV-102	CDR:	KSC 39, PAD A	KSC 33 (KSC 21)	ENG. S.N. 104/104/	BI-066	28.45°	DIRECT	01-23	CARGO:	KSC W/D: OPF 62, VAB 5, PAD 20 = 87 days total.
STS-65	(Flight 17)	Robert D. Cabana	189:16:42:59.977Z	204:10:38:00Z	109%	DI-000	(36)	INSERTION	(1)	32880 LBS	$\underline{KSC} \ \underline{W/D}. \ \mathbf{OFT} \ 02, \ \mathbf{VAD} \ 5, \ \mathbf{FAD} \ 20 = 67 \ \mathbf{uays} \ \mathbf{total}.$
SEQ FLT #63	Columbia	(Flt 3 - STS-41, STS-53)	12:43:00 AM EDT (P)	6:38:00 AM EDT	10770	RSRM	(00)		(.)	02000 200	LAUNCH POSTPONEMENTS:
562161#05		P347/R113/V84/M101	12:43:00 AM EDT (P) 12:43:00 AM EDT (A)		PREDICTED:	39 KM		POST OMS-2:		PAYLOAD	- Baselined launch date of 6/23/94 on 4/2/93.
KSC-63	14th		Friday 10	Saturday 11	100/104/104/			163 X 160 NM		CHARGEABLE:	- Postponed launch date to 7/8/94 on 4/15/93.
	Spacelab	PLT:	7/8/94 (3)	7/23/94 (4)	67/104	ET-64				24282 LBS	
PAD 39A-39	Flight	James D. Halsell, Jr. P348/R178/M156	LAUNCH WINDOW:	DEORBIT BURN:	ACTUAL:	LWT 57				DEPLOYED:	LAUNCH SCRUBS: None
39A-39	Long	1 340/10/01/01/01/01	2H30M CTOB	204:09:40:38Z	100/104/104/	LWIJI				0 LBS	LAUNCH DELAYS: None
MLP-3	Module 10	M/S 1 (PAYLOAD CDR):		XRANGE: 180 NM	67/104	ET					
		Richard J. Hieb	EOM PLS: KSC			PRED				<u>NON-DEPLOYED</u> : 22521 LBS	TAL WX:
	EDO 4	(Flt 3 - STS-39, STS-49)	TAL: BYD	<u>ORBIT DIR</u> : DL 32	SSME S/N:	<u>RPT</u>				22521 LBS	- Banjul (prime & selected) forecast and observed GO.
	OMS PODS:	P349/R128/V70/M115	TAL WX: BEN	AIM PT: NOMINAL	1 = 2019(14) 2 = 2030(0)					MIDDECK:	- Ben Guerir forecast NO GO (rain) but observed GO.
	LP05-6	M/S 2:	SELECTED:		$\begin{array}{l} 1 = 2019 (14) \\ 2 = 2030 (9) \\ 3 = 2017 (10) \end{array}$	ET				1761 LBS	DOLILU/I-LOADS:
	RPO5-6	Carl E. Walz	RTLS: KSC 15/N/N	MLGTD: 2996 FT 204:10:38:00Z VEL: 207 KGS		BKUP					- Both DOLILU and NOMINAL I-loads were GO, NOMINAL I-
	FRC2-17	(Flt 2 - STS-51)	TAL: BYD 32/N/SF	VEL: 207 KGS	<u>M 3 EOM</u> :			DEORBIT:		<u>SHUTTLE</u> ACCUMULATED	loads were selected, no uplink required.
		P350/R170/V106/M148	AOA: EDW 22/N/N PLS: EDW 22/N/N	199 KEAS HDOT: -2.5 FPS	WEIGHT:	<u>ET</u> IMPACT		137 X 127 NM		ACCUMULATED	
	TAL OF	<u>M/S 3:</u>	PLS: EDW 22/IN/IN		229368 LBS X CG:	1:21:08				WEIGHTS: DEPLOYED:	FLIGHT DURATION CHANGES: - Waved off landing at KSC on orbits 220 and 221 due to
ANA	AALSELL	Leroy Chiao	TDEL:	<u>TD NORM 205</u> : 2501 FT	1078.6	MET		<u>VELOCITY</u> : 25720 FPS		766601 LBS	forecast and observed rain and potential lightening. Extended
5 20	11 PL	P351/R179/M157	0.19 -0.048/-0.01		107010	LAT:				NON-DEPLOYED:	flight 1 day.
73				DRAG CHUTE DEPLOY: 174 KEAS 204:10:38:09Z	LANDING:	13.6°S		ENTRY		856014 LBS	5
T 1		<u>M/S 4</u> :	MAX Q NAV: 673 677	DEPLOY: 1/4 KEAS	WEIGHT:	LONG:		RANGE		CARGO TOTAL:	SIGNIFICANT ANOMALIES: - Supply water dump nozzle icing occurred on third dump on
CT		Donald A. Thomas P352/R180/M158	673 677		229261 LBS X CG:	163.3°W		4381 NM		1899522 LBS	FD3. FES was used to dump water for the rest of flight.
II C	3	F 552/K 160/W1156	SRB STG:	NLGTD: 8313 FT	1080.1					PERFORMANCE	- WCS problems included commode fault during compaction,
× 0,	- NO	P/S 1:	2:03.8 2:05	204:10:38:18Z VEL: 138 KGS	100011					MARGINS (LBS):	commode filter fit and odor problems, and fan sep 1 stall and
HIAO	THOMAS	Chiaki Naito-Mukai		HDOT: -5.7 FPS						FPR: 3981	liquid backflow.
		P353/R181/F23	<u>PERF</u> : NOMINAL	<u>BRK INIT</u> : 115 KGS						FUEL BIAS: 987	- IMU redundant rate BITE messages.
		(Japan - NASDA)	2 ENG TAL (BYD):							FINAL TDDP: 2169 RECON: 3531	- RCS vernier thruster R5D failed off, then nominal ops. - Low wastewater dump flow. Second dump in three cycles.
		MCC FCR-1 (42)	<u>2:47 2:43</u>	DRAG CHUTE <u>JETTISON</u> : 52 KGS 204:10:38:43Z						KECON. 5551	Third dump required seven cycles.
			2.10	204:10:38:43Z						PAYLOADS:	- Ops recorder 2 track 2 poor dump quality.
		FLIGHT DIRECTORS:	NEG RETURN:							PLB:	 Galley rehydration station did not dispense cold water.
		A/E/O1 - J. W. Bantle	4:00 4:01	AVE BRK DECEL: 5.7 FPS/S	11/2			110	all.	INTERNATIONAL	- Arriflex magazine jams, Hasselblad jam and lens stuck.
STS065-4	42-017	LD/O 2 - J. M. Heflin O 3 - R. E. Castle	PTA (U/S 244):					ELSA A	0	MICROGRAVITY LABORATORY	
Spacelab	(IML-2)	O4 - P. L. Engelauf	<u>5:12</u> 5:01	WHEELS STOP: 204:10:39:08Z	Trank and	16	No.		010	LIFE SCIENCES	
in payload	bav	MOD - A. L. Briscoe		13207 FT		<u>E</u>	29			AND MATERIAL	
	,		DROOP (BYD):						1 1	SCIENCES	
			5:31 5:27	<u>ROLLOUT:</u> 10211 FT		28			1 22	EXPERIMENTS	
and the second second			PTM:	68 SEC			14 Y			(IML-2/LM) OARE	
	Della I	31 84 11	<u>6:03</u> 5:50	<u>WINDS:</u> T3,0X KTS OFFICIAL: 1503P04	1	11	11 =	Res C	-	UNIC	
1 194	and world here	211	0.00			1	21	to	4	MIDDECK:	
ALL AND THE ALL AND AL	1. 1. 1		IVIECO CIVID.	T3,0X KTS	Sill 1		CT I		-	CPCG	
	+ - +		8:32 8:31	<u>DENS ALT</u> : 840 FT		Color.			-	MAST	
2 5 5 9 0 P	AN A	5	VI		2 X -			ALL SA	1-1	AMOS SAREX-II	
	100	A A	<u>vi</u> . 25877 25870	FLT_DURATION: 14:17:55:00							
-	and the			353:55:00				se in SL: Fro			
- Terr		and the second	<u>OMS-2</u> :	S/T: 458:21:45:06	row: CDR	Cabana	a flanke	d by PLT Hal	Isell		STS065-214-037 DR.Chiaki Naito-Mukai
1000		A CARA	<u>39:55</u> 39:55		& Mukai/	PS (NAS	SDA). E	Back row: (lef	t to	4 + 4 EDO CRYO	enters IML-2 science module in cargo bay to
1 22			221 FPS 221 FPS	<u>OV-102</u> :151:10:44:53	right) Hiel	o/PLC, T	Thomas	/MS, Walz/M	1S,	TANK SETS	conduct microgravity experiments.
				DISTANCE:	& Chiao/N					NO RMS	conduct microgravity experiments.
	1			6,143,846 sm							

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		CREW	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(6)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-64 SEQ FLT #64 KSC-64 PAD 39B-25 MLP-2 MCC FCR-1 FLIGHT DIR A/E/01 - N. V LD/0 2 - G. A Pennington PLNG - W. D MOD - B. R. STS064 Meade	ECTORS: W. Hale A. Reeves Stone 114-027	CDR: Richard N. Richards (Fit 4 - STS-28, STS-41, STS-50) P354/R101/V55/M92 PLT: L. Blaine Hammond (Fit 2 - STS-39) P355/R124/V107/M111 <u>M/S 1:</u> Jerry M. Linenger P356/R182/M159 <u>M/S 2:</u> Susan J. Helms (Fit 2 - STS-54) P357/R158/V108/F19 <u>M/S 3/EV2:</u> Carl J. Meade (Fit 3 - STS-38, STS-50) P358/R117/V76/M105 <u>M/S 4/EV1:</u> Mark C. Lee (Fit 3 - STS-30, STS-47) P359/R100/V78/M91 SS EVA #28 SAFER FF #1 SCHEDULED EVA #24 9/16/94	Friday 11 9/9/94 (5) <u>LAUNCH WINDOW:</u> 2H30M CTOB <u>EOM PLS</u> : KSC TAL: ZZA TAL WX: MRN, BEN <u>SELECTED</u> : <u>RTLS</u> : KSC 15/CI/N TAL: ZZA <u>AOA</u> : NOR 17/N/N <u>PLS</u> : EDW 22/N/N <u>TDEL</u> : 0.19 -0.088/-0.05 <u>MAX O NAV</u> : 688 691 <u>SRB STG</u> : 2:04.3 2:03 <u>PERF</u> : NOMINAL <u>2 ENG TAL (MRN)</u> : 2:38 2:37	EDW 04 CONC (EDW 41, CONC 22) 263:21:12:52Z 2:12:52 PM PDT Tuesday 10 9/20/94 (7) <u>DEORBIT BURN:</u> 263:20:17:00Z <u>XRANGE</u> : 110 NM <u>ORBIT DIR</u> : AL 15 <u>AIM PT</u> : NOMINAL <u>MLGTD:</u> 2386 FT 263:27:12:52Z VEL: 208 KGS 198 KEAS HDOT: -1 FPS <u>TD NORM 195:</u> 2627 FT <u>DRAG CHUTE</u> <u>DEPLOY:</u> 184 KEAS 263:21:12:59Z <u>NLGTD:</u> 6192 FT 263:221:13:03Z VEL: 163 KGS HDOT: -6.7 FPS <u>BRK INIT</u> : 133 KGS <u>DRAG CHUTE</u> <u>JETTISON: 56 KGS</u> 263:21:13:31Z	2 = 2109 (13) 3 = 2029 (10) <u>M 3 EOM</u> : WEIGHT: 212294 LBS X CG: 1082.3 <u>LANDING</u> : WEIGHT:	BI-068 RSRM 41 ET-66 LWT 59 <u>ET</u> <u>PRED</u> <u>271K</u> <u>ET</u> <u>BKUP</u> 214K <u>ET</u> <u>III3:57</u> MET <u>LAT:</u> 43.3°S <u>LONG:</u> 155.5°W	57° (16)	DIRECT INSERTION <u>POST OMS-2:</u> 141 X 140 NM 132.4 X 127.8 NM <u>VELOCITY</u> : 25727 FPS <u>ENTRY</u> <u>RANGE</u> : 4433 NM	(2)	CARGO: 25621 LBS PAYLOAD CHARGEABLE: 20417 LBS DEPLOYED: 0 LBS NON-DEPLOYED: 16212 LBS MIDDECK: 1363 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 766601 LBS NON-DEPLOYED: 766601 LBS NON-DEPLOYED: 873589 LBS CARGO TOTAL: 1925143 LBS PERFORMANCE MARGINS (LBS): FPR: 3981 FUEL BIAS: 987 FINAL TDDP: 6409 RECON: 9639 PAYLOADS: PLB: LIDAR In-Space	KSC W/D: OPF 125, VAB 8, PAD 20 = 153 days total. LAUNCH POSTPONEMENTS: - - Launch date was 6/16/94 on 2/19/93. - - Launch date postponed to 9/15/94 on 4/2/93. - - Launch date advanced to 9/9/94 on 11/19/93. LAUNCH SCRUBS: None LAUNCH DELAYS: - Launch delayed 1H52M55S. Held at T-9 minutes for 1H34M18S because of detached opaque thunderstorm anvil and thunderstorms within 20 nm. Picked up count and held at T-5 minutes for 13M37S until KSC weather was GO. TAL WX: - Zaragosa (prime and selected) Moron and Ben Guerir were all three forecast and observed GO. DOLILU/I-LOADS: - Both NOMINAL and DOLILU were GO. NOMINAL I-loads were selected, no uplink required. FLIGHT DURATION/LANDING SITE CHANGES: - Flight was 9+1+1 and was extended 1 day for science. - Waved off landing at KSC on orbits 159 and 160 due to forecast of lightening and thunderstorms with 30 nm and ceiling violations. Extended another day for weather. - Waved off landing at KSC on orbits 175 and 176 due to ceiling and rain within 30 nm. Decision made to change landing site to EDW. FLIGHT EXTENSION: 2 days plus 2 orbits.
test the n Simplified EVA Res (SAFER).	ew I Aid for cue	EV1 - MARK LEE EV2 - CARL MEADE 6H51M35S DURATION EVALUATED SAFER PERFORMANCE	NEG RETURN: 4:08 4:10 PTA (U/S 250): 4:43 DROOP (ZZA): 5:31 5:28 5:31 PTM: 5:28 5:31 5:28 MECO CMD: 8:35.3 VI: 25805 25800 OMS-2: 36:09 36:09 309.1 FPS 209.1 FPS 209.1 FPS	AVE BRK DECEL: 4.6 FPS/S WHEELS STOP: 263:21:13:532 12042 FT ROLLOUT: 12045 FT 61 SEC WINDS: 10H, 3L KTS 0FFICIAL: 0204P09 H4, L2 KTS DENS ALT: 4927 FT FLT DURATION: 10:22:49:57 262:49:57 262:49:57	(upper rig against corner. (ght), foun the ove Others, c IS & Helr	nd stab rhead clockwi ms/MS	CDR Richa ility with his b in upper u se from him PLT Hammo	oack right are	LIDAR III-Space Technology Experiment Atmospheric Research using Laser (LITE) SPARTAN-201 Astronomy (Deploy & retrieve) GBA ROMPS <u>MIDDECK:</u> SSCE, BRIC, RME-III, MAST, SAREX-II, AMOS 4 CRYO TK SETS RMS 37 (S.N. 201) RMS used for SPARTAN deploy, retrieve, and berth, and for SPIFEX and SAFER ops	LANDING SITE CHANGE: KSC to EDW due to KSC weather. RENDEZVOUS #17: To retrieve, berth, and return SPARTAN-201, which was deployed earlier in flight. SIGNIFICANT ANOMALIES: - FES feedline A accumulator temperature decreased below thermostat spec. - Torn AFRSI blanket on left OMS pod. - Supply H ₂ O dump valve leakage (burp). - FES outlet temperature oscillations during radiator bypass. - AFT MCA 1 OP STAT 4 indication. - Articulating portable foot restraint simulator fit interference. - Electronic cuff checklist #1 touch screen operation degraded during EVA. - PGSC PL3 hard disk error message and unexplained lockups on flight deck PGSC. - TACAN RM fails. - PROX OPS camera ALC logic lockup. - Side hatch locking device obstruction. - RCS jet L1A fail off.

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		CREW	LAUNCH SITE,	LANDING SITE/ RUNWAY.	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(6)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW		(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
				WINDS	ENG. S.N.						
STS-68	OV-105	CDR: Michael A. Deker	KSC 39 PAD A 273:11:15:59.98Z	EDW 22, CONC	104/104/	BI-067		DIRECT INSERTION	OI-22 (8)	<u>CARGO</u> : 34252 LBS	KSC W/D: OPF 59, VAB 20 (2), PAD 41 (2) = 120 days total.
850	(Flight 7) Endeavour	Michael A. Baker (Flt 3 - STS-43 & STS-52)	7:16:00 AM EDT (P)	(EDW 42, CONC 23) 284:17:02:08Z	109%	RSRM	(17)	INSERTION	(8)	34202 LBS	LAUNCH POSTPONEMENTS:
SEQ FLT #65	Endeavour	P360/R133/V81/M/118	7:16:00 AM EDT (A)	10:02:89 AM PDT	PREDICTED:	40		POST OMS-2:		PAYLOAD	- Launch date baselined as 10/27/94 on 7/9/93.
			Friday 12	Tuesday 11	100/100/100/			120 X 119 NM		CHARGEABLE:	- Launch date advanced to 8/18/94 on 9/2/93.
KSC-65	OMS PODS: LPO4-14	PLT: Terrence W. Wilcutt	9/30/94 (6)	10/11/94 (6)	67/104	ET-65				27640 LBS	 Launch date postponed to 10/2/94 after pad abort #5 on 8/18/94, moving STS-68 after STS-64. Rolled back on 8/24/94 to VAB to replace all three engines.
PAD	RP01-20	P361/R183/M160	LAUNCH WINDOW:	DEORBIT BURN:	ACTUAL:	LWT 58				DEPLOYED:	- Rolled back on 8/24/94 to VAB to replace all three engines.
39A-40	FRC5-7		2H30M CTOB	284:16:07:19Z	100/100/100/					0 LBS	Returned to pad on 9/13/94.
		M/S 1: Steven V. Smith	EOM PLS: KSC	XRANGE: 746 NM	67/104	<u>et</u> Pred				NON-DEPLOYED:	- Advanced launch date to 9/30/94 when range became available.
MLP-1		P362/R184/M161	TAL: ZZA	ORBIT DIR: DR 12	1 = 2028 (9)	RPT:				<u>NON-DEPLOYED</u> : 25997 LBS	avaliable.
			TAL WX: MRN, BEN		2 = 2033 (6)	271K					LAUNCH SCRUBS/PAD ABORT #5:
		M/S 2:			3 = 2026 (4)	гт				MIDDECK:	- 8/18/94 launch scrubbed with pad abort #5 at -1.86 seconds
		Daniel W. Bursch (Flt 2 - STS-51)	<u>SELECTED</u> : RTLS: KSC33/N/N	MLGTD: 3522 FT 284:17:02:08Z	M 3 EOM:	<u>et</u> Bkup:				1643 LBS	when HPOTP turbine discharge temp A exceeded 1560 degrees R start redline limit. Rolled back to VAB and replaced
		P363/R169/V109/M147	TAL: MRN20/N/N	IVEL: 196 KGS	WEIGHT:	214K				<u>SHUTTLE</u>	all three engines. Rescheduled launch to 10/2/94 and moved
		M/C D	AOA: NOR17/N/N	193 KÉÁS HDOT: -2.3 FPS	221784 LBS	гт		DEORBIT:		ACCUMULATED	STS-64 ahead of STS-68.
		M/S 3: Peter J. K. (Jeff) Wisoff	PLS: EDW22/N/N		X CG: 1078.7	<u>et</u> IMPACT		111 X 110 NM		WEIGHTS: DEPLOYED:	LAUNCH DELAYS: None
		(Flt 2 - STS-57)	TDEL:	<u>TD NORM 205</u> : 2589 FT	1070.7	1:13:26		VELOCITY:		766601 LBS	
		P364/R166/V110/M145	-0.16 -0.038/0.0		LANDING:	MET		25658 FPS		NON-DEPLOYED:	TAL WX: - Zaragoza was prime but was forecast and observed NO GO for
		M/S 4 (PAYLOAD CDR):	MAX Q NAV:	DRAG CHUTE DEPLOY: 188 KEAS	WEIGHT: 221673 LBS	<u>LAT</u> : 43.9°S		ENTRY		901229 LBS CARGO TOTAL:	ceilings.
		Thomas D. Jones	688 690	284:17:02:11Z	X CG:	43.9 3 LONG:		RANGE:		1959395 LBS	- Moron (selected) and Ben Guerir were forecast and observed
		(Flt 2 - STS-59)		NLGTD: 7299 FT	1080.4	156.3°W		4480 NM			G0.
BAKER WIL	COTT SMITH	P365/R177/V111/M155	<u>SRB STG</u> : 2:03.8 2:03	284.17.02.217						PERFORMANCE MARGINS (LBS):	DOLILU/I-LOADS:
		MCC FCR-1 (44)	2.03.0 2.03	VEL: 133 KGS HDOT: -5.1 FPS						FPR: 3981	- NOMINAL and DOLILU I-loads were GO, selected NOMINAL,
			<u>PERF</u> : NOMINAL	BRK INIT: 82 KGS						FUEL BIAS: 987	no uplink required.
	JUES .	FLIGHT DIRECTORS:								FINAL TDDP: 1721	FLIGHT DURATION CHANGES: - Flight extended from 10 to 11 days for additional science. - Waved off landing at KSC on orbit 182 due to late convection
SOFF BUR	ISCH JON	A/E/O1 - R. D. Jackson LD/O 2 - C. W.Shaw	2 ENG TAL (MRN): 2:58 2:59	<u>DRAG CHUTE</u> JETTISON: 55 KGS						RECON: 2071	- Flight extended from 10 to 11 days for additional science.
		0 3 - R. E. Castle		284:17:02:45Z						PAYLOADS:	- Waved off landing at KSC on orbit 182 due to late convection activity and forecast (and observed) 3000 ft ceiling variable
		MOD - A. L. Briscoe	NEG RETURN:	AVE BRK DECEL						PLB:	activity and forecast (and observed) 3000 ft ceiling variable broken. Waved off landing at KSC on orbit 183 due to
			4:03 4:04	AVE BRK DECEL: 4.0 FPS/S						SPACE RADAR LABORATORY	continuing convective activity and forecast ceiling violations and
			PTA (U/S 180):	WHEELS STOP:						(SRL-2)	chance of rain within 30 nm. Total flight extensions - 1 day plus one orbit.
			5:56 5:49	WHEELS STOP: 284:17:03:10Z						ŚIR-C/X-SAR	
		and the	PTM :	12017 FT	-		3		A	MAPS GAS (5)	LANDING SITE CHANGE:
	134	1 - A	<u>6:18</u> 6:05	ROLLOUT: 8495 FT			25	125			- Changed landing site to EDW due to forecast of worsening weather at KSC on Wednesday; hence, landed at EDW on orbit
	Calif.			62 SEC			Y I	A		MIDDECK:	183.
		and the second	MECO CMD: 8:34.8 8:33.9		-				1	CPCG CHROMEX	
		Contraction of the second	0.37.0 0.33.7	<u>WINDS:</u> H7, L3 KTS	=	1	· /-		A	BRIC	SIGNIFICANT ANOMALIES: - MTU accumulator 3 lost.
	A STREET		<u>VI</u> :	OFFICIAL: 2208P10 H8, L1 KTS		SA	1			CREAM	- FES feedline A hi load line temp read off-scale-high.
	_	No. of Concession, No. of Conces	<u>2</u> 5780 25775				2			MAST	- Rudder channel 3 slow to bypass during FCS checkout.
	A.S.	AC STRACT	<u>OMS-2</u> :	<u>DENS ALT</u> : 3912 FT	20		19	. 9			- Simulation termination during DOLILU I-load verification. - Ku-Band CH3 (PL MAX) interference on channels 2 and 1.
a la		T March	35:09.7	FLT DURATION:				-A.	15	5 CRYO TK SETS	- CCTV cameras B, C, and D problems.
1 E	1-1 7.01 -	A A A A A A A A A A A A A A A A A A A	159 FPS	11:05:46:08 273:46:08		A STATE OF	1000			DMC 20	- Linhof, Hasselblad, and Nikon camera problems.
	1 1 1 1 1 1 h	A REAL PROPERTY OF A REAL PROPER			STOORD C	02.046	Crow in	middeelu		RMS 38 (S.N. 303)	- Degraded tracks on payload recorder. - WSB 2 reg pressure increase.
STS068-	070-023	The Space Radar		<u>S/T</u> : 481:02:21:11				middeck:		· /	- WSB 2 reg pressure increase. - WSB 1 and WSB 3 pressure decay.
) in the Space		<u>OV-105</u> : 66:02:45:23	(clockwise				лт	RMS NOT USED	- RCS jet L3D fail off, low chamber pressure indication.
	ndeavour's			<u>DISTANCE</u> : 4,703,000 sm	Wilcutt, S			Bursch/MS, F		PER PLAN	- RCS jet L5D oxidizer injector temp sensor erratic, implemented GMEM and vernier control.
				4,703,000 sm	wilcutt, S			011/10/5.			

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			<u> </u>								
FLT NO.	ORBITER	CREW (6) TITLE, NAMES	LAUNCH SITE, LIFTOFF TIME, LANDING SITES,	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES	SSME-TL NOM-ABORT EMERG THROTTLE	RSRM AND	INC	ORBIT HA/HP	FSW	PAYLOAD WEIGHTS, PAYLOADS/	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION, WINDS	PROFILE ENG. S.N.	ET		DIDEAT	01.55	EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-66 SEQ FLT #66 KSC-66 PAD 39B-26 MLP-3	OV-104 (Flight 13) Atlantis 15th Spacelab Flight <u>OMS PODS:</u> LP03-17 RP04-13 FRC4-13	CDR: Donald R. McMonagle (FII 3 - STS-39, STS-54) P366/R126/V87/M113 PLT: Curtis L. Brown (FII 2 - STS-47) P367/R152/V112/M136 M/S 1 (PAYLOAD CDR): Ellen Ochoa (FIt 2 - STS-56) P368/R160/V113/F20 M/S 2: Joseph R. Tanner P369/R185/M162 M/S 3: Jean-Francois Clervoy P370/R186/M163 (ESA - France) M/S 4: Scott E. Parazynski P371/R187/M164 MCC FCR-1 (45) FLIGHT DIRECTORS: A/E - J. W. Bantle LD/O 2 - R. E. Castle O 1 - J M Heflin	11/3/94 (9) LAUNCH WINDOW: 1H02M, Crista-SPAS Beta Req ≥ 20 deg EOM PLS: KSC TAL: ZZA TAL WX: MRN, BEN SELECTED: RTLS: KSC 33/N/N TAL: BEN 36/N/N AOA: NONE PLS: EDW 04/N/N TDEL: 0.19 0.552/0.59 MAX Q NAV: 688 691 SRB STG: 2:04 2:05 PERF: NOMINAL 2 ENG TAL (BEN):	EDW 22, CONC (EDW 43, CONC 24) 318:15:33:45Z 7:33:45 AM PST Monday 13 11/14/94 (9) DEORBIT BURN: 318:14:31:05Z XRANGE: 745 NM ORBIT DIR: AL 16 AIM PT: NOMINAL MLGTD: 3219 FT 318:15:33:45Z VEL: 195 KGS 10 NORM 195: 3032 FT DRAG CHUTE DEPLOY: 183 KEAS 318:15:33:49Z NLGTD: 6390 FT 318:15:33:56Z VEL: 150 KGS HDOT: -4.4 FPS BRK INIT: 108 KGS DRAG CHUTE JETTISON: 62 KGS	104/104/ 109% PREDICTED: 100/100/100/ 67/104 <u>ACTUAL</u> : 100/100/100/ 68/104 1 = 2030 (10) 2 = 2034 (5) 3 = 2017 (11) <u>M 3 EOM</u> : WEIGHT: X CG: 1084.4 <u>LANDING</u> : WEIGHT:	BI-069 RSRM 38 ET-67 LWT 60 ET <u>RPT</u> 271K ET <u>BR/UP</u> 214K ET <u>III4:01</u> MET <u>1:14:01</u> MET: 42.2°S <u>LONG</u> : 156.9°W	57° (18)	DIRECT INSERTION <u>POST OMS-2</u> : 164.8 X 164.2 NM <u>DEPLOY</u> (SPAS): 00/19:50:06 MET 164 X 163 NM <u>SPAS</u> <u>GRAPPLE</u> : 08/20:05:35 MET 160 x 157 NM <u>SPAS BERTH</u> : 08/23:50:19 MET <u>DEORBIT</u> : 162 X 156 NM <u>VELOCITY</u> : 25798 FPS <u>ENTRY</u> <u>RANGE</u> : 4387 NM	(3)	CARGO: 23560 LBS PAYLOAD CHARGEABLE: 18135 LBS DEPLOYED: 0 LBS NON-DEPLOYED: 9901 LBS MIDDECK: 1080 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 766601 LBS NON-DEPLOYED: 766601 LBS NON-DEPLOYED: 766601 LBS NON-DEPLOYED: 766601 LBS NON-DEPLOYED: 766601 LBS NON-DEPLOYED: 766601 LBS NON-DEPLOYED: 766601 LBS NON-DEPLOYED: 776600 TOTAL: 1982955 LBS PERFORMANCE MARGINS (LBS): FPR: 3775 FUEL BIAS: 1136 FINAL TDDP: 3284 RECON: 3158 PAYLOADS: PLB: CRISTA/SPAS	KSC W/D: OPF 110, VAB 6, PAD 24 = 140 days total. LAUNCH POSTPONEMENTS: - - Launch baselined as 8/18/94 on 4/22/93. - - Postponed launch to 10/27/94 on 9/30/94 after STS-68 pad abort. - LAUNCH SCRUBS: None. LAUNCH DELAYS: - - Launch delayed for 3M43S while holding at T-5 min to discuss TAL weather. ZZA and MRN were NO GO due to forecast ceiling and rain. BEN was forecast NO GO for crosswinds. Decision made to select BEN for launch because observed crosswind trend was downward (last observed at 15 knots). Waiver to flight rule 4-64 was written.) TAL WX: - - - ZZA (prime) was forecast NO GO for ceiling, tailwind, and light rain within 5 nm. MRN was forecast NO GO for ceiling and light rain within 5 nm. MRN was forecast NO GO for ceiling and light rain within 5 nm. MRN was forecast NO GO for ceiling and light rain within 5 nm. MRN was forecast NO GO for ceiling and light rain within 5 nm. MRN was forecast NO GO for ceiling and light rain within 5 nm. MRN was forecast NO GO for ceiling and light rain within 5 nm. MRN was forecast NO GO for ceiling and light rain within 5 nm. MRN was forecast NO GO for ceiling and light rain within 5 nm. MRN was forecast NO GO for ceiling and light rain within 5 nm. MRN was forecast NO GO for ceiling and light rain within 5 nm. MRN was forecast NO GO for ceiling and light rain within 5 nm. MRN was forecast NO GO for ceiling and light rain within 5 nm. MRN was forecast NO GO for ceiling and light rain within 5 nm. MRN was forecast NO GO for ceiling and light rain within 5 nm. All NOMINAL I-loads were GO, N
	6-129-005 / bayload bay	ATLAS-3 payload	NEG RETURN: 4:07 4:09 PTA (U/S 300): 4:41 PTM (U/S 215): 5:30 5:32 5:30 5:32 5:32 MECO CMD: 8:34.4 4:41 VI: 25832 25826 OMS-2: 36:12 36:13 265 FPS 262 FPS 13	318:15:34:16Z <u>AVE BRK DECEL</u> : 6.01-PS/S <u>WHEELS STOP</u> : 318:15:34:35Z 10866 FT <u>ROLLOUT</u> : 7647 FT 50 SEC <u>WINDS</u> : <u>T3, R3 KTS</u> <u>OFFICIAL</u> : 3064 T3, R3 KTS <u>DENS ALT</u> : 645 FT <u>FLT DURATION</u> : 10:22:34:02 262:34:02 262:34:02 <u>S/T</u> : 492:00:55:13 <u>OV-105</u> : 83:08:27:02 <u>DISTANCE</u> : 4,554,791 sm	left to rig CDR Mc PLT Brov	ht in lov Monagle wn. Floa	ver rov e, Para ating a	on Flight De v,Tanner/MS azynski/MS,	eck: S,	(Deploy & retrieve)) Atmospheric Science Experiments ATLAS-3 SSBUV-A ESCAPE-II <u>MIDDECK:</u> PARE/NIH-R PCG-TES PCG-STES SAMS, HPP STL/NIH-C 5 CRYO TK SETS RMS 39 (S.N. 202) RMS used for CRISTA/SPAS deploy, grapple and berth, and monitor supply and waste water dump (saw icicle form)	LANDING SITE CHANGE: KSC to EDW FIRSTS: - First use of "R-BAR" approach for rendezvous which is required to protect Mir solar arrays on Mir rendezvous flights. <u>RENDEZVOUS #18</u> : To retrieve and return CHRISTA-SPAS, which was deployed earlier in flight. <u>SIGNIFICANT ANOMALIES</u> : - Spacelab ERAU 20 skipped triplet. - GPS 4 MMU1 BCE 18 failure. - Damaged tile at overhead window (W8). - FES oscillations at low heat loads. - FES oscillations at low heat loads. - FES outlet temp sensor lag. - Av Bay 2 Smoke Detector A concentration transients. - Ice formation on PLBD during simultaneous supply and waste water dump on FD8 (1.5" D X 5-6' long). Canceled icicle removal with RMS when RMS wrist camera failed. At landing, ice (approx 3"x5"x3") was seen on PLBD. - FES B undertemp shutdown. - Fuel Cell 2 H2O through alternate path. - Spacelab subsystem inverter shutdown. - NSP 2 to Ku-Band Channel 1 interface failure. - WSB 3 regulator pressure decay.

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		CREW	LANDING SITE/ SSME-TL								
		(6)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(0)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION, WINDS	PROFILE ENG. S.N.	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-63	OV-103	CDR:	KSC 39 PAD B	KSC 15 (KSC 22)	104/104/	BI-070	51.66°	DIRECT	01-23	CARGO:	KSC W/D: OPF 71, VAB 5, PAD 25 = 101 days total.
515 05	(Flight 20)	James D. Wetherbee	34.05.22.03 967	42.11.50.197	109%		(1)	INSERTION	(4)	24903 LBS	
	Discovery	(Flt 3 - STS-32, STS-52) P372/R108/V80/M97	00:22:04 AM EST (P) 00:22:04 AM EST (A)	6:50:19 AM EST Saturday 12		RSRM 42		DOST ONS 2		PAYLOAD	LAUNCH POSTPONEMENTS: - Launch date baselined as 5/19/94 on 1/19/93.
FLT #67	Spacehab-3		Friday 13	2/11/95 (3)	PREDICTED: 100/104/97/	42		<u>POST OMS-2</u> : 183.9 X 168.9		CHARGEABLE:	- Launch date postponed to 1/26/95 on 11/18/93.
KSC-67		PLT: Eileen M. Collins	2/3/95 (4)	<i>、</i> ,	69/104	ET-68		NM		19051 LBS	- Launch date postponed to 2/2/95 on 3/25/94.
	OMS PODS:	P373/R188/F24	LAUNCH WINDOW:	<u>DEORBIT BURN:</u> 42:10:44:04 Z	ACTUAL:	LWT		MIR RNDZ:		DEPLOYED:	
PAD 39B-27	LP01-23		5 min Planar/Phase	<u>XRANGE</u> : 469 NM	100/104/94/	61		Mir CPA of		23 LBS	LAUNCH SCRUBS: - 2/2/95 launch scrubbed at L-9 hours caused by IMU2 (HAINS)
070 27	RPO3-21	M/S 1/EV2 (PAYLOAD CDR): Bernard A. Harris	Window for Mir		69/104			37 feet at			platform fail BITE during transition from STBY to OPERATE. Replaced IMU and rescheduled launch for 2/3/95.
MLP-2	FRC3-20	(Flt 2 - STS-55) P374/R162/V114/M142	Rendezvous	<u>ORBIT DIR</u> : DR 13	1 = 2035 (1)	<u>et</u> RPT		3/13:58 MET 37/19:20Z		NON-DEPLOYED: 15249 LBS	Replaced IMU and rescheduled launch for 2/3/95.
		P374/R162/V114/M142	<u>EOM PLS</u> : KSC <u>TAL</u> : ZZA	<u>AIM PT</u> : CLOSE IN	2 = 2109 (14)	271K		213.5 X 206 NM		13247 LD3	LAUNCH DELAYS: None
		<u>M/S 2/EV1</u> :	TAL: ZZA	<u>MLGTD</u> : 1261 FT 42:11:50:19Z	3 = 2029 (11)					MIDDECK: 1128 LBS	
		C. Michael Foale	<u>TAL WX</u> : MRN, BEN	42:11:50:19Z		<u>et</u> BR/UP		<u>Backaway</u> : 3/14:10 MET		1128 LBS	TAL WX: - ZZA (prime and selected) and BEN were forecast and observed
		(Flt 3 - STS-45, STS-56) P375/R143/V92/M127	SELECTED:	VEL: 206 KGS 212 KEAS HDOT: -2.8 FPS	<u>M 3 EOM</u> :	214K		5/14.10 ME1		<u>SHUTTLE</u> ACCUMULATED	GO. MRN was forecast and observed NO GO for visibility (fog).
			<u>RTLS:</u> KSC33/CI/N TAL: ZZA30/N/N	HDOT: -2.8 FPS	WEIGHT:	гт		Flyaround		ACCUMULATED	, , , , , , , , , , , , , , , , , , ,
		M/S 3: Janice E. Voss	<u>AOA</u> : KSC33/CI/N <u>PLS</u> : EDW04/N/N	TD NORM 195:	212775 LBS X CG:	<u>ET</u> IMPACT		Initiated: 3/14:53 MET		WEIGHTS: DEPLOYED:	DOLILU/NOMINAL I-LOADS: - Both DOLILU and NOMINAL I-loads were NO GO for Q-plane
			<u>PLS</u> : EDW04/N/N	2583 FT	1079.5	1:27:07				766624 LBS	exceedance with boundary violation for engine knockdown.
		P376/R167/V115/F22	TDFL:	DRAG CHUTE DEPLOY: 185 KEAS		MET		<u>Sep Burn</u> : 3/15:50 MET		NON-DEPLOYED: 928587 LBS	exceedance with boundary violation for engine knockdown. NOMINAL I-loads were selected because exceedance point on alpha beta envelope was bounded by a wing strut indicator which
		<u>M/S 4</u> :	<u>TDEL</u> : -0.32 -0.478/0.28	42:11:50:27Z	LANDING: WEIGHT:	<u>LAT</u> : 0.036°S		3/15:50 IVIE I		CARGO TOTAL:	had adequate margin of safety. Waiver was written.
		Vladimir Titov	MAX Q NAV:	NI GTD: 5460 FT	212693 LBS	LONG:		<u>DEORBIT</u> : 212 X 204 NM		2007858 LBS	, , ,
		(SS Flt #1) (Flt 4 - SOYUZ T-8,	716 723	42:11:50:33Z	X CG: 1081.2	125.6°W		212 X 204 NM VELOCITY:		PERFORMANCE	NIGHT LAUNCH: Space Shuttle Night Launch #10.
		SOYUZ T-10,		NLGTD: 5460 FT 42:11:50:33Z VEL: 148 KGS HDOT: -4.8 FPS	1001.2			26903 FPS		MARGINS (LBS):	FLIGHT DURATION CHANGES: None
		MIR SOYUZ TM-4) P377/R189/M165	<u>SRB STG</u> : 2:05.6 2:05	<u>BRK INIT</u> : 57 KGS						FPR: 3775	
		RUSSIAN COSMONAUT						<u>ENTRY</u> RANGE:		FUEL BIAS: 1136 FINAL TDDP: 1830	FIRSTS: - First flight with a female pilot Eileen Collins
			<u>PERF</u> : NOMINAL	<u>DRAG CHUTE</u> <u>JETTISON:</u> 58 KGS 42:11:51:05Z				4329 NM		RECON: 3476	- First African-American to walk in space - Bernard Harris
		<u>SS EVA #29</u> EMU/TETHERED EVA	<u>2 ENG TAL (BEN)</u> :	42:11:51:05Z							·
		SCHEDULED EVA #25	2:25 2:22	AVE BRK DECEL:						PAYLOADS: PLB:	RENDEZVOUS #19: - Rendezvous with Mir, prox ops and flyaround with closest
		EVA DEVELOPMENT FLIGHT TEST (EDFT) #1 TO	NEG RETURN:	2.9 FPS/S	2000 L				-	SPACEHAB-3	approach of 37 feet.
		DEMONSTRATE EVA	4:04 4:06	WHEELS STOP:		9	-			CGP/ODERACS-2	
		PROCEDURES AND	PTA (U/S 293):	<u>WHEELS STOP:</u> 42:11:51:40Z 12269 FT	HAR -	- Im.	A		IN TA	(deployed) SPARTAN-204	RENDEZVOUS #20: - Rendezvous with SPARTAN, retrieve and berth. SPARTAN
		ABILITY TO MOVE LARGE OBJECTS. COLD	4:28 4:24		212 6		_			(deployed and	was deployed earlier in flight.
		ENVIRONMENT TESTS.	PTM (U/S 295):	ROLLOUT: 11008 FT		5	TA			retrieved)	
		2/9/95	<u>5:54</u> 5:44	70 SEC		en	1	VE COM			EVENTS: - ODERACS deployed at 00/23:35 MET.
		4H38M10S DURATION		WINDS: H5, R2 KTS OFFICIAL:		TANK I	11-			MIDDECK:	- ODERACS deployed at 00/23:35 MET. - SPARTAN deployed at 4/07:05:33 MET, grapple at 6/06:11:16
			<u>SE TAL (ZZA)</u> : 5:53	OFFICIAL:		(IS) a		1126	A	SSCE	MET, and berth at 6/06:48:23 MET
	BBEE Co			1705P07 H5, R1 KTS	5 HV -	2	1	STATISTICS STATISTICS	1 st	AMOS	RADIATOR DEPLOY #16:
ETH	and the		<u>SE PTM (U/S 810)</u> : 6:57 6:57		TAKEL	1		h L		4 CRYO TK SETS	- Port radiator deployed for approx 7 hours on FD2 for SPARTAN
6	-			DENS ALT: -443 FT	A STREET	P and	RY	SINC	re ke	RMS 40	ops (FES INHIBIT period). - Bistable HPOTP on engine 2035 limited throttle bucket to
E N	++	2	MECO CMD:	FLT DURATION: 8:06:28:15				a secolar de la secolar			- Bisiable HPOTP on engine 2035 limited throttle bucket to 69 percent.
H N	× + /		8:30.6 8:31.9	8:06:28:15 202:28:15	STS063-0	6-018 0	Crew o	n aft flight de	ck:	RMS used for	a ha a a
8		7	<u>VI</u> : 25885 25892	<u>S/T</u> : 500:07:23:28	Front row					SPARTAN deploy, retrieve, and berth	Continued
4			25885 25892	<u>OV-103:</u> 137:01:29:49				o rt), Voss/M	S,	and TCS maneu-	
		Continued	<u>OMS-2</u> :		Titov/MS ((Russia)	, CDR	Wetherbee,		vers, water dumps	
		Sommucu	42:10.3	<u>DISTANCE</u> : 2,922,000 sm	PLT Collin	ns (first f	emale	pilot).		and EVA objectives	
			252.6 FPS								

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			0.7								-
FLT	ORBITER	CREW (6)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-63 Continued			STS063-86-028 Co	Dilins and Titov		OFFER STS06	202 <u>1231</u> 3-716-(e e g zie D64 Freeflyin	954 g SPA	** •	Continued <u>SIGNIFICANT ANOMALIES</u> : - Cabin pressure transducer shifted low by 0.23 PSI. - Fuel Cell 2 H ₂ motor status increased between 0.6 volts and 0.83 volts. - EV2 crewman experienced burning sensation in his eyes during repressurization at 5 PSI. Funny odor inside suit was reported. - During EVA, both EV1 and EV2 electronic cuffs were partially unresponsive. - THC hotstick event when aft flight controller power was turned on (ref. STS-66), several thrusters fixed. - TCZ z-axis system failure during MIR backaway at 322 feet. - Erratic TCS data sporadically throughout TCS ops on SPARTAN rendezvous day. - Port radiator latch 1-6 "A" latched indication intermittent. - Spacehab module pressure decay (air leak into airlock). - RCS jet R1U failed off (oxidizer temp dropped below RM limit of 30 degree F), oxidizer leak. - RCS jet L2D failed off. Jet had good driver output with
	ring sha	Harris on RMS foot red EVA. Harris on n space.			ation with	docked	Soyu	Discovery: Iz (at botto I.		Scientist) wi NASA JSC many JSC M	low (< 13 PSI) chamber pressure. RCS jet F1F fail leak, indicated oxidizer leak. FRCS jet F1F fail leak, indicated oxidizer leak.

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					_	-					
		CREW	LAUNCH SITE.	LANDING SITE/	SSME-TL	CDD		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(7)	LIFTOFF TIME,	RUNWAY, CROSSRANGE	NOM-ABORT EMERG	SRB RSRM		URBIT	FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.	UKDITEK		LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP	F3W	PAYLOADS/	TAL WEATHER. ASCENT I-LOADS.
NO.		TITLE, NAMES	ABORT TIMES	FLT DURATION,	PROFILE	ET	INC			EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S	ADOINT HIMLS	WINDS	ENG. S.N.	L1					TIKSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-67	OV-105	CDR:	KSC 39A	EDW 22, CONC	104/104/	BI-071	28.45°	DIRECT	01-23	CARGO:	KSC W/D: OPF 81, VAB 5, PAD 19 = 105 days total.
515-07	(Flight 8)	Stephen S. Oswald	61:06:38:12.95Z	(EDW 44, CONC 25)	109%		(37)	INSERTION	(5)	28528 LBS	······································
SEQ	Endeavour	(Flt 3 - STS-42, STS-56)		77:21:47:14Z		RSRM					LAUNCH POSTPONEMENTS:
FLT #68	Spacelab	P378/R139/V91/M124	01:38:13 AM EST (A) Thursday 18	1:47:14 PM PS1 Saturday 13	PREDICTED: 100/104/104/	43		<u>POST OMS-2</u> : 190.4 X		<u>PAYLOAD</u> CHARGEABLE:	- Launch date baselined as 11/3/94 on 6/24/93 - Postponed launch to 12/1/94 on 11/5/93
KSC-68	Pallet	<u>PLT</u> :	3/2/95 (5)	3/18/95 (5)	70/104	ET-69		190.4 X 187.3 NM		20067 LBS	- Postponed launch to 1/12/95 on 3/25/94
K3C-00		William G. Gregory	.,	()							- Postponed launch to 2/23/95 on 9/26/94
PAD	16th	P379/R190/M166	LAUNCH WINDOW:	DEORBIT BURN: 77:20:39:13Z	<u>ACTUAL</u> : 100/104/104/	LWT 62				<u>DEPLOYED</u> : 01BS	- Postponed launch to 3/2/95 on 11/30/94
39A-41	Spacelab Flight	M/S 1:	2H30M CTOB		100/104/104/ 67/104					0 LBS	LAUNCH SCRUBS: None
MLP-1	riigin	John M. Grunsfeld	EOM PLS: KSC	<u>XRANGE</u> : 268 NM	07/104	ET				NON-DEPLOYED:	LAUNCH SCRUDS. None
	EDO 5	P380/R191/M167	TAL: BEN	ORBIT DIR: AL17	SSME S/N:	RPT				18303 LBS	LAUNCH DELAYS:
			<u>TAL WX</u> : MRN	AIM PT: NOMINAL	1 = 2012 (16)	271K					- Delayed coming out of T-9 min hold awaiting confirmation that
	OMS PODS: LPO4-15	M/S 2: Wendy B. Lawrence	SELECTED:		2 = 2033 (7) 3 = 2031 (12)	ET		DEORBIT:		MIDDECK: 1764 LBS	FES feedline B heater 1 was operating after switching from heater 2 at T-18 mins. Launch delay of 1M13S.
	RP01-21	P381/R192/F25	1(1EO. 1(00 00/01/1	<u>MLGTD</u> : 1672 FT 77:21:47:01Z		BR/UP		193 X 182 NM		1704 LDS	ficator 2 at 1-10 mins. Eautor aciay or minso.
	FRC5-8		TAL: BEN 36/CI/N	VEL: 201 KGS	<u>M 3 EOM</u> :	214K				SHUTTLE	TAL WX:
		M/S 3 (PAYLOAD CDR):	AOA: EDW 22/CI/N PLS: EDW 22/CI/N	VEL: 201 KGS 209 KEAS	WEIGHT: 217646 LBS	ст		VELOCITY: 25852 FPS		ACCUMULATED WEIGHTS:	- Ben Guerir (prime & selected) and Moron were forecast and observed GO. Banjul was not available because of local
		Tamara E. Jernigan (Flt 3 - STS-40, STS-52)		HDOT: -1.4 FPS	X CG:	<u>ET</u> IMPACT		20002 FP3		DEPLOYED:	instability.
		P382/R130/V83/F14	TDEL:	<u>TD NORM 195</u> : 2980 FT	1083.5	1:22:37		ENTRY		766624 LBS	instability.
		5/6.4	0.48 0.202/0.24			MET		RANGE:		NON-DEPLOYED:	DOLILU/NOMINAL I-LOADS:
		P/S 1: Samuel T. Durrance	MAX Q NAV:	<u>NLGTD</u> : 6240 FT 77:21:47:14Z	LANDING: WEIGHT:	<u>LAT</u> : 15.5°S		4216 NM		948654 LBS CARGO TOTAL:	- Both DOLILU and nominal were NO GO for ET load indicator ES-73 using L-1 data base. Using M data base, both were
		(Flt 2 - STS-35)	728 PSF 739 PSF	77:21:47:14Z	217437 LBS	LONG:				2036386 LBS	GO, DOLILU was selected because we had a better data base
		P383/R120/V116/M108	<u>SRB STG</u> :	VEL: 151 KGS HDOT: -6.3 FPS	X CG:	159.45°W				2030300 203	at MACH 1.4. An LSEAT waiver was written.
		D/0 0	2:06.9 2:05	DRAGCHUTE	1085.0					PERFORMANCE	
		P/S 2: Ronald A. Parise		DEPLOY: 147 KEAS						<u>MARGINS (LBS)</u> : FPR: 3775	NIGHT LAUNCH: Space Shuttle night launch #11.
		(Flt 2 - STS-35)	<u>PERF</u> : NOMINAL	77:21:47:16Z						FUEL BIAS: 1136	FLIGHT DURATION CHANGES/LANDING SITE CHANGE:
		P384/R119/V117/M107	2 ENG TAL:	BRK INIT: 142 KGS						FINAL TDDP: 4099	- Waved off landing at KSC on orbits 246, 247, and 248
			2:38 2:35							RECON: 6754	because of forecast ceiling violations and thunderstorms within
	N OSWALD		NEG RETURN:	<u>DRAGCHUTE</u> <u>JETTISON:</u> 54 KGS						PAYLOADS:	30 nm. Extended flight 1 day. - Waved off landing at KSC on orbits 262 and 263. Forecast of
36	STRO 2	(B)	3:59 4:01	77:21:47:43Z	-		CT II		-2-4	<u>PLB:</u> ASTRO-2	low ceiling and 0.2 cloud cover under 12K. Decision made to
45 +	X1+	. 22		AVE BRK DECEL:	2.0			C TIE	1	ASTRO-2	change landing site to EDW.
9 9		+ 5	<u>PTA (U/S 297)</u> : 4:22 4:15	5.5 FPS/S	2.00		athor			GAS-2	- Total flight duration extension 1 day plus 1 orbit.
SFE	+ 10			WHEELS STOP:	2 X	Y	A A				LANDING SITE CHANGE: KSC to EDW
NIR I			<u>PTM (U/S 427)</u> :	77:21:48Z	all all			Las!		MIDDECK:	
10 m	H EI		5:30 5:17	11647 FT	A	The second	141		-	CMIX,	EVENTS:
	april In		SE T/M (BYD):	ROLLOUT:		7				PGS-TCS PGS-STES	- Most persons in orbit at one time, total eleven (11). Mir 18 was launched at 9:11 a.m. Moscow time (12:11 a.m. CST) on
	DURSE DURSE		5:49 5:49	9935 FT		-				SAREX-2, MACE	March 14 from Baikonur cosmodrome with Norm Thagard.
			SE PTM (U/S-897):	47 SEC							March 14 from Baikonur cosmodrome with Norm Thagard, Vladimir Dezhurov and Gennady Strekalov on board
			6:33 6:33	WINDS:				A COM		5 + 4 EDO CRYO TK	(planned return on Atlantis on STS-71). Three Russians went on Mir plus 7 Americans on Endeavor).
		MCC FCR-1 (47)		H14 R5 KIS						SETS EDO	went on will plus / Americans on Endeavor).
		FLIGHT DIRECTORS:	MECO CMD: 8:27.65 8:27.3	OFFICIAL: 2515P22 H14, R4 KTS						PALLET	
		A/E - R. E. Jackson	0.21.00 0.21.0	DENS ALT: 3481 FT	STS067	317-002 0	rowin	aft flight decl	k.		Continued
		O 1 - B. P. Austin O 2 - A. L. Pennington	MECO VI:	<u>DENS ALT</u> : 3401 FT	Front (It to				κ.	RMS 41 (S.N. 303)	
		O 3 - J. P. Shannon	25922 25914					. Back (It to	rt)	(3.14. 303)	
		L/O 4 - C. W. Shaw	<u>OMS-2</u> :					Durrance/PS		RMS NOT USED	
		MOD - A. L. Briscoe	40:19.8 40:19.8	Continued	and Grun		15e/P3,	Durrance/PS	э,		
		MOD - J. W. Bantle	279 FPS 279 FPS		and Grun	SIEIU/IVIS.					

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		••••							
FLT ORBITER NO.	CREW (7) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE ENG. S.N.	SRB RSRM AND ET	ORBIT	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
TS-67 ontinued			Continued <u>FLT DURATION</u> : 16:15:08:48 <u>S/T</u> : 516:22:32:16 <u>OV-105</u> : 82:17:54:11 <u>DISTANCE</u> : 6,892,836 sm	STS067-1	nd Gr	8 Oswald (egory (Right) in			Continued <u>SIGNIFICANT ANOMALIES</u> : - Spacelab SCOS cache addressing error. - FES primary A failed to come out of standby. - Noisy supply water tank D quantity transducer. - High N ₂ flow on PCS system 2, 14.7 cabin regulator. - Middeck audio terminal unit failure (main bus current spike). - CCPI failure to power portable light or camcorder. - Handheld mike was inoperative on both middeck and airlock ATU's. Possible short. - TEAC 8 mm VCR anomaly (degraded picture quality). - Unexplained external IPS disturbances. Pointing performanc degraded. - Water spray boiler 2 excessive water usage (most of water w accidentally off-loaded prelaunch.) - L5D oxidizer injector temperature erratic (GMEM uplinked). - R4R jet fail leak, jet stopped leaking at 21:53 MET.
STS067-721A-087 World", the Plate (foreground) & Gan	eau of China.	Roof of the Himalalyan		nmy Hollow	/ay, pre	Program Managesents STS-67 V Done".			sts067-s-041 Glynn Lunney (left), VR & Program Manager USA (and former NASA Flight Director & Shuttler Porgram MGR) and Flight Director Randy Stone in MCC.

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FLT	ORBITER	CREW (10) 7 UP, 8 DOWN	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,	
NO.	URDITER	TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION,	THROTTLE PROFILE	AND ET	INC	HA/HP	гзи	PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)	
STS-71 SEQ FLT #69 KSC-69 PAD 39A-42 MLP-3	OV-104 (Flight 14) Atlantis Spacelab-Mir LM-11 17th Spacelab Flight <u>OMS PODS</u> : LPO3-18 RPO4-14 FRC4-14	CDR: Robert L. (Hoot) Gibson (Fit 5 - STS-41-B, STS 61-C, STS-27, STS-47) P385/R30/V27/M29 PLT: Charles J. Precourt (Fit 2 - STS-55) P386/R161/V118/M141 <u>WS 1 (PAYLOAD CDR)</u> : Ellen S. Baker (Fit 3 - STS-34, STS-50) P387/R105/V75/F10 <u>M/S 2</u> : Gregory T. Harbaugh (Fit 3 - STS-39, STS-54 P388/R125/V88/M112 <u>M/S 3</u> : Bonnie J. Dunbar	KSC 39A 178:19:32:18.95Z 3:32:19 PM EDT (P) 3:32:19 PM EDT (A) Tuesday 9 6/27/95 (7) <u>LAUNCH WINDOW:</u> 10M19S Mir Planar/ Phase Window <u>EOM PLS</u> : KSC TAL: ZZA TAL WX: MRN, BEN <u>SELECTED:</u> <u>RTLS</u> : KSC 33/CI/N TAL: MRN 20/N/N <u>AOA</u> : NOR 23/N/N <u>PLS</u> : EDW 22/N/N <u>TDEL</u> : -0.13 0.192/0.23	WINDS KSC 15 (KSC 23) 188:14:54:35Z 10:54:35 AM EDT Friday 8 7/7/95 (6) DEORBIT BURN: 188:13:45:19Z XRANGE: 645 NM ORBIT DIR: AL 18 AIM PT: NOMINAL MLGTD: 2243 FT 188:T4:54:35Z VEL: 206 KGS 201 KEAS HDOT: -1.8 FPS TD NORM 195: 2575 FT DRAG CHUTE DEPOY: 184 KEAS 108:T4:54:39Z	ENG. S.N. 104/104/ 109% <u>PREDICTED:</u> 100/104/104/ 68/104 <u>ACTUAL:</u> 100/104/104/ 68/104 <u>SSME S/N:</u> 1 = 2028 (10) 2 = 2034 (6) 3 = 2032 (3) <u>M 3 EOM:</u> WEIGHT: 216527 LBS X CG: 1079.7	BI-072 RSRM 45 ET-70 LWT 63 ET <u>RPT</u> 271.3K <u>ET</u> <u>BR/UP</u> 214K <u>EI</u> <u>IMPACT</u> 1:26:57 MET <u>LAT:</u> 0.08°S	51.63° (2)	DIRECT INSERTION <u>POST OMS-2</u> : 159.5 x 85.2 NM <u>DOCKING</u> <u>CAPTURE</u> : 1/17:27:57 MET <u>HARD MATE</u> : 1/17:35:54 MET <u>SHUTTLE</u> <u>HATCH OPEN</u> : 1/19:28:56 MET <u>HAND SHAKE</u> : 1/19:28:56 MET <u>SOYOZ</u> <u>UNDOCKING</u> : 6/15:32:34 MET		CARGO: 26577 LBS PAYLOAD CHARGEABLE: 17941 LBS DEPLOYED: 0 LBS NON-DEPLOYED: 17251 LBS MIDDECK: 690 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 766624 LBS NON-DEPLOYED: 766595 LBS CARGO TOTAL:	KSC W/D: OPF 115, VAB 6, PAD 44 = 165 days total. LAUNCH POSTPONEMENTS: - - Baselined 5/30/95 as launch date on 10/21/93. - Changed launch date to 5/24/95 on 9/1/94. - Postponed launch date to NET 6/19/95 due to delays in SPECKTR launch. STS-70 was moved ahead of STS-71. - Postponed launch date to NET 6/22/95 due to Mir EVA's to allow time to configure Mir docking ports and solar arrays. - Postponed launch date to NET 6/23/95 (docking on FD4 would be same date as 6/24/95 launch with docking on FD3). LAUNCH SCRUBS: - Scrubbed 6/23/95 launch at T-6.25 hours when tanking window ran out. Tanking violation of lightning within 5 miles. - Scrubbed 6/24/95 launch at L-44 mins while holding at T-9 minutes due to ceiling violations, rain, and thunderstorms in KSC area. LAUNCH DELAYS: None TAL WX: -ZZA (prime) was forecast NO GO for ceiling and thunderstorms within 20 nm. MRN (selected) and BEN were both forecast and	
		(Flt 4 - STS 61-A, STS-32, STS-50) P389/R79/V49/F7 <u>MIR 19 CREW UP</u> : <u>MIR-19 CDR:</u> Anatoly Y. Solovyev P390/R193/M168 <u>MIR-19 FLIGHT ENGINEER:</u> Nikolai Budarin P391/R194/M169 <u>MIR-18 CREW DOWN</u> : <u>MIR-18 CDR</u> :	MAX O NAV: 716 SRB SEP: 1:59:10 PERF: NOMINAL 2 ENG TAL (MRN): 2:31 NEG RETURN: 4:05 PTA (U/S 267): 4:32	108:14:54:392 <u>NLGTD</u> : 5471 FT 188:14:54:44Z VEL: 166 KGS HDOT: -6.0 FPS <u>BRK INIT</u> : 144 KGS <u>DRAG CHUTE</u> <u>JETTISON: 52 KGS</u> 188:14:55:09Z <u>AVE BRK DECEL</u> : 5.6 FPS/S <u>WHEELS STOP</u> : 188:14:55:28Z 10607 FT ROLLOUT:	LANDING: WEIGHT: 216352 LBS X CG: 1081.3	125.4°W		<u>DEORBIT:</u> 215 X 209 NM <u>VELOCITY:</u> 25913 FPS <u>ENTRY</u> <u>RANGE</u> : 4321 NM		2062963 LBS PERFORMANCE MARGINS (LBS): FPR: 3775 FUEL BIAS: 1136 FINAL TDDP: 1040 RECON: 1398 PAYLOADS: PLB: SHUTTLE-MIR MISSION 1 SL-M/LM ODS	observed GO. <u>DOLILU/I-LOADS:</u> - Selected and uplinked, DOLILU uplink #14, I-load uplink #20, last use of DOLILU I-load. <u>FLIGHT DURATION CHANGES</u> : None <u>FIRSTS/SPECIAL EVENTS</u> : - Lowest perigee of all space shuttle flights of 85 nm (phasing maneuver) achieved during initial orbit Smallest OMS-2 Delta V of 75.5 FPS First permanent transfer of Russian/American crews (Mir-19 up and Mir-18 crew down on Atlantis - 7 up, 8 down Carried up orbiter docking system and attached to Mir First docking of U.S. & Russian spacecraft since Apollo-Soyuz in 1975.	
The second secon	PUNBAR COROBLED	Vladimir Dezhurov P392/R195/M170	DROOP (ZZA): 5:21 5:23 PTM: 5:56 SE TAL (ZZA): 5:56 5:58 6:07 SE PTM (U/S 784): 7:01 7:01 6:59 Continued 5:58	<u>WINDS:</u> 53 SEC <u>WINDS:</u> T3, L5 KTS OFFICIAL: 0307 T4, L6 <u>DENS ALT</u> : <u>T376 FT</u> <u>FLT DURATION</u> : <u>9:19:22:15</u> <u>S/T</u> : 526:12:54:31	U.S. hum 1st docki	ian space ng betwe	e flight. en the	Liftoff of 100 It featured th U.S. Space Space Station)th ne	<u>MIDDECK:</u> IMAX, SAREX-II 5 CRYO TK SETS NO RMS	EVENTS: - Thagard lifted off from Baikonur Cosmodrome in Kazakhstan on March 14, 1995, at 9:11:00 AM local time (73:06:11:00Z). - Total Soyuz/Mir time for Thagard 107:09:57:18, total flight time 115:08:43:35. - Mir/Shuttle capture at 180:13:00:14Z, docking complete at 180:13:08:18Z. - Crews transfer time at 180:16:08:18Z (Mir 19 from Atlantis to Mir, and Mir 18 to Atlantis, when seat liners transferred to Atlantis). - Transferred equipment, experiments, 1067 lbm H ₂ O, 48 lbm O ₂ , and 87 lbm N ₂ to Mir. - Undocking completed at 185:11:09:42Z. Continued	

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FLT ORBITER NO.	CREW (10) 7 UP - 8 DOWN) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION,	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE	SRB RSRM AND ET	ORBIT	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-71 Continued MCC FCR-1 (48) <u>FLIGHT DIRECTORS:</u> A/E - N. W. Hale LD/O 1 - R. E. Castle O 2 - P. L. Engelauf PLNG - P. F. Dye FD Moscow - W. D. Reeves MOD - A. L. Briscoe	Continued <u>MIR-18 FLIGHT ENGINEER</u> : Gennady Strekalov P393/R196/M171 <u>MIR-18 COSMONAUT</u> <u>RESEARCHER:</u> Norman E. Thagard (Flt 5 - STS-7, STS 51-B, STS-30, STS-42) P394/R20/V14/M19	Continued MECO CMD: 8:30.72 8:31.1 VI: 25876.5 25871 OMS-2: 42:57.2 42:57.2 Delta V 75.5 FPS TGO = 00:47	WINDS Continued <u>OV-104:</u> 93:03:49:17 <u>DISTANCE</u> : 4,100,000 sm	ENG. S.N.	G				Continued <u>RENDEZVOUS #21</u> : - Rendezvous and dock with Russian Mir Space Station (first docking). <u>SIGNIFICANT ANOMALIES</u> : - Postflight disassembly of RSRM nozzle joint 3 revealed RTV gas paths with slight heat effect and erosion to primary O-rings of STS-71 LH RSRM and STS-70 RH RSRM. Technique developed to remove RTV from joint and do a vacuum backfill for STS-69 and STS-73 RSRM's.
Mir module and tunnel at KSC. In for is Obiter Docking (ODS) topped w	transfer reground system ith red ogynous System BELOW: S from link: <u>http://io.js</u> <u>1-s-072.jr</u>	es Mir docking n ise reported th happily yelled, " reference to the pannas from Cub Soyuz photo of S c.nasa.gov/photo	Shuttle docked to	Rep naut ssia MIR 507 Sof Sof Sof Sof Sof Sof Sof Sof Sof Sof	sfer of up and okwise om cen larbaug Precourt er, Boi gard, G	2-013 1995 First Russian/American Mir-18 crew down from Anatoly Y. S ter, arms folded) a h, Robert L. Gibse , Nikolai M. Budar nnie J. Dunbar, sennadiy M. Streka ir N. Dezhurov.	crews (on STS colovyev are Gre on, Cha in, Elle Normar	(Mir- -71. y (at gory arles n S. T. E.	 GPC 4 annunciated GPC BITE fault message followed by GPC 4 fail. Determined to be single event upset, GPC 4 was assigned string 4 and used successfully during entry. Slow docking module vestibule depress rate. H₂ manifold valve tank 1 failed open. Cryo O₂ tank 1 leak through flight cap of fill/drain line QD. H₂ manifold valve 1 microswitch failure. Erratic O₂ tank 5 heater temperature. VHF system transmit failure. PDIP power fail. S-band comm string 2 uplink problem. RCS jettison R2U fail off (low chamber pressure).

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FLT	ORBITER	CREW (5)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.	ORDITER	TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND	INC	HA/HP	1.300	PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-70 SEQ FLT #70 KSC-70 PAD 39B-28 MLP-2	SSME, n test,	CDR: Terence T. (Tom) Henricks (Fit 3 - STS-44, STS-55) P395/R135/V93/M120 PLT: Kevin R. Kregel P396/R197/ M172 M/S 1: Donald A. Thomas (Fit 2 - STS-65) P397/R180/V119/M158 M/S 2: Nancy J. (Sherlock) Currie (Fit 2 - STS-57) P398/R165/V120/F21 M/S 3: Mary Ellen Weber P399/R198/F26 MCC FCR-1 (49) (A/E & TDRS DEPLOY) WHITE FCR (1) (ON ORBIT OPS) FLIGHT DIRECTORS: A/E - R. D. Jackson LD/O 2 - R. M. Kelso O 1 - J. P. Shannon PLNG - B. P. Austin MDR 1 - C. W. Shaw	MAX Q NAV: 686 692 686 SRB STG: 2:05 2:02.7 2:05 PERF: NOMINAL 2 ENG TAL (BEN):	KSC 33 (KSC 24) 203:12:02:00Z 8:02:00 AM EDT Saturday 14 7/22/95 (6) DEORBIT BURN: 203:11:00:13Z XRANGE: 430 NM ORBIT DIR: DL 33 AIM PT: NOMINAL MLGTD: 2601 FT 203:12:02:00Z VEL: 198 KGS 194 KEAS HDOT: -1.4 FPS TD NORM 195: 2400 FT DRAG CHUTE DEPLOY: 189 KEAS 203:12:02:03Z NLGTD: 5460 FT 203:12:02:03Z NLGTD: 5460 FT 203:12:02:35Z AVE BRK DECEL: 4.6 FPS/S WHEELS STOP:	104/104/ 109% <u>PREDICTED</u> : 100/104/104/ 67/104 <u>ACTUAL</u> : 100/104/104/ 67/104 <u>SSME S/N</u> : 1 = 2036 (1) 2 = 2019 (15) 3 = 2017 (12) <u>M 3 EOM</u> : WEIGHT: 194267 LBS X CG: 1097.2 <u>LANDING</u> : WEIGHT: 194190 LBS X CG: 1099.1	BI-073 RSRM 44 ET-71 LWT 64 ET <u>RPT</u> 271K ET <u>BR/UP</u> 214K ET <u>IMPACT</u> 13.75°S <u>LONG</u> : 163°W	28.45° (38)	DIRECT INSERTION <u>POST OMS-2</u> : 160.9 X 160.7 NM <u>DEORBIT</u> : 166 X 155 NM <u>VELOCITY</u> : 25789 FPS <u>ENTRY</u> <u>RANGE</u> : 4265 NM	(2)	CARGO: 46799 LBS PAYLOAD CHARGEABLE: 44445 LBS DEPLOYED: 37714 LBS NON-DEPLOYED: 5585 LBS MIDDECK: 1086 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 804398 LBS NON-DEPLOYED: 804398 LBS NON-DEPLOYED: 973266 LBS CARGO TOTAL: 2109762 LBS PERFORMANCE MARGINS (LBS): FPR: 3775 FUEL BIAS: 1136 FINAL TDDP: 3789 RECON: 5299 PAYLOADS: PLB: TDRS-G/IUS	KSC W/D: OPF 63, VAB 14 (2) PAD 43 (2) = 120 days total. LAUNCH POSTPONEMENTS: Baselined launch date 6/29/95 on 3/18/94. - Advanced launch date to 6/22/95 on 9/26/94. - Advanced launch date to 6/8/95 on 5/2/95, moving STS-70 ahead of STS-71. Delays on SPEKTR launch & docking with Mir caused STS-71 launch to be postponed. - Postponed 6/8/95 launch to 7/13/95 on 6/2/95 based on decision to rollback to VAB and repair holes (>200) in ET caused by a pair of woodpeckers (Northern Flickers). Moved STS-70 after STS-71. LAUNCH SCRUBS: None LAUNCH DELAYS: - Launch delayed 55 seconds while holding at T-31 seconds due to Range Safety ET destruct package receiver fluctuating AGC (possible multipath). TAL WX: - BEN was prime and selected. MRN was forecast and observed NO GO due to crosswinds. Banjul in plane site was down for runway repair. DOLILU/NOMINAL I-LOADS: - First planned use of DOLILU II I-loads. DOLILU II was selected and uplinked. DOLILU II uplink #1, I-load uplink #21. FLIGHT DURATION CHANGES: - Waved off landing at KSC on orbits 127 and 128 because of forecast and observed low ceiling and ground fog. - Waved off landing at KSC on orbit 142. Weather was observed GO but marginal with potential for ground fog but observed GO at landing time.
Hausma	r, Dail In,/P&W/ Ivne/ KSC	MDR 1 - C. W. Shaw MDR 2 - J. M. Heflin MOD - B. R. Stone	PTA (U/S 244): 5:03 5:01 DROOP (BYD): 5:31 5:00 5:31 PTM (U/S): 5:47 5:46 5:47 SE TAL (BYD): 5:59 5:59 6:06 SE PTM (U/S 537): 7:01 7:01 7:01 MECO CMD: 8:30.75 8:30.75 8:30.7 VI: 25876 25874 OMS-2: 39:54.9 39:55 DELTA V 222 FPS	203:12:02:58Z 11066 FT <u>ROLLOUT</u> : 8465 FT 58 SEC <u>WINDS</u> : 12, L2 KTS OFFICIAL: 2005 P8 T3, L4 KTS <u>DENS ALT</u> : <u>THT7 FT</u> <u>FLT DURATION</u> : 8:22:20:05 214:20:05 <u>S/T</u> : 535:16:14:36 <u>OV-103:</u> 145:23:49:54		ag as bao , Currie/I	ckdrop: MS, CD	crew portrait Left to right, R Henricks,		(DEPLOYED)	 Total flight extensions 1 day plus 1 orbit. <u>FIRSTS:</u> First flight to be controlled by White FCR in new MCC (Bldg 30S) for most of orbit operations. Ascent and entry plus early and late orbit ops being controlled from old MCC FCR-1. First flight with Block I SSME (2036). <u>SIGNIFICANT ANOMALIES:</u> Postflight disassembly of RSRM nozzle joint 3 revealed gas paths with slight heat effect and corrosion to primary o-ring of STS-70 RH RSRM. Erratic supply water tank C transducer. Ops recorder 2 track 3 degradation. Vacuum cleaner power cable pinched (IFM fixed). Crew reported W6 impact crater. Lost MOC capability when MOC went to 100% CPU.

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				LANDING SITE/	SSME-TL						
		CREW	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(5)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		UKDIT	FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.	ORDITER		LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP	1300	PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
NO.		TITLE, NAMES	ABORT TIMES	FLT DURATION,	PROFILE	ET	INC	11/5/111		EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S	ADOINT HIMES	WINDS	ENG. S.N.	L1					TIKSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-69	OV-105	CDR:	KSC 39A	KSC 33 (KSC 25)	104/104/	BI-074	28.45°	DIRECT	01-24	CARGO:	KSC W/D: OPF 81, VAB 7 PAD 47 (2) = 135 days total.
515-07	OV-105 (Flight 9)	David M. Walker	250:15:08:59.96Z	261:11:37:55Z	109%		(39)	INSERTION		31549 LBS	
SEQ FLT #71	Endeavour	(Flt 4 - STS 51-A, STS-30,	11:09:00 AM EDT (P)	7:37:55 AM EDT		RSRM					LAUNCH POSTPONEMENTS: - Baselined launch date of 3/16/95 on 11/18/93.
FLT #71		STS-53)	11:09:00 AM EDT (A)	Manday 14	PREDICTED: 100/104/104/	48 KM		POST OMS-2: 201 x 199 NM		PAYLOAD CHARGEABLE:	- Postponed launch date to 5/4/95 on 3/24/94.
KCC 71		P400/R48/V40/M45	Thursday 20 9/7/95 (7)	Monday 14 9/18/95 (8)	67/104	ET-72		201 X 199 INIVI		25346 LBS	- Postponed launch date to 7/20/95 on 10/6/94.
KSC-71	OMS PODS:	PLI:	/////J (/)		0//104	L1-72		DEORBIT:		20040 200	- Postponed launch date to 8/5/95 caused by delays in STS-71
PAD	LPO4 - 16	Kenneth D. Cockrell	LAUNCH WINDOW:	DEORBIT BURN: 261:10:35:13Z	ACTUAL:	LWT		186 x 181 NM		DEPLOYED:	and STS-70.
39A-43	RPO5 - 7	(Flt 2 - STS-56) P401/R159/V121/M140	2H30M CTOB		100/104/104/	65				0 LBS	- Postponed launch date to 8/31/95 while program analyzed RTV gas paths in nozzle joint #3 on STS-71 and STS-70, then
	FRC5 - 9		FOM DI S. KSC	<u>XRANGE</u> : 202 NM	67/104	FT		VELOCITY: 25839 FPS		NON-DEPLOYED:	developed a fix for STS-69
MLP-1		M/S 1 (PAYLOAD CDR):	<u>EOM PLS</u> : KSC <u>TAL</u> : BEN	ORBIT DIR: DL 34	1 = 2035 (2)	<u>RPT</u>		20037153		16739 LBS	- Rolled back to VAB on 8/1/95 under threat of Hurricane Erin.
		James S. Voss	TAL WX: MRN		2 = 2109(16)	271K		ENTRY		10/07 200	- Returned to pad on 8/8/95.
		(Flt 3 - STS-44, STS-53) P402/R136/V85/M121		AINT 1. CLOSE IN	3 = 2029 (12)			RANGE: 4332 NM		MIDDECK:	LAUNCH SCRUBS:
	WALKER		<u>SELECTED</u> : <u>RTLS</u> : KSC 15/CI/N	MLGTD: 1912 FT 261:11:37:55Z VEL: 218 KGS 212 KEAS	M 2 EOM	ET BR/UP		4332 NM		1301 LBS	- Scrubbed 8/31/95 launch at approx. L-7.5 hours when fuel cell 2
a C		M/S 2/EV-1:	TAL: BEN 36/N/N	VEL: 218 KGS	M 3 EOM: WEIGHT:	214K	sts069-	714-042-Voss ((top)	SHUTTLE	condenser exit temperature exceeded LCC limit of 160 deg F.
	A	James H. Newman (Flt 2 - STS-51)	AOA: EDW 22/N/N	212 KEAS	219395 LBS			hardt EVA		ACCUMULATED	- Rescheduled launch for 9/7/95.
and the second s		P403/R168/V122/M146	<u>PLS</u> : EDW 22/N/N	HDOT: -4 FPS	X CG:	<u>et</u>	a demi			WEIGHTS:	LAUNCH DELAYS: None
TOMOT	VORB		TDEL:	TD NORM 205:	1080.7	IMPACT				DEPLOYED:	
		M/S 3/EV-2: Michael L. Gernhardt	0.0 0.032/-0.09	2468 FT	LANDING:	1:24:54 MET				804398 LBS NON-DEPLOYED:	TAL WX: - BEN (prime and selected), MRN forecast NO GO for ceiling
			MAX Q NAV:	<u>DRAG CHUTE</u> <u>DEPLOY</u> : 187 KEAS	WEIGHT:	<u>LAT</u> :		- 100		991306 LBS	and rain but observed GO 10 mins prior to landing time.
MCC FCR	R-1 (50) (A/E)		705 PSF 715 PSF	DEPLOY: 187 KEAS	219298 LBS	18.8°S		10 1	-	CARGO TOTAL:	· •
WHITE FC	CR (2)	SS EVA #30 EMU/Tethered EVA		261:11:38:03Z	X CG:	LONG:			• •	2141311 LBS	DOLILU II/NOMINAL I-LOADS: - Nominal I-loads were not certified for September. DOLILU-II
(ORBIT)		Scheduled EVA #26	SRB SEP:	NLGTD: 6325 FT	1082.3	151.9°W	The Party	100	TEP/12		I-loads uplinked. DOLILU-II uplink #2, total DOLILU uplink
<u>FLIGHT D</u> A/E - N. W	IRECTORS:	EVA flight test (EDFT) #2 to	2:03.7 1:59.1	261:11:38:08Z VEL: 167 KGS			18C		Past	PERFORMANCE MARGINS (LBS):	#16 I-load uplink #22.
	I. W. Bantle	evaluate space suit mods to	<u>PERF</u> : NOMINAL	VEL: 167 KGS HDOT: -6.5 FPS				40	and a	FPR: 3775	
02-P.F.	. Dve	protect space walkers from	2 ENG TAL (BEN):	BRK INIT: 97 KGS					Chille Start	FUEL BIAS: 1136	FLIGHT DURATION CHANGES: None
PLNG - G	. A.	the cold of space, including heated gloves & LCVG leg	2:40 2:49						12 20	FINAL TDDP: 5409	EVENTS:
Penningto		hypace) DET 4U44M11C		<u>DRAG CHUTE</u> JETTISON: 62 KGS			. 🥖		The second	RECON: 7966	- SPARTAN released 1:00:38:59, grapple 2:23:53, latched
MOD - A.	L. Briscoe		<u>NEG RETURN</u> : 4:01 4:02	261:11:38:36Z	A COL			37		PAYLOADS:	3:00:03 MET.
	1 hort of		4:01 4:02		- 9 -		1	· 1 5		PI B [.]	- WSF released 3:20:16:15, grapple 6:22:50:11 MET.
	-		<u>PTA (U/S 328)</u> :	AVE BRK DECEL: 5.6 FPS/S	1 Production		Aller I.	1. anti-	101	WSF (Wakeshield	RENDEZVOUS #22:
	A THE		4:18 4:14	WHEELS STOP:			-		1	Facility), IEH,	- Rendezvous, grapple & berth WSF.
11-		ATTIC TO ATTIC TO A	DROOP (BYD):	<u>WHEELS STOP</u> : 261:11:38:557	- ARC. 4 (21)	in the	-		52	Spartan-201-03 CAPL-II/GBA	RENDEZVOUS #23:
Transfer and			5:28 5:30	261:11:38:55Z 12142 FT			195	1811 7 3	0		- Rendezvous, grapple & berth SPARTAN 201-03.
	and the second second		PTM (U/S 328):	ROLLOUT:				NY V		MIDDECK:	
-		A CONTRACTOR	5:24 5:24	<u>ROLLOUT:</u> 10230 FT 60 SEC			0	0	(STL/NIH-C	SIGNIFICANT ANOMALIES:
144	S SIG AND	MAAL PRIME							5	CGBA, BRIC, EPICS	- CRT 1 dim display. - Fuel cell 2 condenser exit temp high (scrubbed launch attempt).
			<u>SE TAL (BYD</u>): 5:51	WINDS: T2, L4 KTS		DET.				CMIX	- Waste dumpline blockage. IFM to bypass dump filter was
Contraction of the		AP/ AL		OFFICIAL:	15	M			7 36		- Waste dumpline blockage. IFM to bypass dump filter was unsuccessful, so off loaded waste tank into CWC.
· ·····	777		<u>LAST TAL (BEN</u>):	2205P06, T2, L5 KTS						5 CRYO TK SETS	- EVA power tool failed.
-01			6:28		112	9,			KP	DMC 12	 Portable foot restraint fit problem. S-band preamp 2 degraded causing intermittent forward link.
1 and the second	MAN -		MECO CMD:	<u>DENS ALT:</u> 1315 FT			-			RMS 42 (S.N. 303)	- S-band preamp 2 degraded causing intermittent forward link. - Middeck speaker ATU failure.
		- Company	8:30.2 8:30.2	FLT DURATION:						(0.14. 000)	- Camcorder tape eject failure.
-15-	and the second	1-011	MECO VI:	10:20:28:55	110		-			RMS USED TO	- Camera D downlink lost.
			<u>1012-00 v1</u> . 25946 25940							DEPLOY AND	 Loss of Ku-band forward link. Random ops recorder commands issued when panel brightness
	-	6-1,Cell		<u>S/T</u> : 546:12:43:31	STS069-7	15-050 (Crew in	middeck: Fro		RETRIEVE SPARTAN AND	- Random ops recorder commands issued when panel brightness control adjusted in new MCC.
S95-07	799 FD's 1	team in MCC. FD AI	<u>OMS-2</u> : 41:43 41:43	<u>OV-105</u> : 93:14:23:06				CDR Walker		WSF. SUPPORT	- Hydraulics pump 3 stuck in norm press (cycled switch twice to
			41:43 41:43 293.4 FPS 293.4 FPS	93:14:23:06	Backrow:					FOR EVA AND	get response then started APU
	Volf shaking		2,5,11102,0,1110	<u>DISTANCE</u> : 4,500,000 sm	Gearhard					CLAWS.	- WSB 3 lub oil overcooling during entry.
	19			4,500,000 sm	Countaiu	, and, and					

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		CREW (7)	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT NO.	ORBITER	TITLE, NAMES & EVA'S	LIFTOFF TIME, LANDING SITES, ABORT TIMES	CROSSRANGE LANDING TIMES FLT DURATION, WINDS	EMERG THROTTLE PROFILE ENG. S.N.	RSRM AND ET	INC	HA/HP	FSW	WEIGHTS, PAYLOADS/ EXPERIMENTS	(LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-73 SEQ FLT #72 KSC-72	OV-102 (Flight 18) Columbia 18th Spacelab	CDR: Kenneth D. Bowersox (IFII 3 - STS-50, STS-61) P405/R146/V97/M130 PLT: Kent V. Rominger	KSC 39 PAD B 293:13:52:59.98Z 9:53:00 AM EDT (P) 9:53:00 AM EDT (A) Friday 14 10/20/95 (8)	KSC 33, (KSC 26) 309:11:45:21Z 7:45:21 AM EDT Sunday 10 11/5/95 (10)	104/104/ 109% <u>PREDICTED</u> : 100/104/104/ 67/104	BI-075 RSRM 50 ET-73	39.0° (4)	DIRECT INSERTION <u>POST OMS-2</u> : 151 X 147 NM	OI-24	<u>CARGO:</u> 33705 LBS <u>PAYLOAD</u> <u>CHARGEABLE</u> : 25310 LBS	<u>KSC W/D</u> : OPF 100, VAB 7, PAD 48 = 155 days total. <u>LAUNCH POSTPONEMENTS</u> : - Baselined 9/24/95 as launch date on 6/30/94. - Postponed launch to 9/28/95 on 9/8/95 caused by delay to STS-69 launch (RSRM nozzle joint #3 repairs).
MLP-3	Flight LM-12 EDO 6 <u>OMS PODS:</u> LPO5-7 RPO1-22 FRC2-18	P406/R200/M174 <u>M/S 1:</u> Catherine G. Coleman P407/R201/F27 <u>M/S 2:</u> Michael E. Lopez-Alegria P408/R202/M175 <u>M/S 3/Payload CDR:</u> Kathryn C. Thornton (Flt 4 - STS-33, STS-49, STS-61) P409/R107/V73/F11 <u>P/S 1:</u> Fred Leslie P410/R203/M176 <u>P/S 2:</u> Al Sacco, Jr. P411/R204/M177	PLS: EDW 04/N/N TDEL: 0.00 -0.078/-0.04 MAX Q NAV:	DEORBIT BURN: 309:10:46:40Z <u>XRANGE</u> : 231 NM <u>ORBIT DIR</u> : DR 14 <u>AIM PT</u> : CLOSE IN <u>MLGTD</u> : 2500 FT 309:TT:45:21Z VEL: 214 KGS 212 KEAS HDOT: -1.7 FPS TD NORM 205: 3079 FT DRAG CHUTE DEPLOY: 187 KEAS 309:11:45:29Z	ACTUAL: 100/104/104/ 67/104 <u>SSM3 S/N:</u> 1 = 2037 (1) 2 = 2031 (3) 3 = 2038 (1) <u>M 3 EOM:</u> WEIGHT: 230603 LBS X CG: 1080.7 <u>LANDING:</u> WEIGHT:	LWT 67 ET 271K ET BR/UP 214K ET I:24:50 MET LAT: 2.8°S LONG:		<u>DEORBIT</u> : 140 x 136 NM <u>VELOCITY</u> : 25744 FPS <u>ENTRY</u> <u>RANGE</u> :		DEPLOYED: 0 LBS NON-DEPLOYED: 23302 LBS MIDDECK: 2008 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 804398 LBS NON-DEPLOYED: 1016616 LBS CARGO TOTAL: 2175016 LBS	LAUNCH SCRUBS: - Scrubbed 9/28/95 launch at L-5:40 hrs when engine #1 main fuel valve leaked hydrogen. Rescheduled launch for 10/5/95. - Scrubbed 10/5/95 launch prior to L-1 day MMT due to forecast of high winds and rain under influence of Hurricane Opal, rescheduled launch for 10/6/95. - Scrubbed 10/6/95 launch at L-6:35 hrs while holding up tanking due to failure to service hydraulic sys 1 NLG section when MFV was replaced. Rescheduled launch for 10/7/95. - Scrubbed 10/7/95 launch while holding at T-20 minutes due to MEC 1, CORE B failure. Rescheduled launch for 10/14/95. - Scrubbed 10/14/95 launch at L-1 day MMT to measure high pressure oxidizer duct weld after test stand duct failure caused an oxidizer leak. Rescheduled launch for 10/15/95. - Scrubbed 10/15/95 launch while holding at T-5 mins. due to forecast and observed range and RTLS NO GO for ceiling (launch window extended to 3H49M (BEN dark).
Crew this scie module	in PLB, here flying	MCC FCR-1 (51) (ASCENT/ENTRY) WHITE FCR (3) (ORBIT OPS) <u>FLIGHT DIRECTORS:</u> A/E - R. D. Jackson O 1 - B. P. Austin LD/O 2 - G. A. Pennington O 3 - J. P. Shannon O 4 - R. M. Kelso MOD - A. L. Briscoe	708 713 SRB STG: 2:04.5 2:04.5 2:04 PERF: NOMINAL 2 2 ENG TAL (BEN): 2:48 2:48 2:47 NEG RETURN: 3:59 3:59 4:02 PTA (U/S): 5:19 DDOOD (100) 5:19	NLGTD: 7098 FT 309:11:45:29Z VEL: 157 KGS HDOT: -5.7 FPS BRK INIT: 125 KGS DRAG CHUTE JETTISON: 50 KGS 309:11:45:58Z AVE BRK DECEL: 6.0 FPS/S WHEELS STOP: 309:11:106:17Z 11532 FT	230479 LBS X CG: 1082.3	138.97°W		4519 NM		PERFORMANCE MARGINS (LBS): FPR: 3775 FUEL BIAS: 1136 FINAL TDDP: 1906 RECON: 4902 PAYLOADS: PLB: U.S. MICROGRAVITY LABORATORY (USML-2) FLUIDS PHYSICS, MATERIALS	LAUNCH DELAYS: - Launch delayed 3M0S while holding at T-5 mins. due to R/S command problem. TAL WX: - BEN (prime & selected) with MRN and ZZA forecast and observed GO. DOLILU-II/NOMINAL I-LOADS: Both GO - DOLILU-II selected and uplinked . DOLILU-II uplink #3, DOLILU uplink #17, total uplink #23. FLIGHT DURATION CHANGES: None FIRSTS: - First flight with 2 block I SSME's (S/N 2037 & 2038).
			DROOP (109): 5:28 5:19 PTM (U/S-220): 6:00 6:00 5:48 SE TAL (BEN): 6:08 MECO CMD: 8:29.7 VI: 25866 25860 OMS-2: 41:29 41:29 186.1 FPS 186.0 FPS 186.0 FPS	ROLLOUT: 9032 F1 71 SEC WINDS: H3, R4 KTS OFFICIAL: 0305P07, H2,R4 KTS DENS ALT: 206 F1 FLT DURATION: 15:21:52:21 381:52:21 381:52:21 S/T: 562:10:35:52 OV-102: 167:08:37:14 DISTANCE: 6 600.000 sm	STS073-3 module: Alegria/M from him,	Front (ar S. Others Thornto , PLT Ro	ms fold s, count n/PLC,	ortrait in scier ded), Lopez- ter clockwise Coleman/MS c, Leslie PS, 8	З,	MIDIENALS SCIENCE, BIOTECHNOLOGY, AND COMBUSTION SCIENCE OARE <u>MIDDECK</u> : 5 + 4 EDO CRYO TANK SETS EDO PALLET NO RMS	 SIGNIFICANT ANOMALIES: CRT-2 display flickered (IFM to replace with ORT-4). FES feedline A mid 2 thermostat/heater failure. FCL 1 P/L head exchanger flow degraded. FC 3 cell performance monitor failed. H₂ manifold valve tank 1 failed open. S-band lower right quad antenna degraded. Spacelab high rate dump data bad. APU 1 fuel pump inlet pressure decrease. F1F jet failed off, chamber pressure deceased. R5D and R5R transient fail off. TDRSS STGT failure.

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		CREW	LAUNCH SITE,	LANDING SITE/	SSME-TL	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(5)	LIFTOFF TIME,	RUNWAY, CROSSRANGE	NOM-ABORT EMERG	RSRM		URBIT	FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.	UNDITER		LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP	1300	PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
NO.		TITLE, NAMES	ABORT TIMES	FLT DURATION,	PROFILE	ET	INC			EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S	ABORT TIMES	WINDS	ENG. S.N.						
STS-74	OV-104	<u>CDR</u> :	KSC 39A	WINDS KSC 33 (KSC 27) 324:17:01:27Z	104/104/109%	BI-076	51.65°	DIRECT	OI-24	CARGO:	KSC W/D: OPF 76, VAB 8 PAD 23 = 107 days total.
	(Flight 15)	Kenneth D. Cameron	316:12:30:42.98Z	324:17:01:27Z 12:01:29 PM EST			(3)	INSERTION	(4)	23687 LBS	
SEQ FLT #73	Atlantis	(Flt 3 - STS-37, STS-56) P412/R121/V90/M109	7:30:43 AM EST (P) 7:30:43 AM EST (A)		PREDICTED: 100/104/104/	RSRM 51		DOST OMS 2		PAYLOAD	LAUNCH POSTPONEMENTS: - Baselined launch date of 10/26/95 on 5/5/94.
FLI#/3		P412/K121/V90/W109	Sunday 8	Monday 15 11/20/95 (11)	67/104	51		POST OMS-2: 162 X 162 NM		CHARGEABLE:	- Postponed launch date to 11/2/95 on 9/8/95, caused by SRB
KSC-73	OMS PODS:	PLT:	11/12/95 (10)			ET-74		102 / 102 / 110		14064 LBS	nozzle joints #3 and #4 repairs to STS-69, STS-73, and STS-74. - Advanced launch date to 11/1/95 on 10/4/95.
	LPO3-19	James D. Halsell		DEORBIT BURN: 324:15:53:49Z	<u>ACTUAL:</u> 100/104/104/	UNIT (7					- Advanced launch date to 11/1/95 on 10/4/95.
PAD- 39A-44	RPO4-15 FRC4-15	(Flt 2 - STS-65) P413/R178/V123/M156	LAUNCH WINDOW: 7 minutes		100/104/104/ 67/104	LWT-67				DEPLOYED: 10015 LBS	- Postponed date to 11/16/95 on 10/27/95 caused by STS-73 launch scrubs.
	1104-13	1413/11/0/0123/101130	MIR PLANAR/	<u>XRANGE</u> : 612 NM	07/104					10013 203	
MLP-2		<u>M/S 1</u> :	PHASE WINDOW	ORBIT DIR: DR 15	SSME S/N:	<u>et</u> RPT				NON-DEPLOYED:	LAUNCH SCRUBS:
		Chris Hadfield	EOM PLS: KSC TAL: ZZA	AIM PT: NOMINAL	1 = 2012 (17)	RPT 070 1K				3135 LBS	- Scrubbed 11/11/95 launch at T-4 minutes while holding at T-5
		(Canada) P414/R205/M178	TAL: ZZA TAL WX: MRN, BEN		2 = 2026 (5) 3 = 2032 (4)	273.1K				MIDDECK:	mins, when all 3 TAL sites (BEN, MRN, ZZA) were forecast and observed NO GO for weather.
CA	MER			<u>MLGTD:</u> 24/TFT 324:17:01:277		ET				914 LBS	
SELL		<u>M/S 2</u> :	SELECTED:	MLGTD: 2471 FT 324:17:01:27Z VEL: 196 KGS 201 KEAS		BR/UP					LAUNCH DELAYS: None
S V		Jerry L. Ross (Flt 5 - STS 61-B, STS-27,	RTLS: KSC 33/CI/N TAL: ZZA 30/N/N	201 KEAS HDOT: -1.4 FPS	M 3 EOM: WEIGHT:	214K				<u>SHUTTLE</u> ACCUMULATED	TAL WX:
	Sec. 10	STS-37, STS-55)	AOA: KSC 33/CI/N		202767 LBS	ET		DEORBIT:		WEIGHTS:	- ZZA (prime & selected) was forecast GO but observed NO GO
P		P415/R89/V38/M80	PLS: EDW 22/N/N	<u>TD NORM 195</u> : 2955 F I	X CG:	IMPACT		185 x 184 NM		DEPLOYED:	for 7000' broken ceiling. MRN forecast and observed TO. BEN
ETD		M/C D	TDEL:		1078.7	1:26:05				814413 LBS	forecast observed NO GO for ceilings and crosswinds.
ATLANTIS	C C C	M/S 3: William McArthur	0.04 0.122/0.16	<u>DRAG CHUTE</u> <u>DEPLOY</u> : 180 KEAS	LANDING:	MET LAT:		VELOCITY: 25840 FPS		NON-DEPLOYED: 1020665 LBS	DOLILU-II I-LOADS:
		(Flt 2 - STS-58)	MAX Q NAV:	324:17:01:33Z	WFIGHT:	0.31°S				CARGO TOTAL:	- Selected and uplinked DOLILU-II I-loads, DOLILU-II uplink
		P416/R172/V124/M150	711 PSF 711 PSF	<u>NLGTD: 5565</u> FT	202718 LBS	<u>LONG:</u> 125.6°W		ENTRY		2198703 LBS	#4, DOLILU uplink #18, I-load uplink #23. (Last flight with
		MCC FCR-1 (52)		<u>NLGTD</u> : 5565 FT 324:17:01:37Z VEL: 156 KGS HDOT: -6.7 FPS	X CG: 1080.6	125.6°W		RANGE: 4346 NM		PERFORMANCE	nominal I-load availability.)
		Ascent/Entry	<u>SRB STG</u> :	HDOT: -6.7 FPS	1000.0			13101111		MARGINS (LBS):	FLIGHT DURATION CHANGES: None
			PERF: NOMINAL	<u>BRK INIT</u> : 72 KGS 324:17:02:00Z						FPR: 3775	
		WHITE FCR (3) (Orbit Ops)	2 ENG TAL (MRN):	324:17:02:00Z						FUEL BIAS: 1136 FINAL TDDP: 1823	RENDEZVOUS #24: - Rendezvous and dock with Russian Mir space station
		(Orbit Ops)	2:22 2:22	<u>DRAG CHUTE JETTISON:</u> 55 KGS						RECON: 3689	(second docking).
		FLIGHT DIRECTORS:		<u>JETTISON:</u> 55 KGS 324:17:02:07Z		-					
		A/E - N. W. Hale LD/O 1 - W. D. Reeves	<u>NEG RETURN</u> : 4:06 4:08	AVE BRK DECEL:	1	13				PAYLOADS:	EVENTS: Dealing module unberth 1/19/01, conture 1/19/46/12
sts074-7	16-021	02-PFDve		5.0 FPS/S	2/		(<u>Plb</u> : Shuttle/Mir	 Docking module unberth 1/18:01, capture 1/18:46:12, hardmate 1/18:53:41.
Mir as se	en from	O 2 - P. F. Dye PLNG - P. E. Engelauf	PTA (U/S 255): 4:27 4:22	WHEELS STOP	1 hours					MISSION 2	- Docking module APDS-1 to Mir docking at 2/17:56:57 MET.
Atlantis.		MOD - R. E. Castle		WHEELS STOP: 324:17:02:25Z		1 La	- The second second			ICBC, GPP	hardmate at 2/18/05:05 MET. - Transferred 993 lbm H_2O , 59 lbm O_2 , and 44 lbm N_2 to Mir.
7 (1011(13)			DROOP (ZZA):	11078 FT	3	Tak		V GEL	-	ORBITER DOCKING	 I ransterred 993 lbm H₂O, 59 lbm O₂, and 44 lbm N₂ to Mir. Undocking from Mir at 5/19:45:01 MET.
			5:24 5:26	ROLLOUT: 8607 FT			1	N V		DOCKING MODULE	ů
			PTM (U/S 255):	58 SEC		Dell	Om		8		RADIATOR DEPLOY #17:
			6:04 6:03		Contraction of the		RE			MIDDECK: SAREX-II	 Deployed radiator to make water available for transfer to Mir. Port RAD deployed to make water 83:23:14 GMT.
			<u>SE TAG (ZZA):</u>	WINDS: H6, R4 KTS	111	A	Y	The Pr		JAREA-II	- FUIT NAD UEPIUYEU IU MAKE WALEE 83:23:14 GIVET.
	1	- And the second	5:56 5:56	OFFICIAL: 0107P10 H5, R4	140		200	**		5 CRYO TK SETS	SIGNIFICANT ANOMALIES:
Carrow Ca	and the l		<u>SE PTM (U/S 842):</u>	<u>DENS ALT</u> : 670 FT							- Fuel cell 3 cell performance monitor delta volt measurements
			7:00 6:54		3		Total L	A and		RMS 43 (S.N. 301)	for all 3 substacks shifted approximately 5 millivolts. - Cryo O ₂ manifold tank 1 valve failed open.
19 . TE	11		MECO CMD:	FLT DURATION: 8:04:30:44 196:30:44	60 a		5	101	and the second se		 PLB aft port and aft starboard lights failed.
motor.		C. C	8:33.7 8:33.2	196:30:44		-	-			RMS used for	 H₂ manifold valve 1 microswitch failure.
1/2/1/1	Store.	Con the set	VI.	S/T·	070074.0	10.005	Crowie	Decking Mark		docking module installation on Mir	 TCS 1 lost calibration, TCS 2 self-test failures. ODS stowage bag adapter plate jammed.
	the second		<u>vi</u> : 25878 25870	570:15:06:36				Docking Modu mera at bottom		and monitor plume	- OPS-1 recorder track 8 data degradation.
100	S. C. PARS	12 Miles Contracts		OV-104 TOTAL:				kwise from him	•	impingement.	 Mir camcorder battery low capacity.
	Stor Charles		<u>OMS-2</u> : 41:50 41:51.9	101:08:20:01				loss/MS, and			- WSB 2 regulator pressure erratic postlanding.
S. Marso	Signal A		212 FPS 212 FPS	DISTANCE: 3,400,000 sm	CDR Cam		, ,				
				3,400,000 SM		T	1	I			

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		CREW		LANDING SITE/	SSME-TL						
FLT	ORBITER	(6)	LAUNCH SITE,	RUNWAY,	NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	Payload Weights,	
NO.	URBITER		LIFTOFF TIME, LANDING SITES,	CROSSRANGE LANDING TIMES	THROTTLE	AND	INC	HA/HP	FSW	PAYLOADS/	(LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS,
110.		TITLE, NAMES & EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
070 70	01/ 105		KCC 20D	WINDS	ENG. S.N.	DL077	20.45%	DIDECT	01.04	04000	
STS-72	OV-105 (Flight 10)	CDR: Brian Duffy	KSC 39B 11:09:40:59:98Z	KSC 15 (KSC 28) 20:07:41:40Z 2:41:40 AM EST	104/104/ 109%	BI-077	28.45° (40)	DIRECT INSERTION	OI-24 (5)	<u>CARGO</u> : 21018 LBS	KSC W/D: OPF 64, VAB 5, PAD 21 = 90 days total.
SEQ	Èndeavor	(Flt 3 - STS-45, STS-57)	4:18:00 AM EST (P)		DDEDIOTED	RSRM			(-)	PAYLOAD	LAUNCH POSTPONEMENTS:
FLT #74		P417/R142/V94/M126	4:41:00 AM EST (Á) Thursday 21	Saturday 15 1/20/96 (6)	PREDICTED: 100/104/104/	52		<u>POST OMS-2</u> : 248 x 94.9 NM		CHARGEABLE:	- Baselined launch date of 8/24/95 on 6/6/94. - Postponed launch date to 11/30/95 on 10/6/94.
KSC-74		PLT: Brent W. Jett, Jr.	1/11/96 (7)	.,	67/104	ET-75				14087 LBS	- Postponed launch date to 1/11/96 on 9/8/95.
PAD-39B-30	<u>oms pods</u> : LPO4 - 17	P418/R206/M179	LAUNCH WINDOW:	DEORBIT BURN: 20:06:41:23Z	ACTUAL:	LWT-68		SFU GRAPPLE 2:01:16:19 MET		<u>DEPLOYED</u> : 0 LBS	LAUNCH SCRUBS: None
	RP05 - 8	M/S 1/EV 1:	49M33S SFU PLANAR/	XRANGE: 220 NM	100/104/104/			256.8 x 251 NM			LAUNCH DELAYS:
MLP-1	FRC5 - 10	Leroy Chiao	PHASE WINDOW	ORBIT DIR: DL 35	67/104	ET		ORBIT ADJ:		<u>NON-DEPLOYED</u> : 10546 LBS	- 23 minute launch delay while holding at T-5 minutes due to MCC old front end processor and associated problems. 100%
		(Flt 2 - STS-65) P419/R179/V125/M157		AIM PT: NOMINAL	1 = 2028 (11) 2 = 2039 (1)	<u>RPT</u> 271.3K		<u>ORBIT ADJ</u> : 2:04:56:13 MET 254.7 x 164.9			CPU caused by not loading a necessary S/W patch.
		M/S 2/EV 3:	EOM PLS: KSC TAL: BEN		2 = 2039(1) 3 = 2036(2)	271.3N		NM		MIDDECK: 898 LBS	TAL WX:
		Winston E. Scott	<u>TAL WX</u> : NONE	MLGTD: 3386 FT 20:07:41:40Z	<u>M 3 EOM</u> :	<u>ET</u> PD/IID		CIRC MNVR:		SHUTTLE	- No TAL site available but no TAL site required (29 seconds overlap between RTLS and AOA). BEN was manned but NO
		P420/R207/M180	SELECTED:	VEL: 193 KGS 185 KEAS	WEIGHT:	<u>BR/UP</u> 214K		2:05:43:29 MET		ACCUMULATED	GO for ceiling.
DUFFY	JETT	<u>M/S 3:</u> Koichi Wakata	<u>RTLS: KSC</u> 15/N/N TAL: BEN 36/N/N	HDOT: -1.7 FPS	218496 LBS X CG:	FT		165.2 X 164.7 NM		WEIGHTS: DEPLOYED:	NIGHT LAUNCH: #12
5		(Japan)	AOA: EDW 04/CI/N	<u>TD NORM 195</u> : 2768 FT	1081.7	<u>ET</u> IMPACT				814413 LBS	NIGHT LANDING: #8
		P421/R208/M181	PLS:EDW 04/CI/N		LANDING:	1:27:10 MET		<u>OAST REL</u> : 3:01:51:53 MET		NON-DEPLOYED: 1032109 LBS	
3		M/S 4/EV 2:	<u>TDEL</u> :	DRAG CHUTE DEPLOY: 179 KEAS	WEIGHT:	<u>LAT</u> : 18.4°S		166 X 164 NM		CARGO TOTAL: 2219721 LBS	DOLILU-II I-LOADS: - First flight with only DOLILU-II I-Loads. DOLILU-II uplink #5.
		Daniel T. Barry P422/R209/M182	0.00 0.002/0.10	20:07:41:43Z	218345 LBS X CG:	18.4°S LONG:		DEORBIT:			Total I-load uplink #24.
		SS EVA #31:	MAX Q NAV:	<u>NLGTD</u> : 6574 FT 20:07:41:51Z VEL: 146 KGS HDOT: -6.7 FPS	1083.3	<u>LONG:</u> 145.5°W		167 x 161 NM		<u>Performance</u> Margins (LBS):	FLIGHT DURATION CHANGES: None
MCC FCR-	1 (53)	EMU/Tethered EVA	710 PSF 713 PSF	VEL: 146 KGS				VELOCITY:		FPR: 3775	EVENTS:
ASCENT/E	NIRY	EVA1 - 1/14/96 to 1/15/96 Scheduled EVA #27	<u>SRB STG</u> : 2:05.1 2:05	<u>BRK INIT</u> : 86 KGS	13 1 1			<u>VELOCITY</u> : 25799 FPS		FUEL BIAS: 1136 FINAL TDDP: 11447	- Japanese SFU grapple at 2:01:16:19 MET, latch at 2:01:58:30
WHITE FC		by EV 1 and EV 2 6H09M19S Duration			AND	7 B	Real	ENTRY		RECON: 13346	- Japanese SFU grapple at 2:01:16:19 MET, latch at 2:01:58:30 MET. Launched from Tanagashima, Japan. - OAST release 3/01:51:33 MET, grapple 5:00:06:15 MET, latch
FOR ORBI			<u>PERF</u> : NOMINAL	DRAG CHUTE JETTISON: 58 KGS			1 Ca	RANGE: 4340 NM		PAYLOADS:	5:00:31:40 MET. - EVA 1 started at 3:19:52:51 MET.
FLIGHT DIF A/E - J. W.	<u>RECTORS</u> : Bantle	<u>SS EVA #32:</u> EVA 2 - 1/16/96 to 1/7/96	<u>2 ENG TAL (BEN)</u> :	20:07:42:17Z	SP	3000	200	4340 10101		<u>PLB</u> : SPACE FLYER	- EVA 2 started at 5:19:59:06 MET.
LD/O 1 - B.	P. Austin	Scheduled EVA #28	2:05 NO CALL	<u>AVE BRK DECEL</u> : 4.7 FPS/S	1 Price			TOP: EVA	2	UNIT (SFU) RETRIEVED	RENDEZVOUS #25:
0 2 - R. M. PLNG - J. F	110130	EMU/Tethered EVA by EV 1 and EV 3	NEG RETURN:	WHEELS STOP:	A State	AD		Barry, lov	wei	(JAPAN)	- Rendezvous, grapple, berth, and return of SFU.
MOD - J. W	/. Bantle &	6H53M41S Duration. To test	4:03 4:07	20:07:42:46Z 12155 FT			8	left, & Chai	о,	ÒAST FÍ YFR	RENDEZVOUS #26:
A. L.	Briscoe	and evaluate EVA hardware for Space Station use.	<u>PTA (U/S 411)</u> :		1 to be	5-18 M	ST.	upper right		(DEPLOYED/ RETRIEVED)	- Deploy, rendezvous, grapple, and return of OAST Flyer.
			3:34 3:33	ROLLOUT: 8767 FT	Louise			DOTTON		SSBUV/A SLA-01/GAS (5)	SIGNIFICANT ANOMALIES: - FCS shutdowns and topping FES case icing.
the state	"Control	the first	DROOP:	66 SEC		10	1	BOTTOM:			- EMU helmet light damage.
	To Pla		5:23 5:24	<u>WINDS:</u> T6, R2 KTS OFFICIAL: 3206P08	E -	- 20		1 Scott in		<u>MIDDECK</u> : PARE/NIH-R	- EMU glove cut damage. - Loss of reception in left ear piece of EV 1.
			<u>PTM (U/S 411)</u> : 4:42 4:34	OFFICIAL: 3206P08 T6, R1	and state	1	1	P/L bay, Ch is out of fra		STL/NIH-C PCG-STES	- Several EDFT-03 anomalies.
	- The		<u>SE PTM (U/S-1073)</u>			1		13 OUL OF ITA	ine.	CPCG-STES	 OAST-FLYER unexpected trajectory dispersions. MOC front end processors operating at 100%.
			6:23 6:20	<u>DENS ALT:</u> -1007 FT				Both EVA's	;	5 CRYO TK SETS	- RCS jet L1A fail off with maximum chamber pressure of 16 PSI.
120	P		MECO CMD:	FLT DURATION:		Res		used to		RMS 44 (S.N. 303)	- RCS jet R2U fail leak. Jet had oxidizer leak.
			8:27.3 8:27.1	8:22:00:40		14	2	demonstrate	ISS	RMS used for SFU	- Failure of SFU solar array panels to retract for capture and berthing, jettisoned solar arrays.
			<u>VI</u> : 26025.7 26025	<u>S/T</u> : 579:13:07:16	A DESCRIPTION			assembly		grapple & berth,	- SFU ĂHIU thermal discrepancies. Flight SFU not wired same
		Crew: Front, It to rt	<u>OMS-2</u> : 43:30 43:30	<u>OV-105:</u> 102:12:23:46	ALL C	F . 4	200	techniques .		grapple & berth, OAST deploy & retrieve & EVA	as training SFU. - RMS wrist roll joint rate degradation.
		Duffy, & Chiao/MS. J Jett, & Scott/MS.	43:30 43:30 115 7EPS 115 7 EPS		3	1	1			support	- LO ₂ ET umbilical frangible nut detonator did not fire (pyro wiring
Rear. Wa	Kala/IVIS, PL		115.7FPS 115.7 FPS	3,700,00 sm		-					problem).

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		CREW		LANDING SITE/	SSME-TL						
ELT.		(7)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT	FOW	PAYLOAD	MISSION HIGHLIGHTS
FLT NO.	ORBITER		LIFTOFF TIME, LANDING SITES,	CROSSRANGE LANDING TIMES	EMERG THROTTLE	RSRM AND	INC	HA/HP	FSW	WEIGHTS, PAYLOADS/	(LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS,
NO.		TITLE, NAMES	ABORT TIMES	FLT DURATION,	PROFILE	ET	INC	11/2/111		EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S		WINDS	ENG. S.N.						
STS-75	OV-102 (Flight 19)	CDR: Andrew M. Allen	KSC 39B 53:20:17:59:97Z	KSC 33 (KSC-29) 69:13:58:20Z 8:58:20 AM EST	104/104/ 109%	BI-078	28.46° (41)	DIRECT INSERTION	01-24 (6)	<u>CARGO</u> : 32006 LBS	KSC W/D: OPF 64, VAB 5, PAD 25 = 94 days total.
SEQ	Columbia	(Flt 3 - STS-46, STS-62)	3:18:00 PM EST (P)	8:58:20 AM EST	109%	RSRM	(41)	INSERTION	(0)	32000 LD3	LAUNCH POSTPONEMENTS:
FLT #75		P423/R149/V101/M133	3:18:00 PM EST (A)	Saturday 16	PREDICTED:	53		POST OMS-2:		PAYLOAD	- Baselined launch date of 2/15/96 on 10/13/94.
KSC-75		PLT:	Thursday 22 2/22/96 (5)	3/9/96 (6)	100/104/104/ 67/104	ET-76		161.9 x 160.2 NM		CHARGEABLE: 23353 LBS	- Postponed launch date to 2/22/96 on 12/1/95.
KSC-75	OMS PODS:	Scott J. Horowitz		DEORBIT BURN:		-					LAUNCH SCRUBS: NONE
PAD	LPO5-8 RPO1-23	P424/R210/M183	LAUNCH WINDOW: 2H30M CTOB	69:12:55:43Z	<u>ACTUAL</u> : 100/104/104/	LWT-69		<u>USMP</u> PRCS 1		DEPLOYED: 1494 LBS	LAUNCH DELAYS: NONE
39B-31	FRC2-19	<u>M/S 1</u> :		<u>XRANGE</u> : 234 NM	67/104			5/21:45:00		1474 LD3	LAUNCIT DELATS. NONE
MLP-3		Jeffrey A. Hoffman		<u>ORBIT DIR</u> : DL 36	1 0000 (10)	ET		160.1 x 153.5		NON-DEPLOYED:	TAL WX:
		(Flt 5 - STS 51-D, STS-35, STS-46, STS-61)	<u>EOM PLS</u> : KSC TAL: BEN	<u>AIM PT</u> : CLOSE IN	1 = 2029 (13) 2 = 2034 (7)	<u>RPT</u> 271K		MEPHESTO:		20490 LBS	- Both BEN (prime & selected) and MRN were forecast and observed GO. BYD was not available as an intact abort site due
-	-	P425/R57/V59/M52	TAL WX: MRN	MLGTD: 2175 FT	3 = 2017(13)			10:12:25:00		MIDDECK:	to local situation.
Aller Horowit		<u>M/S 2</u> :	SELECTED:	69:13:58:20Z	<u>M 3 EOM</u> :	<u>et</u> Br/Up		MET 158.4 X 149.4		1369 LBS	DOLILU-II I-LOADS:
Hoffmar Che		Maurizio Cheli	RTLS: KSC 15/N/N	69:13:58:20Z VEL: 189 KGS 211 KEAS	WEIGHT:	214K		NM		<u>SHUTTLE</u>	- DOLILU II uplink #6, I-load uplink #25.
Chang-Día Chuidon		(Italy-ESA) P426/R211/M184	<u>TAL:</u> BEN 36/N/N <u>AOA</u> : KSC 15/N/N	HDOT: -1.0 FPS	226443 LBS X CG:	ст		DEORBIT:		ACCUMULATED WEIGHTS:	FLIGHT DURATION CHANGES:
4		F 420/K211/104	PLS: KSC 15/N/N	<u>TD NORM 205</u> : 2706 F1	1079.40	IMPACT		173 x 146 NM		DEPLOYED:	Extended flight 1 day for additional USMP science. Decision to not try to land on orbit 235 due to forecast of low
ST	IS-75	M/S 3:				1:20:58				815907 LBS	- Decision to not try to land on orbit 235 due to forecast of low
		Claude Nicollier (Switzerland - ESA)	<u>TDEL</u> : 0.0 0.182/0.22	DRAG CHUTE DEPLOY: 193 KEAS	LANDING: WEIGHT:	MET <u>LAT</u> :		<u>VELOCITY</u> : 25816 FPS		NON-DEPLOYED: 1053968 LBS	celling. Waved off landing on orbits 236 and 237 due to forecast of low celling. Extended flight second day for weather.
		(Flt 3 - STS-46, STS-61)		69:13:58:28Z	226287 LBS	13.6°S				CARGO TOTAL:	- Waved off landing at KSC on orbit 251 due to forecast of low
MCC FCR- ASCENT/E		P427/R150/V98/M134	<u>MAX Q NAV</u> : 690 697	<u>NLGTD</u> : 6451 FT 69:13:58:36Z	X CG: 1080.94	<u>LONG:</u> 163.3°W		<u>ENTRY</u> RANGE:		2251727 LBS	ceiling. - Total flight duration extension of 2 days plus one orbit.
		M/S 4/PAYLOAD CDR:		VEL: 130 KGS HDOT: -5.2 FPS	1000.71	100.0 11		4375 NM		PERFORMANCE	
WHITE FC FOR ORBI		Franklin R. Chang-Diaz (Flt 5 - STS 61-C, STS-34,	<u>SRB STG</u> : 2:06.9 2:09	HDOT: -5.2 FPS						MARGINS (LBS): FPR: 3775	FIRSTS/LASTS: - First flight with thermocouple transducers on all 3 engines.
FURURDI	T UP3	STS-46, STS-60)		<u>BRK INIT</u> : 100 KGS						FUEL BIAS: 1136	- This high with thermocouple transducers on all 5 engines.
FLIGHT DI		P428/R89/V46/M81	<u>PERF</u> : NOMINAL	DRAG CHUTE						FINAL TDDP: 1594	EVENTS:
A/E - R. D. LD/O 2 - C		<u>P/S1:</u>	2 ENG TAL (BEN):	<u>JETTISON: 62</u> KGS 69:13:58:52Z						RECON: 638	- TSS deployed at 03:00:27:00 MET, tether broke at 03:05:11:35, tether length of 19,695 meters, and TSS separated
01-G.A.	Pennington	Humberto Guidoni	3:06 3:07	AVE BRK DECEL:						PAYLOADS:	rapidly from orbiter. Tether was rewound starting at 03:21:49:00
03-R.E. 04-J.P.		(Italy) P429/R212/M185	NEG RETURN:	3.8 FPS/S	210	THE PARTY OF	South Star	de desta de		<u>PLB</u> : TETHERED	MET and boon retraction completed at 03:02:41 MET.
MOD - A. L			3:57 3:59	WHEELS STOP:			am			SATELLITE	SIGNIFICANT ANOMALIES:
	404			69:13:59:25Z 10635 FT			R			SYSTEM REFLIGHT (TSS-1R)	- Left main engine chamber pressure read 40% in lieu of 104%. - FA1 MDM card 0 failure during FCS C/O, aerosurfaces not
			<u>PTA (U/S 242)</u> : 4:59		2	40		2/ Ber		U.S.	receiving commands from FA1 (waiver written to F/R 2-30A.2a.
				<u>ROLLOUT</u> : 8460 F I		and the	Ye	0 0 0		MICROGRAVITY	MDF or next PLS).
	-	久. 4	DROOP:	65 SEC	Lat.	1				PAYLOAD SEMICONDUCTER	- Topping FES core icing used, ice flush procedure. - Fuel cell 3 CPM not doing self-test.
				WINDS:	1	C-A-				SEMICONDUCTER EXPERIMENTS	- H ₂ tank 4 heater A failure.
	A A A A A A A A A A A A A A A A A A A		<u>PTM</u> : 6:02 5:58	H13. 0X KTS OFFICIAL:	250	-	M.S.F.			(USMP-3) OARE	 AC 1 phase B short caused loss of utility outlets J31 and J7. IMU 3 X and Y axis drift, compensations up to 8 sigma.
				3312P20 H12, L2		1230	S	M.			Powered off to preserve lifetime. Used for entry but continued
	1.9	· · /	<u>MECO CMD</u> : 8:27.4 8:28.3	<u>DENS ALT</u> : -1645 FT		P al	C			MIDDECK: TSS SUPPORT	high drift rates. - MLS 2 did not lock on in range.
	1	aft-		FLT DURATION:		E .		Children Contraction		EQUIPMENT	- MLS 2 did not lock on in range. - S-band transponder 2 failed to acquire TDRS (forward link).
	T		<u>VI</u> : 25877 25869	15:17:40:21				a second		MGBX	- MOC processing problems.
			<u>25</u> 877 25869	<u>S/T</u> : 595:06:47:37				t crew portrai	IT.	CPCG	 APU 1 fuel pump inlet pressure decay. TSS was lost when tether parted when being deployed (at 19.7)
			<u>OMS-2</u> : 39:56 39:52					n. Clockwise		5 CRYO TK SETS	kilometers).
			39:56 39:52 223 FPS 222 FPS	<u>OV-102:</u> 183:02:17:35				C, Cheli/MS,		PLUS 4 EDO EDO PALLET	- Uncommanded SFMDM warm starts. - LH aft structure attach (to ET) blade valve not fully closed
Tet	hered Satell	lite System (TSS)	223113 222153		Nicollier/M Guidioni/F					NO RMS	(debris catcher).
				DISTANCE: 6,500,000 sm	Guidioni/F	3-ASI, I	ionna	1/1/10.			

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				LANDING SITE/	SSME-TL						
		CREW	LAUNCH SITE.	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(6)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		ONDIT	FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.	ORDITER		LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP	1011	PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
110.		TITLE, NAMES	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFIC:T ANOMALIES, ETC.)
		& EVA'S		WINDS	ENG. S.N.						
STS-76	OV-104	CDR:	KSC PAD 39B	EDW 22, CONC	104/104/	BI-079	51.65°	DIRECT	OI-24		KSC W/D: OPF 68, VAB 6, PAD 22 = 96 days total.
	(Flight 16)	Kevin P. Chilton	82:08:13:03.9Z	(EDW 45, CONC 26)	109%		(4)	INSERTION	(7)	24605 LBS	
SEQ	Atlantis	(Flt 3 - STS-49, STS-59)	3:13:04 AM EST (P)	91:13:28:57Z		RSRM		DOCT OMO O			LAUNCH POSTPONEMENTS:
FLT #76	Spacehab 4	P430/R145/V103/M129	3:13:04 AM EST (Å) FRIDAY 15	5:28:57 AM PST SUNDAY 11	PREDICTED: 100/104/104/	46		POST OMS-2: 158.5 x 85.1		PAYLOAD CHARGEABLE:	- Baselined launch date of 3/21/96 on 12/14/94.
KSC-76	Spacenab 4	PLT:	3/22/96 (6)	3/31/96 (7)	67/104	ET-77		NM		14152 LBS	LAUNCH SCRUBS:
K3C-70	OMS PODS: LPO3-20	Richard A. Searfoss	.,								Scrubbed 3/21/96 launch at ET tanking MMT on 3/20/96 at approx. L-8 hours due to weather forecast of excessive RTLS
PAD	LPO3-20	(Flt 2 - STS-58) P431/R171/V126/M149	LAUNCH WINDOW:	DEORBIT BURN:	ACTUAL:	LWT-70		MIR-RNDZ		DEPLOYED:	approx. L-8 hours due to weather forecast of excessive RTLS
39B-32	RPO4-16 FRC4-16		6M59S MIR PLANAR/	91:12:23:08Z	100/104/104/ 69/104			MNVR AT 1/01:11 MET		2814 LBS	crosswinds, chance of 5000' broken ceiling at KSC, and high
	FRC4-10	M/S 1 (PAYLOAD CDR):	PHASE WINDOW	XRANGE: 763 NM	09/104	FT		210 x 127 NM		NON-DEPLOYED:	seas in SRB recovery area.
MLP-2		Ronald M. Sega			1 = 2035 (3)	RPT				10578 LBS	LAUNCH DELAYS: None
		(Flt 2 - STS-60) P432/R175/V127M153	EOM PLS: KSC	ORBIT DIR: DR 16	2 = 2109 (16)	271K		<u>TI</u> : 1:15:28:01 MET			
			TAL: ZZA		3 = 2019 (16)	ET.		1:15:28:01 MET		MIDDECK:	TAL WX:
		<u>M/S 2/EV 2</u> :	<u>TAL WX</u> : MRN, BEN	<u>AIM PT</u> : NOMINAL	M 3 EOM:	<u>ET</u> BR/UP		215.8 x 206.3 NM		760 LBS	- ZZA (prime and selected) and MRN were forecast and observed GO. BEN forecast and observed NO GO for ceiling and visibility.
		M. Richard Clifford (Flt 3 - STS-53, STS-59)	SELECTED:	<u>MLGTD</u> : 2185 FT	WEIGHT:	269K				SHUTTLE	GO. DEN IDIECASI AND ODSEIVED NO GO IDI CENING AND VISIONILY.
		P433/R157/V104/M139	RTLS: KSC 33/CI/N	91:13:28:57Z	211913 LBS			DEORBIT:		ACCUMULATED	DOLILU-II I-LOADS:
			<u>TAL</u> : ZZA 30/N/N	VEL: 204 KGS	X CG:	<u>ET</u>		216 X 206 NM		WEIGHTS:	- DOLILU-II I-Loads uplinked (#8), I-Load uplink #27.
		<u>M/S 3/EV 1:</u>	AOA: KSC 33/CI/N	198 KEAS	1082.76	IMPACT				DEPLOYED:	
		Linda M. Godwin (Flt 3 - STS-37, STS-59)	<u>PLS</u> : EDW 22/N/N	HDOT: -1.6 FPS	LANDING:	1:25:49 MET		VELOCITY: 25898 FPS		818721 LBS NON-DEPLOYED:	SPACE SHUTTLE NIGHT LAUNCH: #13
		P434/R122/V105/F13	TDEL:	TD NORM 195:	WEIGHT:	LAT:		23070113		1065306 LBS	FLIGHT DURATION CHANGES/LANDING SITE CHANGE:
			0.09 0.492/0.49	2433 FT	211805 LBS	0.1°N		ENTRY RANGE:		CARGO TOTAL:	- MMT decision on 3/28/96 to land 1 day early on 3/30 (forecast of
		M/S 4: Shannon W. Lucid			X CG:	LONG:		RANGE:		2276332 LBS	low ceiling & fog).
		(Flt 5 - STS 51-G, STS-34,	<u>MAX Q NAV:</u> 720 PSF 724 PSF	DRAG CHUTE DEPLOY: 188 KEAS	1084.46	125.4°W		4243 NM			- Loss of APU 3 imposed weather placards, flight rule 10-4A.
		STS-43, STS-58, to return	52 SECS MET	91:13:29:00Z						PERFORMANCE MARGINS (LBS):	- Waved off landing at KSC on orbit 129 due to overcast ceiling. - Waved off landing at KSC on orbit 130. Extended flight 1 day to
		on STS-79)	52 3E63 MET	71.13.27.002						FPR: 3775	original duration.
		P435/R65/V45/F6	SRB STG:	<u>NLGTD</u> : 5747 FT						FUEL BIAS: 1136	- Waved off landing at KSC on orbit 144 due to ground fog.
		SS EVA #33	2:05.5 2:09	91:13:29:08Z						FINAL TDDP: 3140	Changed landing site to EDW.
		Tethered with SAFER CTGY	PERF: NOMINAL	VEL: 154 KGS HDOT: -5.0 FPS						RECON: 3563	- Total flight duration extension: one orbit.
		EV 1 - Linda Godwin	PERF. NOWINAL	NDU13.0 FP3						PAYLOADS:	FIRSTS/LASTS:
		EV 2 - Rich Clifford	2 ENG TAL (BEN):	BRK INIT: 116 KGS				1996) Atla		PLB:	- Mir docking at 01:18:39:26, hatch opening at 01:20:18:00 MET.
		Scheduled EVA #29 To install MEEP on Mir DM,	2:25 2:28		as seen fro	om Mir di	uring re	endezvous.		SHUTTLE/MIR	- Mir docking at 01:18:39:26, hatch opening at 01:20:18:00 MET. - Shannon Lucid transferred to Mir 21 crew at 02:04:29:00 MET
		evaluate EVA H/W, aids &		DRAG CHUTE				-		MISSION 3	(84:12:42:04Z) and will return on STS-79.
		tools.	<u>NEG RETURN</u> : 4:06 4:09	<u>JETTISON</u> : 54 KGS 91:13:29:31Z	Caller 36				1	SPACEHAB 4 ORBITER DOCKING	- Fifteen CWC's, total of 1506 lbm water, 42 lbm N_2 , 62 lbm O_2 , 614 lbm food transferred to Mir.
		3/27/96 - 6:02:28 Duration	4.09	71.1J.27.JIL	main !!				-	SYSTEM (ODS)	- First EVA during orbiter/Mir docked operations at 04:22:23 MET.
	ON SEAR		<u>PTA (U/S 242)</u> :	AVE BRK DECEL:	7				1	. ,	- Mir undocking at 06:16:54:59 MET.
	+ +		4:23 4:24	5.4FPS/S		-	53.0			MIDDECK:	- Last flight from old MCC (FCR-1). First flight controlled from old
	K Stel		DROOP (ZZA):	WHEELS STOP:	ANT ANT	1	P	5	22 E	KIDSAT SAREX-II	MCC was Gemini 4.
<u>ē</u> +	+ .	E	<u>5:24</u> 5:23	91:13:29:52Z			17-			JAREA-II	RADIATOR DEPLOY #18:
ю		8	5.21 5.25	10579 FT	1.1			Leona	-		- Port radiator deployed for 47 hours to conserve water for
			<u>PTM</u> :		() and in	- w	1.		L		transfer to Mir.
9	AN B		5:54 5:58	ROLLOUT:	als		ALL CAL	and the second	F	5 CRYO TK SETS	
	ORD GOUT		SE TAL (ZZA):	8394 FT 55 SEC	×	Annone and a state		and the second s	22	NO RMS	<u>RENDEZVOUS #27:</u> - Rendezvous and third docking with Mir Space Station (third
			<u>5:54</u> 6:09	33 JL0	10 121						docking flight).
				WINDS:	and a. ?	line h		3			····· ································
		MCC FCR-1 (55) ASCENT ONLY	MECO CMD:	H0, L1 KTS							
			8:32.6 8:33.2	OFFICIAL:	the we		S.S.				Continued
		Continued	Continued	1301P04 T0, L1 Continued	has and	5 5 .	The set	A COLORED			
										1	

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		CREW			LANDING SITE/	SSME-TL						
FLT C	ORBITER	(6)	LAUNC LIFTOF		RUNWAY, CROSSRANGE	NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.	ORDITER	TITLE, NAMES	LANDIN		LANDING TIMES	THROTTLE	AND	INC	HA/HP	1300	PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S		TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFIC:T ANOMALIES, ETC.)
070 7/			Continuod		WINDS	ENG. S.N.						
515-76		Continuea	Continued		Continued			1		Section 2	* 00	Continued
portrait on r CDR Chiltor row: Clifford	71-002 (2 mid deck on, and P rd/MS, Lu	Continued WHITE FCR (6) ORBIT OPS & ENTRY FLIGHT DIRECTORS: A/E - J. W. Bantle LD/O 1 - P. L. Engelauf O 2 - W. D. Reeves PLNG - P. F. Dye MOD - R. E. Castle	v: Godwi ght on ba ommande	25871 42:21.9 76.8 FPS	Continued <u>DENS ALT</u> : 1536 FT <u>FLT DURATION</u> : 9:05:15:53 <u>S/T</u> : 604:12:03:30 <u>OV-105:</u> 110:13:35:54 <u>DISTANCE</u> : 3,800,000 sm	Above: ST bar on Min EVA while	Docking MIR & S M21-399	g Modu Shuttle 9-001	are docked. - Aboard Mir	ind Goo	restraining dwin mark first Block Module	Continued <u>SIGNIFICANT ANOMALIES</u> : - Hydraulic System 3 leak during ascent (approximately 20% fluid lost), kept in low pressure for entry, F/R waiver S063689CU. - WSB 3A failed to cool during ascent. - WSB 2 overcooked post-MECO. - Loss of PLBD centerline 9-12 release microswitch inclinations postlanding wave-off. - WSB 3B steam vent heater transient failure. - R4R fail off (low chamber pressure). - L2L fail leak (oxidizer leak). - L2U fail off (low chamber pressure). - EVA camera bracket not onboard. - EVA 2 biomed (ECG) signal conditioner failed. - EMU 2 battery power discrete fail on. - MCC loss of forward link during countdown. - Loss of KCA forward link. - Water transfer mineral syringe failed to inject.

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		LANDING SITE/	SSME-TL								
		CREW (6)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT	FOW	PAYLOAD	MISSION HIGHLIGHTS
NO.	ORBITER		LIFTOFF TIME, LANDING SITES,	CROSSRANGE LANDING TIMES	EMERG THROTTLE	RSRM AND	INC	HA/HP	FSW	WEIGHTS, PAYLOADS/	LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS,
NO.		TITLE, NAMES	ABORT TIMES	FLT DURATION,	PROFILE	ET	INC			EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S	Abort Times	WINDS	ENG. S.N.						
STS-77	OV-105	<u>CDR</u> :	KSC PAD 39B	KSC 33 (KSC 30) 150:11:09:20Z	104/104/	BI-080	39.03°	DIRECT	01-24	CARGO:	KSC W/D: OPF 69, VAB 5, PAD 27 = 101 days total.
050	(Flight 11) Endeavour	John H. Casper (Flt 4 - STS-36, STS-54,	140:10:29:59.973Z 6:30:00 AM EDT (P)	7:09:20 AM EDT	109%	RSRM 47	(5)	INSERTION	(8)	35205 LBS	
SEQ FLT #77	LINGAVOUI	STS-62)	6:30:00 AM EDT (A)		PREDICTED:			POST OMS-2:		PAYLOAD	LAUNCH POSTPONEMENTS: - Baselined launch date of 4/25/96 on 6/19/95.
		P436/R111/V86/M99	Sunday 9	Wednesday 8 5/29/96 (6)	100/104/104/	ET-78		152.9 x 152.8		CHARGEABLE:	- Postponed launch date to 5/16/96 on 9/11/95.
KSC-77		PLT:	5/19/96 (3)		67/104	LWT 71		NM		27393 LBS	- Postponed launch date to 5/19/96 on 5/14/96 (Atlas launch had range priority).
PAD	OMS PODS:	Curtis L. Brown	LAUNCH WINDOW:	DEORBIT BURN: 150:10:09:30Z	ACTUAL:			SPARTAN		DEPLOYED:	range phoney).
39B-33	LPO4-18	(Flt 3 - STS-47, STS-66)	2H30M CTOB	XRANGE: 314 NM	100/104/104/			DEPLOY:		1104 LBS	LAUNCH SCRUBS: None.
MLP-1	RPO5-9 FRC5-11	P437/R152/V112/M136	FOM PLS: KSC	ORBIT DIR: DR 17	67/104	FT		153.6 x 150.4 NM			LAUNCH DELAYS: None.
IVILP-1	1103 11	<u>M/S 1</u> :	EOM PLS: KSC TAL: BEN		1 = 2037 (2)	<u>RPT</u>				<u>NON-DEPLOYED</u> : 23586 LBS	
		Andrew S. W. Thomas	<u>TAL WX</u> : MRN, ZZA	<u>AIM PT</u> : CLOSE IN	2 = 2040(1)	271K		<u>SPARTAN</u> GRAPPLE:			TAL WX:
		P438/R213/M186	SELECTED:	<u>MLGTD</u> : 1687 FT 150:11:09:20Z VEL: 216 KGS 216 KEAS	3 = 2038 (3)	ET		<u>GRAPPLE</u> : 153.1 x 152.0		MIDDECK: 866 LBS	• BEN (prime) was forecast NO-GO for broken ceiling but observed GO at TAL landing time. MRN was forecast GO, selected, and observed GO. ZZA was forecast GO but
		<u>M/S 2</u> :	RTLS: KSC 33/N/N	VEL: 216 KGS	<u>M 3 EOM</u> :	BR/UP		NM			selected, and observed GO. ZZA was forecast GO but
		Daniel W. Bursch (Flt 3 - STS-51, STS-68)	<u>TAL:</u> MRN 20/N/N <u>AOA</u> : KSC 33/N/N	216 KEAS HDOT: -4.6 FPS	WEIGHT: 222399 LBS	214K		PAMS/STU		<u>SHUTTLE</u> ACCUMULATED	observed NO-GO for broken ceiling at TAL landing time.
		P439/R169/V109/M147	PLS: EDW 22/N/N	TD NORM 205:	X CG:	ET		DEPLOY:		WEIGHTS:	DOLILU-II I-LOADS:
1.1				2536 F I	1080.45	ET IMPACT		152.6 x 152.0		DEPLOYED:	DOLILU-II I-LOADS: - DOLILU-II uplink #8, I-load uplink #27.
		<u>M/S 3:</u> Mario Runco, Jr.	<u>TDEL</u> : 0.1 -0.108/0.09	DRAG CHUTE	LANDING:	1:24:57 MET		NM		819825 LBS NON-DEPLOYED:	FLIGHT DURATION CHANGES: None Elight was planned to
X		(Flt 3 - STS-44, STS-54)		DRAG CHUTE DEPLOY: 191 KEAS	WEIGHT:	LAT:		DEORBIT:		1089758 LBS	FLIGHT DURATION CHANGES: None. Flight was planned to be 10 days assuming 5/19/96 liftoff; hence, this does not count
CASPER	ROWN	P440/R137/V89/M122	<u>MAX Q NAV</u> : 693 701	150:11:09:27Z	222276 LBS	2.97°N		154 x 147 NM		CARGO TOTAL: 2311537 LBS	as a flight duration change.
A D	THOMAS	M/S 4:	093 /01	<u>NLGTD:</u> 6612 FT 150:11:09:35Z VEL: 150 KGS HDOT: -4.8 FPS	X CG: 1082.04	<u>LONG</u> : 138.89°W		VELOCITY:		2311037 LBS	FIRSTS/LASTS:
And a second sec	BURSCH RUNCO	Marc Garneau	<u>SRB STG</u> :	VEL: 150 KGS				25763 FPS		PERFORMANCE	- First flight with all 3 Block I engines.
GAR	WEAU	(Canada) (Fit 2 - STS 41-G)	2:05.4 2:05					ENTRY		<u>MARGINS (LBS)</u> : FPR: 3080	- First flight to be controlled completely from the new MCC (White FCR).
		(Flt 2 - STS 41-G) P441/R47/V128/M44	PERF: NOMINAL	<u>BRK INIT</u> : 99 KGS				RANGE:		FUEL BIAS: 900	(writte r ert).
				DRAG CHUTE JETTISON: 59 KGS				4378 NM		FINAL TDDP: 5381	EVENTS:
		MCC WHITE FCR (7) (ALL OPS)	<u>2 ENG TAL (MRN)</u> : 2:40 2:36	150:11:09:56Z						RECON: 8528	- SPARTAN deployed at 1:01:59:12 MET. - SPARTAN grappled at 2:04:22:34 MET and berthed at
		. ,		AVE BRK DECEL:						PAYLOADS:	2:05:25:41 MET.
s77e505	3 RMS	FLIGHT DIRECTORS: A/E - R. D. Jackson	<u>NEG RETURN</u> : 3:59 4:00	6.8 FPS/S						<u>PLB</u> : SPACEHAB-4	- PAMS/STU deployed at 2:22:50:00 MET.
holds Sp	artan 207	LD/O 2 - N. W. Hale		WHEELS STOP: 150:11:10:11Z 10978 FT						SPACENAD-4 SPARTAN 207/IAE	RENDEZVOUS #28: Rendezvous, capture, and berth (return) of
free flyer		O 1 - B. P. Austin	PTA (U/S 249):	10978 FT	* -	* *	Salar .	1.		TEAMS (GANE,	SPARTAN-207).
PLB. SP		PLNG - L. J. Ham MOD - J. W. Bantle	4:45 4:36	ROLLOUT:	* * =	*	-	11	#	LMTE, VTRE, PAMS/STU	
is in fore	ground.	NOD 5. W. Danae	DROOP (BYD):	9291 FT 51 SEC	* : -	* *	TRIF		5.15	(deployed))	RENDEZVOUS #29, #30, & #31: Rendezvous & PROXIVOUS OPS with PAMS/STU payload.
			5:23 5:23		*	1. * -	m g		71.	ĠBĂ (12 BETSCE	"STS-77 still holds the record for most number of rendezvous
2 - 1	Constant .		PTM:	WINDS: H0. L6 KTS		1	1		-	BEISCE	operations of any space flight"'- From Wayne Hale's blog:
e	and and the A		5:41 5:32	H0, L6 KTS OFFICIAL: 2607P9 H2, L7	2100		PIP	1000		<u>MIDDECK:</u> ARF-01	http://blogs.nasa.gov/cm/newui/blog/viewpostlist.jsp?blogname=
5 31 Jac			MECO CMD:			FA				ARF-01 BRIC-07	waynehalesblog - "My Favorite Shuttle Flight" posted May 26,
1 1	1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	8:27.66 8:28.1	<u>DENS ALT:</u> 1012 FT				-			2010.
1. 14			<u>М</u> .	FLT DURATION:		7	1300 1			5 CRYO TK SETS	SIGNIFICANT ANOMALIES:
St. 5. 6	and the second	- PARA	<u>VI</u> : 25865 25856	10:00:39:20						RMS 45	- IPS file server (MPSR1) disk crash prelaunch.
maria				<u>S/T</u> : 614:12:42:50	STS077	214 011	Inflight	t crew portra		(S.N. 301)	- FES failure to come out of standby.
And.		in the second second	<u>OMS-2</u> : 41:47 41:47	<u>OV-105:</u> 112:13:03:06						RMS used for	 PCS 1 O₂ supply transducer failed. WSB 2 failed to cool during ascent.
Styl	NASA	SPACEHAB	2:06 2:07					nas/MS, CDF	•	SPARTAN 207	- APLL2 fuel nump seal cavity drain line pressure decay
		in inter	198.5 FPS 198.6 FPS	DISTANCE:				Back row: PI		deploy, retrieve, and	- WSB 3 overcool during entry. - RCS jet F2F fail leak (oxidizer leak).
877E5263 1846-05.21.09	9130			יייין די און אין אין די און אין די	Brown, C	farneau /	MS/CS	A & Bursc/N	MS.	berth (IAE deployed from SPARTAN).	- RCS jet R3A heater failed off.
		1	9	1							,

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		CREW	LAUNCH SITE.	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(7)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		ONDIT	FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION, WINDS	PROFILE ENG. S.N.	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-78	OV-102	CDR:	KSC PAD 39B		104/104/	BI-081	39.03°	DIRECT	01-24	CARGO:	KSC W/D: OPF 63, VAB 7, PAD 19 = 89 days total.
	(Flight 20)	Terence T. (Tom) Henricks	172:14:48:59.987	KSC 33 (KSC 31) 189:12:36:36Z	109%		(6)	INSERTION	(9)	31854 LBS	
SEQ FLT #78	Columbia	(Flt4 - STS-44, STS-55 STS-70)	10:49:00 AM EDT (P) 10:49:00 AM EDT (A)	8:39:36 AM EDT	PREDICTED:	RSRM 55		POST OMS-2:		PAYLOAD	LAUNCH POSTPONEMENTS/ADVANCEMENTS: - Baselined launch date of 6/27/96 on 3/30/95.
FLI #/8	19th	P442/R135/V93/M120	Thursday 23	Sunday 12 7/7/96 (7)	100/104/104/	00		153.6 X 146.7		CHARGEABLE:	- Advanced launch date to 6/20/96 on 3/21/96.
KSC-78	Spacelab		6/20/96 (8)		67/104	ET-79		NM		23666 LBS	
PAD	Flight	<u>PLT</u> : Kevin Kregel	LAUNCH WINDOW:	DEORBIT BURN: 189:11:36:36Z	ACTUAL:	LWT		TRIM 1 BURN:		DEPLOYED:	LAUNCH SCRUBS: None
39B-34	LM-13	Kevin Kregel (Flt 2 - STS-70)	2H30M CTOB	XRANGE: 91 NM	100/104/104/	72		4:30:00 MET		0 LBS	LAUNCH DELAYS: None
	EDO 8	P443/R197/V129/M172	EOM DI S. KSC	ORBIT DIR: DR 18	67/104	ст		146.6 X 146.4 NM			TAL WX:
MLP-3	EDU 0	M/S 1:	<u>EOM PLS</u> : KSC TAL: BEN		1 = 2041 (1)	<u>R</u> PT		INIVI		<u>NON-DEPLOYED</u> : 21598 LBS	- BEN (prime and selected) and MRN were forecast and
	OMS PODS:	Richard M. Linnehan	<u>TAL WX</u> : MRN, ZZA	AIM PT: NOMINAL	2 = 2039 (2)	271.3K		TRIM 2 BURN:			observed GO. ZZA was forecast and observed NO-GO
	LPO5-9 RPO1-24	P444/R214/M187	SELECTED:	<u>MLGTD</u> : 2300 FT 189:12:36:367	3 = 2036 (3)	ЕT		15:23:29:00Z 142.3 X 129.6		<u>MIDDECK:</u> 2066 LBS	(thunderstorms within 20 NM).
	FRC2-20	M/S 2 (PAYLOAD CDR):	<u>RTLS: KSC</u> 33/N/N	189:12:36:36Z VEL: 214 KGS 208 KEAS	<u>M 3 EOM</u> :	BR/UP		NM			DOLILU-II I-LOADS: DOLILU-II uplink #9, I-load uplink #28
		Susan J. Helms (Flt 3 - STS-54, STS-64)	TAL: BEN 36/N/N	HDOT: -1.3 FPS	WEIGHT: 229134 LBS	214K		DEORBIT:		<u>SHUTTLE</u> ACCUMULATED	FLIGHT DURATION CHANGES:
		P445/R158/V108/F19	<u>AOA</u> : EDW 22/N/N <u>PLS</u> : EDW 22/N/N	TD NORM 205:	X CG:	ET		142 X 130 NM		WEIGHTS:	- Extended flight 1 day to 17 days for additional science
				2515 FT	1081.88	IMPACT				DEPLOYED:	(planned 16 + 1).
	-	M/S 3: Charles F. Brady, Ir	<u>TDEL</u> : 0 -0.178/0.02	DRAG CHUTE <u>DEPLOY:</u> 191 KEAS 189:12:36:40Z	LANDING:	1:24:50 MET		VELOCITY: 25749 FPS		819825 LBS NON-DEPLOYED:	EVENTS:
UENRIC	KREGEL	Charles E. Brady, Jr. P446/R215/M188		189:12:36:40Z	WEIGHT:	LAT:				1113422 LBS	- Longest space shuttle flight to date.
	*++++=	P/S 1:	<u>MAX Q NAV</u> : 705 714	<u>NLGTD</u> : 6537 FT 189:12:36:48Z	228986 LBS X CG:	2.86°N <u>LONG</u> :		ENTRY RANGE:		CARGO TOTAL: 2343391 LBS	RADIATOR DEPLOY #19: Full deploy for cooling.
E P	h 11 8	Jean-Jacques Favier	703 714	189:12:36:48Z VEL: 158 KGS	1083.40	<u>138.9</u> °W		4466 NM		2343371 LD3	<u>RADIATOR DEPEOT #19</u> . 1 dil deploy for coolling.
		(France)	SRB STG:	HDOT: -5.2 FPS						PERFORMANCE	SIGNIFICANT ANOMALIES:
THER -	100 (N/S)	P447/R216/M189	2:04.6 204	BRK INIT: 124 KGS						<u>MARGINS (LBS):</u> FPR: 3080	- Main engine 2036 violated thrust build up rate at engine start (>14,000 lbs thrust change for any two consecutive 20 millisec
	INNEHAN	<u>P/S 2</u> :	<u>PERF</u> : NOMINAL	DRAG CHUTE						FUEL BIAS: 900	time intervals).
		Robert B. Thirsk (Canada)	2 ENG TAL (BEN):	<u>JETTISON:</u> 189:12:37:12 Z 59KGS						FINAL TDDP: 3683 RECON: 4245	- MPS LH2 low level cutoff sensors indicated dry (flashed) 2.3 seconds after MECO during shutdown transient flow (changed
		P448/R217/M190	2:43 2:41	59KGS					L		mixture ratio for STS-79 to 6.020).
				AVE BRK DECEL:						PAYLOADS:	 Heavy sooting and heat effect (discoloration and charring) observed on insulation interfaces within STS-78 field joints. No
		MCC WHITE FCR (8)	<u>NEG RETURN</u> : 3:57 3:59	5.6FPS/S	PA		100	The second secon	St	<u>PLB:</u> LIFE AND	heat effects to metal interface or capture feature o-ring no gas
		FLIGHT DIRECTORS:		<u>WHEELS STOP:</u> 189:12:37:31Z 11639 FT		and and a	TEPLY	2 CAR	-	MICROGRAVITY	past CE O-rings (Environment process change this fight to J-
sts078-7	30-033	A/E - J. W. Bantle LD/O 2 - J. P. Shannon	<u>PTA (U/S 240)</u> : 5:15	11639 FT	A ST		-	TO STEND		SCIENCES (LMS) Musculoskeletal	leg adhesive and joint cleaning process.) Postponed STS-79 to use STS-80 stack with old processing.
	crogravity	O 1 - P. L. Engelauf		ROLLOUT: 9339 FT			-W	cut and isi	21	Physiology, Fluid	- Center MPS LH2 inlet pressure failed OSH.
Sciences		O 3 - B. P. Austin O 4 - C. W. Shaw	<u>DROOP</u> : 5:25 5:24	9339 FT 55 SEC		25		CAN		Physics, Advanced	- BFS I/O TERMINATE B discrete toggling low. BFS moved to GPC 2 for entry.
PLB.	` ,	MOD - A. L. Briscoe	5:25 5:24	WINDS:				1951		Semiconductory and Metal Alloys	- FES high-load duct temps low during ascent and high-load
			<u>PTM (U/S 240)</u> :	TRITKTS	1	1 4	34	A CONTRACT	1	Processing	- FES high-load duct temps low during ascent and high-load core freeze-up during deorbit prep. High-load core was flushed.
	1 + KA	TAN	5:47 5:45	OFFICIAL: 1803P5 T3, L2	1279	XE	and the second	KAS S		(SPACELAB LM) OARE	- FES topping core freezeup at 2 days 1 hour MET and during deorbit prep. Core flush procedure performed.
Yes V		Cal Se	MECO CMD:		art		T	E LA	-		- Crvo N ₂ tank 4B heater failed.
	010	- Ke	8:27.9 8:29.6	<u>DENS ALT:</u> 854 FT		A L	5			<u>MIDDECK</u> : BRIC	- Spacelab EPDB 2 AC phase A amps and EPDB 3 AC phase C amps transducer failures.
and a	TINE		VI:	FLT DURATION:		-				SAREX II	- Loss of MCC read/write (aka HA) servers.
	1 .		25865.4 25856	16:21:47:35				ses in LMS-1		-	- APU 1 fuel pump seal leakage more severe that seen on
			OMS-2:	<u>S/T</u> : 631:10:30:25				center. Other		5 CRYO TK SETS + 4 EDO, 5 GN2	STS-75. - APU 1 turbine speed transducer erratic.
			41:28.7 41:28.6	<u>OV-102:</u> 200:00:05:10	clockwise	: Favier/F	S (Fra	ance), Thirsk/I	MS	TANKS	- WSB 1 ready indication intermittent (or bypass valve
	Cont Salton		185.6 FPS 185.7 FPS 1:59 1:59		(Canada), Linnehan/	MS and	egel, B	lanricka		EDO PALLET	indication).
1000	Sec. Sec.		1.57 1.57	DISTANCE: 7,046,000 sm	Linnenah/	wo, and	CDR	Tenneks.		NO RMS	

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		CREW		LANDING SITE/	SSME-TL						
FLT	ORBITER	(7) 6 UP / 6 DOWN	LAUNCH SITE, LIFTOFF TIME,	RUNWAY, CROSSRANGE	NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
NO. STS-79 SEQ FLT #79 KSC-79 PAD 39A-45 MLP-1	OV-104 (Flight 17) Atlantis Spacehab 5 OMS PODS: LPO3-21 RPO4-17 FRC4-17	TITLE, NAMES & EVA'S 2DR: William F. Ready (FI 3 - STS-42, STS-51) P449/R140/V96/M125 PLT: Terrence W. Wilcutt (FIt 2 - STS-68) P450/R183/V130/M160 <u>M/S 1:</u> Jay Apt (FIt 4 - STS-37, STS-47, STS-59) P451/R123/V79/M110 <u>M/S 2:</u> Thomas D. Akers (FIt 4 - STS-41, STS-49, STS-61) P452/R115/V74/M103 <u>M/S 3:</u> Carl E. Walz (FIt 3 - STS-51, STS-65) P453/R170/V106/M148 <u>M/S 4:</u> Ascent John E. Blaha (FIt 5 - STS-29, STS-33, STS-43, STS -58, stay on Mir 22, and return on STS-81) P454/R97/V48/M88 <u>M/S 4:</u> Descent Shannon Lucid (FIt 5 - STS-51-G, STS-34, STS-43, STS-58, Ascent on STS-76, on-orbit stay on Mir 21 and Mir 22) P455/R65/V45/F6 MCC WHITE FCR (9) FLIGHT DIRECTORS:	ABORT TIMES KSC PAD 39A 260:08:54:48.96Z 4:54:49 AM EDT (P) 4:54:49 AM EDT (A) Monday 11 9/16/96 (8) LAUNCH WINDOW: 5:47M MIR PLANAR/ PHASE WINDOW EOM PLS: KSC TAL: ZZA	FLT DURATION, WINDS KSC 15 (KSC 32) 270:12:13:13Z 8:13:13 AM EDT Thursday 8 9/26/96 (9) DEORBIT BURN: 270:11:06:14Z XRANGE: 777 NM ORBIT DIR: DR 19 AIM PT: CLOSE IN MLGTD: 807 FT 270:12:13:13Z VEL: 217 KGS 217 KEAS HDOT: -4.3 FPS TD NORM 195: 2496 FT DRAG CHUTE DEPLOY: 192 KEAS 270:12:13:22Z NLGTD: 5760 FT 270:12:13:29Z VEL: 150 KGS HDOT: -4.2 FPS BRK INIT: 89 KGS DRAG CHUTE JETTISON: 55 KGS 270:12:13:57Z AVE BRK DECEL: 3.1FPS/S WHEELS STOP: 270:12:14:34Z 1788 FT ROLLOUT: 10981 FT 81 SEC	PROFILE ENG. S.N. 104/104/ 109% <u>PREDICTED:</u> 100/104/104/ 67/104 <u>ACTUAL:</u> 100/104/104 67/104 1 = 2012 (18) 2 = 2031 (14) 3 = 2033 (8)		INC 51.67 (5)	HA/HP DIRECT INSERTION POST OMS-2: 158.6 X 85.3 NM NC6: 2:14:05:33 MET 203.7 X 201 NM NC2: 2:15:38:10 MET 208.8 X 201.9 NM SEP BURN: 7:16:49:15 MET 211 X 201.3 NM DEORBIT: 209.1 X 197.7 NM VELOCITY: 25892 FPS ENTRY RANGE: 4276 NM	(1)	EXPERIMENTS CARGO: 27812 LBS PAYLOAD CHARGEABLE: 19039 LBS DEPLOYED: 3170 LBS NON-DEPLOYED: 15151 LBS MIDDECK: 718 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 822995 LBS NON-DEPLOYED: 1129291 LBS CARGO TOTAL: 2371203 LBS PERFORMANCE MARGINS (LBS): FPR: 4456 FUEL BIAS: 432 FINAL TDDP: 462 RECON: 716 PAYLOADS: PLB: SHUTTLE/MIR MISSION 4 SPACEHAB 5 (DOUBLE MODULE) ODS MIDDECK: SAREX IMAX MSX CPCG MGM SAMS CGBA MGBX	FIRSTS, SIGNIFICANT ANOMALIES, ETC.) KSC W/D: OPF 73 (2), VAB 17 (3), PAD 25 (3) = 115 days total LAUNCH POSTPONEMENTS: - Baselined 8/1/96 launch date on 5/4/95. - 5/4/95 launch date was postponed when the shuttle was rolled back from pad A to VAB on 7/10/96 under threat from Hurricane Bertha. - Due to STS-78 booster sooting and heat effects in field joints, decision was made to restack using STS-80 SRB's (and ET) which used old process. Set launch date to 9/12/96. - Rolled back to VAB 9/4/96 under threat of Hurricane Fran. Postponed launch to 9/16/96. LAUNCH SCRUBS: None LAUNCH WINDOW: - Mir rendezvous planar/phase window was 7M00S; however, it was limited to 5M475 due to a negative performance margin (-523 lbs) at window opening. Liftoff was delayed (per plan) for 36 seconds for zero performance margin plus an additional 10 seconds (total delay 46 seconds) which allowed approx + 200 lbs APM (wind, loads allowance). SHUTTLE NIGHT LAUNCH #14 DOLILU-II I-LOADS: DOLILU-II uplink #10, I-load uplink #29. FLIGHT DURATION CHANGES: Extended 1 day for additional science. FIRSTS: - First U.S. spaceflight with female flight director for entry/ landing (Linda Ham). RENDEZVOUS #32: Rendezvous and dock with Mir (fourth docking). EVENTS: - First U.S. spaceflight with female flight director for entry/ landing (Linda Ham). RENDEZVOUS #32: Rendezvous and dock with
	AS EN LC O PL	ASC - R. D. Jackson ENT- L. J. Ham LD/O 1 - P. F. Dye O 2 - R. E. Castle PLNG - W. D. Reeves MOD - A. L. Briscoe	<u>OMS-2:</u> 42:50.9 42:50.9 75.9 FPS 75.9 FPS 00:47 00:47	WINDS: H4, L3 KTS OFFICIAL: 1206P09 H5, L3			-023 STS-79 Atlantis approach to MIR.			5 CRYO TK SETS 4 GN₂ TANKS NO RMS	RADIATOR DEPLOY #19: - Both port and starboard radiators were deployed for cooling and to conserve water for transfer to Mir. - Transferred 20 CWC's with 2025 lbs water. Continued

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FLT	ORBITER	CREW (6)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFIC:T ANOMALIES, ETC.)
STS-79 Continued				Continued <u>DENS ALT</u> : 1084 FT <u>FLT DURATION</u> : 10:03:18:24 <u>S/T</u> : 641:13:48:49 <u>OV-104:</u> 120:16:54:18 <u>DISTANCE</u> : 3,900,000 sm	STS079-3- left to right	, Aleksa	ndr Y. I		Apt, Bla	Wir: Front row, ha, Readdy, Warie Content	Continued <u>SIGNIFICANT ANOMALIES</u> : - RH RSRM nozzle erosion beginning in throat ring and extending aft into forward exit cone (approx 60 longitudinal erosion areas up to 0.4 inch diameter). - Supply water tank B quantity transducer dropouts. - Fuel cell 0 ₂ flow transducer degraded. - Cryo H ₂ tank 3 B heater failure. - Single string GPS erroneous time reference, loss of lock and runaway. (Firmware problem.) - TCS range discrepancy. - APU 2 underspeed shutdown at 13:14 MET. Two-APU entry/landing. - APU 2 fuel pump seal cavity drain line pressure decay to vacuum.
		Changeout: Lucid (le visit, Blaha stays up			Korzun/MI	R, Wilcu	tt.	to right, Pl addy on af king to cor	LT Wild	Futt, deck for	STS079-810-028 Russia's Mir Space Station as seen after undocking.

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		CREW	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(5)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
- Musgrav	ohs Wake acility ee flight h 600mm	CDR: Kenneth D. Cockrell (Flt 3 - STS-56, STS-69) P456/R159/V121/M140 PLT: Kent V. Rominger (Flt 2 - STS-73) P457/R200/V131/M174 M/S 1 (EV1): Tamara E. Jernigan (Flt 4 - STS-40, STS-52, STS-67) P458/R130/V83/F14 M/S 2 (EV2): Thomas D. Jones (Flt 3 - STS-59, STS-68) P459/R177/V111/M155 M/S 3: F. Story Musgrave (Flt 6 - STS-6, STS 51-F, STS-33, STS-44, STS-61) P460/R15/V19/M15 Two 6-hour EVA's planned by Jernigan (EV1) and Jones (EV2) for EDFT. EVA's were canceled when crew could not get "B" hatch open. MCC WHITE FCR (10) FLIGHT DIRECTORS: A/E - N. W. Hale LD/O 2 - G. A. Pennington O 1 - R. M. Kelso O 3 - J. P. Shannon O 4 - B. P. Austin MOD - J. W. Bantle	KSC PAD 39B 324:19:55:46.95Z 2:53:00 PM EST (P) 2:55:47 PM EST (A) Tuesday 10 11/19/96 (11) LAUNCH WINDOW: 2H30M CTOB EOM PLS: KSC TAL: BEN TAL WX: MRN SELECTED: RTLS: KSC15/N/N TAL: BEN36/N/N AOA: EDW22/N/N PLS: EDW22/N/N PLS: EDW22/N/N PLS: EDW22/N/N TDEL: -0.04 -0.238/-0.2 MAX Q NAV: 717 719 SRB STG: 2:04.3 -2:05	WINDS KSC 33 (KSC 33) 342:11:49:04Z 6:49:04 AM EST Saturday 17 12/7/96 (8) DEORBIT BURN: 342:10:48:02Z XRANGE: 72 NM ORBIT DIR: DL 37 AIM PT: NOMINAL MLGTD: 3068 FT 342:11:49:04Z VEL: 210 KGS 203 KEAS HDOT: -1.0 FPS TD NORM 205: 3063 F1 DRAG CHUTE DEPLOY: 193 KEAS 342:11:49:08Z NLGTD: 7100 FT 342:11:49:08Z NLGTD: 7100 FT 342:11:49:17Z VEL: 149 KGS HDOT: -5.5 FPS BRK INIT: 121 KGS DRAG CHUTE JETITSON: 54 KGS 342:11:49:40Z BRK DECEL FPS2: AVE 5.1 PK 7.6 WHEELS STOP: 342:11:50:13Z 11789 FT ROLLOUT: 872T FT 69 SEC WINDS: 2T, 4L KTS OFFICIAL: 200	ENG. S.N. 104/104/ 109% PREDICTED: 100/104/104/ 67/104 ACTUAL: 100/104/104/ 67/104 1 = 2032 (5) 2 = 2026 (6) 3 = 2029 (14) M 3 EOM: WEIGHT: 227815 LBS X CG: 1079.10 LANDING: WEIGHT: 2276/10 LBS X CG: 1080.62		(42)	DIRECT INSERTION POST OMS-2: 190 X 188 NM DEORBIT: 203 X 169 NM VELOCITY: 25877 FPS ENTRY RANGE: 4346 NM	(2)	CARGO: 31111 LBS PAYLOAD CHARGEABLE: 21208 LBS DPLY/RETRIEVE: 12524 / 12427 LBS NON-DEPLOYED: 7575 LBS MIDDECK: 1109 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 822995 LBS NON-DEPLOYED: 822995 LBS NON-DEPLOYED: 822995 LBS NON-DEPLOYED: 1137975 LBS CARGO TOTAL: 2402314 LBS PERFORMANCE MARGINS (LBS): FPR: 3100 FUEL BIAS: 884 FINAL TDDP: 486 RECON: 1102 PAYLOADS: PLE DRFEUS-SPAS (Astronomical observations) WSF-3 (CASTON CASSING SEM MIDDECK: PARE/NIH-R CMIX VIEW-CPL CCM-A, BRIC, MSX 5 CRYO TK SETS + 4 EDO & 5 N2 TANKS EDO PALLET RMS 46 (S.N. 202)) RMS used for ORF FUS-SPAS de-	KSC W/D: OPF 80, VAB 6, PAD 33 = 119 days total. LAUNCH POSTPONEMENTS: - - Baselined launch date of 117/96 on 7/14/95. - Advanced launch date to 11/8/96 on 9/20/96 to analyze implications of STS-79 RH SRM nozzle erosion. - Postponed launch date to 11/15/96 to allow Thiokol time to complete SRM analysis. LAUNCH SCRUBS: - - Scrubbed 11/15/96 launch date after L-2 MMT on 11/13/96 due to forecast of high surface winds at KSC from 11/15/96 through 11/18/96. New launch date of 11/19/96. LAUNCH DELAYS: - - Launch delayed 2M47S at T-31 secs while measuring H2 gas in aft compartment per preplanned procedure to confirm <600 ppm.
			279 FPS 279 FPS	<u>OV-102:</u> 217:16:58:27 DISTANCE: 7,043,950 sm	Cockrell, Front row Musorave	, Jones/		PLT Roming t) &	ger.	ploy, grapple & berth and WSF deploy, grapple & berth and EDFT-05	 and in latch actuator planetary gears. Window W8 impact damage. IMU 1 BITE annunciations (deselected from selection filter for entry.) EV2 helmet difficult to latch.

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		CREW (7)	LAUNCH SITE,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT	SRB		ORBIT	FOW	PAYLOAD	MISSION HIGHLIGHTS
FLT NO.	ORBITER	6 UP / 6 DOWN TITLE, NAMES	LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION,	EMERG THROTTLE PROFILE	RSRM AND ET	INC	HA/HP	FSW	WEIGHTS, PAYLOADS/ EXPERIMENTS	(LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-81	OV-104	& EVA'S CDR:	KSC PAD 39B	WINDS	ENG. S.N. 104/104/	BI-082	51.67	DIRECT	01-25	CARGO:	KSC W/D: OPF 62, VAB 5, PAD 24 = 91 days total.
SEQ FLT #81 KSC-81	(Flight 18) Atlantis Spacehab 6 OMS PODS:	Michael A. Baker (Fit 4 - STS-43, STS-52, STS-68) P461/R133/V81/M118 PLT:	12:09:27:23Z 4:27:23 AM EST (P) 4:27:23 AM EST (A) Sunday 10 1/12/97 (9)	KSC 33 (KSC 34) 22:14:22:44Z 9:22:44 AM EST Wednesday 9 1/22/97 (7) DEORBIT BURN: 22:13:17:33Z	109% <u>PREDICTED</u> : 100/104/104/ 67/104	RSRM 54 ET-83	(6)	INSERTION <u>POST OMS-2</u> : 159.9 X 84.9 NM	(3)	28149 LBS <u>PAYLOAD</u> <u>CHARGEABLE</u> : 19321 LBS	LAUNCH POSTPONEMENTS: - Baselined 12/5/96 as launch date on 9/1/95. - Postponed launch date to 1/16/97 on 8/1/96 (SRM heat effects and nozzle erosion on STS-79 and STS-80). - Advanced launch date to 1/12/97 on 9/5/96.
PAD 39B-36 MLP-2	LPO3-22 RPO4-18 FRC4-18	Brent W. Jett, Jr. (Flt 2 - STS-72) P462/R206/V132/M179 <u>M/S 1</u> :	LAUNCH WINDOW: 6M59S. Mir planar/ phase window and ET heating constraint	<u>XRANGE</u> : 34 NM <u>ORBIT DIR</u> : DL 38	<u>ACTUAL</u> : 100/104/104/ 70/104 1 = 2041 (2)	LWT 76 <u>ET</u> PRED		<u>NC5</u> : 14:09:10:43Z 209.7 X 142.4 NM		<u>DEPLOYED</u> : 4019 LBS <u>NON-DEPLOYED</u> : 14492 LBS	LAUNCH SCRUBS: None LAUNCH DELAYS: None TAL MY:
		Peter J. K. (Jeff) Wisoff (Flt 3 - STS-57, STS-68) P463/R166/V110/M145 <u>M/S 2</u> :	EOM PLS: KSC TAL: ZZA TAL WX: MRN SELECTED:	AIM PT: NOMINAL MLGTD: 2926 FT 22:14:22:44Z VEL: 199 KGS 195 KEAS HDOT: -1.4 FPS	2 = 2034 (8) 3 = 2042 (3) M 3 EOM:	<u>RPT</u> : 271.3K <u>ET</u> <u>BRKUP</u> : 214K		<u>NC6:</u> 14:23:41:15Z 209.9 X 201.6 NM		SHUTTLE	TAL WX: - Zaragoza was prime but NO-GO due to forecast overcast 500 feet and observed broken 300 feet. Moron was selected. Moron and Ben Guerir were forecast and observed GO.
		John M. Grunsfeld (Flt 2 - STS-67) P464/R191/V133/M167	<u>RTLS:</u> KSC15/N/N <u>TAL</u> : BEN36/N/N <u>AOA</u> : EDW22/N/N <u>PLS</u> : EDW22/N/N	TD NORM 195: 2961 FT DRAG CHUTE DEPLOY: 187 KEAS	WEIGHT: 215403 LBS X CG: 1081.41	<u>ET</u> IMPACT 1:26:53		BRAKING: 15:02:38:46Z 209.5 X 208.9 NM		<u>DEPLOYED</u> : 827014 LBS NON-DEPLOYED:	DOLILU-II I-LOADS: - DOLILU-II uplink #12, I-Load uplink #31 SHUTTLE NIGHT LAUNCH #15
FLIGHT DI ASC - R. D ENT - L. J.	Ham	Marsha S. Ivins (Flt 4 - STS-32, STS-46, STS-62) P465/R109/V77/F12	<u>TDEL:</u> -0.04 -0.238/-0.2 <u>MAX Q NAV:</u> 717 PSF 719 PSF	<u>22:14:22:55</u> Z <u>NLGTD:</u> 6377 FT <u>22:14:22:55</u> Z VEL: 144 KGS 136 KEAS	LANDING: WEIGHT: 215337 LBS X CG: 1083.11	MET <u>LAT:</u> 0.38°S <u>LONG</u> : 125.6°W		<u>SEP</u> : 20:04:01:40Z 212.7 X 203.2 NM		1153277 LBS <u>CARGO TOTAL</u> : 2430463 LBS PERFORMANCE	FLIGHT DURATION CHANGES: - Waved off landing at KSC on orbit 161 due to forecast of broken 4000 foot ceiling. - Flight duration extended one orbit.
02-P.F.	L. Engelauf	<u>M/S 4</u> : Ascent Jerry M. Linenger (Flt 2 - STS-64, stay on Mir 22, and return on STS-84)	<u>SRB STG</u> : 2:04.3 2:05 <u>PERF</u> : NOMINAL	BRK INIT: 79 KGS DRAG CHUTE JETTISON:				DEORBIT: 207.5 X 181.9 NM VELOCITY: 25891 FPS ENTRY		<u>MARGINS (LBS):</u> FPR: 3100 FUEL BIAS: 884 FINAL TDDP: 1285 RECON: 2117	EVENTS: - Mir capture at 15:03:54:49Z, 2:18:27:26 MET. - Docking at 15:04:02:28Z, 2:18:35:05 MET. - Blaha transferred to STS-81/Atlantis and Linenger transferred to Mir 22 at 3:00:17:00 MET. - Blaha total flight time 127:05:27:55 and Mir time 116:22:38:34.
		P466/R182/V134/M159 M/S 4: Descent	2 ENG TAL (BEN): 3:03 3:03 NEG RETURN:	56 KGS 22:14:23:26Z BRK DECELFPS ² AVE 4.0 PK 7.7	STS081-36	<mark>9-003</mark>	- Inflight	RANGE: 4428 NM	of	ODS	- Hatch closure at 07:03:19 MET and undocking at 20:02:15:23Z, 07:16:48:00 MET. RENDEZVOUS #35: Rendezvous and dock with Mir (fifth
STS081-	328-013	John E. Blaha (Flt 5 - STS-29, STS-33, STS-43, STS-58, Ascent on STS-79, and stay on	3:58 3:59 <u>PTA (U/S 304)</u> : 4:55 4:51	WHEELS STOP: 22:14:23:51Z 12276 FT ROLLOUT:	81 CDR Ba Kaleri/FE/M	aker, Gru ⁄lir-22. N	Inflight crew portrait of crews. Front: It to rt, STS- runsfeld/MS, Aleksandr Y. Middle row: Mir-22 CDR			SHUTTLE-MIR MISSION 5 SPACEHAB	docking). SIGNIFICANT ANOMALIES: - Fuel Cell 1 voltage erratic below MNA voltage.
Mir as se Atlantis.		Mir 22) P467/R97/V48/M88	<u>DROOP (ZZA)</u> : 5:23 5:24	9350 FT 67 SEC WINDS: 4T, TR KTS	Valeri G. Korzun, Ivins/MS, & Blaha/Mir-22 now MS. Back: Linenger/MS & current guest researcher, Wisoff/MS, & PLT Jett.					DOUBLE MODULE MIDDECK: CREAM	 Fuel Cell 2 cell performance monitor self test anomaly. OCA video conference VLHS cable adapter failure. LiOH door latch jammed closed. EVA protect mode command fails when used in TEC (capability
			PTM (U/S 304): 5:57 5:55 MECO CMD: 8:30.4	OFFICIAL: 1404P6 4T, 1R <u>DENS ALT</u> : 86 FT <u>FLT DURATION</u> :						KIDSAT SAMS MSX 5 CRYO TK SETS 4 N2 TANKS	not in software). - VIU S.N. 1025 failure. - IMU3 exhibited large X and Y gyro drift rates. Took to standby.
1	-		VI: 25922 25915 <u>OMS-2</u> : 40:25 40:24 279 FPS 279 FPS	10:04:55:21 <u>S/T</u> : 669:10:37:27 <u>OV-104:</u> 130:21:49:39 <u>DISTANCE</u> : 3,900,000 sm						NO RMS	

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		CREW		LANDING SITE/	SSME-TL						
		(7)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS
FLT	ORBITER	(* 7	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW		(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION,	THROTTLE PROFILE	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S	ADUKT HIMES	WINDS	ENG. S.N.	EI				EAPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-82	OV-103	CDR:	KSC 39A	KSC 15 (KSC 35)	104/104/	BI-085	28.46	DIRECT	01-25	CARGO:	KSC W/D: OPF 147, VAB 5, PAD 26 = 178 days total.
	(Flight 22)	Kenneth D. Bowersox	42:08:55:16.98Z	52:08:32:24Z	109%		(43)	INSERTION	(4)	24891 LBS	
SEQ FLT #82	Discovery	(Flt 4 - STS-50, STS-61, STS-73)	3:55:17 AM EST (P) 3:55:17 AM EST (A)	3:32:24 AM EST	PREDICTED:	RSRM 58		DOST OMS 2		PAYLOAD	LAUNCH ADVANCEMENTS: - Baselined 2/13/96 launch date on 10/27/96.
FLI #82		P468/R146/V97/M130	Tuesday 11	Friday 9	100/100/100/	50		POST OMS-2: 312.9 X 186.3		CHARGEABLE:	- Advanced launch date to 2/11/97 on 1/15/97.
KSC-82	OMS PODS:		2/11/97 (6)	Friday 9 2/21/97 (4)	67/104	ET-81		NM		17374 LBS	
	LPO1-25 RPO3-23	PLT: Scott L (Doc) Horowitz	LAUNCH WINDOW:		ACTUAL:	LWT-74		FINAL			LAUNCH SCRUBS: None
PAD 39A-46	FRC3-22	Scott J. (Doc) Horowitz (Flt 2 - STS-75)	1H6M30S	<u>DEORBIT BURN</u> : 52:07:21:55Z	<u>ACTOAL</u> . 100/100/100/	LVV1-74		BRAKES:		DEPLOYED: 6941 LBS	LAUNCH DELAYS: None
39A-40		P469/R210/V135/M183	HST PLANAR/		68/104	<u>et</u>		322.3 X 316.4			
MLP-1			PHASE WINDOW	<u>XRANGE</u> : 484 NM	1 2027 (2)	<u>PRED</u> RPT:		NM		NON-DEPLOYED: 9921 LBS	TAL WX:
		M/S 1/EV-4 Joseph R. Tanner	EOM PLS: KSC	ORBIT DIR: DL 39	1 =2037 (3) 2 =2040 (2)	271.3K		REBOOST 1:		9921 LBS	- Only Ben Guerir was manned; however, Ben Guerir was NO-GO for ceiling and visibility (overcast 500 feet and
		(Flt 2 - STS-66)	TAL: BEN		3 = 2038 (3)			323.7 X 319.2		<u>MIDDECK:</u> 512 LBS	ground fog). There was no requirement for a TAL site due
		P470/R185/V136/M162	<u>TAL WX</u> : NONE	<u>AIM PT</u> : CLOSE IN		<u>et</u> Brkup:		NM		512 LBS	to a planned 8-second overlap between RTLS and PTA
		<u>M/S 2</u> :	SELECTED.	<u>MLGTD</u> : 2522 FT	<u>M 3 EOM</u> : AVE	<u>BRKUP</u> : 214K		REBOOST 1A:		SHUTTLE_	(actual overlap 14 seconds).
		Steven A. Hawley	<u>SELECTED</u> : <u>RTLS</u> : KSC 15/N/N	52:08:32:24Z VEL: 184 KGS	WEIGHT:			325.4 X 320.0		ACCUMULATED	DOLILU-II I-LOADS:
		(Flt 4 - STS 41-DR,	TAL: NONE	191 KEAS	213949 LBS	<u>ET</u> IMPACT		NM		WEIGHTS:	- DOLILU-II uplink #13, I-Load uplink #32
		ŠTS 61-C, STS-31) P471/R39/V29/M38	AOA: KSC 15/N/N PLS: KSC 22/N/N	HDOT: -1.5 FPS	X CG: 1077.83	1:29:22		REBOOST 2		DEPLOYED: 833955 LBS	SHUTTLE NIGHT LAUNCH #16
		1 47 1/1(3 // 12 //100	<u>1 ES</u> . RSC 22/11/11	TD NORM 195:	1077.05	MET		REBOOST 2: 328.9 X 320.5		NON-DEPLOYED:	
		<u>M/S 3/EV-3:</u>	TDEL:	2394 FT	LANDING:	<u>LAT</u> :		NM		1163710 LBS	FLIGHT DURATION CHANGES:
		Gregory J. Harbaugh (Flt 4 - STS-39, STS-54,	-0.01 0.312/0.35		WEIGHT: 213869 LBS	17.4°N <u>LONG</u> :		REBOOST 3:		CARGO TOTAL: 2455354 LBS	- Waved off landing at KSC on orbit 149 due to clouds forming over runway with chance of 3000 feet broken. Landed on orbit
		STS-71)	MAX Q NAV:	<u>DRAG CHUTE</u> DEPLOY: 184 KEAS	X CG:	<u>141.1°</u> W		335.1 X 321.0		24JJJJ4 LDJ	150.
		P472/R125/V88/M112	745 PSF 754 PSF	52:08:32:27Z	1079.57			NM		PERFORMANCE	- Extended flight duration 1 rev.
		M/S 4/EV-1:	SRB STG:					DEORBIT:		MARGINS (LBS): FPR: 3100	SHUTTLE NIGHT LANDING #9
		Mark C. Lee	2:04.3 2:05	<u>NLGTD</u> : 5581 FT 52:08:32:34Z				334.1 X 312.2		FUEL BIAS: 884	STIDTTEE NIGHT LANDING #9
		(Flt 4 - STS-30, STS-47,		VEL: 136 KGS				NM		FINAL TDDP:3503	FIRSTS/LASTS:
		STS-64) P473/R100/V78/M91	<u>PERF</u> : NOMINAL	140 KEAS				DEORBIT		RECON:4235	- First night landing at KSC with centerline lights.
		F473/K100/V70/10191	2 ENG TAL (BEN):	HDOT: -6.7 FPS				BURN:		PAYLOADS:	EVENTS:
		<u>M/S 5/EV-2</u> :	NO CALL	<u>BRK INIT</u> : 94 KGS				504 FPS		PLB:	- HST grapple at 1:23:38 MET - Space Shuttle altitude record 335.1 NM X 321.0 NM after
		Steven L. Smith (Flt 2 - STS-68)	NEG RETURN:	DRAG CHUTE				VELOCITY:		Hubble Space Telescope Service	- Space Shuttle altitude record 335.1 NM X 321.0 NM after Reboost 3 maneuver.
		P474/R184/V137/M161	4:04 4:05	JETTISON: 52 KGS				26120 FPS		Mission 2	Rebuust 5 maneuver.
				52:08:32:56Z	OTOGOG					(HST SM-02)	RENDEZVOUS #36:
			PTA (U/S 500): 3:56 3:51	BRK DECEL FPS2:	STS082-E			<u>ENTRY</u> RANGE:			- Rendezvous, grapple, service, reboost, and release of HST.
	LEE * HARBAI		5.50 5.51	AVE 5.2 PK 7.7	Captured	HST		4238 NM			HST REBOOST MANEUVERS:
ALL C	10	W	DROOP:	WHEELS STOP:			(2.)			MIDDECK:	HST REBOOST MANEUVERS: - Reboost 1 was 20M43S at 04:01:09:28 MET.
I Z C	1/1		5:27 5:25	52:08:33:16Z		_			/	MSX	- Reboost 1A was 10M13S at 04:06:07:02 MET with delta V 33
-	CAN N	E	PTM (U/S 500):	9588 FT							FPS. Maneuver was to avoid a conjunction with Pegasus debris.
E /	A VOY		5:14 5:04	ROLLOUT:					_/		- Reboost 2 was 19M47S at 05:01:15:00 MET.
5	1 A	5		7066 FT		PREFE	1			5 CRYO TK SETS +	- Reboost 3 was 31M54S at 07:01:32:58 MET.
		N	MECO CMD: 8:30.1 8:29.8	52 SEC		(Har)	L.H.			5 N2 TANKS	SIGNIFICANT ANOMALIES
801	STS-S2		0.27.0	WINDS:					1	RMS 47	SIGNIFICANT ANOMALIES: - HST + V2 solar array rapid slew during airlock depress. For
	ERSOX + HOR		VI:	5H, 1L KTS OFFICIAL:1407P13		11.01				(S.N. 301)	subsequent airlock depresses, one equalization valve on each
			2 6129 26119	7H, 1L		C. Barr	A A A			RMS USED FOR	hatch was duct-taped to limit air flow. - EMU gloves had yellow smudges from HST handrails.
		Continued	<u>OMS-2</u> :						HST CAPTURE,	- FES feedline A accumulator heater failure.	
			44:29.6 44:33.6	Continued					BERTH, & DEPLOY	- Erratic supply water tank D transducer.	
			273.8 FPS 276 FPS					•		l	

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			ARY	Page 2-100 - 515-62							
FLT NO.	ORBITER	CREW (7) TITLE, NAMES	LAUNCH SITE, LIFTOFF TIME, LANDING SITES,	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES	SSME-TL NOM-ABORT EMERG THROTTLE	SRB RSRM AND	INC	orbit Ha/Hp	FSW	PAYLOAD WEIGHTS, PAYLOADS/	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION, WINDS	PROFILE ENG. S.N.	ET				EXPERIMENTS	FIRSTS, SIGNIFIC:T ANOMALIES, ETC.)
STS-82 Continued		Continued		Continued					02		Continued
		SS EVA #34 EMU/tethered EVA 1 by EV1 and EV2 on 2/13/97 Scheduled EVA #30 6H42M21S duration		<u>DENS ALT</u> : 926 FT <u>FLT DURATION</u> : 9:23:37:07 <u>S/T</u> : 679:10:14:34							SIGNIFICANT ANOMALIES (CONTINUED: - Fuel cell 3 water flow through alternate path causing concern that H ₂ gas would get into EMU's during recharge from tank C. - Bent pins on SADE-2R P2 harness. - Three PGSC problems. - No RSRM erosion found.
		SS EVA #35 EMU/tethered EVA 2 by EV3 and EV4 on 2/14/97 Scheduled EVA #31 7H27M31S duration SS EVA #36		<u>OV-103:</u> 155:23:27:01 <u>DISTANCE</u> : 3,800,000 sm			M	RE			
		EMU/tethered EVA 3 by EV1 and EV2 on 2/15/97 Scheduled EVA #32 7H11M00S duration			582E5948 1997.02:19 11	04:53	U	W			
		SS EVA #37 EMU/tethered EVA 4 by EV3 and EV4 on 2/16/97 Scheduled EVA #33 6H34M30S duration			pay tribute to rt),Tann	to the H er/MS, L awley/MS	IST and .ee/MS	l ground sup	port tea /MS. B	gn and shirts am. Front (It Behind them Iorowitz. In	
		SS EVA #38 EMU/tethered EVA 5 by EV1 and EV2 on 2/17/97 Unscheduled EVA #5 5H17M21Sduration								274	
		MCC WHITE FCR (12) <u>FLIGHT DIRECTORS</u> : A/E - N. W. Hale LD/O 1 - J. W. Bantle O 2 - B. P. Austin PLNG - C. W. Shaw MOD - A. L. Briscoe									
			Smith/MS on F	ee/PLC inside HS RMS during remo Resolution Spec	val of	Tanr	ner/MS	Harbaugh/N on RMS acc ensor (FGS)	essing	Fine	STS081-E-5937 HST begins its separation from Discovery following release.

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		CREW	LAUNCH SITE.	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(7)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		UKDIT	FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
070.00	01/ 102			WINDS KSC 33 (KSC 36)	ENG. S.N.	DL 00/	20.47	DIDECT	01.05	CADCO	
STS-83	OV-102 (Flight 22)	CDR: James D. Halsell, Jr.	KSC, PAD 39A 94:19:20:31.98Z	98:18:33:11Z	104/104/ 109%	BI-086	28.46 (44)	DIRECT INSERTION	OI-25 (5)	<u>CARGO</u> : 34373 LBS	KSC W/D: OPF 73, VAB 6, PAD = 24, 103 days total.
SEQ	Columbia	(Flt 3 - STS-65, STS-74)	2:00:00 PM EST (P)	2:33:11 PM EDT		RSRM	()		(-)		LAUNCH POSTPONEMENTS:
FLT #83	20th	P475R178/V123/M156	2:20:32 PM EST (Å) Friday 16	Tuesday 12 4/8/97 (10)	PREDICTED: 100/104/104/	59		POST OMS-2: 163.5 X 160.1		<u>PAYLOAD</u> CHARGEABLE:	- Baselined 3/27/97 as launch date on 12/14/95. - Postponed launch date to 4/3/97 on 1/16/97
KSC - 83	Spacelab	PLT:	4/4/97 (12)		67/104	ET-84		NM		25556 LBS	- Tosponeu launch date to 4/3/97 on 1/10/97
	Flight	Susan L. Still		DEORBIT BURN: 98:17:31:18Z	ACTUAL	LWT-77					LAUNCH SCRUBS:
PAD 39A - 47	LM-14	P476/R218/F28	LAUNCH WINDOW: 2H30M CTOB		ACTUAL: 100/104/104/	<u>et</u> Pred				DEPLOYED: NONE	 Scrubbed 4/3/97 launch on 4/1/97 at approximately L-42 hours based on decision to add missing insulation blankets to water
39A - 47		M/S 1 (PAYLOAD CDR):		<u>XRANGE</u> : 56 NM	67/104	RPT:					coolant lines on 576 bulkhead.
MLP - 3	EDO 10	Janice E. Voss (Flt 3 - STS-57, STS-63)	EOM PLS: KSC	<u>ORBIT DIR</u> : DL 40	1 = 2012 (19) 2 = 2109 (17)	271.3K				NON-DEPLOYED: 23536 LBS	LAUNCH DELAYS:
	OMS PODS:	P477/R167/V115/F22	TAL WX: BEN, MRN	AIM PT: NOMINAL		ET				23030 ED3	
	LP05-11			MI GTD: 3127 FT		<u>et</u> <u>BRKUP</u> :		DEORBIT:		MIDDECK:	- Launch delayed 20M32S during T-9 minute hold because the cabin pressurization probe nose seal was found damaged and
	RPO5-10 FRC2-22	M/S 2: Michael L. Gernhardt	<u>SELECTED</u> : <u>RTLS</u> : KSC 15/N/N	98:18:33:11Z	<u>M 3 EOM</u> : WEIGHT:	214K		162.7 X 158.3 NM		2020 LBS	was replaced. Followed by high O2 reading in mid-body caused by cabin vent into PLB.
	1102 22	(Flt 2 - STS-69)	TAL: BYD 32/N/N	MLGTD: 3127 FT 98:18:33:11Z VEL: 193 KGS 197 KEAS	235510 LBS	ET				<u>SHUTTLE</u>	
	VOSe	P478/R199/V138/M173	AOA: KSC 15/N/N PLS: FD1 NONE	HDOT: -1.3 FPS	X CG: 1078.45	<u>IMPACT</u> 1:21:10		VELOCITY: 25791 FPS		ACCUMULATED WEIGHTS:	TAL WX: - Banjul (prime and selected) and Moron were forecast and
THOMAS	Party.	M/S 3:	FD2 DELAY PRESS	<u>TD NORM 205</u> : 2553 FT	1076.43	MET		20/91 FP3		DEPLOYED:	observed GO. Ben Guerir was forecast NO-GO for crosswinds
5	ANN AND	Donald A. Thomas	12 SECONDS	2553 F I	LANDING:	LAT:		<u>ENTRY</u>		833955 LBS	but observed GO.
HAT 3		(Flt 3 - STS-65, STS-70) P479/R180/V119/M158	TDEL:	DRAG CHUTE DEPLOY: 186 KEAS	WEIGHT: 235421 LBS	13.68°N <u>LONG</u> :		<u>RANGE</u> : 4402 NM		NON-DEPLOYED: 1189266 LBS	DOLILU-II I-LOADS:
E /	MSI B		0.01 0.012/0.05	98:18:33:15Z	X CG:	163.15°		102 1000		CARGO TOTAL:	- DOLILU-II uplink #16, I-Load uplink #33.
8	1111	P/S 1: Roger Crouch		<u>NLGTD</u> : 6654 FT	1079.99	W				2489727 LBS	FLIGHT DURATION CHANGES:
OUCH	83 LINTE	P480/R219/M191	MAX Q NAV: 709 708	98.18.33.237		Proventie	ALC: NO.	197		PERFORMANCE	- Planned NEOM was on orbit 251. A Minimum Duration Flight
1.00				VEL: 145 KGS 151 KEAS HDOT: -5.8 FPS	718 . 1	1.192	Cart of		E.S.	MARGINS (LBS):	(MDF) was declared due to concern about fuel cell 2 substack 3
		P/S 2: Gregory T. Linteris	<u>SRB STG</u> : 2:03.5 2:03	HDOT: -5.8 FPS			A DE			FPR: 3100 FUEL BIAS: 884	increasing delta volts. Landing occurred on orbit 64 (11 days and 11 orbits early).
		P481/R220/M192		<u>BRK INIT:</u> 85 KGS	210	1/37-	- ATT	Call a L	L	FINAL TDDP: 4820	,, ,,
			<u>PERF</u> : NOMINAL	DRAG CHUTE			1	0.24	-	RECON: 3741	FIRSTS/LASTS:
		MCC WHITE FCR (13) FLIGHT DIRECTORS:	2 ENG TAL (BYD):	<u>JETTISON:</u> 57 KGS 98:18:33:48Z			$\mathcal{L} \otimes$	Mar an	4	PAYLOADS:	 First U.S. spaceflight with female flight director for ascent (Linda Ham).
		A/E - L. J. Ham	2:40 2:41		1	and the second	1		i.e	PL B [.]	
		LD/O 3 - R. M. Kelso O 1 - W. D. Reeves	NEG RETURN:	BRK DECELFPS ² : AVE 4.8 PK 6.9	STS083-3	303-002	рі т	Still floats in	to	Microgravity Science	SIGNIFICANT ANOMALIES: - FC2 substack 3 delta volts unusual start up and continuing on-
		O 2 - G. A. Pennington	3:57 4:00					ing activation	n	Protein	orbit trend toward 300 myolts caused a Minimum Duration Flight
		O 4 - J. P. Shannon	<u>PTA (U/S 154)</u> :	<u>WHEELS STOP</u> : 98:18:34:11Z 11729 FT	no opado					Crystallography, Combustion	(MDF) to be declared. Postflight analysis indicated trend in
		MOD - J. W. Bantle	5:21 5:16		1- 14				12	Science, and	multiple cells, not a single cell. - FC2 H ₂ reactant valve failed to close by switch action when
				<u>ROLLOUT</u> : 8602 F I			AT No	Alla		Materials Sciences	shutting down FC2 (regulator vented reactants). Valve closed
S98-160	095	955m	<u>DROOP (BYD)</u> : 5:29 5:30	60 SEC		-Y			The second	(MSL-1/LM) OARE	6 hours later. Y star tracker bypassed by PASS.
In JSC 1		Service and the service of the servi	0127 0100	<u>WINDS</u> : H10, R2 OFFICIAL: 0209P18			1- 100		AF	CRYOFD	7 star tracker pressure fail
Linda H		A THINK	<u>PTM (U/S 243)</u> : 5:45 5:45	OFFICIAL: 0209P18			-				- F3F failed off (low PC). - Subsystem RAU E transient
first fen			5.45 5:45		0				-	MIDDECK: SAREX-II	- Subsystem RAU E transient - Multiple ECOS "hang" occurrences.
			MECO CMD:	<u>DENS ALT: </u> 963 FT		-		The second second		MSX	,
Ascent	<u> </u>		8:29.7 8:30.7	FLT DURATION: 3:23:12:39	Se land		X			5 CRYO TK SETS +	
Director			<u>VI</u> :		STS083-3	25-004	- Crew	portrait in		4 EDO	
(Photo i	1000		25877 25871	<u>S/T</u> : 683:09:27:13	Spacelab.					5 N2 TANKS	
STS-09.	5)	1	OMS-2:	<u>OV-102:</u> 221:15:11:06	Voss/MS/	PLC, CD	R Hals	ell, &		EDO PALLET	
			39.53 39.54 7		Thomas/N	IS. Rear	(It to r	t) Crouch/PS			
			221.6FPS 222 FPS	<u>DISTANCE</u> : 1,500,000 sm	Gernhardt	MS. PI	T Still	& Linteris/P	S.	NO RMS	

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		ODEW		LANDING SITE/	SSME-TL						
		CREW (8) 7 UP & 7 DOWN	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER		LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION, WINDS	PROFILE ENG. S.N.	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-84	OV-104	CDR:	KSC, PAD A	KSC 33 (KSC 37)	104/104/	BI-087	51.65	DIRECT	01-25	CARGO:	KSC W/D: OPF 76, VAB 4, PAD 21 = 101 days total.
515-04	(Flight 19)	Charles J. Precourt	135:08:07:47.9Z	KSC 33 (KSC 37) 144:13:27:43Z	109%		(7)	INSERTION	(6)	28497 LBS	
SEQ FLT #84	Atlantis	(Flt 3 - STS-55, STS-71)	4:07:48 AM EDT (P) 4:07:48 AM EDT (A)	9:27:43 AM EDT	PREDICTED:	RSRM 60		DOCT OMC 3		PAYLOAD	LAUNCH POSTPONEMENTS: - Baselined 5/1/97 launch date on 1/12/96.
FLI #84	Spacehab 7	P482/R161/V118/M141 PLT:	Thursday 24	Saturday 18 5/24/97 (7)	100/104/104/	00		POST OMS-2: 160.6 X 85.5		CHARGEABLE:	- Postponed launch date to 5/15/97 on 2/1/96 due to STS-78
KSC-84		Eileen M. Collins	5/15/97 (4)		67/104	ET-85		NM		19643 LBS	SRB sooting and heat effects in field joints.
	OMS PODS: LPO3-23	(Flt 2 - STS-63) P483/R188/V139/F24	LAUNCH WINDOW:	<u>DEORBIT BURN:</u> 144:12:23:33Z	ACTUAL:	LWT-78		TI		DEPLOYED:	LAUNCH SCRUBS:
PAD 39A-48	RP04-19	M/S 1 (PAYLOAD CDR):	7M00S		<u>ACTOAL</u> . 100/104/104/	LVVI-/O		<u>1:</u> 1:17:11:52		<u>3902 LBS</u>	- None
J 7A-40	FRC4-19	Jean-Francois Clervoy	MIR PLANAR/	<u>XRANGE</u> : 34 NM	67/104			MET			
MLP-2		(Flt 2 - STS-66) ESA Astronaut (France)	PHASE WINDOW	<u>ORBIT DIR</u> : DL 41	1 = 2032 (6)	<u>et</u> Pred		215.6 X 203.4 NM		NON-DEPLOYED: 14605 LBS	LAUNCH DELAYS: - None
		P484/R186/V140/M163	EOM PLS: KSC	<u>AIM PT:</u> NOMINAL	2 = 2032 (0) 2 = 2031 (15)	RPT:				14000 LDS	- NORE
		<u>M/S 2</u> :	TAL: ZZA		2 = 2031 (15) 3 = 2029 (15)	271.3K		7:03:48		MIDDECK:	TAL WX:
PRECOURT	84 CO	Carlos I. Noriega P485/R221/M193	TAL WX: MRN, BEN	MLGTD: 2882 FT 144:13:27:43Z		ЕT		214.3 X 199.7 NM		1136 LBS	- Zaragoza (prime and selected), Moron, and Ben Guerir All forecast GO and observed GO.
	. Ψ. ἔ	M/S 3:	SELECTED:	VEL: 208 KGS 196 KEAS	<u>M 3 EOM</u> :	BRKUP:				<u>SHUTTLE</u>	
LEAN	â 💥 🕺	Edward T. Lu	RTLS: KSC 33/N/N	196 KEAS HDOT: -1.0 FPS	WEIGHT:	214K		07:08:10:39		ACCUMULATED	DOLILU-II I-LOADS:
1000	H- CHI	P486/R222/M194 M/S 4:	TAL: ZZA 30 AOA: KSC 15/N/N	TD NORM 195:	216168 LBS X CG:	ET		214.3 X 199.7 NM		WEIGHTS: DEPLOYED:	- DOLILU-II uplink #15, I-Load uplink #34
"EGA	ITTE LU N	Elena V. Kondakova	PLS: EDW 22/N/SF	2989 FT	1080.95	IMPACT				1205007 LBS	SHUTTLE NIGHT LAUNCH #17
	_	(Russia)	TDEL	DRAG CHUTE		1:26:42		DEORBIT:		NON-DEPLOYED:	
MCC WHI	TE FCR (14)	È487/R223/F29 M/S 5:	<u>TDEL</u> : 0.06 0.142/0.18	<u>DEPLOY: 183</u> KEAS 144:13:27:47Z	LANDING: WEIGHT:	MET <u>LAT</u> :		214.1 X 199.7 NM		2042864 LBS CARGO TOTAL:	FLIGHT DURATION CHANGES: - Waved off landing on orbit 144 due to forecast of 5000 feet
FLIQUED		Ascent			216021 LBS	0.95°S				2518224 LBS	variable broken and too dynamic.
<u>FLIGHT D</u> A/E - N. W	IRECTORS: / Hale	C. Michael Foale (Flt 4 - STS-45, STS-56 &	<u>MAX Q NAV</u> : 725 728	<u>NLGTD</u> : 5720 FT 144:13:27:52Z	X CG: 1082.57	<u>LONG</u> : 128.0°W		VELOCITY: 25906 FPS		PERFORMANCE	- Extended flight one orbit and landed on orbit 145.
LD/0 1 - P	P. L. Engelauf	STS-63, stay on MIR 23,	120 120	VEL: 175 KGS 156 KEAS	1062.37	120.0 VV		20900 FP3		MARGINS (LBS):	EVENTS:
02-R.E.		and return on STS-86)	<u>SRB STG</u> :	HDOT: -6.9 FPS				ENTRY		FPR: 3100	- Elena Kondakova's first flight was on Soyuz TM-17.
PLNG - P. MOD - A. I		P488/R143/V92/M127 M/S 6:	2:04.2 2:04	BRK INIT: 134 KGS				RANGE: 4397 NM		FUEL BIAS: 884 FINAL TDDP: 938	- Mir 23 crew is Commander Vasily Tsibiliyev and Flight Engineer Alexander Lazutkin.
WOD - A. I	E. DIISCOC	Descent	PERF: NOMINAL	DRAG CHUTE				4377 10101		RECON: 868	- Mir capture at MET 1:18:25:36 Hooks closed at MET 1:18:33
		Jerry M. Linenger		<u>JETTISON:</u> 53 KGS 144:13:28:17Z							- Halch open at MET 1:20:16. - Crew transfer time: Foale to Mir 23 and Linenger to STS-84 was
		(Flt 2 - STS-64, ascent on STS-81, and stay on Mir	2 ENG TAL (BEN): 2:32 2:37	144:13:28:17Z						PAYLOADS:	2D6H13M. Linenger stay time on Mir was 122:04:36:25 and total
		22 and 23)		BRK DECEL FPS ² :					1	PLB:	flight time was132:04:00:20.
		P489/R182/V134/M159	NEG RETURN:	AVE 6.2 PK 9.6		2	10		T	SHUTTLE/MIR	- Transferred equipment, 1038 lbm H ₂ O, 82 lbm O ₂ , and 21 lbm
			4:03 4:05	WHEELS STOP: 144:13:28:36Z		201 5 20	1 FF	· · · · · · · · · · · · · · · · · · ·	Contra la	MISSION 6	N ₂ to Mir. - Hatch closing at MET 6:04:32; undocking at MET 6:15:56.
Russi	a's Mir-post /	Atlantis sep.	PTA (U/S 263):	11266 FT		A A	The second secon	TICIN	-	SPACEHAB	, , , , , , , , , , , , , , , , , , ,
			4:37 4:35	ROLLOUT:			-		M	DOUBLE MODULE	FIRSTS: First EVA by a LLS_astronaut from Mir Space Station to deploy
	1		DROOP (ZZA):	8384 F I 53 SEC			1	ES 75			 First EVA by a U.S. astronaut from Mir Space Station to deploy optical properties monitor by Linenger and Tsibiliyev. EVA was on 4/29/97. Exit from KVANT-2 airlock in Orlan M suit. Duration
	A demail	7	5:20 5:25		FM	100	- FU	TATER	4	MIDDECK:	on 4/29/97. Exit from KVANT-2 airľock in Orlan M suit. Duration
	-	a pro-	PTM (U/S 263):	WINDS: 6T, R6 KTS OFFICIAL: 1109P13				12 March	SP-	CREAM MSX	4:57:30.
	1 and the second		6:07 6:07	17, R6	STS084-3	866-015	Cre	ews from STS	5-84	SIMPLEX	RENDEZVOUS #37:
~			MECO CMD:	DENS ALT: 1316 FT				ehab Double	. 04	RME-III	 Rendezvous and dock with Mir (sixth docking).
					Module tie	e record	(ten) f	for number of		EPICS PCG-STES	SIGNIFICANT ANOMALIES:
				FLT DURATION: 9:05:19:55						LME	- GPC Transient Mode Switch - dump indicated it was procedural
			<u>VI</u> : 25873 25870	<u>S/T</u> : 692:14:47:10	percente in erenningg op according i rent						problem. - Aft PL MNC amps measurement failed.
	7				Precourt, Aleksandr L. Lazutkin & Foale.				ale.	5 CRYO TK SETS	- GPS/INS and GPS DTO problems.
			<u>OMS-2</u> :	<u>OV-104</u> : 140:03:09:34	Back, from left: Lu, Colli					4 N2 TANKS	- Primary VHF and radio interface unit failure.
			44:01.6 43:04 75.6 FPS 76 FPS	DISTANCE:	Kondakova & Nori					NO RMS	 Window 1 impact reported by crew. MS4 lightweight seat entry position/"A" hatch interference.
				DISTANCE: 3,600,000 sm				1			

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FLT NO.	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	FLI DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-94 (STS-83R) SEO FLT #85 KSC - 85 PAD 39A-49 MLP-1	OV-102 (Flight 23) Columbia 21st Spacelab Flight LM-15 EDO 11 OMS PODS: LPO5-12 RPO5-11 FRC2-23	CDR: James D. Halsell, Jr. (Fit 4 - STS-65, STS-74, & STS-83) P490/R178/V123/M156 PLT: Susan L. Still (Fit 2 - STS-83) P491/R218/V141/F28 <u>M/S 1 (PAYLOAD CDR)</u> : Janice E. Voss (Fit 4 - STS-57, STS-63, & STS-83) P482/R167/V115/F22 <u>M/S 2</u> : Michael L. Gernhardt (Fit 3 - STS-69 & STS-83) P493/R199/V138/M173 <u>M/S 3</u> : Donald A. Thomas (Fit 4 STS-65, STS-70, STS-83) P494/R180/V119/M158 <u>P/S 1</u> : Roger Crouch (Fit 2 - STS-83) P495/R219/V142/M191 <u>P/S 2</u> :	KSC PAD 39A 182:18:01:59.96Z 1:50:00 PM EDT (P) 2:02:00 PM EDT (A) Tuesday 12 7/1/97 (5) LAUNCH WINDOW: 2H30M CTOB EOM PLS: KSC TAL: BYD TAL: BYD TAL: BYD 32 AOA: EDW 22/N/N PLS: EDW 22/N/N TDEL: 0.01 0.382/0.42 MAX O NAV: 701 PSF 703 PSF SRB STG: 2:04 PERF: NOMINAL 2 ENG TAL (BYD): 2:41 2:41	KSC 33 (KSC 38) 198:10:46:33Z 6:46:33 AM EDT Thursday 9 7/17/97 (8) <u>DEORBIT BURN</u> : 198:09:43:45Z <u>XRANGE</u> : 81.7 NM <u>ORBIT DIR</u> : DL 42 <u>AIM PT</u> : NOMINAL <u>MLGTD</u> : 3056 FT 198:10:46:33Z VEL: 208 KGS 202 KEAS HDOT: -1.1 FPS <u>TD NORM 205</u> : <u>Z774 FT</u> <u>DRAG CHUTE</u> <u>DEPLOY</u> : 194 KEAS 198:10:46:37Z <u>NLGTD</u> : 6583 FT 198:10:46:44Z VEL: 158 KGS 152 KEAS HDOT: -5.9 FPS <u>BRK INIT</u> : 100 KGS DRAG CHUTE	LING. 3.14 104/104/ 109% PREDICTED: 100/104/104/ 67/104 ACTUAL: 100/104/104/ 69/104 1 = 2037 (4) 2 = 2033 (9) M 3 EOM: WEIGHT: 230818 LBS X CG: 1078.40 LANDING: WEIGHT: 230773 LBS X CG: 1080.10	BI-088 RSRM 62 ET-86 LWT-79 ET PRED RPT: 27T.3K ET BRKUP: 214K ET IMPACT 1:21:04 MET LAT: 13.5°N LONG 163.46° W	28.45 (45)	DIRECT INSERTION <u>POST OMS-2</u> : 163.4 X 160.1 NM <u>DEORBIT</u> : 162 X 156.4 NM <u>VELOCITY</u> : 25793 FPS <u>ENTRY</u> <u>RANGE</u> : 4396 NM	(7)	ACCOMULATED WEIGHTS: DEPLOYED: 837857 LBS NON-DEPLOYED: 1230575 LBS CARGO TOTAL: 2552583 LBS PERFORMANCE MARGINS (LBS): FPR: 3200 FUEL BIAS: 809 FINAL TDDP: 2845 RECON: 4193	KSC W/D: OPF 53, VAB 7, PAD 21 = 81 days total. LAUNCH POSTPONEMENTS: None - Reflight of MSL-01/STS-83 was baselined as STS-83R on 4/10/97 with a launch date of 7/1/97. - On 4/25/97, STS-83R was renumbered STS-94. LAUNCH SCRUBS: None - LAUNCH DELAYS/EARLY LAUNCH TIMES: Aft the L-1 MMT, the weather forecast at KSC for 7/1/97 launch at 1837Z was thunderstorms/rain with 90% probability of NO-GO. The decision was made to move the launch time 47 minutes early to improve the probability of launch, which changed the EDW landing opportunities from 2-2-2 to 1-1-1. New launch time was 1750Z. Counted down to T-9 minutes and held due to thunderstorm forecast for RTLS landing time. Thunderstorms at RTLS time was removed from the forecast. Launch delay was 12M00S TAL WX: Banjul was prime and selected. Banjul was NO GO for most of the count for 3000 feet broken but became GO late in count. Ben Guerir forecast and observed GO. DOLILU-II I-LOADS: DOLILU-II uplink #16, I-load uplink #35. KSC LANDING WEATHER: - Forecast for landing time was technically NO-GO for rain within 30 NM; however, rain was offshore, moving NE, and approach path was Clear. Observed GO at deorbit burn minutes.
Crouch	nal	Gregory T. Linteris (Fit 2 - STS-83) P496/R220/V143/M192 MCC WHITE FCR (15) FLIGHT DIRECTORS: A/E - L. J. Ham LD/O 3 - R. M. Kelso O 1 - W. D. Reeves O 2 - G. A. Pennington O 3 - J. P. Shannon MOD - A. L. Briscoe	NEG RETURN: 3:56 3:58 PTA (U/S): 5:08 5:11 5:08 DROOP (BYD): 5:30 PTM (U/S): 7:05 7:03 7:05 MECO CMD: 8:29 VI: 25877 25871 OMS-2: 39:53 39:53 3222 FPS 221.7 FPS BURN TIME: 2:23 2:23 2:23	<u>JETTISON: 52</u> KGS 198:10:47:12Z BRK DECEL FPS ² : AVE 5.8 PK 7.2 WHEELS STOP: 198:10:47:31Z 11948 FT ROLLOUT: 8892 FT 58 SEC WINDS: T1, 0X KTS OFFICIAL: 1502P02 T2, 0X KTS DENS ALT: 1113 FT <u>FLT DURATION:</u> 15:16:44:33 <u>S/T</u> : 708:07:31:41 <u>OV-102:</u> 237:07:55:39 <u>DISTANCE:</u> 6,200,000 sm	Front (It to	ort): PL ⁻ w (It to ri Linteris	T Still & t): Ger s/PS.B		rrait.	PAYLOADS: PLB: Microgravity Science Laboratory. Protein Crystallography, Combustion Science, and Materials Sciences (MSL-1/LM) OARE CRYOFD MIDDECK: SAREX-II MSX 5 CRYO TK SETS + 4 EDO 5 N2 TANKS EDO PALLET NO RMS	FLIGHT DURATION CHANGES: None. FIRSTS/LASTS: - First reflight of same payloads (MSL-01 with same crew after STS-83 minimum duration flight declared due to FC2, substack 3 delta volts change). - First flight of Wraparound DAP (called part 5) used for complete entry. RCS usage 500 lbs vs baseline 700 lbs and redline 1430 lbs (28.45 inclination). EVENTS: - Entry was observed at approx 16 degrees elevation in Houston. - Deorbit burn was 298.5 FPS. SIGNIFICANT ANOMALIES: - Fulc cell 3, substack 2, cell performance monitor output increased approximately 32 mv in 20 minutes. - TDRSS Ku-band channel lock dropouts (worse with 48 MBPS on TDRS-E). - Lower port fastener retainer housing separated from locker L6G (transfer from Spacelab to MF28K & M as DTO). - Ku-band roll/alpha gimbal anomaly. - Window #7 debris impact reported by crew. - APU 3 fuel isolation valves on heated string B cycling low.

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FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS.	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-85 SEQ FLT #86 KSC - 86	OV-103 (Flight 23) Discovery	<u>CDR</u> : Curtis L. Brown, Jr. (Fit 4 - STS-47, STS-66 & STS-77) P497/R152/V112/M136 <u>PLT</u> : Kent V. Rominger (Fit 3 - STS-73, STS-80)	KSC PAD 39A 219:14:40:59.98Z 10:41:00 AM EDT (P) 10:41:00 AM EDT (A) Thursday 25 8/7/97 (6) LAUNCH WINDOW:	KSC 33 (KSC 39) 231:11:07:58Z 7:07:58 AM EDT Tuesday 13 8/19/97 (5) DEORBIT BURN:	104/104/ 109% <u>PREDICTED</u> : 100/104/104/ 67/104 ACTUAL:	BI-089 RSRM 57 ET-87 LWT-80	57 (19)	DIRECT INSERTION <u>POST OMS-2</u> : 161 X 160 NM <u>SEP-1</u> : 219:22:28:00	(1)	CARGO: 31959 LBS PAYLOAD CHARGEABLE: 24982 LBS DEPLOYED:	<u>KSC W/D</u> : OPF 102 , VAB 5, PAD 23 = 130 days total. <u>LAUNCH POSTPONEMENTS</u> : - Baselined launch date of 7/17/97 on 3/28/96. - Postponed launch date to 8/7/97 on 4/17/97 caused by remanifest to refly MSL-1 due to STS-83 early termination.
PAD 39A-50 MLP-3	OMS PODS: LPO1-26 RPO3-23 FRC3-23	(http://signature.org/ P498/R200/V131/M174 M/S 1 (PAYLOAD CDR): N. Jan Davis (Fit 3 - STS-47, STS-60) P499/R153/V100/F17 <u>M/S 2</u> : Robert L. Curbeam, Jr. P500/R224/M195 M/S 3:	1H39M CHRISTA- SPAS BETA REQUIREMENTS EOM PLS: KSC TAL: ZZA TAL WX: MRN, BEN	231:10:07:30Z <u>XRANGE</u> : 346 NM <u>ORBIT DIR</u> : AR 7 <u>AIM PT</u> : NOMINAL <u>MLGTD</u> : 2917 FT 231:11:07:587	$\begin{array}{c} 100/104/104/\\ 67/104\\ 1 = 2041 \ (3)\\ 2 = 2039 \ (3)\\ 3 = 2042 \ (2) \end{array}$	ET PRED RPT: 271.3K ET BRKUP:		160.0 X 158.9 NM 228:12:50:47 157.7 X 154.3 NM		<u>DEPLOYED</u> : 0 LBS <u>NON-DEPLOYED</u> : 24982 LBS <u>MIDDECK</u> : 1590 LBS SHUTTLE	LAUNCH SCRUBS: None LAUNCH DELAYS: None_ TAL WX: - ZZA was prime but forecast NO GO with thunderstorms within 20 nm. MRN (selected) and BEN were forecast and observed GO.
		Stephen K. Robinson P501/R225M196 P/S 1: Bjarni V. Tryggvason (Canada) P502/R226/M197 MCC WHITE FCR (16)	TAL: MRN 20/N/N AOA: NOR 35/N/SF PLS: EDW 22/N/N TDEL: 0.0 -0.198/-0.16	VEL: 199 KGS 192 KEAS HDOT: -1.5 FPS <u>TD NORM 195</u> : 2550 FT <u>DRAG CHUTE</u> <u>DEPLOY</u> : 185 KEAS 231:11:08:01Z	<u>M 3 EOM:</u> WEIGHT: 221335 LBS X CG: 1081.95 LANDING: WEIGHT:	214K <u>ET</u> <u>IMPACT</u> 1:14:30 MET		DEORBIT: 4492 NM VELOCITY: 25755 FPS ENTRY RANGE: 4492 NM		ACCUMULATED WEIGHTS: DEPLOYED: 837857 LBS NON-DEPLOYED: 1247831 LBS CARGO TOTAL: 2584542 LBS	DOLILU-II I-LOADS: DOLILU-II uplink #17, I-load uplink #36. PERFORMANCE ENHANCEMENTS (FIRST FLIGHT): - Flight control filter updates. - Yaw gain enhancement. - Constant pitch rate at SRB separation.
		FLIGHT DIRECTORS: A/E/O1 - N. W. Hale LD/O 2 - B. P. Austin PLNG - G. A. Pennington MOD - A. L. Briscoe & J. W. Bantle	<u>PERF</u> : NOMINAL <u>2 ENG TAL (MRN)</u> :	<u>NLGTD</u> : 6065 FT 231:11:08:09Z VEL: 153 KGS 144 KEAS HDOT: -6.1 FPS <u>BRK INIT</u> : 84 KGS	221264 LBS X CG: 1083.63	<u>LAT:</u> 42.77°S <u>LONG</u> 154.86° W		ENTRY ATTITUDE: 139.2 X 138.4 NM		PERFORMANCE MARGINS (LBS): FPR: 3200 FUEL BIAS: 809 FINAL TDDP: 1446 RECON: 3065 PAYLOADS:	FLIGHT DURATION CHANGES: - Planned landing time was 230:11:14 on 8/16/97, orbit 174. Waved off this only landing opportunity to land at KSC due to forecast of probability of fog. SLF was observed GO at landing time. Landed on orbit 190. - Flight duration extended 1 day. FIRSTS/LASTS: FIRSTS/LASTS:
STS085- SPAS-2	-706-051	Release of CRISTA-	2:53 2:50 <u>NEG RETURN</u> : 4:01 4:02 <u>PTA (U/S 298)</u> : 5:11 5:12 <u>DROOP (ZZA)</u> : 5:28 5:34	DRAG CHUTE JETTISON: 55 KGS 231:11:08:37Z BRK DECEL FPS ² : AVE 5.7 PK 7.2 WHEELS STOP: 231:11:09:07Z			Ģ	0		PLB: CRISTA-SPAS-02 (Atmospheric physics, dynamics, and chemistry by MAHRSI, SESAM, MIDES, GAPS, and IPEX) MFD (Robot Arm)	First flight of OI-26. First flight of OI-26. First flight at 57 degrees inclination since STS-66. First flight of complete Wraparound DAP (DTO 255). Used approx 330 lbm RCS from EI to M=1 (vs. redline of 1630 lbm). <u>FOURTH SHUTTLE CREWMEMBER REPLACEMENT</u> Jeff Ashby was replaced by Rominger in March 1997. (Third shuttle crewmember replacement occurred on STS-46.).
			5:28 5:34 <u>PTM (U/S 579)</u> : 7:05 7:10 <u>MECO CMD</u> : 8:30.7 8:32.7 VI:	11709 FT <u>ROLLOUT</u> : 8792 FT <u>WINDS</u> : T5, L3 KTS OFFICIAL: 2006P09, T4, L5 KTS	A	R	P T	R		TAS-01 (8 technology and science experiments) IEH-2 (UV exp) <u>MIDDECK:</u> SWUIS, BDS-03, BRIC-10, PCG-	EVENTS: - Launched on Kent Rominger's birthday. - CHRISTA-SPAS deployed at 00:07:46:04 MET, 219:22:27:04Z. - CHRISTA-SPAS captured at 228:15:13Z, 09:00:32 MET. - Berthed and latched at 228:16:30:12Z, 09:01:49:32 MET. <u>RENDEZVOUS #38</u> : Deployed, rendezvoused, grappled, and berthed CHRISTA-SPAS.
			25831 25823 <u>OMS-2</u> : 33:06 33:06 254 FPS 254 FPS	<u>DENS ALT</u> : 1565 FT <u>FLT DURATION</u> : 11:20:26:58 <u>S/T</u> : 720:03:58:39 <u>OV-103</u> : 167:19:53:59 <u>DISTANCE</u> : 4,725,000 sm	crew portr	ait: (Lef , Curbea vn, Davi	t to rigl am/MS s/MS/F	, Robinson/M PLC, &	AS,	STES, SSCE, ACIS, MSX, SIMPLEX 5 CRYO TK SETS 5 N2 TANKS RMS 48 (S.N. 301) RMS Used For CHRISTA-SPAS deploy, grapple, and berth	SIGNIFICANT ANOMALIES: - CRT 1 transient BITE message. - Supply H ₂ O tank A quantity erratic. - APU 1 seal cavity drain line pressure decay. - APU 1 fuel pump thermostal cyclic in narrow band. - Payload commanding problems with MCC input set to 3/sec.

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FLT	ORBITER	CREW (8) 7UP, 7DOWN	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-86 SEQ FLT #87 KSC - 87 PAD 39A-51 MLP- 2	OV-104 (Flight 20) Atlantis Spacehab 8 OMS PODS: LP03-24 RP04-20 FRC4-20	& EVA'S CDR: James D. Wetherbee (Flt 4 - STS-32, STS-52, STS-63) P503/R108/V80/M97 PLT: Michael J.Bloomfield P504/R227/M198 M/S 1 EV2: Vladimir Titov (Russia) (Flt 2 - STS-63) P505/R189/V144/M165 M/S 2 EV1: Scott E. Parazynski (Flt 2 - STS-66) P506/R187/V145/M164 M/S 3: Jean-Loup Chretien (France) P507/R228/M199 M/S 4: Wendy B. Lawrence (Flt 2 - STS-67) P508//R192/V146/F25 M/S 5: Ascent_ David A. Wolf (Flt 2 - STS-58, stay on Mir 24 and return on STS-89) P509/R173/V147/M151 M/S 6: Descent Michael C. Foale (Flt 4 - STS-45, STS-56, STS-63, ascent on STS-84, on-orbit stay on Mir 23 and Mir 24, and descent on STS-86)	ABORT TIMES KSC PAD 39A 269:02:34:18.96 10:34:19 PM EDT (P) 10:34:19 PM EDT (A) Thursday 26 9/25/97 (9) LAUNCH WINDOW: 6M38S USING PLT MIR PLANAR /PHASING WINDOW EOM PLS: FCM PLS: KSC TAL: TAL WX: MRN, BEN SELECTED: RTLS: RSC 15/C/N PLS: COD5 0.162/0.20 MAX Q NAV: 723 721 SRB STG: 2:03.05 2:03 PERF: NOMINAL 2 ENG TAL (MRN): 2:32 2:33 NEG RETURN: 4:02 4:04 PTA (U/S 269): 4:48 4:49 DROOP (MRN): 5:22 5:24 PTM (U/S 760): 6:53 <td>KSC 15 (KSC 40) 279:21:55:10Z 5:55:10 PM EDT Monday 16 10/6/97 (7) <u>DEORBIT BURN</u>: 279:20:47:45Z <u>XRANGE</u>: 376 NM <u>ORBIT DIR</u>: AL 19 <u>AIM PT</u>: NOMINAL <u>MLGTD</u>: 2420 FT 279:21:55:10Z VEL: 198 KGS 194 KEAS HDOT: -2.2 FPS <u>TD NORM 195</u>: 2592 FT</td> <td>PROFILE ENG. S.N. 104/104/ 109% PREDICTED: 100/104/104/ 67/104 ACTUAL: 100/104/104/ 67/104 1 = 2012 (20) 2 = 2040 (3) 3 = 2019 (18) M 3 EOM: WEIGHT: 215387 LBS X CG: 1081.33 LANDING: WEIGHT: 215303 LBS X CG: 1083.03 STS086-7 View of d. panel & ra Spektr ca Progress ship that o Mir June causing S repressur photo dur</td> <td>BI-090 RSRM 61 ET-88 LWT-81 ET PRED RPT: 271.3K ET BRKUP: 269.1K ET IMPACT 1:26:44 MET LAT: 0.52°S LONG: 126:53 ° 20-091 amaged adiator o bused by re-supply collided v 25,1997, Spektr to ize. (Atla</td> <td>solar n Mir vith</td> <td>DIRECT INSERTION POST OMS-2: Tot X 138.5 NM NC1: 269:05:59:10Z 201 X 150.9 NM TI: 270:17:31:56Z 211.2 X 203.5 NM CC4: 270:18:52:13Z 211.8 X 204.3 NM UNDOCK: 276:17:28:34Z 212 X 204.4 NM SEP: 276 DEORBIT: 207 X 190 NM VELOCITY: 25898 FPS ENTRY RANGE: 4380 NM ENTRY ATTITUDE: 205 9 X 190.8 NM</td> <td>Ol-26 (2)</td> <td>CARGO: 29728 LBS PAYLOAD CHARGEABLE: 21039 LBS DEPLOYED: 6058 LBS NON-DEPLOYED: 14379 LBS MIDDECK: 602 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 843915 LBS NON-DEPLOYED: 1262812 LBS CARGO TOTAL: 2614270 LBS</td> <td>HRS1S, SIGNIFICANT ANOMALIES, ETC.) KSC W/D: OPF 60, VAB 5, PAD 29 = 94 days total. LAUNCH POSTPONEMENTS: - Baselined launch date of 9/11/97 on 6/21/96; orbiter OV-104. - Postponed launch date to 9/18/97 on 8/1/96; multi-flight changes. - - Changed from orbiter OV-104 to OV-105 on 3/27/97. - - Postponed launch date to 9/18/97 on 4/17/97; multi-flight changes for re-flight of MSL-01 (on STS-94). - - Advanced launch date to 9/26/97 (GMT), 9/25/97 EDT, on 8/21/97. - - Advanced launch date to 9/26/97 (GMT), 9/25/97 EDT, on 8/21/97. - - Advanced launch window for the two panes was 10:57. + - The total launch window for the two panes was 10:57. + However, using the preferred liftoff time of 269:02:34:19 (4m19s into window) the window was only 6m38s. LAUNCH DELAYS: None TAL WX: - - - ZZA was prime but was forecast NO GO (ceiling) at L-15 minutes, MRN was forecast GO and was selected. Both ZZA and MRN were observed GO at TAL time. SHUTTLE NIGHT LAUNCH: #18 DOLILU II uplink #18, total uplink #37. PERFORMANCE ENHANCEMENTS: - - Flight control filter updates. - - Yaw gain enhancement. - - Constant pitch rate at SRB separation.</td>	KSC 15 (KSC 40) 279:21:55:10Z 5:55:10 PM EDT Monday 16 10/6/97 (7) <u>DEORBIT BURN</u> : 279:20:47:45Z <u>XRANGE</u> : 376 NM <u>ORBIT DIR</u> : AL 19 <u>AIM PT</u> : NOMINAL <u>MLGTD</u> : 2420 FT 279:21:55:10Z VEL: 198 KGS 194 KEAS HDOT: -2.2 FPS <u>TD NORM 195</u> : 2592 FT	PROFILE ENG. S.N. 104/104/ 109% PREDICTED: 100/104/104/ 67/104 ACTUAL: 100/104/104/ 67/104 1 = 2012 (20) 2 = 2040 (3) 3 = 2019 (18) M 3 EOM: WEIGHT: 215387 LBS X CG: 1081.33 LANDING: WEIGHT: 215303 LBS X CG: 1083.03 STS086-7 View of d. panel & ra Spektr ca Progress ship that o Mir June causing S repressur photo dur	BI-090 RSRM 61 ET-88 LWT-81 ET PRED RPT: 271.3K ET BRKUP: 269.1K ET IMPACT 1:26:44 MET LAT: 0.52°S LONG: 126:53 ° 20-091 amaged adiator o bused by re-supply collided v 25,1997, Spektr to ize. 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LAUNCH POSTPONEMENTS: - Baselined launch date of 9/11/97 on 6/21/96; orbiter OV-104. - Postponed launch date to 9/18/97 on 8/1/96; multi-flight changes. - - Changed from orbiter OV-104 to OV-105 on 3/27/97. - - Postponed launch date to 9/18/97 on 4/17/97; multi-flight changes for re-flight of MSL-01 (on STS-94). - - Advanced launch date to 9/26/97 (GMT), 9/25/97 EDT, on 8/21/97. - - Advanced launch date to 9/26/97 (GMT), 9/25/97 EDT, on 8/21/97. - - Advanced launch window for the two panes was 10:57. + - The total launch window for the two panes was 10:57. + However, using the preferred liftoff time of 269:02:34:19 (4m19s into window) the window was only 6m38s. LAUNCH DELAYS: None TAL WX: - - - ZZA was prime but was forecast NO GO (ceiling) at L-15 minutes, MRN was forecast GO and was selected. Both ZZA and MRN were observed GO at TAL time. SHUTTLE NIGHT LAUNCH: #18 DOLILU II uplink #18, total uplink #37. PERFORMANCE ENHANCEMENTS: - - Flight control filter updates. - - Yaw gain enhancement. - - Constant pitch rate at SRB separation.
		Continued		Continued	PA ST		1-1-				Continued

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ORBITER	CREW (8) 7UP, 7DOWN	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM	ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
	TITLE, NAMES & EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET	INC HA/HP		EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
	Continued		Continued						Continued
	SS EVA #39 EMU/Tethered EVA #32 Scheduled EVA #34 10/1/97 5H01M26S Duration MCC WHITE FCR (17) <u>FLIGHT DIRECTORS</u> : A/E - L. J. Ham LD/O 1 - P. D. Dye O 2 - C. W. Shaw PLNG - P. L. Engelauf MOD - R. E. Castle		<u>DENS ALT</u> : 1506 FT <u>FLT DURATION:</u> 10:19:20:51 <u>S/T</u> : 730:28:19:30 <u>OV-104</u> : 150:22:30:25 <u>DISTANCE</u> : 4,225,000 sm	joined by t Module for holds a ca	he three r in-flight p (right)	-member Mir-24 cre portrait. New Mir-2 Clockwise from hi	ew in the 24 crew n m are: Ti	bers are Spacehab nember Wolf tov/MS/RSA,	EVENTS: - Mir capture at 270:19:57:46Z, 01:17:23:27 MET - Docking complete at 270:20:06:15Z, 01:17:31:56 MET - Foale transfer to STS-86 and David Wolf transfer to Mir 24 at 2D14H00M, 271:16:34:19Z. Foale Mir stay time 134:02:13:31, total flight time 144:13:47:22. - Foale completed a Mir EVA with Anatoly Solovyev with exit from KVANT-2 airlock in Orlan M suits (5.7 psia). Both were double tethered using U.S. tether reel and waist tethers. EVA duration was 5H59M to inspect Specktr module leak, slew solar arrays, and put out dosimeter. - Scott Parazynski and Vladimir Titov made a Shuttle EVA to retrieve MEEP experiments left on Mir DM on STS-76. - Jean-Loup Chretien flew on Soyuz T-6/Salyut 7 and Soyuz TM-7/Mir11. - Hooks open 276:17:25:59Z, 07:14:51:40 MET - Undock 276:17:28:15Z, 07:14:53:56 MET (one rev late to check Mir computer interface box). - Total consumables transferred to Mir: 1717.2 lbm H ₂ O (17 CWC's), 75.7 lbm O ₂ , 130.7 lbm N ₂ . - Wendy was to replace Foale; however, concerns of inadequate reach in Orlan EVA spacesuit, Wolf moved to STS-86 from STS-89.
				Vinogrado	v/Mir/FE	, CDR Wetherbee,	Laweren	ce/MS,	RENDEZVOUS #39: Rendezvous and dock with Mir Space Station. SIGNIFICANT ANOMALIES:
	arazynski tethered to c shared Titov (RSA) ou							056 Mi as seen l	r by
	6-332-021P	ORBITER 100, 700 WN TITLE, NAMES & EVA'S Continued SS EVA #39 EMU/Tethered EVA #32 Scheduled EVA #34 101/97 5H01M26S Duration MCC WHITE FCR (17) FLIGHT DIRECTORS: A/E - L. J. Ham LD/O 1 - P. D. Dye D 2 - C. W. Shaw PLNG - P. L. Engelauf MOD - R. E. Castle MOD - R. E. Castle	ORBITER (8) 7UP, 7DOWN LANDING SITES, ABORT TIME, TITLE, NAMES & EVA'S LANDING SITES, ABORT TIMES Continued SS EVA #39 EMU/Tethered EVA #32 Scheduled EVA #34 10/1/97 5H01M26S Duration MCC WHITE FCR (17) FLIGHT DIRECTORS: A/E - L. J. Ham LD/O 1 - P. D. Dye O 2 - C. W. Shaw PLNG - P. L. Engelauf	ORBITER TUP, 7DOWN LAUNCH SITE, LIFTOFF TIME, & EVA'S CRUNWAY, CROSSRAGE TITLE, NAMES & EVA'S LANDING SITES, ABORT TIMES LANDING TIMES Continued SS EVA #39 Continued SS EVA #39 EMU/Tethered EVA #32 Scheduled EVA #34 10/1/97 Continued SHO1M26S Duration MCC WHITE FCR (17) FLT DURATION: 10:19:20:51 FLIGHT DIRECTORS: AFE - L. J. Ham LD/O 1 - P. D. Dye O 2 - C. W. Shaw PLNG - P. L. Engelauf MOD - R. E. Castle OV:104: 150:22:30:25 DISTANCE: 4:225,000 sm DISTANCE: 4:225,000 sm	ORBITER JUP, TOOWN LAUNCH SITE, JUP, TOOWN RUNWAY, GE CROSSRAW, GE CROSSRAW, GE CROSSRAW, GE CROSSRAW, GE CROSSRAW, GE CROSSRAW, GE EMERG THREE EMERG ITHE, NAMES & EVAS LANDING SITES, & EVAS LANDING TIMES THROTTLE FLI DURATION, 10:19:20:51 THROTTLE FLI DURATION, 10:19:20:51 SS EVA #39 EMU/Tethered EVA #32 Scheduled EVA #34 10/1/97 Continued DENS ALT: 1506 FT THROTTLE FLI DURATION; 10:19:20:51 MCC WHITE FCR (17) ST: 730:28:19:30 ST 0V:104: 150:22:30:25 ST DISTANCE: 4,225:000 sm ST STS086- joined by the Module for holds a car Vinogrado Foale/MS,	ORBITER TUP, TOOWN LANNCH SITE, LIFTOFT TIME. RUWANOR CONSUMATION, WINDS MADORT SIMES EMERG Continued SE EVA #39 LANDING SITES, & EVA #39 LANDING SITES, BEMUTTENERED EVA #32 Continued SS EVA #39 EMUTTENERED EVA #32 Schedule EVA #34 10/197 Continued DENS ALT: 1506 FT THEOTILE PLOS 5N. AND EVALUATION: 10:19:20:51 MCC WHITE FCR (17) ST: 20:22:19:30 OV-104: 150:22:30:25 DISTANCE: 4:225,000 sm STS086-371-004 joined by the three Module for in-flight holds a cap (right) Mir CDR Anatoly VINDS FLEENTOFF STS086-371-004 Distance: 4:225,000 sm STS086-371-004	ORBITER UAUNCH SITE, JUP, TOOWN LAUNCH SITE, HITPOFT IME, & EVAS RUNWAY, CROSSRAMCE MOMABORT SBB ORBIT ITTLE, MARES & EVA #39 LANDING SITES LAUDONG TIMES HIROTTILE (CONTINUES) ANDING SITES HIROTTILE (CONTINUES) ANDING SITES HIROTTILE (CONTINUES) ANDING SITES S EVA #39 EMM/Tehrend EVA #32 Schedulde EVA #34 10/197 DENS ALT: 1506 FT DENS ALT: 1506 FT Image: Continues - 1 1502 Sites Image: Cont	ORBITER CLAUNCH STIFE, TUP, ZDOWN LAUNCH STIFE, TUP, ZDOWN CRUNNAY, TUP, ZDOWN CONTINUES, ABORT TIMES PROTILE ANDING STIFE, TUP DEATION, NADE CONTINUES, THE DIRATION, NADE PROTILE ADD INC DATE Continued Continued Continued Continued Continued Continued Continued SS EVA #39 EMUTE theored EVA #32 Scheduled EVA #32 Scheduled EVA #32 Continued Continued Continued Continued Continued VID 707 SH01M265 Duration Continued Continued Continued Continued Continued 00 CW HITE FCR (17) STI: 150.2 2.0: 2.30: 25 DISTANCE: DISTANCE: 4225:000 sm DISTANCE: 20: 2.0: X-BW PLNG - P. L. Engelauf MOD - R. E. Castle DISTANCE: DISTANCE: 42: 5:000 sm STIS086-371-004 - Seven STS-86 crew memi- joined by the three-member Mir-24 crew in the Module tor in-flight portrait. New Mir-24 crew in the Module tor in-flight portrait. Laweren Foale/MS, PLT Bioomfield, & Chretien/MS. <td>ORBITER USB to USB</td>	ORBITER USB to USB

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FLT	ORBITER	CREW (6)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM	(ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS
NO.	ONDITEN	TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP	1.011	PAYLOADS/ EXPERIMENTS	(LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
<u>FLIGHT DI</u> ASC - N. W ENT - J. P. LD/O 4 - W O 2 - J. W.	Shannon /. D. Reeves Bantle Hill (1 Shift) Austin Algate	CDR: Kevin R. Kregel (Fit 3 - STS-70, STS-78) P511/R197/V129/M172 PLT: Steven W. Lindsey P512/R229/M200 M/S 1: Kalpana Chawla P513/R230/F30 M/S 2: Winston E. Scott (Fit 2 - STS-72) P514/R207/V148/M180 M/S 3: Takao Doi (Japan) P515/R231/M201 P/S 1: Leonid Kadenyuk (Ukraine) P516/R232/M202 SS EVA #40 EMU/Tethered EVA #33 Scheduled EVA #35 on 11/24/97 TH42M55S Duration EVA start at 05:04:16:05 MET SS EVA #41 EMU/Tethered EVA #34 Unscheduled EVA #6 on 12/3/97 VH450M405	KSC PAD 39B 323:19:45:95.6Z 2:46:00 PM EST (P) 2:46:00 PM EST (A) Wednesday 9 11/19/97 (12) LAUNCH WINDOW: 2H30M CTOB EOM PLS: KSC TAL BYD TAL WX: BEN, MRN SELECTED: RTLS: KSC 33/CI/N AOA: EDW 22/N/N AOA: EDW 22/N/N AOA: EDW 22/N/N AOA: EDW 22/N/N AOA: ONAV: 731 741 SRB STG: 2:04 PERF: NOMINAL 2:04 PERF: NOMINAL 2:41 NEG RETURN: 3:58 3:58 3:59	KSC 33 (KSC 41) 339:12:20:04Z 7:20:04 AM EST Friday 10 12/5/97 (9) <u>DEORBIT BURN</u> : 339:11:21:28Z <u>XRANGE</u> : 66 NM <u>ORBIT DIR</u> : DL 43 <u>AIM PT</u> : CLOSE IN <u>MLGTD</u> : 2549 FT 339:12:20:04Z VEL: 189 KGS 196 KEAS HDOT: -1.1 FPS <u>TD NORM 205</u> : 1821 FT <u>DRAG CHUTE</u> <u>DEPLOY</u> : 188 KEAS 339:12:20:08Z <u>NLGTD</u> : 5612 FT 339:12:20:14Z VEL: 147 KGS 151 KEAS HDOT: -4.6 FPS <u>BRK INIT</u> : 107 KGS <u>JRAG CHUTE</u> <u>JETTISON</u> : 61 KGS 339:12:20:38Z	104/104/ 109% <u>PREDICTED:</u> 100/104/104/ 67/104 <u>ACTUAL:</u> 100/104/104/ 67/104 1 = 2031 (16) 2 = 2039 (4) 3 = 2037 (5) <u>M 3 EOM:</u> WEIGHT: 232930 LBS X CG: 1080.99 LANDING:	BI-092 RSRM 63 ET-89 LWT-82 ET PRED RPT: 271.3K ET BRKUP: 269.1K ET IMPACT 1:25:02 MET LAT: 20.28°N LONG: 147.99° W	(46)	DIRECT INSERTION <u>POST OMS-2:</u> 155 X 150 NM <u>SEP BURN:</u> 02:03:25:30 MET <u>NC5</u> <u>MANEUVER:</u> 05:01:33:33 MET <u>11:</u> 05:03:04:38 MET <u>149:7 X 145.5</u> NM <u>VELOCITY:</u> <u>25760 FPS</u> <u>ENTRY</u> <u>RANGE:</u> 4424 NM		34395 LBS PAYLOAD CHARGEABLE: 21946 LBS DEPLOYED: 0 LBS NON-DEPLOYED: 17496 LBS MIDDECK: 1452 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 843915 LBS NON-DEPLOYED: 843915 LBS NON-DEPLOYED: 1281760 LBS CARGO TOTAL: 2648665 LBS PERFORMANCE MARGINS (LBS): FPR: 3085 FUEL BIAS: 853 FINAL TDP: 4384 RECON: 6115 PAYLOADS: PLB: SPARTAN-201	KSC W/D: OPF 94, VAB 5, PAD 22 = 121 days total. LAUNCH POSTPONEMENTS: - Baselined 10/9/97 launch date on 7/11/97. - Postponed launch date to 11/13/97 on 4/17/97. - Postponed launch date to 11/13/97 on 5/22/97. LAUNCH SCRUBS: - Banglined 10/9/97 launch date to 11/19/97 on 5/22/97. LAUNCH SCRUBS: - Postponed launch date to 11/19/97 on 5/22/97. LAUNCH SCRUBS: - Banjul (prime and selected), Ben Guerir, and Moron were all forecast and observed GO. DOLILU/I-LOADS: - DOLILU/I-LOADS: - DOLILU/I-LOADS: - Vaw gain enhancement. - Constant pitch rate at SRB separation. - First flight with the following performance enhancements: - First flight with the following performance enhancements: - First flight with the following performance enhancements: - Roll-to-heads-up at approximately 6:10 MET, APM loss of 70 lbs. - Extended pitch parallel to MECO (APM gain of approximately 125 lbs). - Second stage pitch gimbal relief (no APM change). EVENTS: - Spartan deploy was delayed 1 day to allow recovery of SOHO satellite. - Spartan deploy at 325:21:04:00Z, 02:01:18 MET. Spartan failed
free-flyir		4H59M40S Duration EVA start at 13:13:24 MET	PTA (U/S 219): 4:59 4:58 DROOP (BYD): 5:30 5:25 5:30 PTM (U/S 567): 6:58 6:58 7:00 MECO CMD: 8:29.9 VI: 25872 25873 OMS-2: 41:04 41:08.9 192.9 FPS 193.8 FPS 2:05 2:08	BRK DECEL FPS2: AVG 4.7 PK 7.7 339:12:21:02Z 10553 FT ROLLOUT: 8004 FT 58 SEC WINDS: 6H, 0X KTS OFFICIAL: 3306P10 6H, 0X KTS DENS ALT: -195 FT FLT DURATION: 15:16:34:04 <u>S/T</u> : 746:15:53:34 <u>OV-102</u> : 253:00:29:43 DISTANCE: 6,544,000 sm	to rt), PLT	Lindse In bac	y, Doi/N k (It to r	deck: In fro (S (NASDA) t), CDR Kre S. STS087 020 Spartan satellite grasp of RMS	nt (lt) & gel, 7-706- in f	AASBE LHP TGDF AERCAM SPRINT <u>MIDDECK:</u> USMP-04/MGBX CUE, MSX, SIMPLEX 5 CRYO TK SETS + 4 EDO 5 N2 TANKS RMS 49 (S.N. 301)	 Saterite. Spartan deploy at 325:21:04:00Z, 02:01:18 MET. Spartan failed to perform pirouette maneuver indicating a problem. Attempt to grapple Spartan at 02:01:24 MET failed, and a tip-off rate of 2 deg/sec was introduced. Separation burn was made at, 02:03:25:30 MET. Decision to hand capture Spartan by two EVA crew, done at 05:05:18:00 MET (rates were very low). RMS berth assist was required with Spartan grapple at 05:06:53 and berth at 05:07:37:22 MET. EDFT-05 tasks were performed on EVA 1 and evaluated crane. An unscheduled EVA 2 was performed to deploy, maneuver, and retrieve a free flying video camera (AERCam Sprint) and to perform EDFT-05 tasks which were planned for EVA 1. RADIATOR DEPLOY #20 Starboard and port radiators deployed twice for thermal control and water production. REINDEZVOUS #40: Deploy Spartan, separate, rendezvous and retrieve Spartan. SIGNIFICANT ANOMALIES: Slicky supply water AVB check valve. Hz tank 4 quantity measurement failure. EV 2 helmet light intermittent. Left outboard tire pressure measurement lost. Spartan MPESS EVA ingress aid extend/stow difficulty during retrieval. RCS jet R5D heater fail off. Excessive tile damage by ET foam loss.

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SPACE SHUTTLE MISSIONS SUMMARY

ELT.	ORBITER	CREW 7 UP, 7 DOWN	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
FLT NO.	URDITER	TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND	INC	HA/HP	<u> </u>	PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-89	OV-105 (Flight 12)	CDR: Terrence W. Wilcutt	KSC PAD 39A 23:02:48:14.98Z	KSC 15 (KSC 42) 31:22:35:09Z	104/104/ 109%	BI-093	51.65 (9)	DIRECT INSERTION	OI-26 (4)	<u>CARGO</u> : 28040 LBS	KSC W/D: OPF 202, VAB 7, PAD 26 = 235 days total.
SEQ FLT #89 KSC - 89	Éndeavour Spacehab 9	(Flt 3 - STS-68, STS-79) P517/R183/V130/M160 <u>PLT:</u> Joseph F. Edwards Jr.	23:02:48:14:98Z 9:48:15 PM EST (P) 9:48:15 PM EST (A) Thursday 27 1/22/98 EST (9)	5:35:09 PM EST Saturday 19 1/31/98 (8)	<u>PREDICTED</u> : 100/104/104 67/104	RSRM 64 ET-90		<u>POST OMS-2</u> : 162.4 X 161.1 NM		<u>PAYLOAD</u> <u>CHARGEABLE</u> : 22163 LBS	LAUNCH POSTPONEMENTS: - Baselined 1/15/98 launch date on 10/1/96. - Moved STS-89 from OV-103 to OV-105 on 5/22/97. - Postponed launch date to 1/22/98 EST (1/23/98 GMT) on
PAD 39A-52 MLP-3	<u>oms pods</u> : LPO4-19 RPO1-26 FRC5-12	P518/R233/M203 <u>M/S 1</u> : James F. Reilly, II	LAUNCH WINDOW: 7M 56S Using PLT MIR PLANAR/ PHASE WINDOW	<u>DEORBIT BURN</u> : 31:21:27:55Z <u>XRANGE</u> : 600NM	<u>ACTUAL</u> : 100/104/104 67/104	LWT-83 <u>ET</u> <u>RPT</u> :		<u>TI</u> : 1:15:03:04 MET 215.6 X 203.4		DEPLOYED: 4596 LBS	12/18/97. LAUNCH SCRUBS: None
		P519/R234/M204 <u>M/S 2</u> : Michael Anderson	<u>EOM PLS</u> : KSC TAL: ZZA	<u>orbit dir</u> : Al 20 <u>Aim Pt</u> : Nominal	$\begin{array}{l} 1 = 2043 \ (1) \\ 2 = 2044 \ (1) \\ 3 = 2045 \ (1) \end{array}$	<u>RP1:</u> 271.3K <u>ET</u> <u>BRKUP</u> :		215.6 X 203.4 NM <u>SEP1:</u> 6:15:28:26		<u>NON-DEPLOYED</u> : 16699 LBS <u>MIDDECK</u> : 868 LBS	LAUNCH DELAYS: None TAL WX: - Zaragoza (prime and selected) and Moron forecast and
	DERo	P520/R235/M205 <u>M/S 3: (PAYLOAD CDR)</u> : Bonnie J. Dunbar	TAL WX: MRN, BEN SELECTED: RTLS: KSC 15/CI/N	<u>MLGTD</u> : 2702 FT 31:22:35:09Z VEL: 202 KGS 198 KEAS	M 3 EOM:	<u>BRKUP</u> : 269.1K <u>ET</u> IMPACT		6:15:28:26 MET 206.6 X 203.2 NM		SHUTTLE ACCUMULATED WEIGHTS:	observed GÖ. Ben Guerir was forecast NO GO for ceiling and visibility (very dense fog). SHUTTLE NIGHT LAUNCH: #19
	A STATEMENT	P521/R79/V49/F7	TAL: ZZA 30/CI/N AOA: NOR 17/N/SF PLS: EDW 22/N/SF TDEL:	HDOT: -2.3 FPS <u>TD NORM 195</u> : 2776 FT	WEIGHT: 217475 LBS	1:27:09		<u>DEORBIT:</u> 207.1 X 193.7 NM		<u>DEPLOYED</u> : 848511 LBS <u>NON-DEPLOYED</u> : 1299327 LBS	DOLILU/I-LOADS: - DOLILU II uplink #20, total uplink #39.
2		<u>M/S 4</u> : Salizhan Shakirvich Sharipov (Russia) P522/R236/M206	<u>1022.</u> 0.14 -0.098/0.1 <u>MAX Q NAV:</u> 702 PSF 710 PSF	DRAG CHUTE DEPLOY: 190 KEAS 31:22:35:13Z	LANDING: WEIGHT: 217422 LBS	<u>LONG</u> : 120.7°W		<u>VELOCITY</u> : 25900 FPS ENTRY		<u>CARGO TOTAL</u> : 2676765 LBS	PERFORMANCE ENHANCEMENTS: - Standard set plus Block IIA SSME's. FLIGHT DURATION CHANGES:
	ыпов	<u>M/S 5</u> Ascent Andrew S. W. Thomas (Flt 2 - STS-77) Stay on Mi <u>r 2</u> 4 and Mir 25,	<u>SRB STG</u> : 2:03.8 2:06	<u>NLGTD</u> : 6112 FT 31:22:35:20Z VEL: 152 KGS 149 KEAS	X CG: 1088.16			<u>RANGE</u> : 4341 NM		PERFORMANCE MARGINS (LBS): FPR: 3272 FUEL BIAS: 854 FINAL TDDP: 2309 DECOND 3504	- None. Landed on orbit 139. FIRSTS/LASTS: - First flight using Block IIA SSME's (Rocketdyne HPETP)
	E FCR (19) RECTORS: L.J. Ham	return on STS-91. P523/R213/V149/M186 <u>M/S 6</u>	<u>PERF</u> : NOMINAL <u>2 ENG TAL (ZZA)</u> : 2:26 2:25	HDOT: -5.9 FPS <u>BRK INIT</u> : 94 KGS <u>DRAG CHUTE</u> <u>JETTISON</u> : 56 KGS						RECON: 3594 <u>PAYLOADS</u> : <u>PLB:</u> SHUTTLE/MIR	 First flight with external airlock. Record number of people in orbit: Mir 3 - 2 Russians, 1 American; Soyuz 3 - 2 Russians, 1 French; Endeavour 7 - 6 Americans, 1 Russian.
O2- R.E. C PLNG- P.S	Engelhauf astle Hill	Descent David A. Wolf (Flt 2- STS-58) Ascent on STS-86,	<u>NEG RETURN</u> : 4:02 PTA (U/S 2/5):	31:22:35:53Z BRK DECEL FPS ² :			-			SPACEHAB (Double Module)	EVENTS: - Mir capture at 24:20:14:21Z, 1:17:26:06 MET. - Docking complete at 24:20:23Z, 1:17:35 MET. - Andrew Thomas transferred to Mir 24 and David Wolf to
ENTRY- J. MOD - A. L	P. Shannon Briscoe	stay on Mir 24. P524/R173/V147/M151	<u>PTA (U/S 265)</u> : 4:42 4:35 <u>DROOP (ZZA)</u> : 5:20 5:22	AVE 3.6 PK 5.0 <u>WHEELS STOP</u> : 31:22:36:21Z 12492 FT	N G			(CF)		GAS (4) ODS	 - Mir capture at 24:20:14:21Z, 1:17:26:06 MET. - Docking complete at 24:20:23Z, 1:17:35 MET. - Andrew Thomas transferred to Mir 24 and David Wolf to STS-89 Endeavour at 26:05:51:15Z, 3D13H3M. David Wolf total Mir time 119:23:16:56 and total flight time 127:20:00:50. - Undocking at 29:16:56:56Z, 6:14:08:41 MET. - Inert weight adjustment of -200 lbs included in STS OPR
		1 Star	<u>PTM (U/S 265)</u> : 5:50 5:48	ROLLOUT: 9790 FT 72 SEC					V.	<u>MIDDECK:</u> HP, MPNE, AST, CREAM, SIMPLEX, SAMS, MGM (2),	chargeablě. <u>RENDEZVOUS #41:</u> - Rendezvous and dock with Mir.
	A RE		MECO CMD: 8:28.9 8:29	<u>WINDS:</u> 4T, 4L KTS OFFICIAL: 0205P11			Yn			CEBAS, EARTHCAM	RADIATOR DEPLOY #21: SIGNIFICANT ANOMALIES:
			<u>VI:</u> 25876 25873 <u>OMS-2</u> :	7T,8L <u>DENS ALT</u> : -103 FT <u>FLT DURATION</u> :	convention Wolf/MS(fc	al positio ormer Mir	on (from guest),	Pavel V.		5 CRYO TK SETS 6 GN2 TANKS	- GPC 3 mode switch no apparent detent at standby. Went to halt from run. - Payload bay floodlights FWB STBD and MID PORT failed (new design).
	Concerned of		41:46 41:48 213 FPS 213 FPS	8:19:46:54 <u>S/T</u> : 755:11:40:28	CDR Anato Dunbar/MS	oly Y. Sol S/PLC.A	lovyev, bove, l	DR Wilcutt, M & nead-to-head ipov/MS (RSA	with	NO RMS	- TIPS and OCA problems. Z Star Tracker pressure fail BITE. - S-Band antenna electronics 2 failed to select the best antenna.
	42-024 Atla IAB on appro			<u>OV-105:</u> 121:08:50:00 <u>DISTANCE</u> : 3,610,000 sm	Reilly/MS & are: Thoma Anderson/I	& PLT Ed as/MS/Mi	lwards.	At 90 deg an	gle		 Vestibule vent valves were misconfigured (3 of 4 open). Vernier thruster L5D oxidizer temp failed erratic, attitude control passed to Mir jets, then to orbiter PRCS. Right RCS fuel helium isolation valve B failed to open. Vernier driver F5 RPC 2 failed off.

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FLT ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.	TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP	1.5W	PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-90 OV-102 (Flight 25) SEO Columbia FLT #90 23 RD Spacelab KSC-90 Flight	CDR: Richard A. Searfoss (Fit 3 - STS-58, STS-76 P525/R171/V126/M149 PLT: Scott D. Altman P526/R237/M207	KSC 39B 107:18:18:59.99Z 2:19:00 PM EDT (P) 2:19:00 PM EDT (A) Friday 17 4/17/98 (13)	KSC 33 (KSC 43) 123:16:08:59Z 12:08:59 PM EDT Sunday 13 5/3/98 (13)	104/104/ 109% PREDICTED: 100/104/104 67/104	BI-094 RSRM 65 ET-91	39° (7)	DIRECT INSERTION <u>POST OMS-2</u> : 154 X 138 NM	OI-26B (1)	<u>CARGO:</u> 35549 LBS <u>PAYLOAD CHARGEABLE</u> : 25625 LBS	<u>KSC W/D</u> : OPF 80, VAB 5, PAD 24 = 109 days total. <u>LAUNCH POSTPONEMENTS</u> : - Baselined launch date of 3/18/98 on 1/10/97. - Postponed launch date to 4/2/98 on 4/17/97. - Postponed launch date to 4/16/98 on 2/13/98.
PAD 39B-38 LM-16 MLP-2 EDO 13 <u>OMS PODS:</u> LPO5-14 RPO5-13 FRC2-25	<u>M/S 1 (PAYLOAD CDR)</u> : Richard M. Linnehan (Flt 2 - STS-78) P527/R214/V150/M187 <u>M/S 2</u> : Kathryn P. Hire P528/R238/F31	LAUNCH WINDOW: 2H30M Neurolab Crew Circadian Constraint EOM PLS: KSC TAL: BEN TAL WX: MRN, ZZA	MLGTD: 1561 FT	ACTUAL: 100/104/104 69/104 1 = 2041 (4) 2 = 2032 (7) 3 = 2012 (21)	LWT-84 <u>ET</u> 283K <u>ET</u> <u>BRKUP</u> :				<u>9944 LBS</u> <u>MIDDECK</u> : 2340 LBS	LAUNCH SCRUBS: - Scrubbed 4/16/98 launch attempt at approximately L-6 hours due to an NSP 2 problem (did not tank). Replaced NSP 2. LAUNCH DELAYS: None TAL WX:
	M/S 3: Dafydd R. Williams (Canada) P529/R239/M208 <u>P/S 1:</u> Jay C.Buckey, Jr. P530/R240/M209 <u>P/S 2:</u> James A.Pawelczyk	SELECTED: RTLS: KSC 15/CI/N TAL: BEN 36/N/N AOA: EDW 22/N/N PLS: EDW 22/N/N TDEL: 0.08 0.322/0.36 MAX Q NAV: 694 697	123:16:08:59Z VEL: 224 KGS 218 KEAS HDOT: -6.0 FPS TD NORM 195: Z45T FT DRAG CHUTE DEPLOY: 194 KEAS 123:16:09:06Z NLGTD: 6288 FT	<u>M 3 EOM:</u> WEIGHT: 233031 LBS X CG: 1080.33 <u>LANDING</u> : WEIGHT: 232979 LBS	215K <u>ET</u> <u>IIMPACT</u> 1:24:30 MET <u>LAT:</u> 1.88°N		DEORBIT: 149 X 131 NM VELOCITY: 25758 FPS ENTRY_		ACCUMULATED WEIGHTS: DEPLOYED: 848511 LBS NON-DEPLOYED: 1325532 LBS CARGO TOTAL: 2712754 LBS PERFORMANCE	Ben Guerir (prime and selected) was forecast and observed GO. Moron was forecast GO late after ceiling violation, Zaragoza was forecast NO GO for crosswinds and low ceiling, but observed GO at TAL time. <u>DOLILU/I-LOADS</u> : - DOLILU II uplink #21, I-Load uplink #40. <u>PERFORMANCE ENHANCEMENTS</u> : - Standard set plus OMS assist is 4000 lbs. FLIGHT DURATION CHANGES: None. Landed on orbit 256.
	P531/R241/M210	SRB STG: 2:05 2:05.1 2:05 PERF: NOMINAL 2 ENG TAL (BEN): 2:50 2:50 2:49 NEG RETURN: 3:56 3:56 3:58	123:16:09:12Z VEL: 167 KGS 161 KEAS HDOT: -4.6 FPS BRK INIT: 122 KGS DRAG CHUTE JETTISON: 56 KGS 123:16:09:37Z BRK DECEL FPS2:	X CG: 1081.94	<u>LONG</u> : 139.9°W		RANGE: 4422 NM		MARGINS (LBS): FPR: 3085 FUEL BIAS: 853 FINAL TDDP: 3162 RECON: 1999 PAYLOADS: PLB: NEUROLAB SVF GAS (3)	FIRSTS/LASTS: - First use of OMS assist during ascent (102 seconds) 4000 lbs. - Final flight of Spacelab. - Total size of the seven crewmembers was the largest. - Largest number of animals (over 2000 animals on board). EVENTS: - SSME 1 Block IIA and SSME 2 & 3 Phase 2 engines.
STS090-378-022 (17		PTA (U/S 248): 5:31 5:29 DROOP (ALL): 5:24 5:25 PTM (U/S 390): 7:08 7:11	AVE 5.7 PK 9.3 <u>WHEELS STOP:</u> 123:16:09:57Z 11559 FT <u>ROLLOUT:</u> 9998 FT 58 SEC	Spacelab S of Neurolab	cience Mo research at bottom	odule (ce I. Tunne	May 1998): Lenter), hosted 1 from cabin to se and airglow a	ast I6-days	MIDDECK:	RADIATOR DEPLOY #22: Port radiator only. SIGNIFICANT ANOMALIES: - Water spray boiler 3 failed to cool, APU3 shutdown at 13:05 MET. Also failed to cool during FCS C/O, so was not started until TAEM for entry. - Icing in topping FES core (did FES core flush). - CO2 removal system failure. RCRS recovered with IFM. - Waste water dump clogged filter. IFM preformed but urine filter elverged
Crew floats as a un left are: Hire/MS, Buc Searfoss, Pawelczyk/ Williams/CSA/MS (to CDR.	key/PS (top), CDR /PS, PLT Altman,	<u>MECO CMD</u> : 8:27.3 8:28.4 <u>VI</u> : 25864 25860 <u>OMS-2</u> : 41:22	WINDS: TT, L4 KTS OFFICIAL: 2204P11 T1, L4 KTS <u>DENS ALT:</u> 1560 FT F <u>LT DURATION:</u> 15:21:49:59 <u>S/T</u> : 771:09:30:27	1 A				A	Y	clogged. - APU 2 Gas Gen/Fuel Pump B heaters failed. - DOLILU processor integrity rule violation at L-6.5 hours.
	A/E - J. P. Shannon LD/O 2 - G. A. Pennington O 1 - B. P. Austin O 3 - R. M. Kelso MOD - J. W. Bantle		<u>S/1</u> : 771:09:30:27 <u>OV-102</u> : 268:22:19:42 <u>DISTANCE</u> : 6,375,000 sm		A				1	

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		CREW	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS
FLT NO.	ORBITER	6 UP, 7 DOWN	LIFTOFF TIME, LANDING SITES,	CROSSRANGE LANDING TIMES	EMERG THROTTLE	RSRM AND	INC	HA/HP	FSW	PAYLOADS/	(LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
110.		TITLE, NAMES & EVA'S	ABORT TIMES	FLT DURATION, WINDS	PROFILE ENG. S.N.	ÊŤ				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-91	OV-103 (Flight 24)	CDR: Charles I Precourt	KSC PAD 39A 153:22:06:24Z 6:06:24 EDT (P) 6:06:24 EDT (A)	KSC 15 (KSC 44)	104/104/	BI-091	51.65 (10)	DIRECT INSERTION	OI-26B (2)	<u>CARGO</u> : 35549 LBS	KSC W/D: OPF 168, VAB 4, PAD 29 = 201 days total.
SEQ FLT #91	Discovery	Charles J. Precourt (Flt 4 - STS-55, STS-71, STS-84)	6:06:24 EDT (P)	163:18:00:17Z 2:00:17 PM EDT	PREDICTED:	RSRM 66	(10)		(2)	PAYLOAD	LAUNCH POSTPONEMENTS: - Baselined launch date of 5/28/98 EDT (5/29/98 GMT) on
	Spacehab 10	P532/R161/V118/M141 PLT:	Tuesday 13 6/2/98 (9)	Friday 11 6/12/98 (4)	100/104/104/ 67/104	ET-96		<u>POST OMS-2</u> : 177 X 129 NM		<u>CHARGEABLE</u> : 25625 LBS	2/20/97. - Changed launch date to 5/28/98 EDT (5/29/98 GMT) on
KSC-91 PAD 39A-53	<u>oms pods</u> : LP01-27	Dominic L. Gorie		DEORBIT BURN:	<u>ACTUAL</u> : 100/104/104/	SLWT-1					- Postponed launch date to 6/2/98 to allow AMS additional time.
MLP-1	RPO3-24 FRC3-24	M/S 1 (PAYLOAD CDR): Franklin R. Chang-Diaz	LAUNCH WINDOW: 7M42S USING MIR PLANAR/ PHASING	163:16:52:26Z XRANGE: 317 NM	100/104/104/ 67/104	JEWI I				<u>DEPLOYED</u> : 2419 LBS	LAUNCH SCRUBS: None
IVILP-1	11(00 24	M/S 1 (PAYLOAD CDR): Franklin R. Chang-Diaz (Flt 6 - STS 61-C, STS-34, STS-46, STS-60, STS-75) P534/R89/V46/M81	WINDOW IN LIEU OF PLT.	<u>ORBIT DIR</u> : AL 21	1 = 2047 (1)	<u>et</u> Pred				<u>NON-DEPLOYED</u> : 2 LBS	
				<u>aim pt</u> : Nominal	2 = 2040 (4) 3 = 2042 (3)	<u>et</u> <u>PRED</u> <u>RPT</u> : 283K					LAUNCH WINDOW: - 7M42S based on Mir planar/phase window (not PLT) to increase LO ₂ drainback time.
		Wendy B. Lawrence	<u>EOM PLS</u> : KSC <u>TAL</u> : ZZA <u>TAL WX</u> : MRN, BEN	<u>MLGTD</u> : 1218 FT 163:18:00:17Z	Block IIA 2047					MIDDECK: 891 LBS	LAUNCH DELAYS: None
count	91 - 90	P535/R192/V146/F25 M/S 3:		VEL: 215 KGS	Throttled to	<u>et</u> <u>Brkup</u> : 215K				<u>SHUTTLE</u> ACCUMULATED	TAL WX:
34.4		lanet L Kayandi	SELECTED: RTLS: KSC 15/N/N/S		104.5 <u>M 3 EOM</u> :			DEORBIT:		WEIGHTS: DEPLOYED:	- ZZA prime and selected. - ZZA, MRN, and BEN were forecast and observed GO.
NG-DIA		M/S 4: Valery V. Ryumin	<u>TAL</u> : ZZA 30/N/N <u>AOA</u> : KSC 15/N/N <u>PLS</u> : EDW 22/N/N	<u>TD NORM 195</u> : 2366 FT	WEIGHT: 226968 LBS	<u>ET</u> IMPACT 1:26:24		204 X 187 NM		1850930 I BS	
to t		(Russia) P537/R244/M212	TDEL:	<u>DRAG CHUTE</u> DEPLOY: 162 KEAS	X CG: 1079.49	MET LAT:		<u>VELOCITY</u> : 25889 FPS		NON-DEPLOYED: 1348738 LBS	<u>DOLILU/I-LOADS</u> : - DOLILU II uplink #22, I-Load uplink #41.
AND.	HOMAS + ON	M/S 5: Andrew Thomas	0.04 0.082/0.12	163:18:00:29Z	LANDING:	2.68°S LONG:		ENTRY		CARGO TOTAL: 2748303 LBS	PERFORMANCE ENHANCEMENTS: - Standard set plus MECO altitude is 52 NM, plus Delta psi.
		(Flt 2 - STS-77) P538/R213/V149/M186	<u>MAX Q NAV</u> : 692 663	<u>NLGTD</u> : 4518 FT 163:18:00:27Z	WEIGHT: 226872 LBS	<u>127.2</u> °W		RANGE: 4418 NM		PERFORMANCE MARGINS (LBS): FPR: 3783	- First use of MECO is 52 NM.
		Launch on STS-89, stay on Mir 24 and 25, return on		VEL: 176 KGS 167 KEAS	X CG: 1081.09					FPR: 3783	FLIGHT DURATION CHANGES: - None. Landed on orbit 155.
CTC00	1 707	STS-91.	<u>SRB STG</u> : 2:03.4 2:03	HDOT: -6.6 FPS <u>BRK INIT</u> : 147 KGS						FUEL BIAS: 720 FINAL TDDP: 631 RECON: 403	FIRSTS/I ASTS
STS09 ⁻ 060 (2-	1-707- 12 June	MCC WHITE FCR (21)	<u>PERF</u> : NOMINAL	DRAG CHUTE					Sel.	PAYLOADS:	- First flight of Super Light Weight tank - First flight of Block IIA SSME 2047 - Last Shuttle flight to Mir (ninth docking).
	MIR as	<u>FLIGHT DIRECTORS</u> : A/E – N. W. Hale LD/O 1 – P. F. Dye	<u>2 ENG TAL (AAZ)</u> : 2:34 2:29	<u>JETTISON:</u> 57 KGS 163:18:00:58Z		600		TOPA		PLB: ODS	- Last Shuttle flight to Mir (ninth docking).
	uring final	02 – A. F. Algate	NEG RETURN:	<u>BRK DECEL FPS²</u> : AVE 4.7 PK 11.2	- FU	-10					<u>EVENTS:</u> - Valery Ryumin's previous flights were Soyuz-25
flyarou	nd by Shuttles.	PLNG – P. L. Engelauf MOD – A. L.Briscoe	4:00 4:02	<u>WHEELS STOP:</u> 163:18:01:28Z			*		1	SHUTTLE/MIR MISSION 9	Soyuz/Salyut-6 (2 flights). - WRAP DAP entry
	Shuttles.		<u>PTA (U/S 274)</u> : 4:45 4:42	163:18:01:28Z 11935 FT		()	A		1	SPACEHAB (Single Module)	 Valery Ryumin's previous flights were Soyuz-25, Soyuz/Salyut-6 (2 flights). WRAP DAP entry. Andrew Thomas, last American to visit Mir. Andy transferred to STS-91 from Mir at 155:18:33:24Z. Mir time is 129:02:42:09 and btol flight time is 14/04.51145.
1			DROOP (ZZA):	<u>ROLLOUT:</u> 10717 FT	- 50	No.	X			AMS, SEM (2),	total flight time is 140:15:11:45.
1			5:30 5:30	71 SEC		-			~	GAS (6)	RENDEZVOUS #42: - Rendezvous and docking with Mir.
0.		l unita	<u>PTM (U/S 780)</u> : 6:16 6:16	<u>WINDS:</u> T3, L6 KTS	- 7	Car	- SE	T		<u>MIDDECK</u> : SSCE	5
		1 I I I		OFFICIAL: 0407P11			6		2	SIMPLEX CPCG	SIGNIFICANT ANOMALIES: - Center SSME PC sensor failure. - Fuel cell 3 overboard relief.
		- All	8:29.4 8:30.2	T2, L7 KTS DENS ALT:			Mark .	e - 111			Eucl coll monitoring time word problem
- and			<u>VI</u> : 25931 25924	2260 FT	STS091-7 Bottom, fr			Crew portra	uit:	5 CRYO TK SETS	MAGR-S3S GPS ascent performance anomaly. Cyclic GNC GPC errors caused by bad GPS SV caused by handshaking problem between GPS and the GNC. Failure of Ku-Band to radiate (no Ku-band return link).
	- was	S 60 - 50	OMS-2	FLT DURATION: 9:19:53:53				Precourt, Diaz/PLC. At		5 CRYO TK SETS 5 N2 TANKS RMS 50	 Failure of Ku-Band to radiate (no Ku-band return link). Camera C pan and tilt failure.
P3. 0		and the	44:11 44:11 161 FPS 161 FPS	<u>S/T</u> : 781:05:24:20	top, from	left, PL1	Gorie	, Lawrence/I	MS,	Used to check out S.N. 201 With new	- Camera C pan and tilt failure. - Thrusters R2U and F2U failed off at first command firing of both jets (low chamber pressures).
2.2	T	Ant		<u>OV-103:</u> 177:16:47:42	I homas/N 4 months			MS(RSA). A was last	itter	digital SPA H/W.	- LOMS ball valve failed open. - RPOP error during approach.
	a .	and the		DISTANCE:	American						
	-			3,800,000 sm							

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		00514		LANDING SITE/	SSME-TL						
		CREW	LAUNCH SITE,	RUNWAY,	NOM-	SRB	(ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(7)	LIFTOFF TIME,	CROSSRANGE	ABORT	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
					EMERG						
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& ÉVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
	OV-103	CDR:	KSC 39B	WINDS KSC 33 (KSC 45)	ENG. S.N. 104.5/104.5/	BI-096	28.45°	DIRECT	OI-26B	CARGO:	KSC W/D: OPF 76, VAB 5, PAD 29 = 110 days
STS-95	(Flight 25)	Curtis L. Brown	302:19:19:33:98Z	311:17:03:30Z	104.5/104.5/	DI-090	(47)	INSERTION	(3)	38618 LBS	<u>NGC WID</u> . OTT 70, VAD 3, TAD 27 – TTO days
SEQ FLT #92	Discovery	(Flt 5 - STS-47, STS-66,	302:19:19:33:98Z 2:00:00 PM EST (P) 2:19:34 PM EST (A)	12:03:30 PM EST	10770	RSRM	()			DA1/4 OAD	LAUNCH POSTPONMENTS:
JLQ1L1#72	,	STS-77, STS-85)	2:19:34 PIVIEST (A) Thursday 28	Saturday 20	PREDICTED:	68		POST OMS-2:		PAYLOAD CHARGABLE:	- Baselined launch date of 10/8/98 on 7/31/97.
KSC-92	OMS PODS:	P539/R152/V112/M136	10/29/98 (10)	11/7/98 (11)	100/104.5/			303 X 295 NM		28520 LBS	- Postponed launch date to 10/29/98 on 12/18/97.
	LPO1 - 28			DEORBIT BURN:	104.5/67/	ET-98		0504			LAUNCH SCRUBS: None
PAD	RPO3 - 26 FRC3 - 25	<u>PLT</u> : Steven W. Lindsey	LAUNCH WINDOW: 2H30M CTOB	311:15:52:54Z	104.5	SLWT-2		<u>SEP 1</u> : 2:23:46:30		DEPLOYED: 125 LBS	
39B-39	11(03-23	(Flt 2 - STS-87)		XRANGE: 172 NM	ACTUAL:	SLWI-Z		2.23.40.30 MET			LAUNCH DELAYS:
MLP-2		P540/R229/V131/M200	EOM PLS: KSC TAL: BYD		100/104.5/	SLWT		302.2 X 294		NON-DEPLOYED: 24108 LBS	- Held for 9 minutes 36 seconds during T-9 minute hold to understand the cause of the three master alarms (MA)
			TAL WX: BEN, MRN	<u>ORBIT DIR</u> : DL 44	104.5/72/	RPT		NM			during cabin leak checks. First MA was cabin P reached 15.35 psi during cabin leak check. Two MA's were
		<u>M/S 1</u> :		<u>AIM PT</u> : NOMINAL	104.5	MAX:				MIDDECK: 1314 LBS	15.35 psi during cabin leak check. Two MA's were
		Stephen K. Robinson	<u>SELECTED</u> : <u>RTLS</u> : EDW 15/N/SF	MI GTD: 3243 FT	1 0040 (1)	283K <u>MIN</u> :		<u>SEP 2</u> :		1314 LD3	differential pressure/differential time alarms. It was concluded that the alarms were expected and count was
		(Flt 2 – STS-85) P541/R222/V152/M196	TAL: BYD 32/N/SF	<u>MLGTD</u> : 3243 FT 311:17:03:30Z	1 = 2048 (1) 2 = 2043 (2)	215K		3:06:16:40 MET		<u>SHUTTLE</u> ACCUMULATED	resumed.
		1 341/1\222/10132/101170	AOA: EDW 22	VEL: 199 KGS	3 = 2045 (2) 3 = 2045 (2)	2151				ACCUMULATED WEIGHTS:	- Held for 9 minutes 58 seconds at T-5 minutes for
		M/S 2:	PLS: EDW 22/CI/N	196 KEAS HDOT: -1.0 FPS	0 2010 (2)	SLWT		<u>TI</u> :5:22:01:37		DEPLOYED:	range safety hold call for two intruder aircraft in Launch Danger Area. Resumed count but two calls were made
		Scott E. Parazynski	<u>TDEL</u> : -0.03 -0.108/0.07		ALL BLOCK	<u>IMPACT</u>		MET		850155 LBS	to hold at T-31 seconds, one for engine 2 pitch position
		(Flt 3 - STS-66, STS-86)	-0.03 -0.108/0.07	<u>TD NORM 205</u> : 2559 FT	II A ENGINES	1:28:02		301.5 X 293.5		NON-DEPLOYED: 1378355 LBS	NO GO and the second for range safety NO GO. These holds were removed before count reached T-31
		P542/R187/V145/M164	MAX Q NAV:		MAEOM	MET LAT:		NM		CARGO TOTAL:	seconds; hence, no additional delay.
		M/S 3:	755 765	DRAG CHUTE DEPLOY:	M 3 EOM WEIGHT:	20.8°N		DEORBIT		2824652 LBS	seconds, nence, no additional delay.
		Pedro Duque	SDB STC:	NOT USED	228455 LBS	LONG:		ALT:		PERFORMANCE	TAL WX:
ROWN	LINDSS	(ESA-Spain)	<u>SRB STG</u> : 2:03.7 2:03	<u>NLGTD</u> : 6248 FT	X CG:	147.2°W		301.5 X 285.9		MARGINS (LBS):	- Banjul, Ben Guerir, and Moron were forecast and observed GO. Banjul was prime and selected.
		P543/R245/M213		311:17:03:40Z	1076.83			NM		FPR: 3783	ubserved GO. Balijul was prime and selected.
3/			<u>PERF</u> : NOMINAL	VEL: 164 KGS 164 KEAS						FUEL BIAS: 720 FINAL TDDP: 1587	DOLILU/I-LOADS:
	× 8	<u>P/S 1</u> : Chiaki Mukai	2 ENG TAL (BYD):	HDOT: -6.6 FPS	LANDING: WEIGHT:			VELOCITY 26063 FPS		RECON: 2740	- DOLILU II uplink # 23, I-Load uplink # 42.
ç 🔍		(Japan)	2:11 2:13	BRK INIT: 138 KGS	228388 LBS			20003113			PERFORMANCE ENHANCEMENTS:
a Discu	ERY	(Flt 2 - STS-65)	NEG RETURN:	8726 FT	X CG:			ENTRY		<u>Payloads</u> : PLB:	- Standard set plus PE High Q.
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	212	P544/R181/V153/F23	3:45 3:52		1078.45			RANGE		SPACEHAB	
		D/0.0	PTA (U/S 500):	DRAG CHUTE JETTISON:				4290 NM		(Single) HOST	FLIGHT DURATION CHANGES: None
		P/S 2: Senator John H. Glenn (2)	4:12 4:08	NOT USED	1		-			SPARTAN-201	FLIGHT RULE WAIVER:
		P545/R246/M214		BRK DECEL FPS ² :	1	-		- 19		(Deploy & Retrieve)	- Forecast at deorbit burn time was a maximum
			DROOP: 5:21	AVE 5.8 PK 7.8	1.				1	(Solar Wind Exp.)	crosswind of 16 knots. Flight rule limit is 15 knots. Observed crosswind < 10 knots. Landed on orbit 135.
		MCC WHITE FCR (22)		WHEELS STOP:			2	- PA	1	GAS (2) IEH-3 (PANSAT)	UDSELVEU GUSSWIIIU < TU KIIUIS. LAIIUEU UH UIDIL 133.
			PTM (U/S 500): 5:13 5:06	311:17:04:30Z	No.				1	(Deployed)	FIRSTS/LASTS/RECORDS:
		<u>FLIGHT DIRECTORS</u> : A/E - L. J. Ham	5.15 5.00	12751 FT	the second second	m	AR			MIDDECK:	- First flight using High Q flight design.
		LD/O1 - P. L. Engelauf	MECO CMD:	ROLLOUT:		1999	Y	200		PCG-STES	- First flight with three Block IIA SSME's (Rocketdyne HPFTP).
		0 2 - P. S. Hill	8:20.7 8:21.6	9508 FT 60 SECS	·		*		5	SAREX-II BRIC	- John Glenn's first flight was Mercury-Atlas 6 on
		O 3 - P. F. Dye	VI:		1 -	- +		171			2/20/62.
		MOD - J. W. Bantle	26102 26092	WINDS:	1	1	2AL	2		5 CYRO TK SETS	- Glenn's age at first flight 40Y7.5M, second flight
			OMS-2:	OH, 10R KTS OFFICIAL:	1 2 1	COM BU	A V			5 GN2 TANKS	77Y4M, 36Y8.5M between flights. - First flight using space-to-space comm system (as
			<u>OMS-2</u> : 41:57 41:57	0609P14				998): CDR Bro			DTO).
			5.02 FPS 5.02 FPS	T0, R9 KTS				y, Robinson/M	S,		- Second flight of Super Lightweight Tank (SLWT).
					Duque/MS/ES			IASDA,		O and the set of	
					Parazynski/M	S, & Sen. C	Glenn/PS.			Continued	Continued
				Continued							

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FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM- ABORT EMERG	SRB RSRM	(Orbit	FSW	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
Earth, Frie Sen. John	andship7/MA Glenn, at 7 Glenn, at 7 Glenn, at 7 Glenn, at 7 Clear	& ÉVA'S Image: Stress of the second	erican to orbit 0-29-98): Rt, 2e, STS-95.	WINDS Continued DENS ALT: 965 FT FLT DURATION: 8:21:43:56 S/T: 790:03:08:16 OV-103: 186:13:31:48 DISTANCE: 3,644,459 sm	ENG. S.N.	5 (10-29- COMS SU & Flight nda Ham aunch of	srs-95			Continued RMS 51 (S.N. 201) RMS used for SPARTAN-201 deploy, retrieve and berth, ACVS, OSVS, and VGS OPS.	 PIRSTS, SIGNIFICANT ANOMALLES, ETC.) Continued EVENTS: SPARTAN-201 release 305:19:00:12Z, 2:23:40:36 MET. Due to drag chute anomaly, drag chute was not armed and deployed. Inert weight adjustment -200 lbs included in STS OPR chargeable. SPARTAN capture 307:20:47:49Z, 5:01:28 MET. Berth 5:01:46 MET. RENDEZVOUS # 43: Deployed, separated, rendezvoused with SPARTAN-201. RADIATOR DEPLOY # 23 Both port and starboard panels deployed. SIGNIFICANT ANOMALIES: Unpleasant taste (rubber hose) from LIRS. During space-to-space comm tests, no data from EMU 1 in primary. Drag chute door fell off during ME throttle up at T-5 seconds; hence, not deployed during landing. Decision made to disable chute for STS-88. WSB 2 overcooled six times during entry. SPARTAN ground command problem. RCS jet L3L failed off, then failed leak.

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FLT	ORBITER	CREW (6)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	Payload Weights.	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION,	THROTTLE PROFILE	AND	INC	HA/HP	1.500	PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-88/ ISS-2A First Shuttle Flight to ISS SEQ FLT #93 KSC-93 PAD 39A-54MLP-3	OV-105 (Flight 13) Endeavour OMS PODS LPO4-20 RPO1-27 FRC5-13	CDR: Robert D. Cabana (Flt 4 - STS-41, STS-53, & STS-65) P546/R113/V84/M101 PLT: Frederick W. Sturckow P547/R247/M215 M/S 1/EV 1: Jerry L. Ross (Flt 6 - STS-61-B, STS-27, STS-37, STS-55, &STS-74) P548/R89/V38/M80 M/S 2: Nancy J. Currie (Flt 3 - STS-57, STS-70) P549/R165/V120/F21	KSC 39, PAD A 338:08:35:34Z 3:35:34 AM EST (P) 3:35:34 AM EST (A) Friday 18 12/4/98 (5) LAUNCH WINDOW 4M59S Based on Preferred Launch Time and FGB Planar/Phase. EOM PLS: KSC TAL: ZZA TAL WX: MRN, BEN SELECTED: RTLS: KSC 33/N/N TAL: MRN 20/N/N AOA: KSC 33 PLS: KSC 33/N/N TAL: MRN 20/N/N AOA: KSC 33/N/N TDEL: -0.15 -0.008/-0.03 MAX Q NAV: 707 715 SRB STG: 2:05:3 2:05 PERF: NOMINAL 2 ENG TAL (ZZA): 2:25 2:25	WINDS KSC 15 (KSC 46) 350:03:53:30Z 10:53:30 PM EST Tuesday 14 12/15/98 (10) DEORBIT BURN: 350:02:48:04 340 FPS XRANGE: 134 NM ORBIT DIR: AL 22 AIM PT: NOMINAL MLGTD: 3163 FT 350:03:53:30Z VEL: 197 KGS 197 KEAS HDOT: -2.3 FPS TD NORM 195: 3293 FT DRAG CHUTE DEPLOY: CHUTE WAS DISABLED. NLGTD: 6009 FT 350:03:53:38Z VEL: 164 KGS 158 KEAS HDOT: -6.2 FPS	ENG. S.N. 104.5/104.5/ 109% PREDICTED 100/104.5/ 104.5/72/ 104.5 ACTUAL 100/104.5/ 104.5/72/ 104.5 1 = 2050 (1) 2 = 2044 (2) 3 = 2041 (5) ALL BLOCK IIA SSME'S IIA SSME'S	BI-095 RSRM 67 ET-97 SLWT-3 SLWT 283K SLWT BR/UP 207K	51.60 (1)	DIRECT INSERTION POST OMS-2 175 X 97 NM DEPLOY: SEP BURN: 347:21:49Z 213.1 X 209 NM RCS-2 COLLISION AVOIDANCE	OI-26B (4)	CARGO: 37731 LBS PAYLOAD CHARGABLE: 30986 LBS DEPLOYED: 26791 LBS NON-DEPLOYED: 3073 LBS MIDDECK: 1122 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 877846 LBS NON-DEPLOYED: 1378355 LBS CARGO TOTAL: 2824652 LBS PERFORMANCE MARGINS (LBS): FPR: 3783 FUEL BIAS: 720 FINAL TDDP: 2365 RECON: 1043 PAYLOADS: PLB: ISS - 2A Node 1/PMA 1&2	Brief Mission Summary: The STS-88/2A "Unity" mission was the first manned ISS assembly flight. The primary mission objective was to rendezvous with the already launched Zarya control module and successfully attach the Unity connecting module. This mission provided the foundation for assembly of future ISS components. KSC W/D: OPF 187, VAB 5, PAD 37 = 229 days LAUNCH POSTPONEMENTS: - Baselined launch date of 12/4/97 on 6/21/96. - Postponed launch date to 12/3/98 on 6/4/98. LAUNCH SCRUBS: - Scrubbed 12/3/98 launch attempt after LO2 drainback hold time of 3M42S expired based on preferred launch time of 31/42S expired based on preferred launch time of 31/42S expired based at 337:08:55:31 and closed at 337:09:03:19). Opted for use of the Preferred Launch Time of 377:08:58:19 which provided a window of 5M00S. An unexpected master alarm (MA), associated with hydraulic system 1 momentary pressure spike, caused an automatic hold at T-4 minutes. After holding at T-4 minutes for 3 minutes, the count was resumed. at T-31 seconds, another hold was called while troubleshooting the MA. Resolution of the MA occurred slightly after the expiration of the 3M42S LO2 drainback hold time. The count was resumed. at T-4 minutes for 3 minutes, the count was resumed. at T-31 seconds, another hold was called while
		Duration 7H21M EVA start at 3D13H34M MET <u>SS EVA #43</u> : EMU/Tethered EVA #36 Scheduled EVA #37 on 12/9/98 Duration 7H02M EVA start at 5D11H57M30S MET <u>SS EVA #44</u> : EMU/Tethered EVA #37 Scheduled EVA #38 on 12/12/98 Duration 6H59M EVA start at 8D11H57M50S MET Continued	PTA (U/S 500): 4:45 DROOP: 5:24 N/A 5:57 5:57 5:56 MECO CMD: 8:22.6 VI: 25931 25929 OMS-2 TIG: 43:41	BRK DECEL FPS ² : AVE 7.7 PK 9.3 WHEELS STOP: 350:03:54:16Z 11506 FT <u>ROLLOUT</u> : 8343 FT 44 SEC	ISS begar Unity Nod	n with the jo	pining of ssian-bu γ).	DEORBIT 213.6 X 208.8 NM VELOCITY 25898 FPS ENTRY RANGE 4343 NM		(Deployed to ISS) ICBC Mighty Sat (Deployed) SAC-A (Deployed) GAS (1), SEM RMS, ODS <u>MIDDECK:</u> SIMPLEX 5 CYRO TK SETS 6 GN2 TANKS RMS 52 RMS used to grapple Node 1 and position on ODS. Grapple FGB and dock with Node 1.	spike was a "Switch Tease" which momentarily reenergized the systems 1 hydraulic pump pressure solenoid valve. <u>SHUTTLE NIGHT LAUNCH #20</u> <u>LAUNCH DELAYS</u> : None. Launched on-time at 338:08:35:34Z, 3:35:34 AM EST, on Friday, December 4, 1998. <u>TAL WX</u> : - Zaragoza (prime) forecast and observed NO GO (ceiling and crosswind), Moron (selected) forecast and observed GO. Ben Guerir forecast NO GO (ceiling & rain) but observed GO. <u>DOLILU-II I-LOADS</u> : - Uplink #24, I-Load uplink #43. Continued

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<u>FLT</u> NO.	ORBITER	CREW (6) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL NOM-ABORT SRI EMERG RSR THROTTLE ANI PROFILE ET ENG. S.N.	M INC HA/HP	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-88/ SS-2A		Continued MCC WHITE FCR (23) FLIGHT DIRECTORS:		Continued WINDS: 5T, 1R KTS OFFICIAL:					Continued PERFORMANCE ENHANCEMENTS: - Standard set plus PE High Q WIN/DEC, OMS assist
Portinued		A/E/O 4 - J. P. Shannon LD/O 1 - R. E. Castle O 2 - P. L. Engelauf Plng/O 3 - A. F. Algate MOD - J. W. Bantle ISS LD/O 2 - M. A. Kirasich ISS/O 1 - S. P. Davis ISS/Plng/O 3 - J. M. Hanley		3105P09 R2, T5 KTS DENS ALT: -854 FT FLT DURATION: 11:19:17:56 S/T: 801:22:26:12 OV-105: 133:04:07:58					4000 lbs, 52 NM MECO, and Del Psi. <u>FLIGHT DURATION CHANGES</u> : None <u>FIRSTS/LASTS</u> : - First Shuttle flight to International Space Station (FGB), docked node to PMA/FGB. - First ISS assembly flight. <u>SHUTTLE NIGHT LANDING #10</u> - Landed on orbit 186 on KSC 15.
2000 ISS 14	NR SU			133:04:07:58 <u>DISTANCE</u> : 4,650,000 sm	row (left to right) Currie/MS. Top	To FGB Crew in U.Sbuilt are PLT Sturckow, CE row, Krikalev/MS (Russ	R Caba	ana, &	EVENTS: - STS-88/2A first International Space Station (ISS) assembly flight carried NODE, Unity. - First ISS element, the FGB Zarya, was launched from Baikonar Cosmodrome by a PROTON at 324:06:40:006 into an orbit of 191.4 X 100 NM at inclination of 51.62 degrees. - STS-88/2A was the first rendezvous and docking of the CO Devent
					Ross/MS.				ISS Program. - RMS grapple of PMA-1/Node 1/PMA-2 at 339:21:54:19Z, unberth at 339:22:08:10Z, installed on ODS at 339:23:52:40Z, ungrapple at 340:00:09:30Z. - RMS grapple of FGB at 340:23:47:02Z, FGB ungrapple at 341:02:43:52Z. - EVA 1 start at 341:22:09:51Z, end at 342:05:30:42Z, duration 7H21M51S. - ISS reboost burn start at 342:20:35:34Z, duration - EVA 2 start at 343:20:33:04Z, end at 344:03:34:34Z, duration 7H01M30S. - Node 1 (Unity) ingress at 344:19:54Z, FGB ingress at
on consol	98e09779 le: Scott Altr Gorie, & Sco	man, & Ross mate	059 (12-08-98) - ed 40 cables & co t between Zarya o	onnectors		Contraction of the second		e.	344:21:11Z. - EVA 3 start at 346:20:33:24Z, end at 347:03:32:01, duration 6H58M37S. - SAC-A deployed at 0:20:15 MET
K		i i i i i i i i i i i i i i i i i i i	GIGNIFICANT ANOMAL Galley iodine removal a compatibility. Five PLB floodlights fai Anomalous SAFER S/I ressure reading. GPS anomalies. APU 2 fuel pump drain RCS jet R2D fail leak. Right Pad A heater circ Right RCS 1/2 tank iso Right inboard tire press Failed portable foot res atch pin came out, ther	assembly hose QD iled. N 1007 GN2 and tank line pressure decay. cuit failure. lation valves fail open. sure indication failed low straint attachment device	I. backdrop	703-032 Blanketing for the connected Zar after release from End	ya and	Unity	Mighty SAT deployed at 10:17:13 MET. Drag Chute was disarmed pending resolution of STS-9 Drag Chute door anomaly. (Mortar was removed.) Undock at 347:20:24:34Z. ISS Visitor time 6D17H34M20S <u>RENDEZVOUS #44</u> Rendezvous and dock with ISS PMA 2 Node 1 forward port.

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		CREW		LANDING SITE/	SSME-TL						
FLT	ORBITER	(7)	LAUNCH SITE, LIFTOFF TIME,	RUNWAY, CROSSRANGE	NOM- ABORT	SRB RSRM	C	RBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	EMERG THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
ISS-2A.1 SEQ FLT #94 KSC-94	CR (24) <u>TORS</u> : lale eeves ntle S. Hill irasich	& EVAS CDR: Kent Rominger (Flt 4 - STS-73, STS-80, STS-85) P552/R200/V131/M174 PLT: Rick D. Husband P553/R248/M216 <u>MIS 1/EV 1</u> : Tamara E. Jernigan (Flt 5 - STS-40, STS-52, STS-67, STS-80) P554/R130/V83/F14 <u>MIS 2</u> : Ellen Ochoa (Flt 3 - STS-56, STS-66) P555/R160/V113/F20 <u>MIS 3/EV 2</u> : Daniel T. Barry (Flt 2 - STS-72) P556/R209/V155/M182 <u>MIS 4</u> : Julie Payette (Canada) P557/R249/ F33 <u>MIS 5</u> : Valery Tokarev (Russia) P558/R250/M217 <u>SS EVA #45</u> : EMU/Tethered EVA #38 on 5/29/99 Scheduled EVA #39 ISS EVA #4 7H55M Duration	KSC 39B 147:10:49:42Z 6:49:42 AM EDT (A) Thursday 29 5/27/99 (5) LAUNCH WINDOW: BMGS USING PREFFERED LAUNCH TIME EOM PLS: KSC TAL: ZZA TAL WX: MRN, BEN SELECTED: RTLS: KSC 33/CI/N TAL: MRN 20/N/N AOA: KSC 15/N/N PLS: EDW 22/CI/N TDEL: 0.1 -0.18/+0.18 MAX Q NAV: 740 740 SEB STG: 2:04.6 2:05 PERF: NOMINAL 2 PLS: EDW 22/CI/N 1 TDEL: 0.1 -0.18/+0.18 MAX Q NAV: 740 740 SRB STG: 2:04.6 2:05 PERF: NOMINAL 3:57 PTA (U/S 272): 4:21 4:24 DROOP (ZZA): 5:51 5:30 SE TAL (ZZA): 5:51 5:52 SE PTM: 6:41 6:48 MECO CMD: 8:22.1 8:22 VI: 25931 25929	WINDS KSC 15 (KSC 47) 157:06:02:432 02:02:43 AM EDT Sunday 14 6/6/99 (5) DEORBIT BURN: 157:04:54:09Z XRANGE: 712 NM ORBIT DIR: AL 23 AIM PT: CLOSE IN MLGTD: 1963 FT 157:06:2:43Z VEL: 210 KGS 210 KEAS HDOT: -1.0 FPS D NORM 205: 2290 FT DRAG CHUTE DEPLOY:184 KEAS 157:06:02:51Z NLGTD: 6504 FT 157:06:02:57Z VEL: 156 KGS 149 KEAS HDOT: -5.8 FPS BRK INIT: 112 KGS DRAG CHUTE JETTISON: 53 KGS 157:06:03:35Z 10829 FT ROBCO:335Z 10829 FT ROLLOUT: 8866 FT 52 SECS WINDS: 2H, 5L KTS OFFICIAL: 0904P07 2H, 3L KTS	ENG. S.N. 104/104/ 109% PREDICTED: 100/104.5/ 104.5/72/ 104.5 ACTUAL: 100/104.5/ 104.5/72/ 104.5 1 = 2047 (2) 2 = 2051 (1) 3 = 2049 (1) ALL BLOCK IIA SSME'S	BI-098 RSRM 70 ET-100 SLWT-4 ET IMPACT: 1:26:12 MET LAT: 2.46°S LONG: 127.99°W	(2)	DIRECT INSERTION POST OMS-2: 182.7 X 177.1 NM TI: 149:01:35:18Z MET 208.3 X 202.4 NM <u>MC4</u> : 149:02:55:18Z 209.3 X 208.4 NM <u>REBOOST</u> : 154:09:36:53Z 213.9 X 208.6 NM <u>REBOOST</u> : 154:09:36:53Z 213.9 X 208.6 NM <u>DEORBIT</u> : 213.9 X 208.6 NM <u>ENTRY</u> <u>VELOCITY</u> 25915 FPS <u>ENTRY</u> <u>RANGE</u>	Pilot,	CARGO: 33808 LBS PAYLOAD CHARGABLE: 22707 LBS DEPLOYED: 4228 LBS NON-DEPLOYED: 17994 LBS MIDDECK: 1034 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 882074 LBS NON-DEPLOYED: 139783 LBS CARGO TOTAL: 2858460 LBS: PERFORMANCE MARGINS (LBS): FPR: 3783 FUEL BIAS: 720 FINAL TDDP: 4435 RECON: 4306 PAYLOADS: PLB: ISS 2A.1 SPACEHAB (Double Module) ODS, OTD STARSHINE (DEPLOYED) SVF ICC MIDDECK: DTO EMU H/W EMU TOOLS 5 CYRO TK SETS 5 GN2 TANKS RMS 53 (S.N. 303)	Brief Mission Summary: The major objective of STS-96- 2A.1, 2nd ISS mission, was to transfer nearly 2 tons of logistical supplies to the ISS. These supplies would be used to continue the outfitting of the Unity and Zarya modules and for later use to set up the Russian Service Module for occupancy by a three-man crew. In addition, a small educational satellite called STARSHINE was deployed for observation by international students. KSC W/D: OPF 122, VAB 12 (2), PAD 30 (2) = 164 days total (Rollback to repair ET foam) LAUNCH POSTPONEMENTS: • Baselined launch date of 12/9/80 on 10/2/97. • Postponed launch date to 5/13/99 on 6/4/98 (Multi-flight changes to ISS flights), then to 5/20/99, to 5/24/99, and to 5/20/99 on 4/21/99. • Postponed launch date to NET 5/27/99 based on 5/13/99 decision to roll back to VAB on 5/16/99 to repair hail damage to ET foam (648 divots, 459 required repair). • Rolled back to pad on 5/21/99 and confirmed 5/27/99 as the launch date. LAUNCH WINDOW: • The launch window was in two panes. Pane 1 opened at 147:10:48:46Z and closed at 147:10:54:42Z. There was a 10-second cutout with pane 2 opening at 147:10:54:52Z and closing at 147:10:57:48Z. The total launch window was 9M2S with a 10-second gap. LAUNCH DELAYS: None • Launch window of 8 minutes 6 seconds, in two panes with a 10-second gap. LAUNCH DELAYS: None • Launch occurred on time at 147:10:49:42Z, 6:49:42 AM EDT on Friday, May 27, 1999. TAL WX: • ZARAGOZA (Prime) was forecast NO GO - tailwind (at landing time observed NO G, tailwind and thund
			Continued					4358 NM		Continued	Continued

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FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM- ABORT EMERG	SRB RSRM		RBIT	FSW		MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
Rominger, f Tokaerev/M	flanked by Ba IS(RSA), Jeri	t crew portrait: At bottom co arry/MS & Ochoa/MS. Abo nigan/MS & Payette/MS (en arry/MS & Ochoa/MS. Abo	2:43 2:4	Continued <u>DENS ALT</u> : 1321 FT <u>S</u> <u>S</u> <u>S</u> <u>S</u> <u>S</u> <u>S</u> <u>S</u> <u>S</u>	SIGNIFICA - Humidity - Vestibule - SSOR ar squeal, SS TLM from 3 - Difficulty - Lost LG/S - Small equ from D-ring - SAFER F open. - F4R Thru	OR noise ma SSOR static. attaching SC SM retractabl uipment hook g on miniwork byro Valve Fir aster declared -E-5219 - ry after se First flight on s after S	vater carryo ng airlock d ppy EVA co ilfunctions d U 1 to DCM e tether - ca failed open station. ed/Manual I I failed leak	epress. mm, EVA comr uring EVA, EM me off fish strin - tether release solation Valve by RM.	U ger.	Continued RMS USED FOR EVA SUPPORT AND SURVEY SVS (SPACE VISION SYSTEM)	Continued FLIGHT DURATION CHANGES: None - Landed on orbit 154 as planned. FIRSTS/LASTS/RECORDS: - First flight of Functional Drag Chute with strengthened door pins after problem on STS-95 (Inconel was aluminum). - First logistics/maintenance flight to ISS, Third ISS flight, 2nd Docking Flight to ISS (PMA2) Node 1 forward port. SHUTTLE NIGHT LANDING # 11: KSC runway 15 EVENTS: - OMS assist burn 147:10:51:57Z with a duration of 2M42S. - RCS MC4 at 149:02:55:17/01:16:05:35 MET. - ISS ring capture 149:04:23:51Z, docking 149:04:37:38Z/01:17:47:56 MET at PMA2, Node 1 Forward Port. - STARSHINE deployed at 156:07:21Z/08:20:32 MET. - Crew ingressed ISS PMA2 at 149:07:00Z/01:20:10 MET. - IFM: Replaced FGB Battery MIRT's, and Replaced ECOMM Transceiver and Power Distribution Box. - EVA Start Time 150:16:21:36Z/03:05:31:54 MET. EVA End Time 151:00:16:36Z/03:13:26:54 MET. EVA End Tistilation of FGB target mask, installed Orbital Transfer Device and IAPFR on PAM 1, installed Strela crane on PMA2, installed trunnion pin cover, and transferred EVA tools to Node 1. - Reboost Start 154:09:36:54Z/06:22:47:11 MET. Reboost End 154:10:11:40Z, Delta V 21:8 fps, alt
		ay 1999) MS1 Jernigan ela (a Russian word meani		:::::::::::::::::::::::::::::::::::::::							 Final transfers to ISS: EVA 661 lbs, IVA transfers 2881 lbs, and water transfers 686 lbs (7 CWC's), Total to ISS 4228 lbs. To Shuttle 197 lbs. Return IVA transfers to Discovery 213 lbs. Landed on orbit 154, Ascending Left 23, Crossrange 712 NM, range 4370 NM, Runway 15. <u>RENDEZVOUS # 45:</u> Rendezvous and dock with ISS. <u>RADIATOR DEPLOY # 24</u>:

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ELT.	ODDITES	CREW (5)	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB		ORBIT	EC/M	PAYLOAD	MISSION HIGHLIGHTS
FLT NO.	ORBITER		LIFTOFF TIME, LANDING SITES,	CROSSRANGE LANDING TIMES	EMERG THROTTLE	RSRM AND	INC	HA/HP	FSW	WEIGHTS, PAYLOADS/	(LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS,
NO.		TITLE, NAMES & EVA'S	ABORT TIMES	FLT DURATION, WINDS	PROFILE ENG. S.N.	ET	INC			EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-93 SEQ FLT # 95	OV-102 (Flight 26) Columbia	<u>CDR</u> : Eileen M. Collins (Flt 3 - STS-63, STS-84) P559/R188/V139/F24	12:31:00 AM EDT (Å) Friday 19	KSC 33 (KSC 48) 209:03:20:35Z 11:03:20:35 PM EDT Wednesday 10	104/104/ 109% PREDICTED: 100/104/104/	BI-097 RSRM 69	28.45° (48)	DIRECT INSERTION <u>POST OMS-2</u> : 154 X 145 NM	OI-26B (5)	<u>CARGO</u> : 52382 LBS <u>PAYLOAD</u> <u>CHARGEABLE</u> :	<u>Brief Mission Summary</u> : The primary objective of the STS-93 mission was to deploy the \$1.5 billion Chandra, the world's most powerful X-Ray Observatory, and third in NASA's series of "Great Observatories. Other objectives included
KSC- 95 PAD 39B-41	<u>OMS PODS</u> : LPO5-15 RPO5-14	PLT: Jeffrey S. Ashby P560/R251/M218	7/23/99 (6) <u>LAUNCH WINDOW</u> : 46 Minutes	7/28/99 (9) <u>DEORBIT BURN:</u> 209:02:19:00Z	67/104 <u>ACTUAL</u> : 100/104/104/ 67/104	ET-99 SLWT-5		154 & 145 1999		<u>DEPLOYED</u> : 43080 LBS	execution of jet firings for Air Force satellite plume study and operation of the Southwest Ultraviolet Imaging System. This was also the first Shuttle mission commanded by a female, CDR Eileen M. Collins.
MP-1L	FRC2-26	<u>M/S 1</u> : Cady G. Coleman (Flt 2 - STS-73) P561/R201/V156/F27	EOM PLS: KSC TAL: BYD TAL WX: BEN SELECTED: RTLS: KSC 15/N/N	<u>XRANGE</u> : 83 NM <u>ORBIT DIR</u> : DL 45 <u>AIM PT</u> : NOMINAL	1 = 2012 (22) 2 = 2031 (17) 3 = 2019 (19)	Ray ob agains	servato t a dese release	48 Chandra ry, back-dropp rt in Namibia, , from Columbia	ed just	<u>NON-DEPLOYED</u> : 5171 LBS <u>MIDDECK</u> : 1538 LBS	<u>KSC W/D</u> : OPF 223, VAB 5, PAD 43 = 271 days total. <u>LAUNCH POSTPONEMENTS</u> : - Baselined 8/27/98 as launch date on 5/16/97. - Postponed launch date to 12/3/98 and to 1/21/99 (Multi-flight change to ISS flights).
		<u>M/S 2</u> : Steven A. Hawley (Flt 5 - STS 41-D, STS 61-C,STS-31 & STS- 82) P562/R39/V29/M38	T <u>AL:</u> BEN 36/N/N AOA: EDW 22/N/N <u>PLS</u> : EDW 22/CI/N T <u>DEL</u> : 0.05 0.092/0.13	<u>MLGTD</u> : 2533 FT 209:03:20:35Z VEL: 201 KGS 196 KEAS HDOT: -1.0 FPS			and the second		* .	SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 925154 LBS NON-DEPLOYED: 1404092 LBS	 Postponed to 3/18/99, to 3/25/99, to 4/8/99, to 4/15/99, to 7/9/99, to 7/22/99, and to 7/20/99 (primarily Chandra AXAF/IUS delays). <u>LAUNCH SCRUBS</u>: 7/20/99 (12:36 AM EDT.) Launch attempt was halted with a
		M/S 3: Michel Tognini (CNES-France) P563/R252/M219	SRB STG:	<u>TD NORM 195</u> : 2628 FT <u>DRAG CHUTE</u> <u>DEPLOY</u> : 190KEAS 209:03:20:37Z						1404092 LBS <u>CARGO TOTAL</u> : 2910842 LBS <u>PERFORMANCE</u> <u>MARGINS (LBS)</u> : FPR: 3553 FUEL BIAS: 720	manual GLS cutoff at T-7 seconds (approximately 200 milliseconds prior to Main Engine Start) due to a (false) spike indication of 640 ppm H2 concentration in the aft. Insufficient time to wait for the confirmation sample at T-8 seconds and allow time to issue a manual GLS cutoff before Main Engine Start at T-6.33 seconds. The manual cutoff call was made at T-
Coulins Coulins	ASHID	MCC WHITE FCR (25) <u>FLIGHT DIRECTORS</u> : A/E/O1 - J. P. Shannon LD/O 2 - B. P. Austin & P. F. Dye	<u>NEG RETURN</u> : 3:52 3:59 PTA (U/S 219):	<u>NLGTD</u> : 5470 FT 209:03:20:44Z VEL: 159 KGS 149 KEAS HDOT: -4.1 FPS <u>BRK INIT</u> : 122 KGS <u>DRAG CHUTE</u>		Brittin I				PINAL TDDP: 2081 RECON: -3981 PAYLOADS: PLB: AXAF-I/IUS (CHANDRA deployed)	 10 seconds. A 48-hour scrub turnaround was required to replace the Hydrogen Long-Throw Igniters. KSC, BYD, and BEN were forecast and observed GO. Launch reset for 7/22/99. Technical Scrub. 7/22/99 (12:28 AM EDT.) Launch attempt was scrubbed at T+47:30 due to Range and RTLS weather. During count, rain and lightning hits within 20 NM, and thunderstorms within 20
	HAWLEY TOOM	PLNG - C. W. Shaw MOD - B. R. Stone & J. W. Bantle	<u>DROOP</u> : 5:26 5:25 <u>SE TAL (BYD)</u> : 6:02 5:59	<u>JETTISON:</u> 43 KGS 209:03:21:05Z <u>BRK DECEL FPS²:</u> AVE 9.1 PK 10.4	<u>M 3 EOM</u> : WEIGHT: 202872 LBS X CG: 1097.54	<u>ET</u> 283K <u>ET</u> <u>BR/UP</u> : K		DEORBIT:		<u>MIDDECK</u> : MSX, SIMPLEX, SWUIS, GOSMAR, STL-B, LFSAH, CCM, SAREX-II, EARTHKAM, PGIM,	NM. Counted down to T-5 minutes and held awaiting improved weather. Mission Director gave ok to extend window 36 minutes by giving up first day deploy. Scrubbed launch at 203:05:17:35Z (T+47:30) with no signs of improvement in weather (lightning within 8.6 miles of SLF and thundershowers within 20 NM). Banjul was NO GO for ceiling/rain. Ben Guerir was GO. Launch reset for 7/23/99. Weather Scrub.
			MECO CMD:	<u>WHEELS STOP:</u> 209:03:21:19Z 9384 FT <u>ROLLOUT:</u> 6851 FT 44 SEC	<u>LANDING</u> : WEIGHT: 202796 LBS X CG:	<u>ET</u> IMPACT 1:23:16 LAT: 17.54°N LONG:		151 x 139 NM ENTRY VELOCITY: 25762 FPS ENTRY RANGE: 4332 NM		CGBA, MEMS, BRIC 3 CRYO TK SETS (Off Load) 4 GN2 TANKS NO RMS	LAUNCH WINDOW: 46 minutes planned window. During count, the customer relaxed contingency deploy opportunities and IUS battery eclipse constraints to extend window to 116 minutes; however, launch window was limited to Range availability (60 minutes).

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FLT ORBITER CREW (5) NO. TITLE, NAN & EVA'S	ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS Cattlined	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE ENG. S.N.	SRB RSRM AND ET	ORB	it Ha/Hp	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS093-706-039 Chandra X-Ra Observatory after release from Columbia's payload bay.		Continued 9 <u>WINDS</u> : 0 OFFICIAL: 2405P06 SS: OT, 5L PK: OT, 6L <u>DENS ALT</u> : 1551 FT <u>FLT DURATION</u> : 4:22:49:35 <u>S/T</u> : 816:16:28:48 <u>OV-102</u> : 273:21:09:17 <u>DISTANCE</u> : 1,796,000 sm	and crew and Togr	/ are sh nini/MS		it. In from In rear ar	nt are (re (fron	n the left)	Continued LAUNCH DELAY: - Launch was delayed 7M0S during T-20 minute hold for MILA to change out A Frame Sync Box to restore the forward link Launched at 204:04:31:00Z, 12:31:00 AM EDT on July 23, 1999. SHUTTLE NIGHT LAUNCH #21 TAL WX: - Banjul (prime) was forecast NO GO (thunderstorms and anvil clouds) and observed NO GO (thunderstorms and ceiling). Ben Guerir (selected) was forecast and observed GO. PERFORMANCE ENHANCEMENTS: - Standard set PE LO Q SUM/JUL SHUTTLE NIGHT LANDING # 12: KSC 33 on Wednesday, 7/28/99 at 11:20:35 PM EDT - moonlit landing. FLIGHT DURATION CHANGES: None - Landed on orbit 80 as planned.
ABOVE: Hawley/MS shown with Mexperiment. MEMS monitors a suit RIGHT: Mark Sowa (PAO photogra Columbia above the JSC Rocket Fishuttle Columbia re-entering the at	e of sensors under fligh pher) recorded the fly-o ark. The Saturn V is be	t conditions. ABC	ttle	- At app circuit c resultar controll short w - At lifto erratic. - Four E cutoff o - Right (Post-fil nozzle deactiv for fuel and 8 n - CRT 3 - High-I	on AC1 Phase <i>A</i> at under voltage ers to be disqua as on AC1 Pha aff, the right SRF ET LO ₂ sensors f main engines SSME multiple ight inspection ri tubes caused b ation pin. LH2	Iff plus 5 sectors for approximation of the sector of the	mately 0. ME 1 "A" 'light, it w IE 1 "A" or ressure s y resultin early ME e parame tures in ti of a looso i in contrr w, a 16 fp arryover.	sensor 2 was g in low-level CO. ters deviations hree Engine 2019 e LO ₂ post oller compensating os underspeed,	FIRSTS/LASTS: - First space flight with female Commander (Eileen Collins). - First U.S. flight for Michel Tognini (CNES-France). Michel's first space flight was to Mir on Soyuz TM-15S. - Last flight of phase 2 engines. - Most aft landing Xcg (1099.36)

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		CREW		LANDING SITE/	SSME-TL	0.55				5.0.4.6.15	
FLT	ORBITER	(7)	LAUNCH SITE, LIFTOFF TIME,	RUNWAY, CROSSRANGE	NOM-ABORT EMERG	SRB RSRM	(ORBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.	UNDITER		LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP	1300	PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
110.		TITLE, NAMES	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S		WINDS	ENG. S.N.						
STS-103	OV-103	CDR:	KSC, PAD 39B	KSC 33 (KSC 49)	104/104/	BI-099	28.45°	DIRECT	0I-26B		Brief Mission Summary: The STS-103 mission was the
	(Flight 27) Discovery	Curtis L. Brown (Flt 6 - STS-47,	354:00:50:00Z	362:00:00:47Z 7:00:47 PM EST	109%	RSRM 73	(49)	INSERTION	(6)	20276 LBS	third Servicing Mission to ensure the health of the
SEQ FLT	Discovery	STS-66, STS-77,	7:50:00 PM EST (P) 7:50:00 PM EST (A)	7.00.47 PIVI EST	PREDICTED:	13		POST OMS-2:		PAYLOAD	Hubble Space Telescope (HST), the first of NASA's "Great Observatories". Included were four spacewalks
#96		STS-85, & STS-95)	Sunday 11	Monday 17	100/104.5/	ET-101		315.4 X 170.2		CHARGABLE:	designed to install new equipment and replace old.
KSC-96		P564/R152/V112/M136	12/19/99 (6)	12/27/99 (11)	104.5/67/	SLWT-6		NM		13208 LBS	The primary objective was to replace the six
	OMS PODS: LPO1-30	PLT:	LAUNCH WINDOW:	DEORBIT BURN:	104.5	ст				DEPLOYED:	gyroscopes to restore the three Rate Sensor Units to
PAD 39B-42	RP03-28	Scott J. Kelly	42M16S	361:22:48:26Z	ACTUAL:	<u>RPT</u> :				5423 LBS	full power. Other replacements included: an upgraded
39B-42 MLP-2	FRC3-27	P565/R253/M220	HST Planar/Phase		100/104.5/	283K					computer, a set of Fine Guidance Sensors, and a new
1VIEI 2			Window	XRANGE: 155 NM	104.5/67/	ET.	STS102	3-713-048 (1		NON-DEPLOYED:	Solid State Recorder. Deteriorated insulation on the HST's outer surface was also repaired.
<u>HST FLT</u>		M/S 1/EV 1: Steven L. Smith	EOM PLS: KSC	<u>ORBIT DIR</u> : DL 46	104.5	<u>ET</u> IMPACT:		ember 1999		6451 LBS	nsi s'ouer surface was also repaireu.
#4 (SM-3A)		(Flt 3 - STS-68, STS-82)	<u>TAL: BYD</u> TAL WX: BEN	<u>aim pt</u> : Nominal	1 = 2053 (1)	1:19:15	- Smith	and Grunsf	eld	MIDDECK:	KSC W/D: OPF 141, VAB 9, PAD 36 = 186 days
(SIVI-3A)		P566/R184/V137M161	TAL WX: BEN		2 = 2043 (3)	MET		ig gyroscop		MIDDECK: 1334 LBS	
<u>HST</u> SERVICE		M/C 0	SELECTED:	MLGTD: 2804 FT	3 = 2049 (2)	<u>LAT</u> : 17.4°N		ed in rate	,		LAUNCH POSTPONEMENTS: - Baselined 10/14/99 as launch date on 3/18/99.
SERVICE		M/S 2: Jean-Francois Clervoy	RTLS: KSC 15/N/N	362:00:00:47Z VEL: 187 KGS	ALL IIA	LONG:		units (RSU)		<u>SHUTTLE</u> ACCUMULATED	- Postponed launch to 11/19/99 on 9/16/99. OV-103
<u>FLT #3</u>		(ESA-France)	TAL: BEN 36/N/N AOA: EDW 04/N/N	186 KEAS	ENGINES	141.4°W	inside H		,	WEIGHTS	wire inspections and repair.
		(Flt 3 - STS-66, STS-84)	<u>PLS</u> : EDW 22/N/N	HDOT: -2.9 FPS						DEPLOYED:	- Postponed launch to 12/2/99 on 10/22/99. OV-103
		P567/R186/V140/F163			14 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		5	1 1 10 - 11		930577 LBS	wire inspections and repair. - Postponed launch to 12/6/99 on 11/10/99. OV-103
		M/S 3/EV 2:	<u>TDEL</u> : 0.08 -0.158/-0.12	<u>TD NORM 195</u> : 2237 FT			NAL	1830	1	NON-DEPLOYED: 1411877 LBS	wire inspections and repair.
		John M. Grunsfeld	0.00 -0.130/-0.12		1. 6	1		199 A 1	1 1	CARGO TOTAL:	- Postponed launch to 12/11/99 on 12/7/99.
		(Flt 3 - STS-67, STS-81)	<u>MAX Q NAV</u> :	DRAG CHUTE DEPLOY: 176 KEAS					13	2931118 LBS	Replacement of damaged SSME wiring harness.
		P568/R191/V133/M167	718 720	362:00:00:50Z		N 4		100	-	PERFORMANCE	- Postponed launch to 12/16/99 on 12/9/99. Changeout of dented LH2 4-in Recirc manifold.
		M/S 4/EV 3:	SRB STG:			1 -			the s	MARGINS (LBS):	
		Michael Foale	2:05.3 2:05	NLGTD: 5955 FT			- Control			FPR: 3783	LAUNCH SCRUBS:
		(Flt 5 - STS-45, STS-56,	PERF: NOMINAL	362:00:00:58Z VEL: 141 KGS	Car Co				15	FUEL BIAS: 720	- Scrubbed 12/16/99 launch attempt at 9:18 AM EST at
		STS-63, Up STS-84,& Dn STS-86)		138 KEAS	3		123		1600	FINAL TDDP: 13576 RECON: 13308	ET Tanking MMT while holding at T-6 hours. ET weld wire issue caught by vendor X-ray inspection. ET
		P569/R143/V92/M127	<u>2 ENG TAL (BEN):</u>	HDOT: -4.6 FPS		1	167	122	1	KEGON. 13300	cleared ET hardware. Orbiter needed 24 hours to
			2:05 2:05	<u>BRK INIT</u> : 111 KGS	. 5. 1	1.1.1	minute and		1000	PAYLOADS	review orbiter weld processes and personnel records to
	OWN KO	M/S 5/EV 4:	NEG RETURN:		mar 1	× 1	and the second	No las		PLB:	evaluate possible impact to orbiter hardware. Review found no issue to orbiter fleet. Reset launch to
JOY B	NELLY	Claude Nicollier ESA-Switzerland)	3:51 3:54	DRAG CHUTE	1	fort		March 1		HST SM-3A (3rd HST Service	12/17/99. Technical Scrub.
5		(Flt 4 - STS-46, STS-61, &	PTA (U/S 500):	JETTISON: 54 KGS 362:00:01:18Z		Treat		and a second		Flight)	- Scrubbed 12/17/99 launch attempt at 8:47 PM EST at
ୁ 🦛		STS-75)	3:09 3:08		R. J	1 4	1 1 -			-	4 minutes into window due to KSC range and RTLS
NUS		P570/R150/V98/M134		BRK DECEL FPS ² :						5 CYRO TK SETS	weather. Weather concerns were low ceiling (broken 6500 feet), rain, turbulence, thick cloud layer (triggered
FEL -			PTM (U/S 500): 4:16 4:15	AVE 6.5 PK 10.0	<u>M 3 EOM</u> :					6 GN2 TANKS	lightning), and RTLS crosswinds at limit. Had difficulty
Shar	A July	SS EVA #46 EMU/TETHERED EVA #39 ON 12/22/99		WHEELS STOP:	WEIGHT:					RMS 54	getting Jimsphere balloons to altitude due to icing
- A	FOALE NICO	EVA #39 ON 12/22/99	<u>SE TAL (BYD)</u> : 5:37 5:43	362:00:01:35Z 9809 FT	212288 LBS			DEORBIT:		(S.N. 301)	conditions. Use of 450 MHz radar profiler as backup
		SCHEDULED EVA #40 DURATION 8:15:30		48 SECS	X CG:			330 X 301 NM		RMS USED FOR	confirmation of wind persistence was being worked. EDW runway distance lighting markers power failure.
			MECO CMD:		1080.64			ENTRY		HST GRAPPLE,	FD switched to NOR for AOA and first day PLS.
		SS EVA #47 EMU/TETHERED	8:24.4 8:25.9	<u>ROLLOUT</u> : 7005 FT				VELOCITY:		BERTH, AND	Launch was scrubbed when it became evident bad
		EVA #40 ON 12/23/99	<u>VI</u> : 26128 26124	700311	LANDING:			26114 FPS		RELEASE AND EVA	weather conditions would continue throughout the remainder of the window. Ben Guerir and Banjul TAL
		SCHEDULED EVA #41 DURATION 8:10	26 128 26124		WEIGHT:			ENTRY		SUPPORT	sites were GO. Ben Guerir was selected. Reset launch
				Continued	212217 LBS			RANGE:			to 12/18/99. Window was 42M11S first pane, 10
		Continued	Continued					4237 NM			second cutout, and then 4M11S in second pane.
					X CG: 1082.39						Weather Scrub.
					1002.39						Continued

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SPACE SHUTTLE MISSIONS SUMMARY

FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABOR EMERG	T SRB RSRM	ORBIT	FS W	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-103		Continued	Continued	Continued						Continued <u>LAUNCH SCRUBS</u> :
Continued		SS EVA #48 EMU/TETHERED EVA #41 ON 12/24/99 SCHEDULED EVA #42 DURATION 8:09 MCC WHITE FCR (26) <u>FLIGHT DIRECTORS:</u> A/E/O 4 - N. W.Hale LD/O 1 - L. J. Ham	252 FPS 247 FPS 2:34 2:34 <u>DISTANCE</u> :	<u>WINDS</u> : 1T, 7L KTS OFFICIAL: 2406P12 <u>DENS ALT</u> : -107 FT <u>FLT DURATION</u> : 7:23:10:47 <u>S/T</u> : 824:15:39:35						- Scrubbed 12/18/99 launch attempt at 8:21 AM EST at ET Tanking MMT while holding at T-6 hours due to observed and forecast bad Range and RTLS weather: Rain, low ceiling, and thick clouds triggered lightning conditions. Decision to evaluate 8 + 2, 3 EVA flight, evaluate landing as late as 12/29/99, and vehicle configuration for holiday standdown. At MMT Meeting at 8:30 AM EST on 12/19/99, decision was made to recommend GO for launch on 12/19/99 at 7:50 PM EST. Weather forecast was good and ET MMT gave a GO to tank. Range and RTLS Weather Scrub.
		O 2 - B. P. Austin Plng - J. M. Hanley MOD - J. W. Bantle		<u>OV-103:</u> 204:07:55:46				K		LAUNCH WINDOW: Launch window 42M16S in one pane.
				<u>DISTANCE</u> : 3,267,360 sm			- Crew portrait. Fro , PLT Kelly, & Grut			LAUNCH DELAYS: None - Launched at 354:00:50:00Z (GMT date 12/20/99), 7:50:00 PM EST, on Friday, 12/19/99.
					(It to rt)		, Foale/MS, CDR B			TAL WX: - Banjul (prime) was forecast and observed NO GO with visibility 3 miles (smoke/haze). Ben Guerir (selected) was forecast and observed GO.
		-27 December 1999) elease from RMS.								PERFORMANCE ENHANCEMENTS: - Standard set. PE LO Q WIN/DEC SHUTTLE NIGHT LAUNCH #22 FLIGHT DURATION CHANGES: - Planned landing at KSC on orbit 119. Extended flight one orbit for weather. Waved off landing at KSC on orbit 119 due to crosswinds of 18 knots, peak 19 knots and STA reported turbulence at 500 feet. Landed on KSC 33 on orbit 120.
		A-23					19-21 December 1			SHUTTLE NIGHT LANDING #13 - Landed on KSC 33 on orbit 120 at 362:00:00:47Z, 7:00:47 PM EST on Monday, December 27, 1999.
						iidance Se	(on end of RMS) re nsors (FGS).	placing	J ONE OF HST'S	<u>EVENTS:</u> - HST grapple at 356:00:34:01Z; HST berth 356:01:42:00Z. - EVA-1 - Start at 356:18:41:01Z; MET 02:18:04:40 to
S99-15923	View of JS	SC MCC during Flight Day	3			- Jammed P - Loss of po charger. - HST PFR - Release ha - EMU 2 Po	IT ANOMALIES: FR roll joint. wer indication on middeck bitch joint would not lock. ttch Pip Pin on Starboard <i>i</i> ver up failure. h EMU3 DCM.			03:02:19 MET; duration 8:15:30. - EVA 2 - Start MET 03:18:16 to 04:02:26; duration 8:10. - EVA 3 - MET 04:13:27 to 05:02:36; duration 8:09. - HST unberth at 359:21:18:41Z; HST release 359:23:03:01Z.
		D Linda Ham is at rear righ								RENDEZVOUS # 46: - Rendezvous, capture, service, and release HST.

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		CREW		LANDING SITE/	SSME-TL						
	0001750	(6)	LAUNCH SITE,	RUNWAY,	NOM-ABORT			ORBIT	50.14	PAYLOAD	MISSION HIGHLIGHTS
FLT NO.	ORBITER		LIFTOFF TIME, LANDING SITES,	CROSSRANGE LANDING TIMES	EMERG THROTTLE	RSRM AND	INC	HA/HP	FSW	WEIGHTS, PAYLOADS/	(LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS,
NO.		TITLE, NAMES	ABORT TIMES	FLT DURATION,	PROFILE	ET	INC	палне		EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S	Abolti Himes	WINDS	ENG. S.N.	L'					Thoro, Signi Tohit Michigaeles, ETO.
STS-99	OV-105	CDR:	KSC 39A	KSC 33 (KSC 50)	104/104/	BI-100		DIRECT	01-27	CARGO:	Brief Mission Summary: STS-99 was the first shuttle flight of
SEQ FLT #97	(Flight 14) Endeavour	Kevin R. Kregel (Flt 4 - STS-70, STS-78, &	42:17:43:40Z 12:30:00 PM EST (P)	53:23:22:24Z 6:22:24: PM EST	109%	RSRM	(20)	INSERTION	(2)	35410 LBS	the new century. The primary payload was a space radar,
SEQ FLI #97	Endouvour	ŠTS-87)	12:43:40 PM EST (A)		PREDICTED:	71		POST OMS-2:		PAYLOAD	known as Shuttle Radar Topography Mission (SRTM). The SRTM successfully mapped the Earth in 3-D, 30 times more
KSC-97	OMS PODS:	P571/R197/V129/M172	Friday 20 2/11/2000 (7)	Tuesday 15 2/22/2000 (5)	100/104.5/ 104.5/72/	ET-92		129.5 X 126.1 NM		CHARGEABLE: 29069 LBS	accurately than current global maps. The system used two
PAD	LPO4-21	PLT:	2/11/2000 (7)	2/22/2000 (3)	104.5/72/	E1-92		INIVI		29009 LDS	radar antennas mounted in the shuttle payload bay and two
39A-55	RPO1-28	Dom L. Gorie	LAUNCH WINDOW:	DEORBIT BURN:		LWT		RCS OA		DEPLOYED:	on a 200-foot-long mast extended out of the payload bay.
MLP-3	FRC5-14	(Flt 2 - STS-91) P572/R242/V157/M211	2H10M Closed on SRTM BETA	53:22:25:10Z	ACTUAL: 100/104.5/	85		MANEUVER 4:14:00		260 LBS	This mast was the longest rigid structure deployed in space
			ANGLE	<u>XRANGE</u> : 242 NM	104.5/72/			MET:		NON-DEPLOYED:	at this time. The SRTM is an outgrowth of the Spaceborne Imaging Radar flown on STS-59 and STS-68.
		M/S 1: Gerhard P. J. Thiele	CONSTRAINT	<u>ORBIT DIR</u> : DL 47	104.5			126.5 X 128.7 NM		26987 LBS	
		ESA Germany	EOM PLS: KSC	AIM PT: NOMINAL	1 = 2052 (1)					MIDDECK:	<u>KSC W/D</u> : OPF 257, VAB 10, PAD 44 = 311 days total.
		P573/R254/M221	TAL: ZZA	MLGTD [,] 2885 FT	2 = 2044(3)	JSC200	DOEC	1556 (Janu	ary	1822 LBS	LAUNCH POSTPONEMENTS:
		<u>M/S 2</u> :	TAL WX: MRN,BEN	MLGTD: 2885 FT 53:23:22:24:Z VEL:206 KGS	3 = 2047 (3) ALL BLOCK	2000) -	Ar	tist's concep		SHUTTLE	- Baselined launch date of 6/30/99 on 3/5/98 (OV-104); then to
		Janet L. Kavandi	SELECTED:	207 KEAS	IIA SSME'S			arth mapping	j 🛛	ACCUMULATED	1/22/99 on 6/4/98 (Multi-flight changes ISS SM delay).
		(Flt 2 - STS-91) P574/R243/V158/F32	RTLS: KSC 33/CI/N TAL: ZZA 30/N/N	HDOT: -1.6 FPS		operation	on.			<u>WEIGHTS</u> : DEPLOYED:	- Advanced launch date to 9/16/99 on 7/23/98. OV-104, OV-103 on 7/30/98 to achieve additional GPS DTO Flight. Updates to
		F 374/RZ43/V 130/1 3Z	AOA: NOR 23/CI/N	TD NORM 205:						930837 LBS	flight dates and baseline STS-101 OV-105 on 10/5/98.
		<u>M/S 3:</u>	PLS: EDW 22/CI/N	3004 FT						NON-DEPLOYED:	- Postponed launch date to NET 11/19/99 on 9/16/99.
		Janice Voss (Flt 5 - STS-57, STS-63,	TDEL:	DRAG CHUTE		1.00				1440686 LBS CARGO TOTAL:	STS-103 also NET 11/19/99 due to wire inspections and repairs. - Postponed launch date to 1/13/00; additional wire work and
		STS-83,& STS-94)	0.12 -0.38/-0.04	<u>DEPLOY:</u> 166 KEAS 53:23:22:36Z						2966528 LBS	STS-103 to fly first.
		P575/R167/V115/F22	MAX Q NAV:			100			· .	PERFORMANCE	- Postponed launch date to 1/31/00. STS-103 flight delays and
		M/S 4:	727 733	<u>NLGTD</u> : 6520 FT 53:23:22:34Z		Name.		EK.		MARGINS (LBS):	Y2K testing.
		Mamoru Mohri Japan	<u>SRB STG</u> :	VEL:169 KGS 168 KEAS					THE.	FPR: 3272 FUEL BIAS: 854	LAUNCH SCRUBS:
		(Flt 2 - STS-47)	2:05.6 2:06	HDOT: -65 FPS					<i>i</i>	FINAL TDDP: 1085	- Scrubbed 1/31/00 launch attempt at 31:19:08:55Z
		P576/R155/V159/M137		BRK INIT: 115 KTS						RECON: 395	(T-9M12S) with 40M05S left in 2H02M launch window while counting to T-9 minutes. At T-29 minutes, a preflight BITE test to
			<u>PERF</u> : NOMINAL							PAYLOADS:	the MEC's was executed. MEC 2 (an EMEC) first response was
KREGE	L.		<u>2 ENG TAL (ZZA)</u> :	<u>DRAG CHUTE</u> JETTISON: 52 KGS						PLB:	anomalous (bad address, bad parity, bad SEV). Scrub at
E N		MCC WHITE FCR (27)	2:48 2:46	53:23:23:05Z		-	-			SRTM/SRL-3 with	19:08:55Z (T-9M12S). Decision on a 2/1/00 launch at MMT early Tuesday morning. The Range and RTLS was observed and
2 · ▲ ·		FLIGHT DIRECTORS:	NEG RETURN:	AVE BRK DECEL:			-			radar antennas on	forecast NO GO for 1/31 launch (low ceiling, rain within 20 NM,
92 ×		A/E - J. P. Shannon	3:52 3:55	AVE 5.9 PK 7.8 FPS/S		the second second		- OXA	States	200 ft boom.	field mills in and out, thick cloud layer, and triggered lightning
2	.1.3	LD/O2 - P. F. Dye O-1 - L. E. Cain	PTA (U/S 187):			Carlos and	-	15-AS	-		potential). All 3 TAL sites were GO. Technical/ Weather Scrub. New launch date 2/1/00 at 12:44 PM EST.
	· · · **	O3 - B. P. Austin	5:26 5:21	WHEELS STOP: 53:23:22:23:Z		- and		ADDA	- 3		- Scrubbed 2/1/00 launch attempt at approximately 3:00 AM EST
	GORIE	MOD - J. M. Heflin	DROOP(ZZA):	12828 FT	<u>M 3 EOM</u> :					MIDDECK:	with the decision to change out MEC 2. MEC changeout and
			5:16 N/A	<u>ROLLOUT</u> : 9943 FT	WEIGHT:					EARTHKAM	retest is 5 to 7 days. Tried to get range for 2/9/00. MCC changeout/retest and range availability set next launch to
			PTM (U/S 187):	9943 F I 59 SEC	225092 LBS	ET DDT.		DEORBIT:			2/11/00. Technical scrub.
			6:15 6:11		X CG:	<u>RPT:</u> 283K		127.9 X 124.4			
			SE TAL (ZZA):	<u>WINDS:</u> 1R, 7R KTS	1078.48	CT.		NM			LAUNCH WINDOW: - The Launch Window was 2H10M00S. Opened at 42:17:30:00Z
			6:03	OFFICIAL:	LANDING:	IMPACT		ENTRY			and closed at 42:19:40Z. Closed on 0 degrees beta angle
			MECO CMD: 8:22.5 8:23.42	0507P09		1:12:05		VELOCITY:		5 CRYO TK SETS	constraint for SRTM operations.
			0.22.0 0.23.42	SS: 2T, 7R PK: 3T, 12R	WEIGHT: 225030 LBS	MET LAT:		25714		5 GN2 TANKS	
			<u>VI</u> : 25776 25769			47.41°S		<u>ENTRY</u>		NO RMS	Continued
				<u>DENS ALT</u> : 72 FT	X CG: 1080.19	<u>LONG</u> : 162.19°W		RANGE: 4624			
			Continued	Continued	1080.19	102.19°W		4024			

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FLT	ORBITER	CREW (6)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM	(ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP	1.500	PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
TS-99 ontinued			Continued OMS-2: 34:59.5 35:03 181 FPS 181 FPS	Continued							Continued LAUNCH DELAYS: - Launch delay was 13M40S. Held at T-9 minutes hold to cleat the IPR's: (1) MPS LH2 manifold P, (2) cabin pressure leak check at lower pressure, and (3) Hyd Sys 1 Circ Pump pressu low. Launched at 42:17:43:40Z, 12:43:40 PM EST, on Friday, February 11, 2000. TAL WX: - Zaragoza (prime and selected); Moron (2-engine TAL Call), a Ben Guerir were all forecast and observed GO. PERFORMANCE ENHANCEMENTS: - Standard Set plus: (1) Interim generic High Q WIN/FEB, and OMS Assist is 4000 lbs. FLIGHT DURATION CHANGES: Extended One Rev due to
ftlong m Topograp	nast supporting i	y 2000) The 200 he Shuttle Radar into space from at left).	S.S. Stations 7 and			from her) PLT Go	orie, Kavandi/		nter: Voss/MS, iele/MS (ESA),	Crosswind Violations at KSC. Waved off landing on orbit 181. FIRSTS/LASTS: - First shuttle flight in the year 2000. - First flight of Shuttle Radar Topography Mission using dual- antenna imaging radar with antennas mounted on 200 foot extended boom. - Last flight of Lightweight ET.
21 Februa	ary 2000) Pe	2733 (Release Date: rspective view of San									EVENTS: - Landed on KSC runway 33 on orbit 182 at 53:23:22:24Z, 6:22:24 PM EST on Tuesday, 2/22/00. SIGNIFICANT ANOMALIES: - GPC I/O Errors and EMEC preflight BITE error. - LH ₂ Manifold Pressure Tape Meter Oscillations. - WSB 2 under cool during ascent. - CRT 1 BITE. - ET GH2 Ullage Pressure Low at MECO. - Forward Mission Timer Display Elements Failed. - RRCS Fuel Regulator B Primary Stage Leakage. - Vernier Thruster L5D Oxidizer Temperature Erratic. - Supply water dump nozzle blockage. - APU 1 GG Injector tuber temperature failure.
was creat image (sł developm	ted by draping a howing resident nent) over an SF ohy is exaggerat	Idale, CA. The view a Landsat satellite ial and agricultural RTM elevation model. ted 1.5 times	Center (POCC).	00-01451 SRTM From left are Mike 0-01454 Scott D	Kobrick, Ian	Joughin a	and Dian	e Ainsworth.		ABOVE	

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			•••								
		CREW	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(7)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		UKDIT	FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.	UNDITER		LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP	1.300	PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
NO.		TITLE, NAMES	ABORT TIMES	FLT DURATION,	PROFILE	ET	INC			EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S	ADOICT HIVES	WINDS	ENG. S.N.	L1					TINSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-101/	OV-104	CDR:	KSC 39A	KSC 15 (KSC 51)	104/104/	BI-101	51.60	DIRECT	01-27	CARGO:	Brief Mission Summary: STS-101, 3rd mission to ISS, was
ISS 2A.2a	(Flight 21)	James D. Halsell	140:10:11:10Z	150:06:20:19Z	109%		(3)	INSERTION	(3)	35604 LBS	initially designed to outfit the Russian Zvezda crew quarters.
155 ZA.Za		(Flt 5 - STS-65, STS-74,	6:11:10 AM EDT (P)	2:20:19 AM EDT		RSRM					However, Zvezda's launch was delayed and the mission was
SEQ FLT #98	Atlantis	STS-83, STS-94) P577/R178/V123/M156	6:11:10 AM EDT (A)	Monday 10	PREDICTED: 100/104.5/	74		POST OMS-2: 178.9 X 85.2		<u>PAYLOAD</u> CHARGEABLE:	changed to ISS maintenance and logistics support.
		P377/R178/V123/W130	Friday 21 5/19/00 (6)	Monday 18 5/29/00 (9)	100/104.5/ 104.5/72	ET-102		NM		24733 LBS	Outfitting Zvezda would await STS-106 later in the year. A
KSC-98	OMS PODS:	PLT:	3/1//00 (0)	3/2/100 (7)	104.5	SLWT-7				24755 205	high priority of this flight was the replacement of four of six
DAD	LPO3-25	Scott J. Horowitz	LAUNCH WINDOW:	DEORBIT BURN:	ACTUAL:					DEPLOYED:	800 amp Zarya batteries. Also, this was first flight of Shuttle
<u>PAD</u> 39A-56	RPO4-21	(Flt 3 - STS-75, STS-82)	5M4S BASED ON	150:05:12:10Z	100/104.5/	<u>ET</u> IMPACT				3371 LBS	"Glass Cockpit" upgrade.
MLP-1	FRC4-21	Þ578/R210/V135/M183	ISS IN-PLANE TIME	XRANGE: 95.8 NM	96/72/ 104.5	<u>IMPACT</u> 1:26:29					
		M/S 1:	EOM PLS: KSC		104.5	MET				NON-DEPLOYED: 20159 LBS	KSC W/D: OPF 333, VAB 8, PAD 50 = 391 days total.
THIRD		Mary Ellen Weber	TAL: ZZA	<u>ORBIT DIR</u> : AL 24	1 = 2043 (4)					20107 200	
SHUTTLE FLIGHT TO		(Flt 2 - STS-70)	TAL WX: MRN, BEN	<u>aim pt</u> : Nominal	2 = 2054(1)	LAT:				MIDDECK:	LAUNCH POSTPONEMENTS: - Baselined 8/5/99 as launch date on 10/5/98. Postponed to
ISS		P579/R198/V160/F26		MLGTD: 3269 FT	3 = 2049 (3)	1.955				1262 LBS	10/14/99, then 12/2/99. TACAN scars removed for GPS scar
		M/S 2/EV1:	<u>SELECTED</u> : <u>RTLS</u> : KSC 15/CI/N	150:06:20:19 Z	ALL BLOCK	LONG:				SHUTTLE	then reinstated TACAN.
SPACEHAB		Jeffrey N. Williams	TAL: ZZA 30/CI/N	VEL: 202 KGS	IIA SSME'S	<u>LONG</u> : 127.3 W				ACCUMULATED	- Postponed launch to 11/19/99 on 9/16/99. OV-103 wire
#14		P580/R255/M222	AOA: KSC 15/CI/N	199 KÉÁS HDOT: -2.0 FPS		.27.0 W	150			WEIGHTS	inspections and repair. - Postponed launch to 12/2/99 on 10/22/99. OV-103 wire
		M/S 3/EV2:	PLS: EDW 04/N/SF			in the	182	it on		DEPLOYED:	inspections and repair.
		James S. Voss		<u>TD NORM 205</u> : 2731 FT						934208 LBS	- Postponed launch to 4/14/00 on 4/16/00. CDR training accident
		(Flt 4 - STS-44, STS-53,	TDEL: 0.09 -0.388/-0.19					St 1422		NON-DEPLOYED: 1462107 LBS	(ankle)
		ŠTS-69) P581/R136/V85/M121)		DRAG CHUTE	ALC: NOT STREET	ALC: NO DE CONTRA		itin		CARGO TOTAL:	- Postponed launch to 4/24/00 on 4/16/00. OV-104 Rudder/ Speed Brake PDU R&R from OV-102.
		P381/R130/V85/W121)	MAX Q NAV: 714 709	DEPLOY: 189 KEAS 150:06:20:22 Z	CER -	GUUN		11111	and the	3002132 LBS	Speed Diake PDU Rak IIUIII UV-102.
		<u>M/S 4:</u>			- Charles				and the second second	DEDEODUUNOE	LAUNCH SCRUBS:
		Susan J. Helms	SRB STG:	NLGTD: 6752 FT						PERFORMANCE MARGINS (LBS):	- Scrubbed 3:17:17 PM EDT (115:20:17:17Z) 4/24/00 launch
		(Flt 4 - STS-54, STS-64, STS-78)	2:04.8 2:04	150:06:20:30 Z VEL: 154 KGS	15 18 M	STAT	124 12			FPR: 3783	attempt while holding at T-9 minutes due to high RTLS
		P582/R158/V108/F19	PERF: NOMINAL	152 KEAS HDOT: -4.2 FPS						FUEL BIAS: 720	crosswinds. Scrub was declared at approximately L-15 minutes, when RTLS crosswinds observed and forecast to
				HDOT: -4.2 FPS	AT PZ			LES BELL		FINAL TDDP: 733	exceed the 15-knot limit.
	The	M/S 5:	<u>2 ENG TAL (ZZA)</u> : 2:27 2:27	BRK INIT: 102 KGS	and the	CRIVE S	-			RECON: 998	- Scrubbed 2:53:17 PM EDT (116:19:53:17Z) 4/25/00 launch
HALSELL	CASE	Yuri Usachev (Russia)			271	Street and	a and a			PAYLOADS:	attempt at L-1:35:00 by Launch Director when RTLS crosswinds
HOROWITZ	Those a	P583/R256/M223	NEG RETURN:	DRAG CHUTE JETTISON: 54 KGS	A STA		Ballin - R	The second		PLB:	persisted in 29-30 knots range and were forecast to exceed limit.
USACHEV	+ and		3:52 3:56	150:06:20:57 Z			0= 8- m		S 12		RTLS Weather Scrub. - Scrubbed 2:34:16 PM EDT (117:19:34:17Z) 4/26/00 launch
WEB	ER	SSEVA #49	PTA (U/S 269):	BRK DECEL (fps/s):	13				augusta -	ISS 2A.2a	attempt at 117:19:21Z (L-0H13M) while holding in T-9 min hold
	ALLIAMS	EMU TETHERED EVA #42	4:42 4:47	AVE 5.3 PK 6.6		(Binat)	Theory of the		el ^{ge}	Spacehab DM	attempt at 117:19:21Z (L-0H13M) while holding in T-9 min hold due to no TAL site. All three TAL sites were observed and
and the second		SCHEDULED EVA #43	DROOP (ZZA):	WHEELS STOP:	S99-014	17 1st fl	ight M	EDS cockpit		ICC, SEM-06, MARS RMS, ODS	forecast NO GO: ZZA for showers within 20 nm and forecast
		DURATION 6:44	5:26 5:28	150:06:21:07 Z						11113, 003	chance of broken 4000 feet. MRN for showers/thundershowers and forecast chance of broken 3000 feet. BEN was observed and
				12182 FT	<u>M 3 EOM</u> :						forecast NO GO for crosswind violation BEN wind swing from
		MCC WHITE FCR (28) FLIGHT DIRECTORS:	PTM (U/S 269): 5:59 6:06		WEIGHT:			DEORBIT:		MIDDECK:	around 285 degrees to around 300 degrees after sundown did not
		A/E - J. P. Shannon		<u>ROLLOUT</u> : 8913 FT	226277 LBS			APOGEE: 207.2 NM		CPCG PCG-BAG	around 285 degrees to around 300 degrees after sundown did not materialize - crosswind forecast was steady state R11 and P16. The launch window opened 117:19:24:42Z and closed at 117:1934:16Z and the PLT was 117:19:29:13Z for a launch
		LD/01 - P. L. Engelauf	<u>SE TAL (ZZA</u>):	48 SEC	X CG:			PERIGEE:		BIOTUBE	The launch window opened 117:19:24:42Z and closed at
		O2 - K. B. Beck	6:02 6:02	WINDS:	1081.20			189.3 NM		AST	window of 4M55S. TAL WX Scrub.
		PLNG - C. W. Shaw	MECO CMD:	2407P09							- Unable to get May 9 launch date due to GOES launch delays.
• +	Correction of the second secon	PLNG/O2 - L. E. Cain (Beck, Shaw, and Cain	8:23.8 8:25.3	SS:OH 7R	LANDING:			ENTRY			Scheduled a May 18 launch at 6:32:00 AM EDT. At
Non +	A DEC	switched shifts during flight.)	VI:	PK:IH 9R	WEIGHT: 226212 LBS			VELOCITY: 25899 FPS		5 CRYO TK SETS 6 GH2 TANKS	approximately L-36 hours, the Atlas III launch scrub due to high
			25931 25930	<u>DENS ALT:</u> 1591 FT				23077113		RMS 55	winds caused a slip to May 19.
		ISS LD/O1 - P. S. Hill	OMS-2:	1591 F I	X CG:			<u>ENTRY</u>			LAUNCH WINDOW:
		ISS O2 - A. F. Algate ISS PLNG - J. M. Curry	<u>43:04</u> 43:04	Continued	1082.85			RANGE:		RMS USED FOR	- Window opened at 140:10:09:29Z and closed at 140:10:16:14Z
		MOD - J. W. Bantle	81.3 FPS 81.4 FPS	Continued				4449 NM		EVA SUPPORT	for a total window of 6M45S. Selected Preferred Launch Time
											(PLT) of 140:10:11:10Z for a launch window of 5M4S.
											Continued
				1							Continueu

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FLT NO.	ORBITER	CREW (7) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE ENG. S.N.	SRB RSRM AND ET	INC	orbit Ha/HP	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-101/ ISS 2A.2a Continued				Continued <u>FLT DURATION</u> : 9:20:09:09 <u>S/T</u> : 845:17:27:28							Continued <u>LAUNCH DELAYS</u> : None - Launched on time at 140:10:11:10Z, 6:11:10 AM EDT on Friday, May 19, 2000. <u>TAL WX</u> : - Zaragoza (Prime and Selected), Moron, and Ben Guerir all
*				0 <u>V-104:</u> 160:18:39:34 <u>DISTANCE</u> : 5,076,281 sm							For a goza (Finite and Selected), wordin, and ben Gueni and forecast and observed GO. PERFORMANCE ENHANCEMENTS: Standard Set Plus: (1) PE Operational - High Q TRN/APR, (2) OMS Assist is 4000 lbs, (3) 52 NM MECO, and (4) Del psi FLIGHT DURATION CHANGES: One-day extension. Extended flight one day to accomplish ISS tasks. SHUTTLE NIGHT LAUNCH #23 SHUTTLE NIGHT LANDING #14 - Landed on KSC runway 15 at 150:06:20:19Z, 2:20:19 AM EDT on Monday, May 29, 2000. FIRSTS/LASTS: - First flight of glass cockpit (MEDS) - First flight of OV-104 since STS-86 after OMDP.
		ams/MS attaches Russ Strela was delivered o			(Node 1).	Rear (MS, & F	from lef LT Hor	ght crew po ft): Weber/M owitz. Fron ′oss/MS.	IS, CDI	R Halsell,	 First flight of OV-104 since STS-86 after OMDP. <u>EVENTS:</u> ISS ring capture at 142:03:56:10Z Docked with ISS PMA2 Node 1 Forward Port at 142:04:44:09Z, 1:18:32:59 MET. EVA 1 Start at 143:01:52:58Z, 2:15:41:48 MET and End at
							Left OMS Left OMS Post-Firing Ku-band I PRSD Ox Collins TA Slump tile APCU 1 c MEDS MI	Engine GN2 reg Purges. radiating within F xygen Tank 4 He XCAN BITE fault e at wing leading converter B failu DU CRT 2 displa	Ilant Valv gulator protect eater temp s. edge with re. ay screen	oorarily failed. h internal flow.	 143:08:36:58Z, 2:21:25:48 MET, duration 6:44. Reboost #1 - Start at 145:00:02:11Z, 4:13:51:01 MET, 29.06 fps, final orbit 190 by 184 nm, increase approximately 9 nm. Reboost #2 - Start at 146:02:14:01Z, 5:16:02:51 MET, 29 fps, final orbit 196 by 195 nm, increase approximately 9 nm. Reboost #3 - Start at 146:23:32:38Z, 6:13:21:28 MET, 28.2 fps, final orbit 206.7 by 199.5 nm. Undocked at 147:23:02:38Z, 7:12:51:18 MET STS-101/2A.2a ISS Visitor Time is 5D:18H:18M:29S (Docking to Undocking) Total transfers: To ISS, 3371 lbs consisting of 2657 lbs dry cargo (IVA), 4 CWC's with 387 lbs H2O, and External (EVA) 327 lbs. Completed air quality work, R&R FGB failed electrical equipment and FGB lifetime equipment. EVA tasks completed include installation of OTD and Strela cranes and ECOMM antenna R&R.
Helms/M		-29 May 2000) pattery maintenance	Launch wind	279 - In JSC MC s. From left: Lari Henry Cordova &	ry Bourgeois	/Space	Ops, St	teve Hawley	/FCOE		RENDEZVOUS #47 - Rendezvous and dock with ISS at PMA2, Node 1 Forward Port.

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FLT NO.	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME, LANDING SITES.	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES	SSME-TL NOM-ABORT EMERG THROTTLE	SRB RSRM AND	INC	ORBIT	FSW	PAYLOAD WEIGHTS, PAYLOADS/	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS,
NO.		TITLE, NAMES & EVA'S	ABORT TIMES	FLT DURATION, WINDS	PROFILE ENG. S.N.	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-106/ ISS 2A.2b SEQ FLT #99	OV-104 (Flight 22) Atlantis	CDR: Terrence W. Wilcott (Fit 4 - STS-68, STS-79, STS-89) P584/R183/V130/M160	KSC PAD 39B 252:12:45:47Z 8:45:47 AM EDT (P) 8:45:47 AM EDT (A) Friday 22 9/8/00 (10)	KSC 15 (KSC 52) 264:07:56:44Z 3:56:44 AM EDT Wednesday 11 9/20/00 (10)	104/104/ 109% <u>PREDICTED</u> : 100/104.5/ 104.5/72	BI-102 RSRM 75 ET-103	51.60 (4)	DIRECT INSERTION <u>POST OMS-2</u> : 176.4 X 85.0 NM	OI-27 (4)	<u>CARGO:</u> 34991 LBS <u>PAYLOAD</u> <u>CHARGEABLE</u> : 23967 LBS	<u>Brief Mission Summary</u> : The goal of the STS-106 mission, 4 th mission to ISS, was to prepare the Zvezda Service Module for the arrival, later in the year, of the first residents, Expedition 1 crew, to start a permanent human presence on the ISS outpost.
KSC-99 <u>PAD</u> 39B-43 MLP-2	OMS PODS: LPO3-26 RPO4-22 FRC4-22	PLT: Scott D. Altman (Flt 2 - STS-90) P585/R237/V161/M207 <u>M/S 1/EV1</u> : Edward T. Lu	LAUNCH WINDOW: 3:54 USING PLT (IN- PLANE TIME) EOM PLS: KSC TAL: ZZA	<u>DEORBIT BURN:</u> 264:06:50:07 Z <u>XRANGE</u> : 203 NM <u>ORBIT DIR</u> : AL 25	104.5 <u>ACTUAL</u> : 100/104.5/ 98/72/104.5 1 = 2052 (2)	SLWT-8 <u>ET</u> I <u>MPACT</u> 1:26:12 MET	Atlar a mu since depa	106-712-028 ntis crew foun uch larger ISS e STS-101 arture with the	nd S	<u>DEPLOYED</u> : 5399 LBS <u>NON-DEPLOYED</u> : 17935 LBS	KSC W/D: OPF 66, VAB 5, PAD 22 = 93 days total. LAUNCH POSTPONEMENTS: - Baselined launch date of 8/19/00 on 2/17/00. - Postponed launch to 9/8/00 on 5/17/00. LAUNCH SCRUBS: None
FOURTH SHUTTLE FLIGHT TO ISS SPACEHAB #15		(Flt 2 - STS-84) P586/R222/V162/M194 <u>M/S 2</u> : Richard A. Mastracchio P587/R257/M224 M/S 3:	TAL WX: MRN, BEN SELECTED: RTLS: KSC 33 N/N TAL: ZZA 30 N/N AOA: NOR 17N/SFD PLS: EDW 22 N/N	<u>AIM PT</u> : CLOSE IN <u>MLGTD</u> : 2951 FT 264:07:56:44Z VEL: 187 KGS 186 KEAS HDOT: -2.5 FPS <u>TD NORM 205</u> :	2 = 2044 (4) 3 = 2047 (4) ALL BLOCK IIA SSME'S	<u>LAT</u> : 2.46°S <u>LONG</u> : 128.1°W	Ruse and	tion of the sian Zvezda a docked gress resupply	y	MIDDECK: 1172 LBS <u>SHUTTLE</u> <u>ACCUMULATED</u> WEIGHTS: <u>DEPLOYED</u> : 939607 LBS	LAUNCH SCRUBS. Note LAUNCH WINDOW: - Launch window opened at 252:12:42:01Z and closed at 252:12:49:41Z for a total window of 7M40S. Preferred Launch Time (PLT) (In-Plane Time) was 252:12:45:47Z, 8:45:47 AM EDT, resulting in a launch window of 3M54S.
		Mis J. Daniel C. Burbank P588/R258/M225 <u>M/S 4/EV2</u> : Yuri Malenchenko (Russia) P589/R259/M226 M/S 5:	TDEL: 0.09 -0.348/-0.31 MAX O NAV: 710 710 712 SRB STG: 2:03.4	<u>DRAG CHUTE</u> <u>DEPLOY:</u> 180 KEAS 264:07:56:46Z <u>NLGTD</u> : 5485 FT 264:07:56:52Z VEL: 153 KGS 153 KEAS		a state of the second		*		NON-DEPLOYED: 1481214 LBS <u>CARGO TOTAL</u> : 3037123 LBS <u>PERFORMANCE</u> <u>MARGINS (LBS)</u> : FPR: 3274 FUEL BIAS: 818	LAUNCH DELAYS: None - Launch occurred on time at 252:12:45:47Z, 8:45:47 AM EDT on Friday, September 8, 2000. TAL WX: - Zaragoza (Prime and Selected) and Moron (2-engine TAL) were both forecast and observed GO, Ben Guerir was forecast and observed NO GO for crosswinds. KSC RTLS forecast and observed precipitation within 20 nm; however, was GO based on
		Boris Morukov (Russia) P590/R260/M227 SS EVA #50 EMU/TETHERED EVA #43 SCHEDULED EVA #44 DURATION 6:14	PERF: NOMINAL 2 ENG TAL (ZZA): 2:23 2:28 2:23 NEG RETURN: 3:52 3:52 3:52 PTA (U/S 267): 3:52	HDOT: -6.3 FPS <u>BRK INIT</u> : 71 KGS <u>DRAG CHUTE</u> <u>JETTISON: 56 KGS</u> <u>264:07:57:23Z</u> <u>BRK DECEL FPS²:</u> <u>AVE 2.7 PK 4.8</u>				46		FINAL TDDP: 1940 RECON: 317 PAYLOADS: PLB: ISS-2A.2b Spacehab/DM ICC (SHOSS Box, SOAR)	Flight Rule A2.1.1-6C4e, f, and g, LANDING SITE WEATHER CRITERIA [HC], "2-nm vertical clearance from the top of that shower and a 10-nm lateral clearance must be maintained along the approach paths" <u>PERFORMANCE ENHANCEMENTS</u> : - Standard Set plus: (1) PE Operational High Q SUM/SEP, (2) OMS assist is 4000 lbs, (3) 52 NM MECO, and (4) Del Psi
			<u>Historization</u> 4:38 <u>PTM (U/S 267)</u> : 5:46 <u>SE TAL (ZZA)</u> : 5:52 SE PTM (U/S 827) 6:05	WHEELS STOP: 264:07:58:022 12078 FT ROLLOUT: 9127 FT 78 SEC WINDS:	<u>M 3 EOM:</u> WEIGHT: 222835 LBS X CG: 1080.07 LANDING:			DEORBIT: APOGEE 206 NM PERIGEE 205 NM ENTRY		GAS (2) RMS, ODS <u>MIDDECK</u> : CGBA DTO EMU H/W EVA Tools	FLIGHT DURATION CHANGES: - One-day extension. Extended Flight one day to accomplish additional ISS tasks. <u>SHUTTLE NIGHT LANDING #15</u> : - Landed on KSC runway 15, orbit 185 at 264:07:56:44Z, 3:56:44 AM EDT on Wednesday, September 20, 2000.
	JSS TUDE	Continued	SE PTM (0/S 827) 6:49 6:48 MECO CMD: 8:24.3 8:24.3 8:25.6 Continued	1306P09 SS: 5H 2L PK: 8H 4L <u>DENS ALT</u> : 1761 FT Continued	WEIGHT: 222774 LBS X CG: 1081.73			<u>ENTRY</u> RANGE: 4390 NM ENTRY <u>VELOCITY</u> : 25892		5 CRYO TK SETS 6 GN2 TKS RMS 56 RMS USED FOR EVA SUPPORT	Continued

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			•••	ACE SHU							
FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
rS-106/ S 2A.2b		Continued MCC WHITE FCR (29) <u>FLIGHT DIRECTORS</u> : A/E - N. W. Hale LD/O1 - P. L. Engelauf O2 - P. F. Dye O3 - K. B. Beck O4 - W. D.Reeves ISS LD/O1 - M. J. Ferring ISS O2 - J. M. Hanley ISS PLNG - R. E. LaBrode MOD - J. W. Bantle	Continued <u>VI:</u> 25926 25928 <u>OMS-2</u> : 44:00 44:00 81 FPS 81 FPS 00:52 00:54	Continued <u>FLT DURATION:</u> 11:19:10:57 <u>S/T:</u> 857:12:38:25 <u>OV-102:</u> 172:13:50:31 <u>DISTANCE</u> : 4,919,243 sm							Continued <u>EVENTS:</u> - OMS Assist Start 2:23 MET - Orbiter/ISS capture at 254:05:51:16Z, 1:17:05:59 MET - Docked to ISS PMA2 Node 1 Forward Port at 254:06:04:532 1:17:19:06 MET. - Shuttle ISS EVA #6. EVA Start at 255:04:46:47Z, 2:16:01:5 MET, EVA End 255:11:00:47Z, duration 6:14. Routed and connected 9 power, data, and comm cables between Zvezda (SM) and Zarya (FGB). Installed magnatometer to ISS for usi compass relative to Earth. - Inert weight adjustment is -200 lbs. - Reboost #1 - Start at 255:12:28:47Z, 2:23:43:00 MET, 11 fp: altitude increase 3.2 nm, orbit 201 by 191 nm.
(8-20 Se 2000) unique p	picture s the cabi tis, the m, and				from the I Altman.	eft, Mal Back, fro	enchen om left,		A), CDR S, Lu/M	ISS. Front, Wilcutt, PLT S &	 Reboost #2 - Start at 258:06:13:17Z, 5:17:27:30 MET, 11.4 f altitude increase 3.2 nm, orbit 203.4 by 195.3 nm. Reboost #3 - Start at 259:06:45:47Z, 6:18:00:00 MET, 11.4 f altitude increase 3.4 nm, orbit 206.3 by 199.2 nm. Reboost #4 (Unplanned pre-mission) - Start at 261:03:25:47 8:14:40:00 MET, 11.6 fps, altitude increase 3.3 nm, orbit 208. 203.8 nm. Undocked at 262:03:46:05Z, 9:15:00:18 MET STS-106/2A.2b crew ISS Visitor Time is 7:21:41:05 (Docking Undocking). Total Transfers - Shuttle to ISS, 5399 lbs (Includes 10 CWC' with 780 lbs of H2O.) ISS to Shuttle, 948 lbs. Net transfer to is 4451 lbs. Installed magnetometer and three SM battery blocks. Connected FGB/SM cables. R&R'ed and C/O two FGB batter systems. R&R'ed FGB limited life items, delivered exercise devices. Prepared crew quarters for Expedition 1 crew.
IN THE JS	SC MCC	- LEFT: (I to r) FD's Le	roy Cain, Wayne	Hale & Jeff Bant	le await laun	ch for "l	baton" h	andoff from	A State of the sta	a to Houston.	RENDEZVOUS #48: - Rendezvous and dock with ISS at PMA2, Node 1 Forward F SIGNIFICANT ANOMALIES: - MNB APC5 60 ampere bus transient, power supply fail BITE - Fuel Cell 1 H₂ flowmeter failed OSL - Aft Main Bus B current spike - Loss of crew audio for OCA video conferencing - Ku-band forward link lost - Z Star Tracker failure - Left OMS Forward Fuel Probe failure - ODS C/L Camera misalignment - Camera C iris failed to fully close - Left Vent 8 and 9 Drive Microswitch failures - MSBLS 2 range failure
		ning with FD Kelly Bec									

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		CREW		LANDING SITE/	SSME-TL						
		(7)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT NO.	ORBITER	(*7	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NU.		TITLE, NAMES	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION,	THROTTLE PROFILE	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S	ADURT HIVILS	WINDS	ENG. S.N.	L1					TIKSTS, SIGNIFICANT ANOWALIES, ETC.)
STS-92/	OV-103	<u>CDR</u> :	KSC 39A	EDW 22, CONC	104/104/	BI-104		DIRECT	01-27	CARGO:	Brief Mission Summary: STS-92, the 5th mission to ISS,
100.24	(Flight 8	Brian Duffy	285:23:17:00 Z	EDW 46, CONC 27	109%	DODU	(5)	INSERTION	(5)	35250 LBS	delivered the first framework structure, Z1 truss, to house
	(Discovery)	(Flt 4 - STS-45, STS-57, STS-72)	6:17:00 PM EST 6:17:00 PM EST	298:20:59:42 Z 12:59:42 PM PST	PREDICTED:	RSRM 76		POST OMS-2:		PAYLOAD	communications and motion control equipment; and
SEQ FLT # 100		P591/R142/V94/M126	Wednesday 10	12.07.121 111 01	100/104.5/			175.1 x 85.4		CHARGEABLE:	delivered the third Pressurized Mating Adapter docking
FLI# 100	OMS PODS:		10/11/00 (10)	Tuesday 16	104.5/72/	ET-104		NM		28009 LBS	station. This was the 100 th mission of America's Space Shuttle.
KSC-100	LPO1-31 RPO3-29	PLT: Pamela A. Melroy	LAUNCH WINDOW:	10/24/00 (8)	104.5	SLWT 9				DEPLOYED:	Shutte.
	FRC3-28	P592/R261/F34	4:12 USING PLT	DEORBIT BURN:	ACTUAL:	OLUT /		<u>TI BURN</u> : 1/14:52 MET		21998 LBS	KSC W/D: OPF 197, VAB 10, PAD 21 = 238 days total.
<u>PAD</u> 39A-57			(IN-PLANE TIME)	298:19:52:00Z	100/104.5/			ODDIT			
		M/S 1/EV1: Lerov Chiao	EOM PLS: KSC	XRANGE: 200 NM	104.5/72/ 104.5			<u>ORBIT</u> : 206.2 X 200.1		NON-DEPLOYED: 4678 LBS	LAUNCH POSTPONEMENTS: - Baselined launch date of 7/23/98 on 3/13/97
MLP-3		(Flt 3 - STS-65, STS-72) P593/R179/V125/M157	TAL: ZZA	ORBIT DIR: AL 26				NM			- Postponed launch to 1/14/99 on 5/27/97. ISS Flight Delays
FIFTH		P593/R179/V125/M157	TAL WX: MRN, BEN		1 = 2045(3)					MIDDECK: 1333 LBS	- Postponed launch to 6/17/99 on 6/4/98. ISS Flight Delays
SHUTTLE		M/S 2/EV2:	SELECTED:	<u>aim pt</u> : Nominal	2 = 2053 (2) 3 = 2048 (2)	STS092	2-S-02	2 [EC00-0311-;	31	1999 FRO	- Postponed launch to 12/2/99 on 2/4/99. ISS Flight Delays - Postponed launch to 6/14/00, then to 10/28/99, to 9/21/00, to
FLIGHT TO ISS		William S. McArthur	RTLS: KSC 33 N/N	MLGTD: 2656 FT		(24 OC	TOBE	R 2000)		<u>SHUTTLE</u>	10/5/00 due to ISS Service Module Delays
155		(Flt 3 - STS-58, STS-74) P594/R172/V124/M150	TAL: BEN 36 CI/N AOA: KSC 33 N/N	298:20:59:42Z	ALL BLOCK	Succes	sful lar	nding at EAFB	of	ACCUMULATED WEIGHTS:	
		P 394/R 172/V 124/W130	PLS: EDW CI/N	VEL: 205 KGS 201 KEAS	IIA ENGINES			tle mission – "S	Still	DEPLOYED:	LAUNCH SCRUBS: - Scrubbed launch on EST date of 10/5/00 at ET Tanking MMT
		<u>M/S 3/EV3</u> :		HDOT: -2.9 FPS		young a	at 100"	, PAO.		961605 LBS	due to Orb/ET Attach Bolt Protrusion. Launch was scheduled for
		Peter J. K. (Jeff) Wisoff (Flt 4 - STS-57, STS-68,	<u>TDEL</u> : 0.00 -0.04	TD NORM 195:						NON-DEPLOYED: 1487225 LBS	9:38:46 PM EST (280:01:38:46Z GMT date of 10/6/00). A
		STS-81)	0.00 -0.04	3287 FT						CARGO TOTAL:	Review of STS-106 ET 35 mm film revealed RH Orbiter/ET attach bolt protruding several inches causing concern for bolt contact
		P595/R166/V110/M145	MAX Q NAV:	<u>DRAG CHUTE</u> <u>DEPLOY</u> : 188 KEAS						3072373 LBS	with Orbiter during sep sequence with potential for a tip load and
4		M/S 4/EV4:	752 748	DEPLOY: 188 KEAS 298:20:59:46Z				h		PERFORMANCE	subsequent ET/Orbiter contact. Film review of additional flights and loads analyses needed to clear STS-92 launch. During
		Michael E. Lopez-Alegria	SRB STG:					//		MARGINS (LBS):	recycle. POGO valve #2 did not get an open indication when
DUFFY	MELRO	(Flt 2 - STS-73)	2:02.6 2:02	<u>NLGTD</u> : 6504 FT 298:20:59:54Z	4					FPR: 3274	recycle, POGO valve #2 did not get an open indication when valve was cycled open. Replaced POGO valve with launch date
3+1	E	È596/R202/V163/M175	PERF: NOMINAL	VEL: 144 KGS		a 10 0	· · · · ·			FUEL BIAS: 818 FINAL TDDP: 1532	of 10/9/00. Completed film review and analyses which cleared protruding bolt concern (within pogo valve replacement time.).
The second		<u>M/S 5</u> : Koichi Wakata		152 KEAS HDOT: -6.7 FPS			1 Mars		1	RECON: 2330	Technical Scrub. Reset launch for 10/9/00 EST, 10/10/00 GMT.
3			<u>2 ENG TAL (BEN)</u> : 2·25 2·27			1		1. A.			- Scrubbed launch on EST date of 10/9/00 at ET Tanking MMT
		(Japan) (Flt 2 - STS-72)	2:25 2:27	<u>BRK INIT</u> : 67 KGS	And in case of the local division of the loc				1000	<u>PAYLOADS</u> : PLB:	due to wind gusts greater than 42 knots holding up extension of the GO_2 Vent Arm. Ran out of time to complete work in time for
MISOS	CHIP	P597/R208/V164/M181	NEG RETURN:	DRAG CHUTE		0-10-	To San D	the state of the	the case	ISS-3A	launch at 8:05:17 PM EST, 284:00:05:17Z GMT date of 10/10/00
W	KATA		3:57 3:57	<u>JETTISON:</u> 55 KGS 298:21:00:21Z		Mary				ISS Z1 TRUSS	(3.5 hours work after arm extension before tanking could start at
		SS EVA #51	PTA (U/S 282):		A. 1955	and the state of	(Chillion	and a state of	12	CMG'S KU/S-BAND	L-8.5 hour). Weather Scrub. Reset launch for 10/10/00 at 7:39:36 EST.
		EMU/TETHERED	4:40 4:41	BRK DECELFPS ² : AVE 3.5 PK 5.3						PMA-3/SLP	- Scrubbed 10/10/00 launch at L- 1H07M due to a concern for
5	+ 3	EVA #44 SCHEDULED EVA #45	PTM (U/S 282):		<u>M 3 EOM</u> :	<u>et</u> <u>Brkup</u> : 283 K		<u>DEORBIT</u> : APOGEE		ICBC30 RMS, ODS	debris damage by a wayward pip pin and tether seen on the LO_2 feedline foam inboard support bracket. Pip pin was discovered
	× +	DURATION 6:28	<u>5:56</u> 6:05	WHEELS STOP: 298:21:00:49Z	WEIGHT:	283 K		213 NM		KIVIS, UDS	during ice/debris team walkdown. (Launch had been scheduled
	+			11746 FT	205188 LBS			PERIGEE		MIDDECK:	for 7:39:36 EST. Technical scrub. Reset launch for 10/11/00.
		SS EVA #52 EMU/TETHERED	<u>SE ZZA:</u> 6:02 6:02	ROLLOUT:	X CG:	<u>ET</u> IMPACT		200.9 NM		DTO EMU H/W	LAUNCH WINDOW:
		EVA #45	0.02 0.02	ROLLOUT: 9090 FT	1079.95	1:26:22				EVA TOOLS	- Total launch window was 7M58S. Window opened at
	A/STS.92	SCHEDULED EVA #46	<u>SE PTM:</u>	67 SEC		MET		ENTRY			285:23:13:14Z and closed at 285:23:21:12Z. Selected Preferred
10000		DURATION 7:08	6:48 6:55	<u>WINDS:</u> 2009P16 KTS	LANDING:	LAT:		RANGE: 4352 NM		5 CRYO TK SETS	Launch Time (PLT) of 285:23:17:00Z (in-plane time) giving a launch window of 4M12S.
			MECO CMD:	SS: 8H 4L		2.00 S°				6 GH2 TKS	
			8:25.3 8:25.6	PK: 15H 7L	WEIGHT:			ENTRY			LAUNCH DELAYS: None
		Continued	Continued	DENS ALT:	205129 LBS	<u>LONG</u> : 127.7°W		VELOCITY: 25901		Continued	- Launched on time at 285:23:17:00Z, 6:17:00 PM EST on Wednesday, October 11, 2000.
		o o nandou ni	Sontinuoutti	3743 FT	X CG:			20701		Sommourn	
				Continued	1081.77						Continued

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FLT NO.	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME, LANDING SITES,	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES	SSME-TL NOM-ABORT EMERG THROTTLE	SRB RSRM AND	INC	ORBIT HA/HP	FSW	PAYLOAD WEIGHTS, PAYLOADS/	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS.
		TITLE, NAMES & EVA'S	ABORT TIMES	FLT DURATION, WINDS	PROFILE ENG. S.N.	ET	INC	ΠΑ/ΠΡ		EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		Continued SS EVA #53 EMU/TETHERED EVA #46 SCHEDULED EVA #47 DURATION 6:48 SS EVA #54 EMU/TETHERED EVA #47 SCHEDULED EVA #48 DURATION 6:56 MCC WHITE FCR (30) FLIGHT DIRECTORS: Asc - N. W. Hale Ent - L. E. Cain LD/03 - C. W. Shaw O1 - R. E. Castle O2 - J. P. Shannon O4 - B. P. Austin ISS LD/O1 - S. P. Davis ISS O2 - M. A. Kirasich ISS PIng/O3 - R. E. LaBrode MOD - J. M. Heflin	Continued <u>VI:</u> 25931 25928 <u>OMS-2</u> : 43.30 43.33 82.4 FPS 82.1 FPS 00:54 00:54		ENG. S.N.	rew port	R Duffy	, & McArthu	ur/MS.	Continued RMS 57 (S.N. 301) RMS USED FOR OSVS checkout, Z1 truss grapple and install on ISS and EVA support PMA3/SLP on Z1	Continued TAL WX: - Zaragoza (prime) forecast and observed NO GO for rain, Moror forecast and observed NO GO for violent storms, Ben Guerir (selected) Obar 353 vs. 350 limit at 1100 feet cleared by L-10 minute balloon. NOTE: PTA set on AOA FOR KSC even thoug forecast showed chance of rain and chance 4000 ft broken and peak winds of 13 knots. EDW and NOR down for AOA/PLS, FD; PLS would have resulted in additional 10 second TAL exposure. <u>PERFORMANCE ENHANCEMENTS</u> : - Standard Set Plus: (1) PE Operational High Q TRIVOCT, (2) OMS assist is 4000 lbs, (3) 52 nm MECO, and (4) Del Psi. - Note: OMS Assist Time reduced from 102 seconds to 41 seconds with DOLILU uplink (2400 lbs more OMS to orbit). - Inert weight adjustment is 199 lbs; was -200 lbs. <u>SHUTTLE NIGHT LAUNCH #24</u> <u>FLIGHT DURATION CHANGES</u> : - Total Flight duration extension was 2 days plus 3 orbits. - EDW was not called up for NEOM. - Did not close PLBD's. Waved-off landing at KSC on orbits 170 and 171 due to sustained high SLF crosswinds. EOM+1. Waved-off landing at KSC on orbit 186 and 187 (Did not close PLBD's or crew in suits) due to high crosswinds. - Retargeted to EDW on orbit 187, then waved-off due to broken ceiling and showers within 30 nm. - Targeted EDW on orbit 188, closed PLBD's, and put crew in suits. Waved-off landing at EDW on orbit 189 at Tig-1 hour for showers and rain within 30 nm. NOEM+2. Activated NOR for EOM+2. Did not attempt to land at KSC on orbits 201 and 202 due to forecast and observed high crosswinds, low ceiling, and rain within 30 nm. Landed at EDW runway 22 on orbit 203 at 298:20:59:42Z, 12:59:42 PM PST, Tuesday, October 24, 2000. <u>EVENTS:</u> - Ring capture at 287:17:45:10Z, 1:18:28:10 MET - Docked at PMA2 Node 1 Forward Port at 287:17:57:55Z - 21 Truss grapple at 288:15:57:14Z, Z1 release 288:19:05:30Z - EVA 1 Start at 290:15:43:30Z, PMA release at 290:17:59:35Z - EVA 2 Start at 290:15:43:30Z, PMA release at 290:17:59:35Z - EVA 3 Start at 291:14:29Z, duration 6H28M. - ISS Reboost maneuver

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SPACE SHUTTLE MISSIONS SUMMARY

FLT NO.	ORBITER	CREW (7) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE ENG. S.N.	SRB RSRM AND ET	INC	ORBIT HA/HP	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-92/ ISS 3A				(Je fina	FT: JSC200 ff) Wisoff ar Il of four ST FER backpa	nd Mich S-92 sj	ael Lo	pez-Alegria	a parti	cipate in	Continued <u>EVENTS: (Continued)</u> - Undocked at 294:15:08:21Z, 8:15:51:21 MET - Total transfers to ISS - 21998 lbs (includes Z1=18351 and PMA3=2549 lbs). - Delivered Z1 Truss. Mated Z1 to Node 1 zenith port. Installed CMG jumper. Z1 umbilicals connected and powered. Delivered PMA3 and berthed to Node 1 Nadir Port, umbilicals connected. SGANT deployed. Relocated IAPFR and Z1 FRGF. Installed two DDCU's and ETSD on Z1. - STS-92/3A ISS Visitor Time 6:21:10:26. - ISS Visitor time 6D21H10M26S
	Truss. Fr	E-26636 ISS after om the top, element arya, Node 1 or Unit	ts are the Zvezo	Z1	LOW: JSC2 Iter), Ascenses with the shift.	t Flight	Direct	tor for the S	TS-92	2 mission,	 <u>RENDEZVOUS #49</u>: Rendezvous and dock with ISS at PMA2 Node 1 Forward Port <u>SIGNIFICANT ANOMALIES</u>: - Airlock Depress Valve Cap came loose from tether and was lost - FES Primary B shutdown in Full-Up mode. - Cabin Payload 3 Bus loss, which powered OIU 1, OSVS, ODS C/L Camera. - EMU Middeck Battery Charger ready indication failure - APFR/IAPFR interference with flush side-mounted WIF's - Modular Mini Workstation anomaly - Pistol Grip tool chatter - Difficulty mating PMA 3 P607 to Node J609 - Ku-band lost forward link - WSB 2 failed to cool - ODS C/L Camera misalignment - WSB 2 GN₂ Relief Valve high cracking P and low reseat P. - DSC OM2 Card 22 failure - WSB 3 Steam Vent Heater erratic

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		CREW		LANDING SITE/	SSME-TL			00017		5.0.4.0.05	
		(5)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(6)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
			ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S		WINDS	ENG. S.N.						
STS-97/	OV-105	CDR:	KSC 39B	KSC 15 (KSC 53)	104/104/	BI-103	51.60	DIRECT	01-27	CARGO:	Brief Mission Summary: The STS-97/4A mission, 6th mission
	(Flight 15)	Brent W. Jett	336.03.06.01 7	346:23:03:23Z	109%	51.100	(6)	INSERTION	(6)	42804 LBS	to ISS, helped "Station spread its wings". The 17-ton P6
ISS 4A	(Flight 10)	(Flt 3 - STS-72, STS-81)	336:03:06:01 Z 10:06:01 PM EST (P)	6:03:23 PM EST	10770	RSRM	(0)	MOLITION	(0)	12001 200	to 135, helpeu Station spread its wings. The 17-ton Po
050	Endeavour	P598/R206/V132/M179	10:06:01 PM EST (A)		PREDICTED:	72		POST OMS-2:		PAYLOAD	Integrated Truss Segment (the 1st of four such sets) was
SEQ			Thursday 30	Monday 19	100/104.5/			175.1 X 106.2		CHARGEABLE:	delivered and installed on ISS. With the deployment of its
FLT #101	OMS PODS:	PLT:	11/30/00 (13)	12/11/00 (12)	104.5/72/	ET-105		NM		37486 LBS	240-foot solar arrays the ISS could now provide more
KSC-101	LPO4-22	Michael J. Bloomfield	· · /	· · · ·	104.5						electrical power than on any spacecraft before it. This was
KSC-101	RPO1-29	(Flt 2 - STS-86	LAUNCH WINDOW:	DEORBIT BURN:		SLWT 10		TI BURN:		DEPLOYED:	also the 1 st Shuttle to visit an inhabited ISS.
PAD 39B-44	FRC5-15	P599/R227/V165/M198	4M01S USING PLT	346:21:57:31Z	ACTUAL:			1:14:26:43 MET		36213 LBS	
FAD 370-44			(IN-PLANE TIME)		100/104.5/	ET					KSC W/D: OPF 203, VAB 5, PAD 26 = 234 days total.
MLP-1		<u>M/S 1/EV1</u> :		<u>XRANGE</u> : 20 NM	104.5/72/	IMPACT		ORBIT:		NON-DEPLOYED:	
		Joseph R. Tanner	<u>EOM PLS</u> : KSC	ORBIT DIR: AR 8	104.5	1:26:32		199.6 X 204 NM		719 LBS	LAUNCH POSTPONEMENTS:
SIXTH		(Flt 3 - STS-66, STS-82)	<u>TAL</u> : ZZA			MET					- Baselined launch date of 4/8/99 on 11/6/97
SHUTTLE		P600/R185/V136/M162	<u>TAL WX</u> : MRN, BEN	<u>AIM PT</u> : CLOSE IN	1 = 2054 (2)			<u>MC-4</u> :		MIDDECK: 1021 LBS	- Postponed launch to 8/5/99, 2/3/00, 3/23/00, 7/20/00, 12/2/00,
FLIGHT TO				MLGTD: 2360 FT	2 = 2043(5)	LAT:		1:15:50:55Z		1021 LBS	and then 11/30/00 EST (12/1/00 GMT date). The primary cause
ISS		<u>M/S 2</u> :	SELECTED:	346.23.03.237	3 = 2049 (4)	1.54°S		ODDIT			for postponements was Service Module late delivery to ISS.
100		Marc Garneau	RTLS: KSC 33 N/N	VEL: 196 KGS				ORBIT:		SHUTTLE	
		(Canada)	TAL: ZZA 30 SF/N	199 KEAS	ALL BLOCK	<u>LONG</u> : 127.4°W		205.5 X 201.3		ACCUMULATED	LAUNCH SCRUBS: None
		(Flt 3 - STS-41-G, STS-77)	AOA: KSC 33 N/N	HDOT: -3.5 FPS	IIA ENGINES	127.4°W		NM		WEIGHTS:	
		P601/R47/V128/M44	PLS: EDW 4 N/N							DEPLOYED:	LAUNCH WINDOW:
		M/S 3/EV2:	TDEL:	<u>TD NORM 195</u> : 2783 FT	ST	-		- the second	-	997818 LBS NON-DEPLOYED:	- Total launch window was 7M45S. Window opened at 336:03:02:17Z and closed at 336:03:10:02Z. Selected Preferred
		Carlos I. Noriega	0.11 -0.048/-0.01	270311		1- 7-00		7 10		1488965 LBS	330:03:02:17Z and closed at 330:03:10:02Z. Selected Preferred
		(Flt 2 - STS-84)	0.11 -0.040/-0.01	<u>NLGTD</u> : 5839 FT						CARGO TOTAL:	Launch Time (PLT) of 336:03:06;01Z (In-plane time) resulting in a launch window of 4M01S.
		P602/R221/V166/M193	MAX Q NAV:	346:23:03:35Z	10		-11	100		3115177 LBS	
		1 002/122 1/ 0 100/101175	758 753	VEL: 138 KGS		ALCON THE REAL PROPERTY OF	and and		100	JIIJI// LDJ	LAUNCH DELAYS: None
			/ 50 / 55	144 KEAS		11.0	1			PERFORMANCE	Launched on time at 336:03:06:01 GMT on December 1, 2000
		SS EVA #55	SRB STG:	HDOT: -6.5 FPS		1000				MARGINS (LBS):	 Launched on time at 336:03:06:01 GMT on December 1, 2000 (at 10:06:01 PM EST on Thursday, November 30, 2000). Note: During the count, a loose Firex line bracket/clamp was
		EMU/TETHERED	2:03.5 2:03.0	DRAG CHUTE		-10	and the			FPR: 3274	- Note: During the count, a loose Firex line bracket/clamp was
		EVA #48	210010 210010	DEPLOY: 189 KEAS		the state	a l			FUEL BIAS: 818	discovered on OAA, which was rolled back to allow access and
		SCHEDULED EVA #49	PERF: NOMINAL	346:23:03:27Z	T	心能等	Taple .			FINAL TDDP: 1920	removal using a 180 foot condor crane. No impact to launch.
		DURATION 7:33:23					1			RECON: 2032	· · · · · · · · · · · · · · · · · · ·
			<u>2 ENG TAL (ZZA)</u> :	<u>BRK INIT</u> : 88 KGS							TAL WX:
ID JE	TT	SS EVA #56	2:43 2:40	DRAG CHUTE						PAYLOADS:	- Zaragoza (prime and selected) was forecast and observed GO,
FIEL	GAD	EMU/TETHERED	NEG RETURN:	JETTISON: 70 KGS	S97-E-503	1 (5 Dece	mber	2000)		<u>PLB</u> : ISS-4A	Moron was forecast and observed NO GO due to low ceiling, and
0 ²¹ _	17- 12	EVA #49	3:51 3:54	346:23:03:53Z	Tanner/MS	during E	VA &	newly deployed	4		Ben Guerir (2-engine TAL call) was forecast and observed GO.
2	11 2	SCHEDULED EVA #50	0.01 0.04	BBK DECELEDS/S.	ISS solar a			ing apployee		PV module P6	
a	1	DURATION 6:37:19	<u>PTA (U/S 265)</u> :	BRK DECEL FPS/S: AVE 4.6 PK 6.7						ICBC3D	PERFORMANCE ENHANCEMENTS:
CK P	5		4:54 4:54		112 5014					RMS, ODS	- Standard Set plus: (1) PE Operational High Q WIN/DEC, (2)
2	2	SS EVA #57		WHEELS STOP:	<u>M 3 EOM</u> :						OMS assist is 4000 lbs, (3) 52 NM MECO, (4) No roll to heads up,
12,201	30	EMU/TETHERED	PTM (U/S 265):	346:23:04:20Z 10340 FT	WEICHT			DEORBIT: APOGEE			and (5) Del Psi
	1.0	EVA #50	5:54 5:53		WEIGHT:					MIDDECK: HEDS tech demo	
		SCHEDULED EVA #51 DURATION 5:09:49	SE TAL (ZZA)	ROLLOUT:	197829			198 NM PERIGEE		EMU H/W,	FLIGHT DURATION CHANGES: None
		DURATION 5.09:49	5:55 5:55	<u>ROLLOUT:</u> 7980 FT	X CG:			188.5 NM		EVA Tools	- Landed at KSC runway 15 on orbit 170. MLGTD at
1	OWER MODUL			57 SEC	1085.85			IVIVI C.OOT		LVA 10015	346:23:03:23Z (10:19:57:22 MET) on Monday, December 11, 2000.
P6.1	I ODULE		<u>SE PTM</u>	WINDS:	1003.03			ENTRY RANGE			2000.
		会	6:55 6:58	<u>WINDS</u> : 6H 2L				ENTRY RANGE: 4338 NM		5 CRYO TK SETS	SHUTTLE NIGHT LAUNCH #25
		+	MECO CMD:	OFFICIAL:	LANDING:			1000 1101		5 GN2 Tanks	SHOTTLE MOTT LAUNGIT#23
	S 1943		<u>MECO CMD</u> : 8:24.3 8:25.9	1406P09	ENNONO.			ENTRY		RMS 58	SHUTTLE NIGHT LANDING #16
	*	•	o.24.3 8:25.9	SS: 6H 1L	WEIGHT:			VELOCITY:			- Landed on KSC runway 15 on orbit 170 at 346:23:03:23Z,
				PK: 9H 2L	197781 LBS			25877		RMS USED FOR P6	6:03:23 PM EST on Monday, December 11, 2000.
			Continued							TRUSS AND EVA	site i i i i i i i i i i i i i i i i i i
155-	A + STS-91		Continueu	Continued	X CG:					SUPPORT	
					1087.73					-	Continued
		Continued			-						
				the second s				A second s			

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							0.0			<u> </u>	
FLT	ORBITER	CREW (5)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-97/ ISS 4A		Continued MCC WHITE FCR (31)	Continued	Continued DENS ALT: 1068 FT					0		Continued <u>EVENTS:</u> - Ring capture at 337:19:59:35Z
Continued		FLIGHT DIRECTORS: Asc - N. W. Hale Ent - L. E. Cain LD/O1 - W. D. Reeves O2 - P. L. Engelauf PLNG - K. B. Beck ISS LD/O2 - J. M. Hanley ISS O1 - J. M. Curry ISS PLNG - P. S. Hill MOD - J. W. Bantle	25930 25928 <u>OMS-2</u> : 43:10.6 43:14.6 121 FPS 119 FPS	FLT DURATION: 10:19:57:22 S 881:06:18:29 OV-105: 155:05:44:02 DISTANCE: 4,476,164 sm			unter Broot				 Docked with ISS PMA3 Node 1 Nadir Port at 337:20:11:47Z (1:17:03:59 MET) RMS grapple of P6 Truss from PLB at 337:22:16:57Z, 1:19:59 MET. P6 moved to overnight park position and grapple released at 338:20:17:25Z, 2:17:11 MET. Hatch between orbiter and PMA3 was opened at 338:00:22:01Z, 1:21:16 MET EVA 1 Start at 338:18:34:46Z, 2:15:29:45 MET and End at 2:23:02:06 MET, duration 7:33:23. 2B Solar Array wing deployed, but had tensioning problem. RMS used to deploy P6 Truss to Z1 Truss. P6 Truss 4B SAW deployed. EVA 2 Start at 340:17:20:52Z, 4:14:14:51 MET and End 4:20:52:10 MET, duration 6:37:19 EVA 3 Start at 342:16:12:13Z, 6:13:06:12 MET and End
					Reeves (lef	t), and J	eff Hanle	Directors: Fro ey. Back row, Cain, Paul Hi	, from the	Lead FD Bill e left: John elly Beck.	 6:18:16:01 MET, duration 5:09:49. EVA crew successfully tensioned SAW 2B. Undocked at 344:19:13:00Z (8:16:06:59 MET) Total Transfers from orbiter to ISS 1457 lbs, includes 773 lbs hardware and 7 CWC's with 684 lbs H₂O. Transfers from ISS to orbiter 227 lbs. ISS Visitor time 6:23:01:13 (docking to undocking). Delivered and mated P6 Truss to Z1. Deployed and activated 2B and 4B Solar Array wings. Deployed and activated PMV radiator, EETCS aft radiator. Relocated S-band Antenna Suppor assembly. ISS EPS reconfigured to power U.S. and Russian Segments. FPP assembled and tested.
											RENDEZVOUS #50: - Rendezvous and dock with ISS at PMA2 Node 1 Nadir Port. <u>SIGNIFICANT ANOMALIES</u> : - Waste water quantity sensor dropouts - Crew could not remove Cabin Temp Controller Actuator Pip Pin - APCU 1 converters shutdown and APCU 2 tripped off. - During EVA 1, EV2 reported equipment hook inadvertently opened.
crews pose Front row ar Shepherd, & FE/Sergei K Gidzenko, & representing	for an histo re (left to rig & STS-97 M & Krikalev, & STS-97 P g the Canad	ecember 2000) The ST pric portrait (1 st Shuttle vis ght) STS-97 CDR Jett, EX IS/Tanner. 2nd row (from STS-97 MS/Noriega, EXF LT/Bloomfield. In the rear dian Space Agency (CSA Aviation and Space Agen	it to inhabited ISS) (P 1 CDR William I the left) EXP 1 P 1 Soyuz CDR/Yu is STS-97 MS/Ga). Krikalev and Gid	: M. ri P. rneau	STS097-70 following Ed				New ISS	Configuration	 EV1's WVS EMU TV not received EV2 reported during helmet light battery charging, battery overheated (bad battery). IPS workstation crashed, delaying execute package CPS application on IPS crashed Sequential Still Video processing anomaly ICBC3D Camera stopped filming Erratic RCS jet L5D oxidizer injector temp transducer F5R Fuel Injector temp sensor failure OCA/Audio malfunctions

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				LANDING SITE/	SSME-TL						
		CREW	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(5)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		ONDIT	FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.			LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		TITLE, NAMES & EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
				WINDS	ENG. S.N.						
STS-98/	OV-104	<u>CDR</u> :	KSC 39A	EDW 22, CONC	104/104/	BI-105		DIRECT		CARGO:	Brief Mission Summary: The STS-98/5A mission, 7th mission
ISS 5A	(Flight 23)	Kenneth D. Cockrell (Flt 4 - STS 56, STS-69,	38:23:11:16Z 6:11:16 PM EST	EDW 47, CONC 28 51:20:33:06Z	109%	RSRM	(7)	INSERTION	(1)	39162 LBS	to ISS, delivered and installed the U.S. Destiny Laboratory
050	Atlantis	STS-80)	6:13:02 PM EST	12:33:06 PM PST	PREDICTED:	77		POST OMS-2:		PAYLOAD	onto the forward port of the Unity Node. Destiny is the
SEQ FLT # 102		P603/R159/V121/M140	Wednesday 11		100/104.5/			175.1 X 110.3		CHARGEABLE:	centerpiece for research on the ISS. The lab is 28 feet long
1 L 1 # 102	OMS PODS:		2/7/01 (8)	Tuesday 17	104.5/72/	ET-106		NM		33286 LBS	by 14 feet wide. Atlantis landed at EAFB, CA after two
KSC-102	LPO3-27 RPO4-23	PLT: Mark L. Polansky	LAUNCH WINDOW:	2/20/01 (6)	104.5	SLWT-11				DEPLOYED:	consecutive days of wave offs at KSC, due to high winds, then clouds and rain on the third day.
	FRC4-23	P604/R262/M228	4M42S USING PLT	DEORBIT BURN:	ACTUAL:	ET				32270 LBS	ulen clouus and faill on the third day.
<u>PAD:</u> 39A-58 MLP-2	1110120		(IN-PLANE TIME)	51:19:27:20Z	100/104.5/	IMPACT					KSC W/D: OPF 70, VAB 30 (2), PAD 28 (2) = 128 days total
IVILF-2		<u>M/S 1/EV2</u> :		XRANGE: 381 NM	104.5/67/	1:26:23				NON-DEPLOYED:	(Rollback to inspect SRB cables).
		Robert L. Curbeam (Flt 2 - STS-85)	EOM PLS: KSC		104.5	MET				583 LBS	
SEVENTH		P605/R225/V167/M195	TAL: ZZA	<u>ORBIT DIR</u> : AL 27	1 = 2052 (3)	LAT:				MIDDECK:	LAUNCH POSTPONEMENTS: - Baseline launch date of 5/20/99 on 11/20/97
SHUTTLE FLIGHT TO			TAL WX: MRN, BEN	AIM PT: CLOSE IN	2 = 2044 (5)	1.73°S				983 LBS	- Postponed to 10/28/99, 2/3/00, 3/2/00, 4/20/00, 8/29/00, and 1/18/01
ISS		M/S 2:		MLGTD: 1994 FT	3 = 2047 (5)						- Postponed launch date to NET 2/6/01 when decision made to
		Marsha S. Ivins (Flt 5 - STS-32, STS-46,	<u>SELECTED</u> : RTLS: KSC 33 N/N	51:20:33:06Z	ALL 3 BLOCK	<u>LONG</u> : 127.9°W				<u>SHUTTLE</u> ACCUMULATED	roll back to VAB and inspect/x-ray SRB cables (Replaced
		STS-62, STS-81)	TAL: ZZA 30	VEL: 199 KGS	IIA ENGINES	127.7 11				WEIGHTS:	damaged cables). - Set 2/7/01 launch date at FRR.
		P606/R108/V77/F12	AOA: KSC 33 N/N	209 KEAS HDOT: -2.5 FPS						DEPLOYED:	
			<u>PLS</u> : EDW 22 N/N				0.0	1		1030088 LBS	LAUNCH SCRUBS: None
		M/S 3/EV1: Thomas D. Jones	TDEL:	<u>TD NORM 195</u> : 3540 FT			-	-1		NON-DEPLOYED: 1490535 LBS	LAUNCH WINDOW:
		(Flt 4 - STS-59, STS-68,	0.00 0.22/0.06						_	CARGO TOTAL	- The total launch window was 9M02S, which opened at 38:23:06:56Z and closed at 38:23:15:58Z. The decision was
		ŠTS-80)		<u>NLGTD</u> : 5635 FT 51:20:33:18Z			5		3	3154339 LBS	made to use the Preferred Launch Time (PLT) of 38:23:11:16Z
		P607/R177/V111/M155	MAX Q NAV:	VEL: 133 KGS		-		101 FA	2	DEDEODUANOE	(In-plane time) with a 4M42S launch window.
		SS EVA #58	727 735	144 KEAS		Ling	-		Call and a second	Performance Margins (LBS):	LAUNCH DELAYS:
1 at	2	EMU/TETHERED	SRB STG:	HDOT: -5.9 FPS	A Second	1.	2 th	Main 28	2	FPR: 3274	- During T-9 hold, a step function was seen on APU 1 Turbine
	5 23	EVA #51	2:05.6 2:06	DRAG CHUTE		D.		Mar I		FUEL BIAS: 818	Speed (UA1 card 6). This proved to be a ground-processing
13 200		SCHEDULED EVA #52		DEPLOY: 206 KEAS 51:20:33:08Z				A.C.		FINAL TDDP: 2138	During T-9 hold, a step function was seen on APU 1 Turbine Speed (OA1 card 6). This proved to be a ground-processing problem; however, coming out of T-9 minute hold was 1m46s late, resulting in a launch delay of 1m46s. Launch occurred at 38:23:13:02Z, 6:13:02 PM EST on Wednesday, February 7, 2001.
A State	Or SNIA W	DURATION 7:33:58	<u>PERF</u> : NOMINAL				the.			RECON: 1538	38:23:13:02Z, 6:13:02 PM EST on Wednesday, February 7, 2001.
	+ NN	SS EVA #59	2 ENG TAL (BEN):	<u>BRK INIT</u> : 58 KGS		<u> </u>	100			PAYLOADS:	TAL WX:
. BY	5	EMU/TETHERED	2:34 2:37	DRAG CHUTE				ebruary 2001) ·		PLB:	- Zaragoza (prime and selected) and Ben Guerir (2-engine TAL call) were forecast and observed GO. Moron was forecast and
- 3	5			JETTISON: 64 KGS				intis payload ba	ay	ISS-5A (DESTINY) U.S. LABORATORY	observed NO GO for ceiling and showers within 20 nm.
		SCHEDULED EVA #53 DURATION 6:50	<u>NEG RETURN</u> : 3:53 3:55	51:20:33:36Z	for installa	tion on IS	S.			RMS, ODS,	Ŭ
BE CON				BRK DECEL FPS ² :						SPDU	PERFORMANCE ENHANCEMENTS: - Standard Set Plus: (1) PE Operational High O WIN/JAN. (2)
		SS EVA #60	<u>PTA (U/S)</u> :	AVE 4.7 PK 6.7	<u>M 3 EOM</u> :						- Standard Set Plus: (1) PE Operational High Q WIN/JAN, (2) OMS assist is 4000 lbs, (3) 52 NM MECO, (4) Del Psi
1		EMU/TETHERED EVA #53	4:48 4:46	WHEELS STOP:	WEIGHT:			DEORBIT: APOGEE		MIDDECK: SIMPLEX	FLIGHT DURATION CHANGES
		SCHEDULED EVA #54	PTM:	51:20:34:02Z 9964 FT	197909 LBS			210.8 NM		BMRRM	FLIGHT DURATION CHANGES: - Total extension 2 days plus two orbits and changed landing site
		DURATION 5:25	5:50 5:46					PERIGEE		(LON)	to EDW. - EDW was not called up for NEOM. Closed PLBD's, but waved- off landing at KSC on NEOM orbits 170 (Tig-24 mins) and 171 (Tig-36 mins) due to observed and forecast crosswind violations. Activated EDW for EOM+1. Closed PLBD's for EOM+1 but waved-off landing at KSC on orbit 186 for crosswind violations and orbit 187 due to observed and forecast crosswind violations and precipitation. Waved-off landing at EDW on orbits 188 and 189 due to forecast ceiling, crosswind, and precipitation violations. EOM+2. Waved-off landing at KSC on orbits 201 and 202 due to forecast of low ceiling and precipitation. Landed at
	TINY		05 774	<u>ROLLOUT</u> : 7970 FT	X CG:			196.2 NM			off landing at KSC on NEOM orbits 170 (Tig-24 mins) and 171
	-STINT		<u>SE ZZA:</u> 6:02 5:58	56 SEC	1080.06			ENTRY		5 CRYO TK SETS 6 GH2 TANKS	(Tig-36 mins) due to observed and forecast crosswind violations.
		70 T	0.02 0.00	WINDS:	LANDING:			VELOCITY:		RMS 59	waved-off landing at KSC on orbit 186 for crosswind violations
		21	<u>SE PTM:</u>	20H 1L				25893			and orbit 187 due to observed and forecast crosswind violations
SS -	Contraction of the second	2	6:51 6:51	OFFICIAL:	WEIGHT:					RMS USED FOR	and precipitation. Waved-off landing at LDW on orbits 188 and 189 due to forecast ceiling crosswind and precipitation
	Non 2			23020P27 SS: 20H 2R	197854 LBS			<u>ENTRY</u> RANGE:		U.S. LAB TO NODE 1, PMA-2	violations. EOM+2. Waved-off landing at KSC on orbits 201 and
* (J.S. LAB ★			PK: 27H 3R	X CG:			4350 NM		TO LAB, AND	202 due to forecast of low ceiling and precipitation. Landed at
					1081.98					EVA SUPPORT	202 due to forecast of low celling and precipitation. Landed at EDW runway 22 on orbit 203 at 12:33:06 PST on Tuesday, February 20, 2001.
		Continued	Continued	Continued							
				Continued							Continued

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FLT NO.	ORBITER	CREW (5) TITLE, NAMES	LAUNCH SITE, LIFTOFF TIME, LANDING SITES,	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES	SSME-TL NOM-ABORT EMERG THROTTLE	SRB RSRM AND	INC	Drbit Ha/Hp	FSW	Payload Weights, Payloads/	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS,
STS-98/		& EVA'S	ABORT TIMES	FLT DURATION, WINDS Continued	PROFILE ENG. S.N.	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
SS 5A		MCC WHITE FCR (32) FLIGHT DIRECTORS:	<u>MECO CMD</u> : 8:25.1 8:24.7	<u>DENS ALT:</u> 2334 FT			· · · · · · · · · · · · · · · · · · ·	XIT			FIFTH SHUTTLE CREWMEMBER REPLACEMENT - Mark Lee was replaced by Curbeam in February 2001. (Fourth Shuttle crewmember replacement occurred on STS-85.)
Continued		A/E - L. E. Cain LD/O1 - R. E. Castle O2 - K. B. Beck PLNG/O3 - B. P. Austin ISS LD/O2 - A. F. Algate ISS O1 - M. A. Kirasich ISS O3 - M. J. Ferring MOD - J. W. Bantle	<u>VI:</u> 25928 25928 <u>OMS-2:</u> 43:46 43:45 127.1 FPS 127.1 FPS	FLT DURATION: 12:21:20:04 <u>S/T:</u> 894:03:38:33 <u>OV-102:</u> 185:11:10:35 <u>DISTANCE</u> : 5,369,576 sm							EVENTS: - OMS assist at 2:16 MET, duration 102.2 seconds - MC-4 at 40:15:41:20Z, 1:16:28:18 MET. - Docked with ISS PMA3 Node 1 Nadir Port at 40:16:50:49Z, 01:17:37:47 MET - Collision avoidance maneuver for ISS at 41:11:48:02Z, 02:12:35:00 MET Delta V +2.5 ft/sec, 186.5 by 199.4 nm - RMS grappled PMA2 on Node 1 at 41:14:12Z, 2:14:59 MET. PMA2 installed on Z1 Truss at 41:17:00Z, 2:17:47 MET. - U.S. Laboratory grappled in PLB at 41:17:22Z, 2:18:00 MET. U.S. Lab (Destiny) was attached to Node at 41:19:00Z, 2:19:47
					board I William left: Ser	SS. Fro M. (Bill) rgei K. k	nt, from t Shepher (rikalev/F	he left: CDR d, & Curbear	Cockre n/MS. is/MS, I	ISS crews on II, EXP 1 CDR Rear, from the PLT Polansky, es/MS.	- EVA 1 Start at 41:15:51Z, 2:16:36 MET. EVA duration
opened De	stiny (It to rt)	3 Inside newly :: Ivins/MS, CDR William Shepherd							• • 1	-	 7H33M56S. First ISS Reboost maneuver Started at 42:17:13Z, 3:18:00 MET Second Reboost maneuver Started at 42:18:18Z, 3:19:05 MET. Allitude increase of 3.6 nm, orbit 203.0 by 188.9. EVA 2 Start at 43:15:58Z, 4:16:45 MET, duration 6H50M. Third Reboost maneuver Started at 44:15:53:02Z, 5:16:40:00 MET lasted 4 hours. Fourth Reboost Started at 44:20:06:02Z, 5:20:53:00 MET. 5 nm altitude increase, orbit 206.5 by 193.7 nm EVA 3 Start at 45:14:30Z, 6:15:16:58 MET, duration 5H25M. Fifth Reboost at 45:12:08Z, 6:23:54:58 MET, 1.4 nm altitude increase, orbit 209 by 195 nm. Sixth Reboost at 46:15:23Z, Delta V of 4.4 fps, orbit 209.4 by 195.5 nm. Seventh Reboost at 46:16:56Z, duration 3h41m, Delta V 11.9 fps, orbit 212.5 by 199.2 nm. Hatch closed at 47:13:22Z, 8:14:08:58 MET. Undocked at 47:14:06Z, 8:14:53 MET. Exther and the second of the demonstration of the de
		-016 New ISS I from departing	ABOVE: PLT	CREW GREETIN Polansky (left), CDI Center Director Geo	R Cockrell (ce	nter), gr	etted by S	Steve Hawley		ew Ops Dir.	Relocated PMA2 from Node 1 to fwd CBM. Delivered and installed U.S. Lab on Node 1 fwd CBM and connected umbilicals, activated U.S. Lab core systems. Activated and C/O CMG's, ther handed over attitude control to U.S. GN&C system. - ISS Visitor Time is 6:21:15:11.
			IN MCC: Orbit 1 FC Castle ,near center,			- PCA bolts - EV2 - Broł bail b - Sticl open. - SAS - Bad - STS	vent cover were difficu EMU boot coke. coke. cy mini-work coke. cok. coke. coke. cok. cok. cok. cok. coke. coke. coke. c	bolts did not fit It to start with po pressure point o tor bail linkage,	5/16-in s ower tool during E\ one of riv fectors, c se. onferenci or Reboo	nt. PLT saw about CDR was about socket. PCA vent , , , , , , , , , , , , , , , , , , ,	TRANSFERS: - To ISS: Dry cargo IVA 3036 lbs, U.S. Lab 29866 lbs, external EVA 368 lbs = total 33270 lbs. (Included H2O transfer to ISS: 10 CWC's = 993 lbs) - Transfers from ISS to shuttle 872 lbs. <u>RENDEZVOUS #51</u> : - Rendezvous and dock with ISS at PMA3, Node 1 Nadir Port.

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		CREW									
		(10)	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	7 UP/7 DOWN	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		UNDIT	FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.	ONDITEN		LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP	1 3 1	PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
NO.		TITLE, NAMES	ABORT TIMES	FLT DURATION,	PROFILE	ET	INC	1170111		EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S	ADOINT HIVIES	WINDS	ENG. S.N.	LI					TIKSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-102/	OV-103	CDR:	KSC 39B	KSC 15 (KSC 54)	104/104/	BI-106	51.60	DIRECT	01-28	CARGO:	Brief Mission Summary: STS-102, 8th mission to ISS,
ISS 5A.1	(Flight 29)		67:11:42:09Z	80:07:31:41Z	109%	DI 100	(8)	INSERTION	(2)	37328 LBS	provided the first ISS crew changeout and, the first flight of
133 DA. I	(*	(Flt 5 - STS-32, STS-52,	6:42:09 AM EST (P)	2:31:41 AM EST		RSRM	(-)		(-/		the Italian-built Multipurpose Logistics Module (MPLM)
SEQ	Discovery	STS-63, STS-86)	6:42:09 AM EST (Á)		PREDICTED:	78		POST OMS-2:		PAYLOAD	named Leonardo. Among the MPLM cargo was the first
FLT # 103		P608/R108/V80/M198	Thursday 31	Wednesday 12	100/104.5/	FT 107		126/86.2 NM		CHARGEABLE: 28739 LBS	scientific rack for U.S. Lab, Destiny, delivered on STS-98.
		PLT:	3/8/01 (7)	3/21/01 (7)	104.5/72/ 104.5	ET-107				20/39 LD3	With the ISS crew changeout, three crews participated in the
KSC-103	OMS PODS:	James M. Kelly		DEORBIT BURN:	104.5	SLWT-12				DEPLOYED:	STS-102 mission.
ISS-5A.1	LPO1-32	P609/R263/M229	LAUNCH WINDOW: 4:59 USING PLT	80:06:26:06Z	ACTUAL:	SEWT 12				9649 LBS	515 T02 IIII551011.
PAD	RPO3-30		(IN-PLANE TIME)		100/104.5/						KSC W/D: OPF 84, VAB 8, PAD 24 = 113 days total.
39B-45	FRC3-29	M/S 1 UP/EV3:		XRANGE: 373 NM	104.5/72/	<u>et</u>		DEORBIT:		NON-DEPLOYED: 3517 LBS	
570 45		Andrew S. W. Thomas	<u>EOM PLS</u> : KSC TAL: ZZA	ORBIT DIR: AR 9	104.5	RPT:		APOGEE:		3317 LD3	LAUNCH POSTPONEMENTS: - Baselined launch date of 3/16/00 on 1/28/99.
MLP-3		(Flt 3 - STS-77, Up to Mir on STS-89, Down STS-91)	<u>TAL:</u> ZZA <u>TAL WX</u> : MRN, BEN	AIM PT: NOMINAL	1 = 2048 (3)	283 K		206.5 NM <u>PERIGEE</u> :		<u>MIDDECK</u> : 472 LBS	- Postponed launch to 4/13/00, 6/29/00, 10/19/00, 2/15/01, then
		P610/R213/V149/M186	TAL WA. WIRN, DEN	AINT I. NOMINAL	1 = 2048 (3) 2 = 2053 (3)			206 NM		472 LBS	3/8/01. (Postponements caused by replacement of 9 damaged
EIGHTH			SELECTED:	MLGTD: 2839 FT	2 = 2053 (3) 3 = 2045 (4)			200 1111		SHUTTLE	- Postponed launch to 4/13/00, 6/29/00, 10/19/00, 2/15/01, then 3/8/01. (Postponements caused by replacement of 9 damaged RCS thrusters, STS-98 launch postponements, and SRB x-
SHUTTLE FLIGHT TO		<u>M/S 2/EV4:</u>	RTLS: KSC 33 CI/N	80:07:31:41Z VEL: 199 KGS		<u>ET</u>				ACCUMULATED	rays/inspections and replacement of damaged cables.
ISS		Paul Richards	TAL: BEN 36	203 KEAS	ALL BLOCK	IMPACT		ENTRY		WEIGHTS:	LAUNCH SCRUBS: None
100		P611/R264/M230	AOA: KSC 33 CI/N	HDOT: -1.0 FPS	IIA ENGINES	1:12:24		VELOCITY:		DEPLOYED:	
		M/S 3 UP/EV1/EXP2 Flt	<u>PLS</u> : EDW 22 N/N	TD NORM 205:	M 3 EOM:	MET		25899 FPS		1039900 LBS	LAUNCH WINDOW:
		Eng 1:	TDEL:	2529 FT	WEIGHT:	LAT:		ENTRY		NON-DEPLOYED:	- Launch window opened at 67:11:37:10Z and closed at 67:11:47:08Z for a total window of 9M58S.
		James S. Voss	0.03 -0.118/-0.08	NI CTD. (100 FT	218094 LBS	36.5°S		RANGE: 4391 NM		1494524 LBS CARGO TOTAL:	- Selected the Preferred Launch Time (In-plane time) of
		(Flt 5 - STS-44, STS-53,		<u>NLGTD</u> : 6190 FT 80:07:31:52Z	X CG:			4391 NM		3191667 LBS	- Selected the Preferred Launch Time (In-plane time) of 67:11:42:09Z, 6:42:09 AM EST, giving a launch window of
		STS-69, STS-101)	MAX Q NAV:	VEL: 165 KGS	1083.19	LONG:					4M59S. Note: Sunrise was 2 minutes before launch. This was a
		P612/R136/V85/M121	740 748	VEL: 165 KGS 159 KEAS		158.1°W				PERFORMANCE	daylight launch.
		M/S 4 UP/EV2/EXP2 FIt	SRB STG:	HDOT: -6.3 FPS	LANDING:					MARGINS (LBS):	LAUNCH DELAYS: None
WETHERE	ICE KELLY	Eng 2:	2:05.6 2:04	DRAG CHUTE	WEICHT					FPR: 3274 LBS FUEL BIAS: 818	- Launch occurred on time at 67:11:42:09Z, 6:42:09 AM EST on
	The second second	Susan Helms		DEPLOY: 153 KEAS	218031 LBS					LBS	Thursday, March 8, 2001.
3	ų į	(Flt 5 - STS-54, STS-64,	<u>PERF</u> : NOMINAL	80:07:31:55Z	X CG:					FINAL TDDP: 2847	TAL WX:
9	1 . + 1	STS-78, STS-101)		BRK INIT: 98 KGS	184.92					RECON: 3031	-Zaragoza (prime) was forecast NO GO for crosswinds (observed GO at launch and TAL landing times), Moron was NO GO for
	1-2-1- I	P613/R158/V108/F19	<u>2 ENG TAL (BEN)</u> : 2:24 2:24	DRAG CHUTE						PAYLOADS:	GO at launch and TAL landing times), Moron was NO GO for
		M/S 5 UP/EXP2 CDR:	2.24 2.24	JETTISON: 57 KGS						PLB:	ceiling and showers within 20 nm. Ben Guerir (2-engine TAL call) was GO and selected.
	90	Yury Usachev	NEG RETURN:	80:07:32:31Z						<u>ISS-5A.1</u>	was GO and selected.
HEDVER	HELANE	(Russia)	3:51 3:55	BRK DECEL FPS ² :						MPLM	PERFORMANCE ENHANCEMENTS:
TERD LAD	SEHKO KPV	(Flt 2 - STS-101)		AVE 3.5 PK 5.4						PMA3	- Standard Set Plus: (1) PE OPS High Q WIN/MAR, (2) OMS
		P614/R256/V168/M223	<u>PTA (U/S 152)</u> : 4:48 4:48		L					Logistics	assist is 3717 lbs, (3) 52 nm MECO, (4) Del Psi
		M/S 3 DN/EXP1 Flt Eng:	4.40 4.48	WHEELS STOP: 80:07:33:06Z						GAS (2) WSVFM	FLIGHT DURATION CHANGES:
		Sergei Krikalev	DROOP:	14244 FT						ICC	Total flight duration extensions 1 day plus 1 orbit. Extended 1 day for MPLM stowage exceeding planned time and 1 orbit for showers and low clouds at KSC. Plan was to land at KSC on orbit 201; however, KSC was forecast NO GO for the next 3 days. Waved-off the planned landing at KSC for orbit 201 due to weather forecast NO GO for showers and low clouds. Plan was to land at KSC on orbit 202; if not, then land at EDW on orbit 202. Winntee forecast was observed.
	22	(Rušsia)	4:43			and the second	-	and the second	1	RMS, ODS	- Extended 1 day for MPLM stowage exceeding planned time and
25	6	(Soyuz UP, STS-102 DN)		ROLLOUT: 11244 FT	a stranger	an an ann an Anna an Anna an Anna Anna					KSC on orbit 201: however, KSC was forecast NO GO for the
BAN		(Flt 3 - STS-60, STS-88) P615/R177/V154/M154	<u>PTM (U/S 152)</u> : 6:02 6:01	85 SEC			-			MIDDECK: NONE	next 3 days. Waved-off the planned landing at KSC for orbit 201
	A CONTRACTOR	F013/R177/V134/W134	0.02 0:01				1			NONE	due to weather forecast NO GO for showers and low clouds.
		M/S 4 DN/EXP1 CDR:	MECO CMD:	WINDS:			6.98			5 CRYO TK SETS	Plan was to land at KSC on orbit 202; if not, then land at EDW on
		William M. Shepard	8:21.9 8:23.1	2H 9R OFFICIAL:			1			6 GN2 TANKS	orbit 203. Minutes before Tig, the weather forecast was observed GO and forecast GO to land at KSC on orbit 202. (Observed
RESE	ARCH	(Flt 4 - STS-27, STS-41,		2309P16 KTS			and the second			RMS 68	crosswinds at landing time were 16 knots, a 4-knot violation.)
		STS-52, Soyuz TM UP to	<u>VI</u> : 25823 25824	SS: 2H 9R						RMS used for PMA3	Low ceiling at 4200 feet became scattered minutes before
		ISS, STS-102 DN) P616/R96/V56/M87	25823 25824	PK: 4H 16R						install on lab, MPLM	landing.
		L010/KA0/A20/I/I/A								grapple, deploy,	SHUTTLE NIGHT LANDING #17:
	Continued Continued Continued						STS102-326-034 First Shuttle flight to			retrieve, and berth,	- Landed at KSC runway 15 on orbit 202 at 80:07:31:41Z, 2:31:41
				Sommuou				S is lined up	11 10	and EVA Support	AM EST Wednesday, March 21, 2001. Flight duration
	rendezvous with Sl								101		12:19:49:32. Landed at KSC Orbit 101.
					rendezvol	is with S	nuttie	Discovery.			Continued
				1							Continuou

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				ACE SH							
FLT	ORBITER	CREW (10) 7 UP/7 DOWN	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.	ORDITER	TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-102/ ISS 5A.1		Continued <u>M/S 5 DN/EXP1 Soyuz PLT</u> : Yuri Gidzenko	Continued <u>OMS-2</u> : 38:35 38:37	Continued DENS ALT: 264 FT		T					Continued FIRSTS/LASTS: - First shuttle flight transporting an Expedition crew - Expedition 2 up Expedition 1 down Expedition 1 Crew Jaunched on Elight 2B
Continued		(Russia) (Soyuz Up, STS-102 DN) P617/R265/M231	38:35 38:37 95.6 FPS 97.2 FPS 1:02 1:03.8				HATCH	EXIT	0-5		 FIRSTS/LASTS: First shuttle flight transporting an Expedition crew - Expedition 2 up, Expedition 1 down. Expedition 1 Crew launched on Flight 2R Russian Soyuz rocket from Baikonur Cosmodrome, Kazakhstan on October 31, 2000 at 2:53 AM EST (305:07:53Z). Soyuz docked with ISS on 11/2/2000 at 4:21 AM EST (307:09:21Z). Expedition 1 Crew: CDR - William Shepherd, Soyuz pilot - Yuri Gidzenko, Flight Engineer - Sergei Krikalev. Sheperd flight time 80:07:31:41
		SS EVA #61 EMU/TETHERED EVA #54 SCHEDULED EVA #55 DURATION 8:56		906:23:28:05 OV-103: 230:01:27:50 DISTANCE: 5,357,432 sm							- Sheperd flight time 80:07:31:41 <u>EVENTS:</u> - TI maneuver at 69:03:12:39Z, 1:15:30:30 MET, orbit 199.2 by 205.3. MC-4 at 69:04:33:21Z, 1:16:51:12 MET, orbit 199.1 by 206.1 nm.
ГИДЗЕНКО К SHEPHE	КРИКАЛĒВ ERD	SS EVA #62 EMU/TETHERED EVA #55 SCHEDULED EVA #56		5,357,432 sm							 - ISS capture at 69:06:38:26Z, 1:18:56:17 MET; Docked at PMA2 Lab Forward Port at 69:06:58:23Z; hatch opened at - EVA 1 Start at 2:17:29 MET and End at 3:02:25 MET, duration 8:56. - PMA3 grappled, unberthed, and installed on Node 1 Port ACBM at 70:13:50Z.
		DURATION 8:21 MCC WHITE FCR (33) FLIGHT DIRECTORS:			STS102-31 Destiny. Fr Shepherd, Kelly, Richa	ront (l 1 Helms	to r): Gio , Usach	dzenko/RSA ev/RSA & V	, Krikal oss. R		at 70:13:502. - MPLM grapple at 71:03:36Z, 3:15:54 MET, and installed on Node 1 Nadir ACBM at 71:06:08Z, 3:18:46 MET. - EVA 2 Start at 4:17:45 MET and End 5:00:06 MET, duration 6:21. - Collision avoidance maneuver/ISS Reboost #1 at 73:12:12:09Z, 6:02:30:00 MET, duration 47M22S, orbit 200.1 by 210.8 nm,
		A/E - N. W. Hale LD/O1 - J. P. Shannon O2 - P. S. Hill PLNG/O3 - P. F. Dye MOD - J. W. Bantle				_					Delta V 11.8 fps. - ISS Reboost #2 at 75:11:32:23Z, 7:23:50:14 MET, 7.2 fps, orbit 203 by 212 nm. LSS Deboet #2 at 76:00:17:45Z, 9:22:22:52 MET, 7.4 fps, orbit
VOSE		STATION: LD/O1 - R. E. LaBrode O2 - S. P. Davis PLNG/O3 - R. E. Castle	STS102-312-004	During EVA	1 Voss (and	a	gainst th	712-005 he blackness d after Shutt	s of spa	ace, the ISS	 MSL Republic at 8 at 76:0917.432, 6:22:35:32 WE 1, 7:4 µs, of all 204,5 by 213.7 nm. MPLM grappled at 9:20:22 MET, reberthed in orbiter, and ungrappled at 10:00:05 MET ODS hatch was closed at 78:02:48Z, 10:15:06 MET. Undocked at 78:04:31:53Z, 10:16:50 MET. Transfare: Shuttle to ISS: 96/9 lbs cargo plus 980 lbs water in
console,	Flight Direc		Helms – out of fra docking to ISS U	ame) prepared fo		Lines.					 Transfers: Shuttle to ISS: 9649 lbs cargo plus 980 lbs water in 10 CWC's. ISS to Shuttle: 1647 lbs cargo. Crew rotation (Expedition 1 to Expedition 2). Relocated PMA3 from Node 1 Nadir to Node 1 Port. Berthed MPLM to Node 1 Nadir. Transferred RSP's, RSR's, HRF, ISPR, etc. to ISS. Krikalev flew two long-duration missions to Mir. ISS Visitor Time is 8:21:33:30
mission d	detail.		2	(Jac)							RENDEZVOUS #52: - Rendezvous and dock with ISS at PMA2 Lab Forward Port. SIGNIFICANT ANOMALIES: - Flash evaporator left topping Evaporator Duct Heater String A
											failure - WCS Fan Sep Rotary Switch 2 position failure - Freon® loop flow degradation - EV1 burning sensation in eyes during Airlock depress - PMA3 J603 loose O-ring EVA - Unable to remove PMA3 P608 connector cap - TCS failure during rendezvous termination operation - OCAC fan failure (running slow at all speed settings)
								m,	,		 Right OMS Vapor Isolation Valve #2 anomaly C&W limits set volts pushbutton rotary switch down position not working on panel R13U

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		CREW		LANDING SITE/	SSME-TL						
		(7)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT NO.	ORBITER	(*)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		HA/HP	FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NU.		TITLE, NAMES	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION,	THROTTLE PROFILE	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S	ADORT HIVILS	WINDS	ENG. S.N.	LI					TIRSTS, SIGNIFICANT ANOMALIES, ETC.
STS-100/	OV-105	<u>CDR</u> :	KSC PAD 39A	EDW 22, CONC	104/104/	BI-107		DIRECT	01-28		Brief Mission Summary: STS-100/6A, 9th mission to ISS,
ISS 6A	(Flight 16)	Kent V. Rominger	109:18:40:41:99Z	EDW 48, CONC 29	109%	DCDM	(9)	INSERTION	(3)	38330 LBS	delivered and installed the ISS Canadarm2 robotic arm. The
	Endeavor	(Flt 5 - STS-73, STS-80, STS-85, STS-96)	2:40:42 PM EDT (P) 2:40:42 PM EDT (A)	121:16:10:43Z 9:10:43 AM PDT	PREDICTED:	RSRM 79		POST OMS-2:		PAYLOAD	first job for the arm was to attach a new airlock on ISS, to be
SEQ FLT # 104	Lindoaron	P618/R200/V131/M174	Thursday 32		100/104.5/			178.7 X 85.7		CHARGEABLE:	delivered on the next flight, STS-104. In addition, the second
	OMS PODS:	PLT:	4/19/01 (14)	Tuesday 18 5/1/01 (10)	104.5/72/ 104.5	ET-108		NM		29472 LBS	MLPM, Raffaelo, flown on this flight, transferred needed cargo to ISS and returned items from ISS to Earth.
KSC-104	LPO4-23	Jeffrey S. Ashby	LAUNCH WINDOW:	3/1/01 (10)	104.5	SLWT-13				DEPLOYED:	cargo to 155 and retained items from 155 to Earth.
PAD:	RPO1-30	(Flt 2 - STS-93)	4M49S BASED ON	DEORBIT BURN:	ACTUAL:					<u>DEPLOYED</u> : 6346 LBS	KSC W/D: OPF 82, VAB 5, PAD 23 = 110 days total.
39A-59	FRC5-16	P619/R251/V169/M218	IN-PLANE TIME (PLT)	121:15:02:47Z	100/104.5/ 104.5/72/						LAUNCH POSTPONEMENTS:
		M/S 1/EV1:	(PLI)	<u>XRANGE</u> : 527 NM	104.5					<u>NON-DEPLOYED</u> : 4282 LBS	- Baselined launch date of 12/2/99
ISS-6A		Chris A. Hadfield	EOM PLS: KSC	ORBIT DIR: AL 28	1 005 ((0)			REARDIT			- Postponed launch to 4/20/00, then 7/13/00, 7/27/00, 11/30/00.
MLP-1		(Flt 2 - STS-74) P620/R202/V170/M178	TAL: ZZA TAL WX: MRN, BEN	AIM PT: NOMINAL	1 = 2054 (3) 2 = 2043 (6)	<u>BRKUP</u> : 283 K		<u>DEORBIT:</u> APOGEE		<u>MIDDECK</u> : 781 LBS	- Postponed launch to 4/19/01 on 2/24/00.
NINTH		1 020/1202/ 01/0/001/0	TAL WA		3 = 2049(5)	203 K		219 NM		101 203	LAUNCH SCRUBS: None
SHUTTLE		M/S 2:	<u>SELECTED</u> : <u>RTLS</u> : KSC 33/N/N	MLGTD: 2159 FT 121:16:10:43Z		ET		PERIGEE		<u>SHUTTLE</u> ACCUMULATED	LAUNCH WINDOW:
FLIGHT TO		John L. Phillips CSA/Canada	TAL: MRN 20/N/N	VEL: 207 KGS	ALL BLOCK	IMPACT 1:26:38		204 NM		<u>ACCUMULATED</u> WEIGHTS:	- Launch window opened at 109:18:36:127 and closed at
ISS		P621/R266/M232	AOA: KSC 33/N/N	195 KEAS HDOT: -3.6 FPS		MET		<u>ENTRY</u>		DEPLOYED:	109:45:31Z, giving a total window of 9M29S. The Preferred
		M/S 3/EV2:	<u>PLS</u> : KSC 15/N/N	TD NORM 195:	M 3 EOM: WEIGHT:	LAT:		VELOCITY: 25919 FPS		1046246 LBS NON-DEPLOYED:	Launch Time (PLT) was 109:18:40:42 (In-plane time) 2:40:42 PM EDT, giving a launch window of 4M49S.
		Scott E. Parazynski	TDEL:	2148 FT	220693 LBS	<u>LAT</u> . 1.23°S		20414 LL2		1499587 LBS	
		(Flt 4 - STS-66, STS-86,	0.10 -0.018/0.02	NLGTD: 5410 FT	X CG:			ENTRY		CARGO TOTAL:	LAUNCH DELAYS: None
		STS-95) P622/R187/V144/M165	MAX Q NAV:	121:16:10:53Z	1083.79	<u>LONG</u> : 127.14°W		RANGE: 4387 NM		3229997 LBS	- Launch occurred on time at 109:18:40:42Z, 2:40:42 PM EDT on Thursday, April 19, 2001.
INGER	ASHD		725 728	VEL: 157 KGS 149 KEAS	LANDING:	127.14 10		4307 100		PERFORMANCE	3.1
5 ROM #	Paler	<u>M/S 4</u> :	CDD CTC	HDOT: -5.2 FPS	WEIGHT:					MARGINS (LBS):	TAL WX: - Zaragoza (prime) was NO GO for head wind violations until
		Umberto Guidoni (Flt 2 - STS-75)	<u>SRB STG</u> : 2:03.7 2:04	DRAG CHUTE	220556 LBS X CG:					FPR: 3274 FUEL BIAS: 818	approximately L-3 minutes when head winds dropped to 25 knots.
		(ESA-Italy)		DRAG CHUTE DEPLOY: 191 KEAS	1085.49					FINAL TDDP: 2670	Moron (selected early) was GO and decision made to stay with a
	100	P623/R212/V171/M185	<u>PERF</u> : NOMINAL	121:16:10:45Z						RECON: 2296	solid Moron. Ben Guérir was NO GO for forecast and observed showers/virga.
<u> </u>	all a	M/S 5:	2 ENG TAL (MRN):	<u>BRK INIT</u> : 106 KGS						PAYLOADS:	Showers/ wiga.
TYAKOB GUI	DONI HADPID	Yuri V. Lonchokov	2:33 2:33	DRAG CHUTE						PLB: ISS-6A	PERFORMANCE ENHANCEMENTS:
		(Russia) P624/R267/M233	NEG RETURN:	<u>JETTISON</u> : 53 KGS 121:16:11:16Z		0.0	1199			ISS-6A ICBC3D	- Standard Set Plus: (1) PE Operational High Q TRN/APR, (2) OMS assist is 4000 lbs, (3) 52 nm MECO, (4) Del Psi
		1 024/1207/10233	3:54 3:55		1 mars	A J's			144	MPLM	
			<u>PTA (U/S 243)</u> :	<u>BRK DECEL FPS²:</u> AVE 6.5 PK 10.6	Site Alash	2	142	1 the		SLP-06A	FLIGHT DURATION CHANGES: - Total ext 1 day + 2 orbits. Planned landing was on orbit 170.
159/159	-6A+STS-100		<u>PTA (U/S 243)</u> : 4:47 4:46	WHEELS STOP:	1000	11/20	You .	1.2		RMS, ODS	- Extended 1 docked day due to ISS C&C MDM (computer)
				121:16:11:34Z	A. A.					MIDDECK:	problems resulting in a planned landing on orbit 185. Did not close PLBD's and waved-off landing at KSC on orbits 185 and
	🖉 . † 🔪 📫		<u>PTM (U/S 243)</u> : 5:56 5:50	10123 FT	10-2-2		1		-	DTO EMU H/W	close PLBD's and waved-off landing at KSC on orbits 185 and 186 due to forecast of showers, crosswinds, and low ceiling
			5.50 5.50	ROLLOUT:	1. 1. 1.		A HE	0	South .	EVA Tools	weather violations. Similar weather violations were forecast for
			<u>SE TAL (ZZA</u>):	7964 FT 51 SEC		(.					KSC for the next 2 days. EDW had been called up for EOM
			6:04 6:03		a stant	CH		and the second		5 CRYO TK SETS 7 GN2 TANKS	because KSC WX violations were forecast to continue through the majority of the week. Decision was made to land at EDW on
			<u>SE PTM (U/S 701):</u>	<u>WINDS</u> : 2H 3R	A PR		-0.4	Ser Lake		RMS 61	orbit 187. KSC WX was observed NO GO on the two extension
L			6:53 6:53	OFFICIAL:	15580/1428 38018421 11 14			5 . 4 . L	Sec.	DMC used to	days. Weather observations forecast KSC was NO GO for all 3 days. EDW was GO on EOM+1. Landed on EDW runway 22 on
			MECO CMD:	28006P10 SS: 5H 4R	and an order that	-				RMS used to grapple, deploy,	orbit 187 at 121:16:10:43Z, 8:10:43 AM PST on May 1, 2001,
				PK: 8H 7R				01) Endeavo		retrieve, and berth	11:21:30:01 MET.
		Continued	Continued					nadarm2 on bo	ard,	Spacelab Pallet and	
		Continued	Continued	Continued	approachin	ig 155 10r	uockin	y.		MPLM, and for EVA Support	Continued
										o appoint	1

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FLT	ORBITER	CREW (7)	LAUNCH SI LIFTOFF TI		SSME-TL NOM-ABORT EMERG	SRB RSRM	C	RBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SI ABORT TIM	ES LANDING TIMES	THROTTLE PROFILE	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
Director Le		Continued SS EVA #63 EMU/TETHERED EVA #56 SCHEDULED EVA #57 DURATION 7:09:51 SS EVA #64 EMU/TETHEREDEVA #57 SCHEDULED EVA #58 DURATION 7:39:23 MCC WHITE FCR (34) FLIGHT DIRECTORS: A/E - L. E. Cain LD/O 1 - P. L. Engelauf O 2 - K. B. Beck PLNG/O3 - B. P. Austin MOD - J. M. Heflin STATION: LD/O 1 - J. M. Curry O 2 - M. J. Ferring PLNG/O 3- R. E. Castle	Continued VI: 25930 2 OMS-2: 43:40 4	WINDS Continued 5920 3925 FT 3925 FT 3122 FLT DURATION: 11:21:30:01 S/T: 918:20:58:06 OV-105: 167:03:14:03 DISTANCE: 4,910,188 sm	ENG. S.N.	41-003 Destiny. SA-Italy, //RSA. T	STS-10 Bottom, 1 Rominge s/EXP2, 10 op: Paraz	Yury V. Usac zynski, Phillip	2 crews dfield/C Helms/E chev/EX ps, & As	Lin-flight SA, XP2. Middle P2, & shby.	Continued EVENTS: - MC-4 (RCS) at 1:18:00:36 MET, orbit 199.1 by 206.1 nm - Docked at ISS PMA2 Lab Forward Port at 111:14:10:42Z - EVA 1 Start at 2:17:04:41 MET, duration 7:09:51 - RMS grappled the Spacelab Pallet, unberthed from orbiter, and installed on Lab Cradle Assembly at 2:16:07:18 MET - ISS hatch opening and crew ingress into ISS at approximately 3:14:40 MET MPLM in PLB at 3:19:45 MET grappled and positioned over Node 1 Nadir CBM and installed at 3:21:04 MET First ISS Reboost maneuver Started at 4:01:09:54 MET, duration 59M36S, Delta V 7.41 fps, orbit 205.5 by 212.2, raised orbit 2.1 nm EVA 2 Start at 4:17:53:12 MET, duration 7h39M22S - Second ISS Reboost maneuver Started at 7:16:40:00 MET (RCS), ended at 1 hour, Delta V was 15.9 fps, orbit 210 by 206 RMS berthed MPLM in PLB and powered down at 8:02:43 MET SSRMS to RMS handoff of SLP berthed at 9:02:02 MET Delivered and installed SSRMS and connected cables to U.S. Lab. UHF antenna on U.S. Lab, removed starboard ECOMM antenna. Delivered and installed express racks with payloads. Replaced failed CMC MDM #1 Undocked at 119:17:34:04Z (Extended flight 1 docked day due to ISS C&C MDM and Node MDM problems) Transferred 6346 Ibs cargo to ISS and 1608 lbs from ISS to Shuttle. Transferred 1380 lbs water in 14 CWC's ISS Visitor time is 8:03:23:22. <u>RENDEZVOUS #53:</u> - Rendezvous and dock with ISS at PMA2 Lab Forward Port <u>SIGNIFICANT ANOMALIES:</u> - FES Feedline B Mid 2 Hr 1 failed off - RMS End Effector Capture Switch sticky - WSB 3 anomalous temperature response when operating on WSB 3B controller - Humidity Separator B water carryover - RCS Jet R5D low chamber pressure - EV1 eye irritation during EVA 1 and EVA 2 (Disposable in-suit drink bag leaked) - ISS Early Comm Antenna connector fell apart - Video Signal Converter failed to release from SLP during EVA 2 - SIGI data check bad status indications - SRP - Unburned propellant (3 percent) in RH Forward Booster Separation Motor (BSM). Conclusion is water intrusion LOMS POD inboard Y-w

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				LANDING SITE/	SSME-TL						
FLT	ORBITER	CREW (5)	LAUNCH SITE, LIFTOFF TIME,	RUNWAY, CROSSRANGE	NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-104/ ISS 7A SEQ FLT #105 KSC-105 PAD 39B-46 MLP-2 TENTH SHUTTLE FLIGHT TO ISS	OV-104 (Flight 24) Atlantis OMS PODS: LPO3-28 RPO4-24 FRC4-24	PLT: Charles O. Hobaugh P626/R268/M234 <u>M/S 1/EV1</u> : Michael L. Gernhardt (Fit 4 - STS-69, STS 83, STS-94) P627/R198/V138/M173 <u>M/S 2</u> : Janet L. Kavandi (Fit 3 - STS-91, STS-99) P628/R243/V158/F32 <u>M/S 3/EV2</u> : James F. Reilly (Fit 2 - STS-89)	KSC 39B 193:09:03:59Z 5:03:59 AM EDT (P) 5:03:59 AM EDT (A) Thursday 33 7/12/01 (7) <u>LAUNCH WINDOW:</u> 7M57S USING PLT (IN-PLANE TIME) <u>EOM PLS</u> : KSC TAL: ZZA TAL WX: MRN <u>SELECTED</u> : <u>RTLS</u> : KSC 33 N/N TAL: ZZA 30 N/SF AOA: KSC 15 N/N PLS: EDW 22 N/N TDEL: 2001 0 5	KSC 15 (KSC 55) 206:03:38:55Z 11:38:55 PM EDT Tuesday 19 7/24/01 (10) <u>DEORBIT BURN:</u> 206:02:31:35Z <u>XRANGE</u> : 391 NM <u>ORBIT DIR</u> : AL 29 <u>AIM PT</u> : NOMINAL <u>MLGTD</u> : 2183 FT 206:03:38:55Z VEL: 198 KGS 199 KEAS HDOT: -1.4 FPS TD NORM 195: 2499 FT NLGTD: 5442 FT	104/104/ 109% <u>PREDICTED</u> : 100/104.5/ 104.5/72/ 104.5 104.5/72/ 104.5 1 = 2056 (1) 2 = 2051 (2) 3 = 2047 (6) ENG 1 & 3 BLOCK IIA ENG 2 BLK II <u>M 3 EOM</u> : WEIGHT: 209142 LBS	BI-108 RSRM 80 ET-109 SLWT 14 ET <u>RPT</u> : 283 K <u>ET</u> <u>IMPACT</u> 1:14:17 MET <u>LAT</u> : 36.32 °S <u>LONG</u> : 158.55°W	51.60 (10)	DIRECT INSERTION POST OMS-2: 127 X 85 NM DEORBIT: APOGEE: 211.0 NM PERIGEE: 207.5 NM VELOCITY: 25905 FPS ENTRY RANGE: 4405 NM	OI-28 (4)	CARGO: 35135 LBS PAYLOAD CHARGEABLE: 26424 LBS DEPLOYED: 19792 LBS NON-DEPLOYED: 6060 LBS MIDDECK: 582 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 1066028 LBS NON-DEPLOYED: 15066229 LBS	Brief Mission Summary: STS-104, 10th mission to ISS, delivered, installed, and operated the first ISS airlock, Quest - "Giving ISS a Doorway to Space". Quest provided the capability for conducting EVA's without the presence of Shuttle, for EVA's using either Russian Orlan or U.S spacesuits, and for a new pre-breathing protocol to prevent "the bends". Also, this was first mission support from Houston's ISS Flight Control Room (BFCR). KSC W/D: OPF 82, VAB 11, PAD 21 = 114 days total. LAUNCH POSTPONEMENTS: - Baselined launch date of 8/24/00 on 7/29/99 - Postponed launch date to 2/8/01 on 11/10/99 - Postponed launch date to 7/12/01 LAUNCH SCRUBS: NONE LAUNCH WINDOW: - Launch window opened at 193:08:59:00Z and closed at 193:09:11:56Z in two panes with a 10 second cutout between panes, resulting in a total window of 12M56S. The Preferred Launch Time was 193:09:03:59Z (Pane 1 In-Plane Time)
		P629/R234/V172/M204 SS EVA #65 EMU/TETHERED EVA #58 SCHEDULED EVA #59 DURATION 5:59 SS EVA #66 EMU/TETHERED EVA #59 SCHEDULED EVA #60 DURATION 6:29:20 SS EVA #67 DOCKED EVA 1 FROM QUEST A/L #1 EMU/TETHERED EVA #60 SCHEDULED EVA #61 DURATION 4:01:30 MCC WHITE FCR (35) <u>FLIGHT DIRECTORS</u> : A/E/O 2 - N. W. Hale LD/O 1 - P. S.Hill PLNG/O3 - J. P. Shannon ISS LD/O 2 - M. A. Kirsich ISS O 1 - S. P. Davis ISS PLNG/O3 - J. M. Hanley MOD - R. E. Castle	0.01 0.012/0.05 MAX Q NAV: 732 732 732 SRB STG: 2:02 PERF: NOMINAL 2:02 2ENG TAL (MRN): 2:23 2:23 2:26 NEG RETURN: 3:57 PTA (U/S 159): 4:36 SE OPS 3: NC PTM (U/S 159): 6:02 6:03 6:06 SE PTM (U/S 755): 6:49 6:52 Continued	Number Number 206:03:39:06Z VEL: 148 KGS 148 KEAS 148 KEAS HDOT: -5.7 FPS DRAG CHUTE DEPLOY: 191 KEAS 206:03:38:58Z BRK INIT: 56 KGS DRAG CHUTE JETTISON: 57 KGS 206:03:39:39Z BRK DECEL (FPS): AVE 1.6 PK 5.1 WHEELS STOP: 206:03:40:06Z 13041 FT ROLLOUT: 10858 FT 68 SEC WINDS: 4H 1L OFFICIAL: 005090707 SS: 5H 2L PK: 6H 3L Continued	X CG: 1083.81 LANDING: WEIGHT: 209097 LBS X CG: 1085.59 STS104-E- pose in new Hobaugh. 2 Lindsey, CE Gernhardt/M	5178 S v Quest ai 2nd row, fr DR/EXP2 ` MS. In rea	rlock: I rom le Yury V ir: Kav	A & EXP2 crew Front: PLT off: Reilly/MS, CG Usachev & randi/MS, Jame J. Helms EXP2	ws CDR es S.	CARGO TOTAL: 3265132 LBS PERFORMANCE MARGINS (LBS): FPR: 3274 FUEL BIAS: 818 FINAL TDDP: 2884 RECON: 2990 PAYLOADS: PLB: ISS-7A ISS Airlock Spacehab Double Pallet (O2 and N2 TKS) ICBC3D RMS, ODS MIDDECK: ICBC SPT EQUIP, EMU H/W, EVA TOOLS 5 CRYO TK SETS 7 GH2 TKS RMS 62 RMS used to view A/L Installation, OSVS, and EVA Support	Launch Time Was 193:09:03:597 (Pane 1 In-Plane Time) resulting in a launch window of 7M57S. LAUNCH DELAYS: NONE - Launch occurred On-Time at 193:09:03:59Z (5:03:59 AM EDT) on Thursday, July 12, 2001. TAL WX: - Zaragoza (Prime and Selected) forecast and observed GO. Moron (2-Eng TAL Call) was forecast and observed GO. Ben Guerir was not available due to security concerns (BEN was forecast and observed GO). PERFORMANCE ENHANCEMENTS: - Standard Set Plus: PE Operational High Q SUM/JUL, 52 nm MECO, and Del Psi SHUTTLE NIGHT LAUNCH #26 SHUTTLE NIGHT LAUNCH #26

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						5110					
FLT	ORBITER	CREW (5)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS.	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.	ONDITER	TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-104/ ISS 7A Continued	HPFTP) C	Bik II SSME (P&W ourtesy: Dan P&W/Rocketdyne/	Continued <u>MECO CMD</u> : 8:23.8 8:26 <u>VI:</u> 25824 25823 <u>OMS-2</u> : 38:29 38:33 96.7 FPS 96.6 FPS	Photo at right: JS 21323 During J in MCC (It to rt) F Gest /USA ; Stev Hawley, Dep. Din Lee Briscoe, Ch. MOD; & Milt Hef Director's Office. Continued <u>DENS ALT:</u> 1346 FT F <u>LT DURATION</u> : 12:18:34:56 <u>S/T</u> : 931:15:33:02	SC2001-E- Pre-launch Robert /en r. FCOD; Eng. lin, Ch. Flt						Continued <u>FLIGHT DURATION CHANGES:</u> - Second Extension Day. Called up EDW for EOM+1. Landed on first KSC opportunity on orbit 201 on runway KSC 15 at 206:03:38:55Z, 12:18:34:56 MET, 11:38:55 PM EDT (Tuesday, July 24, 2001 EDT). <u>FIRSTS/LASTS:</u> - First flight of SSME with alternate Pratt & Whitney HPFTP (S/N 2051) Block II engine - First operational use of SSRMS since delivery on STS-100/6A. Used to grapple Airlock and install on Node 1 Starboard Port First use of exercise pre-breathe of pure oxygen to purge nitrogen from EVA crew for EVA 3 (12 minute pre-breathe) First use of ISS Joint Airlock for EVA (by Shuttle Crew on EVA 3). <u>EVENTS:</u> - Docked at ISS PMA2 Lab Fwd Port. ISS contact at 1:18:04:02 MET, 195:03:08:01Z; Docking complete at 1:18:19:16 MET,
			pa his Mic fra air	OV-104: 198:05:45:31 DISTANCE: 5,309,429 sm noto at Right: STS10 Astronaut James F rticipates in a bit of story as he joins ast chael L. Gernhardt ime) in utilizing the lock for the first even alk to earess from IS	E. Reilly space tronaut (out of new Quest er space	- Wate - FES - EMU - EV1 - Airloo - Non-	er Loop 1 f Feedline 3 battery right foot ck Handho tending re	NOMALIES: A heater failure electrolyte leaka discomfort old 0535 installatit tiractable tether o conferencing ar	ige ion failure	perature	 195:03:23:15Z. - ISS Hatch open (first) 1:20:24 MET, 195:05:28Z. - Airlock grapple. - EVA 1 started at 2:18:07 MET, 196:03:12Z; ended at 3:00:06 MET, 196:09:11Z, duration 5H59M. - ISS Reboost 1 maneuver started at 196:01:18:06Z, 3:16:14:07 MET, Delta V=6.8 ft/sec, altitude increase 2.3 nm, altitude 206 by 201 nm. - EVA 2 started at 199:03:05Z; ended at 199:09:34Z, duration 6H29M20S. - ISS Reboost 3 maneuver started at 199:09:59:12Z, 6:00:55:13 MET, delta V=6.9 ft/sec, altitude increase 2.0 nm, altitude 207.8 by 203.7 nm. - ISS Reboost 3 maneuver started at 200:07:35:04Z, 6:22:31:05 MET, delta V=14.9 ft/sec, altitude increase 4.3 nm, altitude 211.1 by 208.6 nm. - EVA 3 started by 202:08:35Z, and ended at 202:08:37Z, duration 4H01M30S. EVA from Joint Airlock. - Delivered and installed ISS Joint Airlock on Node 1 Stbd port using SSRMS. Delivered and installed four HPGT's (two 02 and two H2) on Airlock. End of ISS Phase 2. - ISS Hatch close (Final) at 9:17:51 MET, 203:02:55Z. - Undocked at 9:19:50:00 MET, 203:04:53:59 Z. - Transfers: Shuttle to ISS: 19782 lbs cargo (includes Airlock, 13299 lbs) plus 897 lbm water in 9 CWC's. ISS to Shuttle: 626 lbs. - ISS Visitor Time is 8:01:45:58.
of Orbit 2 tea (BFCR) in Ho shirt) stands	im pose for grou ouston's MCC. C near front at fra) First mission from ISS M p portrait in the ISS flight con Drbit 2 Flight Director Mark Kir me center. Lisa Holmesly, lea n front of Kirasich between the	trol room rasich (blue Id operations			- Faile - Sequ - Ku-B - ODS	d hand he ential Stil and failed C/L Cam	Id microphone. I Video (SSV) noi to detect and tra era misalignment s 8 and 9 Open 2	t operating ack Ku for t	ward signal.	RENDEZVOUS #54: - Rendezvous and dock with PMA2 Lab Forward Port

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		CREW		LANDING SITE/	SSME-TL						
		(7 UP/7 DOWN)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES, ABORT TIMES	LANDING TIMES	THROTTLE PROFILE	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ADURT TIVIES	FLT DURATION, WINDS	ENG. S.N.	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-105/	OV-103	CDR:	KSC 39A	KSC 15 (KSC 56)	104/104/	BI-109	51.60	DIRECT	01-28	CARGO:	Brief Mission Summary: The STS-105/7A. 1 (11th ISS mission)
ISS 7A.1	(Flight 30	Scott J. Horowitz	222:21:10:14Z	234:18:22:59Z	109%		(11)	INSERTION	(5)	33107 LBS	provided a new crew to the ISS, transfer of supplies and
	(Discovery)	(Flt 4 - STS-75, STS-82, STS-101)	5:10:14 PM EDT (P) 5:10:14 PM EDT (A)	2:22:59 PM EDT	PREDICTED:	RSRM 81		POST OMS-2:		PAYLOAD	equipment via the second flight of the Leonardo MPLM. This
SEQ FLT #106	(DISCOVCI y)	P630/R210/V135/M183	Friday 23	Wednesday 13	100/104.5/	01		125.9 X 84.8		CHARGEABLE:	flight completed the first round trip for Expedition rotation
FLI#100	OMS PODS:		8/10/Ŏ1 (7)	8/22/01 (6)	104.5/72/	ET-110		NM		29305 LBS	crews (EXP 2).
KSC-106	LPO1-33 RPO3-31	PLT: Frederick W. Sturckow	LAUNCH WINDOW:	DEORBIT BURN:	104.5	SLWT				DEPLOYED:	KSC W/D: OPF 79, VAB 8, PAD 31 = 118 days total.
PAD	FRC3-30	(Flt 2 - STS-88)	9M58S ISS WINDOW	234:17:15:23Z	ACTUAL:	15				9657 LBS	
39A-60		P631/R247/V173/M215	OPEN	XRANGE: 793 NM	100/104.5/						LAUNCH POSTPONEMENTS: - Baselined launch date of 6/21/01 on 6/22/00
		M/S 1/EV2:	EOM PLS: KSC		104.5/72/ 104.5					<u>NON-DEPLOYED</u> : 4654 LBS	 Postponed launch date to 7/12/01 Postponed launch date to NET 8/5/01 on 6/7/01
MLP-3		Patrick G. Forrester	TAL: ZZA	<u>ORBIT DIR</u> : AR 10	104.5						- Postponed launch date to NET 8/9/01 on 7/11/01
ELEVENTH		P632/R269/M235	<u>TAL WX</u> : MRN, BEN	<u>aim pt</u> : Nominal	1 = 2052 (4)					MIDDECK:	LAUNCH SCRUBS:
SHUTTLE		M/S 2/EV1:	SELECTED:	<u>MLGTD</u> : 1508 FT	2 = 2044 (6) 3 = 2045 (6)					475 LBS	- Scrubbed the 8/9/01 launch attempt. The launch window was in
FLIGHT TO		Daniel T. Barry	RTLS: KSC 15 N/N	234:18:22:59Z VEL: 210 KGS	2010(0)					<u>SHUTTLE</u>	LAUNCH SCRUBS: - Scrubbed the 8/9/01 launch attempt. The launch window was in two planes; however, at the L-2 day MMT, it was decided not to use Plane 2 for the first launch attempt on Thursday, August 9, 2001. Window opened at 221:21:32:47Z and closed at 221:21:42:46Z or 9M59S total window. With a Preferred Launch Time (PLT) of 221:21:37:46Z, the launch window was 5M00S. Launch attempt was scrubbed at L-25 minutes due to thunderstorms within 20nm, lightening strikes at 12 nm, and detached anvils over the Pad and SLF. All three TAL sites were GO. Weather Scrub. Launch set for Friday, August 10.
155		(Flt 3 - STS-72, STS-96 P633/R209/V155/M182	TAL: MRN 20 N/N AOA: KSC 15 N/N	202 KEAS						ACCUMULATED	2001. Window opened at 221:21:32:47Z and closed at 221:21:142:46Z or 0MEQS total window. With a Disferred Launch
		P033/R209/V100/W182	PLS: EDW 22 N/N	HDOT: -3.2 FPS				(12 August 200		WEIGHTS: DEPLOYED:	Time (PLT) of 221:21:37:46Z, the launch window was 5M00S.
		M/S 3 UP/EXP 3 CDR:		TD NORM 195:	SSME'S		ip view	of Shuttle/ISS		1075685 LBS	Launch attempt was scrubbed at L-25 minutes due to
		Frank L. Culbertson, Jr.	TDEL:	2256 FT		docking.				NON-DEPLOYED:	detached anvils over the Pad and SLF. All three TAL sites were
		(Flt 3 - STS-38, STS-51) P634/R116/V95/M105	0.05 -0.148/-0.11	<u>NLGTD:</u> 4971 FT		Colora Official			Ţ	1511356 LBS CARGO TOTAL:	GO. Weather Scrub. Launch set for Friday, August 10.
			<u>MAX Q NAV</u> :	234:18:23:10Z VEL: 157 KGS	and the second second		L	- Alter		22002201.00	
		M/S 4 UP/EXP 3 SPLT: Vladimir N. Dezhurov	723 715	149 KEAS	1000	and the second	Section 2013				- Launch window opened at 222:21:10:142 and closed at 222:21:20:127, giving a total launch window of 9M58S. The PLT
		(Russia)	SRB STG:	HDOT: -6.9 FPS	al m	N.M.	-			PERFORMANCE MARGINS (LBS):	(Preferred Launch Time) of 222:21:15:13Z (In Plane Time) was
	TUR	(Flt 2 - ŚTS-71)	2:02.2 2:07	DRAG CHUTE	Review 1	ALLE:	17.	- autacta		FPR: 3065	late count, thunderstorms were moving toward the launch site
WITZ	ICKO4	P635/R195/V174/M170	PERF: NOMINAL	DEPLOY: KEAS 234:18:23:01Z		2 1	T	21		FUEL BIAS: 937 FINAL TDDP: 705	from the Southwest and forecast to be within 30 nm of the Pad
S AN		M/S 5 UP/EXP 3 Flt Eng:	PERF. NOWINAL			28	-	AND AND	land a	RECON: 631	Launch window opened at 222:21:10:14Z and closed at 222:21:20:12Z, giving a total launch window of 9M58S. The PLT (Preferred Launch Time) of 222:21:15:13Z (In Plane Time) was selected, which gave a planned window of 4M59S. During the late count, thunderstorms were moving toward the launch site from the Southwest and forecast to be within 30 nm of the Pad and SLF at launch time. At L-27 minutes, the Ops Manager made the decision to increase the probability of launching by moving the launch time to the opening of the launch window.
E 🛃 🕅	¥ _ 9	Mikail Tyurin	<u>2 ENG TAL (BEN)</u> :	<u>BRK INIT</u> : 78 KGS	and the second	and the second s	-	ATTACK TO A			Launch Time to the opening of the launch window
2 +		(Russia) P636/R270/M236	2:27 2:21	DRAG CHUTE JETTISON:	and a second	THE REAL OF	and the second	1		PAYLOADS:	Launch Time to the opening of the launch window (222:21:10:14Z), giving the ultimate launch window of 9M58S. Weather was observed GO at RTLS landing time for PLT and
E I		F 030/KZ/0/IVIZ30	NEG RETURN:	<u>56 KGS</u>	And Bar	and the second se				<u>PLB</u> : ISS-7A.1	Window Open Time.
AX 70	5 *	M/S 3 DN/EXP 2 Flt Eng 1:	3:55 3:58	234:18:23:43Z	. avase5667 2001/06/12 16/53 ((MPLM, ICC crew	LAUNCH DELAYS: NONE - Launch occurred On-Time at 222:21:10:14Z, Friday, August 10,
HOROB CH	SERTSON THOP	James S. Voss (Flt 5 - STS-44, STS-53,	<u>PTA (U/S 163)</u> :	BRK DECEL FPS ² :	<u>M 3 EOM</u> :	ET DDT:		<u>DEORBIT</u> : APOGEE		rotation) Heat, GAS (2)	- Launch occurred On-Time at 222:21:10:14Z, Friday, August 10, 2001 at 5:10:14 PM EDT.
OSS YCA	HEB HELMA	STS-69, STS-101,	4:35 4:36	AVE 3.8 PK 4.9	WEIGHT:	<u>RPT:</u> 283K		218.8 NM		RMS, ODS	
		STS-102 UP)		WHEELS STOP:	220682 LBS			PERIGEE		.,	TAL WX: - All three TAL sites were forecast and observed GO (Zaragoza
		P637/R136/V85/M121	<u>SE OPS³:</u>	234:18:24:05Z 11544 FT	X CG:	<u>ET</u> IMPACT		199.2 NM		MIDDECK: None	(prime), Moron, and Ben Guerir). Moron was selected because it had the best weather (ZZA had potential for winds and rain).
	2 Provention		5:25		1083.96	1:14:21		ENTRY		NONE	· · · · · · · · · · · · · · · · · · ·
-			PTM (U/S 163):	<u>ROLLOUT:</u> 10036 FT		MET		VELOCITY:		5 CRYO TK SETS	PERFORMANCE ENHANCEMENTS: - Standard Set plus PE Operational High Q SUM/AUG, 52 nm
A ·		4	6:36 6:44	66 SEC		I AT.		25909 FPS		6 GN2 Tanks RMS 63	MECO, and Del Psi.
l lie					LANDING:	<u>LAT</u> : 36.7°S		ENTRY		KIVIS OS	FIRSTS/LASTS:
	+	•	Continued	Continued	WEIGHT:			RANGE:		RMS used to install	- First Shuttle round trip with Expedition rotation crews
	+				222620 LBS	<u>LONG</u> : 157.75°W		4286 NM		MPLM on Node 1	(Expedition 3 crew up, Expedition 2 crew down).
					X CG:	137.75 W				and berth in PLB, to install EAS on P6	RENDEZVOUS #55:
	SS-7A1				1085.62					truss, and EVA	Rendezvous and dock with ISS-PMA 2 Lab Forward Port
		Continued								Support	Continued
		Continued									

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FLT	ORBITER	CREW (7 UP/7 DOWN)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS.	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS.
NO.	ORDITER	TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP	1300	PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
TS-105/ is 7A.1		Continued <u>M/S 4 DN/EXP 2 Flt Eng 2</u> : Susan J. Helms (Flt 5 - STS-54, STS-64, STS-78, STS-101, STS-102 UP) P638/R158/V108/F19 <u>M/S 5 DN/EXP 2 CDR</u> : Yuri V. Usachev (Flt 2 - STS-101) (Russia) (STS-102 UP) P639/R256/V168/M223 SS EVA #68 EMU/TETHERED EVA #61 SCHEDULED EVA #62 DURATION 6:16 SS EVA #69 EMU/TETHERED EVA #62 SCHEDULED EVA #63 DURATION 5:29	Continued <u>SE TAL (ZZA)</u> : 6:04 5:59 <u>MECO CMD</u> : 8:24.4 8:27 <u>OMS-2:</u> 38:34 38:34 96.4 96.2	WINDS Continued WINDS: 3T 6L OFFICIAL: 04007P11 SS: 6L 3T PK: 10L 4T DENS ALT: 1816 FT FLT DURATION: 11:21:12:45 S/T: 943:12:45:47 OV-103: 241:22:40:35 DISTANCE: 4,912,390 sm	STS105-E-5 involved thre shirts) front t Tyurin/RSA; & Barry, and	ee crèws to back, STS-10 l back ro	s, shown Culberts 5 crew (sow, Horo	2001) The S in U.S. Lab. H on/RSA, Dezh stripped shirts witz and Sturce achev/RSA, Vo	EXP 3 c nurov/R) front kow. E	5 mission crew (white SA, & row, Forrester XP 2 crew	Continued FLIGHT DURATION CHANGES: - Total changes-one orbit weather extension. NEOM was to la at KSC on orbit 186 at approximately 12:46 PM EDT. EDW w not called up. At Tig-25 minutes, waved-off landing due to observed and forecast thunderstorms and rain showers within nm of SLF. STA reported there was not-a-cloud-in-the-sky ow. Florida except for the rain cell that persisted at 1 or 2 miles so of the SLF, which caused the wave-off. Landed at KSC 15 on orbit 187 at 234:18:22:59Z, 2:2:59 PM EDT, on Wednesday, August 22, 2001. EVENTS: - ISS capture was at 1:21:31:27 MET, 224:18:41:41Z. - ISS hard dock at PMA2 Lab Forward Port at 1:21:53:39Z, 224:19:03:53Z. - First ISS hatch opening at 1:23:30 MET, 224:02:41:14Z. - RMS grapple of the MPLM at 2:15:41:46 MET, 225:12:52:00. - MPLM installed on Node 1 at 2:18:35:37 MET, 225:15:45:51; - IELK time and Command Handover Time (ISS transfer from 2 crew to Exp 3 crew and Cmd from Usachev to Culbertson) a 225:19:15Z. - Exp 2 habitant time (Usachev=156:08:35, Voss=154:14:17, Helms=152:10:34). OV-105 crew ISS Visitor Time=7:19:47:44 - EVA 1 Start time 228:13:58:14Z, 5:16:48:00, duration 6H16M - EAS installed on P6 Truss and Pip Pin in at 228:15:40:02Z, 5:18:29:47 MET. - First Reboost maneuver started at 226:17:56:26Z, 3:20:48:12 MET, delta V 6.0 ft/sec, altitude increase 1.7 nm, orbit 218 by nm.
		MCC WHITE FCR (36) <u>FLIGHT DIRECTORS</u> : A/E/ 01 - J. P. Shannon LD/01 - P. F. Dye 0 2 - K. B. Beck PLNG/03 - B. P. Austin ISS LD/01 - M. J. Ferring ISS 02 - R. E. La Brode ISS P/03 - J. M. Curry MOD - N. W. Hale	- Zero-G connector 1 - Safety tether hook EV2's safety tether GPS ADL-CC-15 a - Ku-Band Power Ou - OPS Recorder 1 d - Nose Wheel Steeri - Left OMS Crossfee	lock guard inadvertent nomaly (MAGR trackin utput low	ng difficulty) neater failure	surrou	05-E-526 Ind Early	5 Barry (le Ammonia Se o during EVA 1	rvicer (I	Forrester	 Second Reboost maneuver started at 229:12:12:27Z, 6:15:07. MET, delta V 6.4 ft/sec, altitude increase 1.8 nm, orbit 218.8 b 209.5 nm. EVA 2 started at 230:14:32Z, 7:16:32 MET, and ended at 230:20:01Z, duration 5M29S. SimpleSat deployed from Gas Can at 232:18:29:14Z, 9:21:14 MET. Total transferred to ISS 10651 lbs; 9657 lbs cargo (MPLM 63 ICC 1549, MD 1794, H2O 10 CWC's with 993.8 lbs). Total transferred from ISS 3802 lbs (MPLM 2564, ICC 0, MD 1238). Net transfer from Shuttle to ISS–6849 lbs. Crew rotation, Exp 3 up and Exp 2 down. Delivered and installed EAS on P6 Truss and attached cables. Clamped MIS to ISS Airlock handrails. Installed 11 handrails on U.S. Lab. Undocked at 232:14:51:37Z. ISS Visitor Time is 7:19:47:44. Exp 2 Crew ISS Flight Time 167:06:40:50 (New U.S. record). Exp 2 to Exp 3 IELK transfer times).

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		CREW		LANDING SITE/	SSME-TL	CDD					
EL T		7 UP/7DOWN	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT	FOW	PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER		LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
070 400/	OV-105	CDR:		WINDS KSC 15 (KSC 57)	ENG. S.N. 104/104/	BI-110	F1 (0	DIRECT	01.20	CARGO:	
STS-108/	(Flight 17)	Dominic L. Gorie	KSC 39B 339:22:19:28Z	351:17:55:12Z	104/104/ 109%	BI-TTU	(12)	INSERTION	OI-28 (6)	38177 LBS	<u>Brief Mission Summary</u> : The STS-108/UF 1 (12 th ISS mission)
ISS UF-1	(i light i /)	(Flt 3 - STS-91, STS-99)	5:19:28 PM EST (P)	11:55:12 AM EST	10970	RSRM	(12)	INSERTION	(0)	JU177 EDJ	provided a new crew to the ISS, transfer of supplies and
SEO.	Endeavor	P640/R242/V157/M211	5:19:28 PM EST (A)		PREDICTED:	82		POST OMS-2:		PAYLOAD	equipment via the Raffaello MPLM, and an EVA to install
SEQ FLT #107			Wednesday 12	Monday 20	100/104.5/			124.2 X 121.6		CHARGEABLE:	thermal blankets at the bases of the solar panels. Launch
	OMS PODS:	PLT: Mark E. Kally	12/5/01 (7)	12/17/01 (13)	104.5/72/	ET-111		NM		31393 LBS	was scrubbed twice; first due to debris in ISS docking port from Progress 6 soft dock, and second due to RTLS and
KSC-107	LPO4-24 RPO1-31	PLT: Mark E. Kelly P641/R271/M237			104.5	SLWT 16					
	FRC5-17	1 041/1227 1/10237	LAUNCH WINDOW: 7M34S USING PLT	DEORBIT BURN: 351:16:48:13Z	ACTUAL:	SLWI 10				<u>DEPLOYED</u> : 6454 LBS	Range weather.
<u>PAD:</u> 39B-47	11(05-17	<u>M/S 1</u> :	(IN-PLANE TIME)		100/104.5/					0434 203	KSC W/D: OPF 142, VAB 6, PAD 34 = 182 days total.
39B-47		Linda M. Godwin		<u>XRANGE</u> : 26 NM	93/72/					NON-DEPLOYED:	-
MLP-1		(Flt 4 - STS-37, STS-59, STS-76)	EOM PLS: KSC	ORBIT DIR: AR 11	104.5					8635 LBS	LAUNCH POSTPONEMENTS: - Baselined launch date of 10/4/01 on 9/21/00
		P642/R122/V105/F13	TAL: ZZA		1 2040 (/)						Postponed launch date to NET 11/1/01 Postponed launch date to 11/29/01
TWELFTH			TAL WX: MRN, BEN	<u>aim pt</u> : Nominal	1 = 2049 (6) 2 = 2043 (7)					MIDDECK: 690 LBS	- Postponed launch date to 11/29/01
SHUTTLE		<u>M/S 2</u> : Daniel M. Tani	SELECTED:	MLGTD: 3024 FT	2 = 2043 (7) 3 = 2050 (2)					070 LDO	LAUNCH SCRUBS:
FLIGHT TO		P643/R272/M238	RTLS: KSC 33/N/N	JJ1.17.JJ.1ZL						SHUTTLE	LAUNCH SCRUBS: - Scrubbed Thursday 11/29/01 EDT (11/30/01 GMT) Launch at ET Tanking MMT at L-9.5 Hours due to an ISS problem. Progress 6 had Soft Docked with SM Aft Port; however, did not achieve Hard Dock. Suspect debris within the docking interface. U.S. ISS Mgmt wanted to work problem and it was decided to go into a 24-hour scrub turnaround, then 48-hr scrub turnaround. Initially IP Russia was GO. U.S. ISS management wanted to scrub to work problem. Then IP Russia announced at ISS MMT on 11/30/01 that they planned an EVA on 12/3/01 to clear debris in docking mechanism. SSP MMT on 11/30/01 set launch for 12/4/01 to allow review of results of EVA. IP Russia EVA crew removed damaged seal from previous Progress enabling Progress 6 to Hard Dock. ISS Technical Scrub (new category of scrub).
ISS			TAL: ZZA 30/N/N	VEL: 198 KGS 201 KEAS	ENGINE 2050					ACCUMULATED	Progress 6 had Soft Docked with SM Aft Port: however, did not
		M/S 3 UP/EXP 4 Flt Eng:	AOA: NOR 17/N/SF	HDOT: -1.6 FPS	IS BLOCK II					WEIGHTS:	achieve Hard Dock. Suspect debris within the docking interface.
		Carl E. Walz	<u>PLS</u> : EDW 22/N/N		ENGINE.					DEPLOYED:	U.S. ISS Mgmt wanted to work problem and it was decided to go
		(Flt 4 - STS-51, STS-65, STS-79)	TDEL:	<u>TD NORM 205</u> : 2734 FT	OTHER TWO BLOCK IIA					1082139 LBS	Initially IP Russia was GO. U.S. ISS management wanted to
		P644/R170/V106/M148	0.03 -0.1568		ENGINES.					NON-DEPLOYED:	scrub to work problem. Then IP Russia announced at ISS MMT
				NLGTD: 6901 FT		0070 (7 1	Dooom	ber 2001)		1520683 LBS	on 11/30/01 that they planned an EVA on 12/3/01 to clear debris
		M/S 4 UP/EXP 4 Flt Eng: Daniel W. Bursch	MAX Q NAV:	351:17:55:24Z VEL: 143 KGS				S with ISS P/L			12/4/01 to allow review of results of EVA. IP Russia EVA crew
		(Flt 4 - STS-51, STS-68,	714 708	146 KEAS HDOT: -6.3 FPS	ISS UF-1			0 with 100 172		CARGO TOTAL: 3336416 LBS	removed damaged seal from previous Progress enabling
		STS-77)	<u>SRB STG</u> :	HDOT: -6.3 FPS						3330410 LBS	Progress 6 to Hard Dock. ISS Technical Scrub (new category of scrub).
		P645/R169/V109/M147	2:05 2:04	<u>DRAG CHUTE</u> <u>DEPLOY</u> : 191 KEAS							
		M/S 5 UP/EXP 4 CDR:		DEPLOY: 191 KEAS						MARGINS (LBS):	- Scrubbed Tuesday 12/4/01 launch due to RTLS and Range
		Yuri I. Onufrienko	<u>PERF</u> : NOMINAL	351:17:55:16Z					3010	FPR: 3065	into launch area from the Northeast bringing dynamic weather
		(Russia)		<u>BRK INIT</u> : 92 KGS		9			2	FUEL BIAS: 937 FINAL TDDP: 2881	conditions particularly in last hour before launch. RTLS runway
		P646/R273/M239	2 ENG TAL (MRN): 2:19 2:26	DRAG CHUTE		No. of Concession, Name				RECON: 1182	selection alternated between 33 and 15. Light rain was reported
- Ful		M/S 3 DN/EXP 3 CDR:	2.17 2.20	JETTISON:			1		1 716	RECON. 1102	Observer. Counted down to T-5 minutes and held while
Au and	Te	Frank L. Culbertson, Jr.	NEG RETURN:	57 KGS	induction in the second se			S In	the second second	PAYLOADS:	evaluating the observed and forecast weather. Scrubbed at
5	- ME	(Filt 3 - STS-38, STS-51, STS-105 UP) P647/R116/V95/M105	3:48 3:53	351:17:56:18Z			7 8		-	PLB:	538:22:44:432 (Preferred Laurich Time Was 22:45:082) While holding at T-5 minutes based on STA observations of
- 11 +	1 + N 8	515-105 UP) P647/R116/\/05/M105		BRK DECEL FPS ² :		1	m	A DEST		ISS UF-1	precipitation and cloud cover and a late update SMG forecast of
A V OR			<u>PTA (U/S 154)</u> : 4:51 4:58	AVE 4.2 PK 6.9		14		R LAND		(MPLM, LMC) MACH-1, SEM (1),	- Scrubbed Tuesday 12/4/01 launch due to RTLS and Range weather (light precipitation and low ceiling). Low clouds moved into launch area from the Northeast bringing dynamic weather conditions particularly in last hour before launch. RTLS runway selection alternated between 33 and 15. Light rain was reported only by the STA as it was not visible on radar or by SLF Observer. Counted down to T-5 minutes and held while evaluating the observed and forecast weather. Scrubbed at 338:22:44:43Z (Preferred Launch Time was 22:45:08Z) while holding at T-5 minutes based on STA observations of precipitation and cloud cover and a late update SMG forecast of broken clouds over SLF runway. RTLS and Range WX Scrub. Went into a 24 hour scrub turnaround. All 3 TAL sites were GO.
		M/S 4 DN/EXP 3 SPLT:	4.30	WHEELS STOP:		har.	11111			GAS (5), RMS, ODS,	
ON UTES		Vladimir N. Dezhurov	<u>SE TAL (ZZA 104)</u> :	351:17:56:18Z	L					Crew Transfer	LAUNCH WINDOW:
CH SPA	all all	(Russia) (Flt 2 - STS-71, STS-105	6:03 6:06	11965 FT	<u>M 3 EOM</u> :	ET		DEORBIT:			giving a total window of 11:37 in two panes with a 19-second gap
CRTSON N	WALZOB	UP)		ROLLOUT:	WEIGUT	IMPACT		204 X 191 NM		MIDDECK:	LAUNCH WINDOW: - Window opened at 339:22:15:35Z and closed at 339:22:27:02Z giving a total window of 11:37 in two panes with a 19-second gap between panes. Preferred Launch Time (PLT) in-plane time for pane 1 was 339:22:19:28Z giving a window of 7M34S.
		P648/R195/V174/M170	<u>PTM (U/S 154)</u> : 6:20 6:20	8941 FT	WEIGHT: 220623 LBS	1:14:20 MET		VELOCITY:		ADF CBTM	pane 1 was 339:22:19:28Z giving a window of 7M34S.
			6:20 6:20	66 SEC	220023 LBS			<u>VELOCITY</u> : 25888 FPS		SIMPLEX	LAUNCH DELAYS: None
			<u>SE PTM (U/S 736)</u> :	WINDS:	X CG:					ISS UF-1	- Launch occurred On-Time at 339:22:19:27.951Z, 5:19:28 PM
CREW	ROTATION	J	6:52 6:57	6H, 2L	1083.79	<u>LAT</u> :		<u>ENTRY</u>			EST, on Wednesday, 12/5/01.
E UF			11500 01/5	OFFICIAL:		<u>36.3</u> °S		RANGE:		5 CRYO TK SETS	TAL WX:
E 7 (12			MECO CMD:	14006P13 SS: 6H_2I				4416 NM		6 GN ₂ TANKS	- All three TAL sites (ZZA, MRN, and BEN) were GO. Zaragoza
		- O	8:23.8 8:25.7	SS: 6H, 2L PK: 13H, 2L	LANDING:	<u>LONG</u> : ET				RMS 64	was prime but it was a low energy day there, so Moron was selected.
	the Vite	N H			WEIGHT:	<u></u>				INVIJ UH	- MRN was 2-Eng TAL Call
				Continued	220556 LBS					RMS used for	PERFORMANCE ENHANCEMENTS
5	TOTAL DATE	6"	Continued	Continued						ISS MPLM deploy	PERFORMANCE ENHANCEMENTS: - Standard Set plus PE Operational High Q, OMS Assist is 4000
CARGO	TRANSFE	R			X CG:					and retrieve and	lbs, 52 nm MECO, and Del Psi.
		Continued			1085.49					EVA support	Continued
			1		1	1					

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				LANDING SITE/	SSME	TI					
		CREW	LAUNCH SITE,	RUNWAY,	NOM-AE			ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	7 UP/7 DOWN	LIFTOFF TIME,	CROSSRANGE	EMER			UNDIT	FSW		(LAUNCH SCRUBS/DELAYS,
NO.	ORDITER		LANDING SITES.	LANDING TIMES	THROT		INC	HA/HP	1.500	PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
NO.		TITLE, NAMES	ABORT TIMES	FLT DURATION,	PROF			11/0111		EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S	ABORT HIMES	WINDS	ENG. S						
STS-108/		Continued	Continued	Continued				ΛΔLIES:			Continued
ISS UF-1						- GSE Gaseo	us Hydr	rogen (GH2) Ve	nt Arm d	lid not latch-	
			λ.Д.			back and the	GUCP	rebounded beyo	nd FSS.	GH ₂ Vent Arm	- Extended flight one docked day to allow time for additional ISS
Continued		M/S 5 DN/EXP 3 FIt Eng: Mikail Tyurin	<u>VI</u> : 25822 25823	<u>DENS ALT:</u> 1607 FT		- RCS Thruste	er R4U	Failed-Off and w	vas auto	deselected	tasks. Initially planned (before extension) to land at KSC on orbit
		(Russia)	23022 23023	100711		- RCS Thruste	er F3F I	Failed-Off and w	as auto	tid not latch- GH ₂ Vent Arm ht to next flight) deselected deselected SSOR 1 was	FLIGHT DURATION CHANGES: - Extended flight one docked day to allow time for additional ISS tasks. Initially planned (before extension) to land at KSC on orbit 170. After one day extension, planned landing at KSC on orbit 186. Endeavour landed at KSC on Runway 15 on orbit 186 at Endeavour landed at KSC on Runway 15 on orbit 186 at 171 137 137 137 137 137 137 137 137 137
		(STS-105 UP)	<u>OMS-2</u> :	FLT DURATION:		- Loud while r	Audio	as neard on A/G Rus	z aner s	SSUR I Was	351:17:55:11Z, 122:55:11 PM EST on Monday, December 17, 2002
		P649/R270/M236	37:42 37:47	11:19:35:44		- IMU 2 Platfo	rm fail	and redundant ra	ate BITE		
			164 FPS 164 FPS 1:48 1:48	<u>S/T</u> : 955:08:21:31		- Left RCS Ox	idizer E	B Regulator Low	Flow-Pro	essure	- SMG Weather forecast for KSC on Tig orbit 185/Landing orbit 186
		SS EVA #70	1.40	<u>5/1</u> . 755.00.21.51		- Tear or hole	on dra	as heald off AVG Bus and redundant ra 3 Regulator Low Load Not Contro g chute main car retched	nopy dur	ing dis-reef, 5	FLIGHT DURATION CHANGES: - SMG Weather forecast for KSC on Tig orbit 185/Landing orbit 186 was forecast NO GO due to ceiling (3000 broken and 6500 broken). However, STA was reporting an observed GO and several positive factors provided the FD confidence to give a GO for landing on orbit 184. A Flight Dule where were approved post flight
		EMU/TETHERED		<u>OV-105</u> 178:22:49:47		ribbons torn a	nd 2 sti	retched		5	factors provided the FD confidence to give a GO for landing on orbit
				178:22:49:47		- Failed Lies E	Betweel	n Sabot and Pilo	ot Chute I	Bad	186. A Flight Rule waiver was approved post flight.
		SCHEDULED EVA #64 DURATION 4:11		DISTANCE:							FIRSTS/LASTS:
				4,817,649 sm							- First flight of Block II SSME (S/N 2050) in position 3.
		MCC WHITE FCR (37)									<u>EVENTS</u> :
		FLIGHT DIRECTORS:									- MC4 maneuver at 341:16:52Z, 01:18:32 MET, orbit 195.8 by 209.7
		A/E - L. E. Cain									nm - ODS captured ISS at 3/1/20/03/257_1/21//3/58 MET
		Shuttle LD/O 1 - N. W. Hale									- MPLM grappled by RMS at 342:16:14Z, 2:17:54 MET, unberthed a
		Shuttle O 2 - P. S. Hill						10	-		342:17:00Z, 2:18:40 MET and installed on NODE, RMS ungrappled
		Shuttle Ping - C. A. Koerner						(20	- Reboost #1 Start at 343:15:11:40Z, 3:16:52:12 MET, Delta V = 6.3
		ISS LD/O 1 - S. P. Davis						all a	-		FPS, altitude increase 1.9 nm, resulting orbit 210.6 by 199.0 nm.
		ISS O 2 - R. E. Castle					10	Sa sha a la	1		minutes. Installed MLI blankets on Beta Gimbal Assembly on solar
		ISS PLNG - J. A. McCullough MOD - J. M. Heflin					and a		-	The second	arrays 4B and 2B. Removed SASA blanket and pre-positioned
						/ 200	- 10 JBM				- Reboost #2 Start at 345:16:19:40Z, 5:18:00:12 MET, Delta V = 6.5
				n shirts), STS-108 (blue						A small satellite	FPS, altitude increase 1.8 nm, resulting orbit 211.3 by 201.2 nm.
3	CULA			tiny Lab. Exp 4 from fro		Iled STARSHINI			00 stude	ents studying	FPS. altitude increase of 4.0 nm. resulting orbit 213.4 by 206.9 nm.
STU				Walz/FE. STS-108 ba & Tani/MS. Exp 3 crev		ensity of Earth's u	upper a	unosphere			- Reboost #4 was performed for collision avoidance. Started at
8 3	* 5 5			zhurov/FE & Tyurin/FE.		ELOW: STS108-	F-5350	(10 December '	2001)	Godwin & Tani	349:14:55:402, 9:16:36:13 ME1, Delta V = 2.1 FPS, allitude increas
	1 A CEN			zharovni e & ryannin e.		stall insulation bl				on mechanisms	- Undocking: 349:17:28:35Z, 9:19:08 MET
	V cn		16.34		2						- ISS Separation burn at 349:17:28:352, 9:19:09:08 ME I - Total water transferred to ISS was 299 lbm (210.3 lbm in 3 CWC/s
	800				X						plus 88.7 lbm in 4 PWR's).
M	дежу.		and and annual	E- AN	2		-				 Lotal transfers from Shuttle to ISS was 6244 lbs (from MPLM 5249 lbs and Middeck 995 lbs) total transfer from ISS was 4156 lbs (in
		121			k			A. P.			MPLM 3007 lbs and to Middeck 1149 lbs).
		1. Sala	Man PET							and a second sec	- Endeavour/ISS Visitor Time is 7:21:25:11.
A.	ОНЭФРИЕНКО			YOUR	14		gat	Corper an	100	Sector Contractor	- Expedition 3 Crew ISS Habitant Time - 117:02:57:00.
				The feature	1 N	111.	W.L	N			- Expedition 3 Crew Flight Time - 128:20:44:58
					18	-	15	118419	24	11 Bur	 MC4 maneuver at 341:16:52Z, 01:18:32 MET, orbit 195.8 by 209.7 nm ODS captured ISS at 341:20:03:25Z, 1:21:43:58 MET MPLM grappled by RMS at 342:16:14Z, 2:17:54 MET, unberthed at 342:17:00Z, 218:40 MET and installed on NODE, RMS ungrappled MPLM at 342:18:09/20Z, 2:19:49 MET. Reboost #1 Start at 343:15:11:40Z, 3:16:52:12 MET, Delta V = 6.3 FPS, altitude increase 1.9 nm, resulting orbit 210.6 by 199.0 nm. EVA 1 Start at 344:19:34Z, 4:21:14 MET, duration of 4 hours 11 minutes. Installed MLI blankets on Beta Gimbal Assembly on solar arrays 4B and 2B. Removed SASA blanket and pre-positioned Circuit Interrupt Devices (CID's). Reboost #2 Start at 346:16:22:32Z, 6:17:03:04 MET, Delta V = 6.5 FPS, altitude increase 1.8 nm, resulting orbit 211.3 by 201.2 nm. Reboost #3 Start at 346:15:22:32Z, 6:17:03:04 MET, Delta V = 6.5 FPS, altitude increase of 4.0 nm, resulting orbit 21.3 by 206.9 nm. Reboost #4 was performed for collision avoidance. Started at 349:14:55:40Z, 9:16:36:13 MET, Delta V = 2.1 FPS, altitude increase of 4.0 nm, resulting orbit 21.3 by 206.9 nm. Undocking: 349:17:28:35Z, 9:19:09:08 MET Total water transferred to ISS was 299 lbm (210.3 lbm in 3 CWC's plus 88.7 lbm in 4 PWR's). Total avter transferred to ISS was 6244 lbs (from MPLM 5249 lbs and thiddeck 995 lbs), total transfer form ISS was 4156 lbs (in MPLM 3007 lbs and to Middeck 1149 lbs). Endeavour/ISS Visitor Time is 7:21:25:11. Expedition 3 Crew US Habitant Time - 117:02:57:00. Expedition 3 Crew US Habitant Time - 117:02:57:00. Expedition 3 Crew IS Habitant Time - 117:02:57:00. Expedition 3 Crew IIGht Time - 143:14:50:31 Official transfer time from Expedition 3 to Expedition 4 crew was 342:22:12:00Z. RENDEZVOUS #56:
			12 981 (as	1		1	X	NA 2	14		342:22:12:00Z.
3.0	- Startes						100	A STATE			RENDEZVOUS #56:
				an V	til		0		Story I	114 1 10 1 10 1 10 1 10 1 10 1 10 1 10	- Rendezvous and dock with ISS to PMA2 Lab Fwd Port. Expedition
			Ser S	- Com		-					4 Crew Up, Expedition 3 Crew Down.
		B10853040 2001 12 11 20 54 15	1410	- Contraction		THE R. P. LEWIS CO.	DY s				
								A CONTRACT OF A			
											J
-											

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		CREW		LANDING SITE/	SSME-TL	CDD				PAYLOAD	MISSION HIGHLIGHTS
EL T		(7)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB RSRM		ORBIT	FOW		
FLT	ORBITER		LIFTOFF TIME,	CROSSRANGE	EMERG				FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
070 400	OV-102	CDR:	KSC 39A	WINDS KSC 33 (KSC 58)	ENG. S.N. 104/104/	BI-111	20.45	DIRECT	01.20	CARGO:	Brief Mission Summery, The STS 100 mission was the 4th
STS-109	(Flight 27)	Scott D. Altman	60:11:22:01:99Z	71:09:31:53Z	104/104/	DI-111	28.45 (50)	INSERTION	(7)	27564 LBS	Brief Mission Summary: The STS-109 mission was the 4 th Servicing Mission to the Hubble Space Telescope to
SEQ	(1 light 27)	(Flt 3 - STS-90, STS-106)	6:22:02 AM EST (P)	4:31:53 AM EST	10970	RSRM	(30)	INSERTION	(7)	27304 LD3	rejuvenate the World's Greatest Observatory. During five
FLT # 108	Columbia	P650/R237/V161/M207	6:22:02 AM EST (A)		PREDICTED:	83		POST OMS-2:		PAYLOAD	EVA's the crew replaced the Reaction Wheel Assembly, the
			Friday 24	Tuesday 20	100/104.5/			310.5 x 105.0		CHARGEABLE:	solar arrays, the Power Control Unit (down since 1999) and
KSC-108	OMS PODS: LPO5-16	PLT:	3/1/02 (8)	3/12/02 (9)	104.5/72/	ET-112		NM		20144 LBS	installed a new scientific instrument, the Advanced Camera
	LP05-16	Duane Carey			104.5	CUMT 17					for Surveys (ACS). The ACS is able to survey a field of the
<u>PAD</u> 39A-61	RPO5-15 FRC2-27	P651/R274/M240	LAUNCH WINDOW: HST Planar/Phase	DEORBIT BURN: 71:08:22:39Z	ACTUAL:	SLWT-17				DEPLOYED: 8256 LBS	cosmos twice as large as previous instruments, with ten
39A-61	FRGZ-27	M/S 1/EV1:	Window 61M51S	/1.00.22.392	<u>ACTUAL</u> . 100/104.5/					0200 LD3	times the resolution and four times the speed.
		John Grunsfeld		XRANGE: 268 NM	101/72/	ET				NON-DEPLOYED:	
MLP-2		(Flt 4 - STS-67, STS-81,	EOM PLS: KSC	ORBIT DIR: DL 48	104.5	IMPACT		DEORBIT:		10672 LBS	KSC W/D: OPF 253, VAB 8, PAD 32 = 293 days total.
		STS-103)	<u>TAL</u> : BEN			1:28:35		312.6 x 259 NM			LAUNCH POSTPONEMENTS:
Fourth HST		P652/R191/V133/M167	TAL WX: NONE	<u>aim pt</u> : Nominal	1 = 2056 (2)	MET				MIDDECK: 1216 LBS	- Baselined launch date of 11/1/01 on 9/21/00
Service Flight		M/S 2:	SELECTED:	<u>MLGTD</u> : 3433 FT	2 = 2053 (4) 3 = 2047 (7)	LAT:		VELOCITY: 26082 FPS		17 10 FR2	- Postponed launch date to NET 11/19/01 on 5/4/01
		Nancy Currie	RTLS: KSC 15/CI/N	71.09.31.537	3 = 2047 (7)	<u>LAT</u> . 16.3°N		20002153		SHUTTLE	- Postponed launch date to 1/17/02 on 5/10/01
		(Flt 4 - STS-57, STS-81,	TAL: BEN 36/N/N	VEL: 196 KGS 186 KEAS		10.5 1		ENTRY		ACCUMULATED	- Postponed launch date to 2/14/02 on 10/4/01
		STS-103)	AOA: EDW 22/N/N	HDOT: -2.7 FPS	ALL SSME's	LONG:		RANGE:		WEIGHTS:	- On 12/21/01, postponed launch date to NET 2/21/02 to allow manifest of new RWA (new HST problem) and train EVA crew.
		P653/R165/V120/F21	PLS: EDW 04/CI/N		BLOCK IIA	143.6°W		4274 NM		DEPLOYED:	- On 1/10/02, postponed launch date to 2/28/02, had to prepare
			TRE	<u>TD NORM 195</u> : 2993 FT						1090395 LBS	and ship another RWA to KSC. First RWA was faulty.
		M/S 3/EV2: Richard Linnehan	<u>TDEL</u> : -0.03 -0.26/-0.023	2993 F I						<u>NON-DEPLOYED</u> : 1532571 LBS	
		(Flt 3 - STS-78, STS-90	-0.03 -0.20/-0.023	NLGTD: 6286 FT						CARGO TOTAL:	LAUNCH SCRUBS:
		P654/R214/V150/M187	MAX Q NAV:	71:09:32:01Z VEL: 156 KGS					m. R	3363980 LBS	- 2/28/02 Launch was scrubbed at approximately L-16 hours due to forecast of cold weather at pad at LCC limits. Forecast was for
			693 ??? 754	149 KEAS	Sheet Dawn		Contraction 73		1 720		38 deg, 73 percent humidity, winds 7 to 10 knots. This forecast is
		<u>M/S 4/EV3:</u>	000.070	HDOT: -5.6 FPS			1			PERFORMANCE	one degree above the minimum temperature, and MMT decided
		James Newman	SRB STG:		T INS	The		///		MARGINS (LBS):	to scrub and reschedule launch for 3/1/02. Observation S at
		(Flt 4 - STS-51, STS-69, STS-88)	2:06 2:07	DRAG CHUTE DEPLOY: 181 KEAS	Emiles				125	FPR: 3065 FUEL BIAS: 937	launch time were 28 deg, RH 71 percent, winds 7 to 10 knots.
		P655/R168/V122/M146	PERF: NOMINAL	71:09:31:55Z	2 SD		- ⁽¹⁾ (2)			FINAL TDDP: 3309	Wx scrub #36.
				BRK INIT: 66 KGS	1		14. " 2031			RECON: 4170	
		<u>M/S 5/EV4</u> :	2 ENG TAL (BEN):		170	1:1	JU is				LAUNCH WINDOW:
		Michael Massimino	2:17 2:16	DRAG CHUTE			1 1	7 La Lat	12	PAYLOADS:	- Window was in 2 panes: Pane 1 opened at 60:11:22:02Z and closed at 60:11:27:23Z (5M21S window), pane 2 opened at
		P656/R275/M241	NEG RETURN:	<u>JETTISON:</u> 63 KGS	311		Adl 1	· · · · · · · · · · · · · · · · · · ·	176-	<u>PLB</u> : HST	60:11:27:33Z and closed at 60:12:23:53Z (56M20S window), and
			3:55 3:59	71:09:32:37Z	5	BEES !	11.		1	Service Mission 3B	combined panes 1 & 2 yielded a window of 61M51S with a cutout
	MEAD	SS EVA #71	0.00			ESPACE	1		-	RMS	from 11:23:20 to 11:24:20.
		EMU/TETHERED	PTA (U/S 530):	BRK DECEL (FPS ²):		3 199994			19 Aug. 1		
	1	EVA #64	3:50 3:55	AVE 3.7 PK 7.2	<u>M 3 EOM</u> :	Intro im2	smA(S.jpg in th	e	MIDDECK:	LAUNCH DELAYS: NONE - Launched On-Time at 60:11:22:02Z, 6:22:02 AM EST, on March
S_2/11 \		SCHEDULED EVA #65 DURATION 7:01	PTM (U/S 500):	WHEELS STOP:	WEIGHT:	Clean Ro	om at	GSFC two me	n in	NONE	1, 2002.
		DURATION 7:01	5:06 5:08	71:09:33:05Z	222447 LBS	"bunny s	uits" st	and near the n	ew	5 CRYO TK SETS	1, 2002.
2	X Z Z	SS EVA #72	0.00	13552 FT	222777 600			led on HST.		5 GN2 TANKS	TAL WX:
Z		EMU/TETHERED	<u>SE TAL (BYD):</u>	ROLLOUT:	X CG:						- Ben Guerir was the only TAL site available. Ben Guerir was
3///		EVA #65	5:50 5:50	10119 FT 72 SEC	1082.87					RMS 65	forecast and observed GO.
0114	Carl 1	SCHEDULED EVA #66	MECO CMD.							RMS USED FOR:	SHUTTLE NIGHT LAUNCH #27
	- All	DURATION 7:16	MECO CMD: 8:21.5 8:23.9	WINDS:T5, R2	LANDING:					HST GRAPPLE,	
VEH AN	NEW		0.21.0 0.20.7	OFFICIAL: 13005P08	WEIGHT:					BERTH, SERVICE,	RENDEZVOUS #57:
				SS: T5, R2	222366 LBS					AND RELEASE.	Rendezvous and berth HST, performed service operations, and
		Continued		PK: T8, R3							released HST.
			Continued	O and in the set	X CG:						Continued
				Continued	1084.57						ooniinuou

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		CREW (7)	LAUNCH SITE	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER		LIFTOFF TIME	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES		THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES		PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
				WINDS	ENG. S.N.						
STS-109		Continued	Continued	Continued			and and		_	2 - 1	Continued
					1 COM			the suit of the second	Contraction of the local division of the loc		
Continued			м.	DENC ALT.		5 K	+ =	alla	-	Lag Va	PERFORMANCE ENHANCEMENTS: - Standard Set Plus PE Operational High Q, WIN/FEB
		SS EVA #73 EMU/TETHERED	<u>VI</u> : 26114 2611	<u>DENS ALT</u> : 3 326 FT		2 COLX	1*12				- Standard Set Plus PE Operational High Q, WIWFEB
		EVA #66	20114 201			*		A DIE	The max		SHUTTLE NIGHT LANDING #19
		SCHEDULED EVA #67	OMS-2:	FLT DURATION:	C. Comment	1			1		
		DURATION 6:48	44:00 43:5	7 10:22:09:51						11/10/1	KSC NIGHT LANDING #14
			134 FPS 134 F	PS C/T.						Same 1	
		SS EVA #74	1:27 1:2	7 <u>966:06:31:22</u>			-	Gal			FLIGHT DURATION CHANGES: NONE
MCC WHITE	F FCR (38)	EMU/TETHERED		7 PS 7 966:06:31:22		-		0		251	- Planned landing at KSC on orbit 166. Landed at KSC Runway
	_ 1 01((30)	EVA #67		<u>OV-102:</u> 284:19:19:08	- Allere	19	1 mail		- 1 -		33 on orbit 166, MLGTD at 71:09:31:53Z on Tuesday, March 12,
FLIGHT DIR	ECTORS:	SCHEDULED EVA #68 DURATION 7:30		284:19:19:08				0 11		N.	2002.
LD/O 1 - B. I	P. Austin	DUKATION 7:30		DICTANCE				Stor of		The All	EVENTS:
0 2 - A. J. C		SS EVA #75		DISTANCE: 3,941,705 sm						1 How Hay	- OMS-2 Start at 60:16:43:49Z, 13.8 duration, Delta V 10.3 ft/sec,
PLNG - J. M		EMU/TETHERED		3,741,703 5111		-0-				1 3 - 23	resultant orbit 105.0 by 310.5 nm
A/E - J. P. S		EVA #68				Ser la			100	A PARTING	- NH maneuver (OMS-4) at 62:04:07:30Z, 207 seconds duration, Delta V 326.6 ft/sec, resultant orbit 302.2 by 309.2 nm. MC-4 at
MOD - N. W	. Hale	SCHEDULED EVA #69			and the						Delta V 326.6 ft/sec, resultant orbit 302.2 by 309.2 nm. MC-4 at
		DURATION 7:20									62:08:23:297, resultant orbit 303.4 by 314.9 nm.
					STS109-E	-6032	Crew	on middeck. F	rom lef	t (front row):	 HST capture by RMS at 62:09:31:21Z, and HST berth on FSS in PLB at 62:10:31:Z. 1:22:09:19 MET.
								PLT Carey, F			PLB at 62:10:31:2. 1:22:09:19 ME1.
					row): Grun	sfeld/PL	C. Linn	ehan/MS, New	/man/M	S. & `	- EVA 1 Start at 63:06:37Z, 2:19:15 MET, End at 63:13:38Z, duration 7H01M. Replaced old SA with -V2 Solar Array 3 and
					Massimino		- ,	· · · · · · · · · · · · · · · · · · ·		-,	diode box.
in and	120	No and a second									- EVA 2 Start at 64:06:417, 3:19:19 MET, End at 64:13:577.
COLOR WORK	Carlos and										duration 7H16M Replaced old SA with +V2 Solar Array 3 and
	CARL COME IN L										diode box. Preplaced Reaction Wheel Assembly. Installed NOBL
and the second											in Bay 6 and two doorstop extensions (one on -V2 side and one
		Jamme	2								on +V2 side.)
E.C.				States and							- EVA 3 Start 2 hrs late at 65:08:28Z, 04:21:06 MET (EMU 1 got water in suit), hence had to resize EMU 3 for use by EV1. EVA
the state	1 0 1		1	2.787 - 2.458							duration 6H48M. Powered down HST and replaced PCU (Power
Propher St.	and in			and the second		64					Control Unit).
and the state	Et th		·								- EVA 4 Start at 66:09:00Z, 5:21:38 MET, duration 7H30M.
and the				and the second s		all the					Replaced FOC (Faint Object Camera) with new ACS (Advanced
- to all	ALL MAR		94 - C		TANK TO AN	in a					Camera for Surveys), installed Electronics Support Module and
e of	and is	Contract of the second	The second second	ALL TRANS	I HIT I HIT I	S.M.	SIGNIFI	CANT ANOMALI	<u>ES:</u>		PCU clean up tasks.
1 1 1 1	11				F.P. S.	A. 4. 7	- Freon	Loop 1 Aft Cold	plate Flov	v Blockage	- EVA 5 Start at 67:08:46Z, 6:21:24 MET. Installed NICMOS
11	more la					A State .	- LOSS 0	f EV1 Suit data di ard Slidewire Slid	uring EVA	1 	Camera and cryogenic cooler, duration 7:20.
2			No and a second		a contraction of the second se	E mileto		ard Slidewire Slid Arlock "A" Hatch I			- HST Reboost started at 67:17:18:04Z, 7:05:56:02 MET, Delta V 11.8 fps, altitude increase 3.6 nm, orbit of 314.7 by 310.6 nm.
10 m	-				1		actuate	MINUCK A HALLIH	UCKING UE		- HST unberthed from Orbiter at 68:08:34Z, 7:21:12 MET and
	211 1				and in the Martin	CALL SE	- APLL3	Drain Line Press	ure Deca	V	released at 68:10:04Z, 7:22:42 MET.
	Ela C		FA C	100 M		A State	- MPS L	H2 4-Inch Recirci	ulation Di	sconnect Slow to	- Orbit Adjust maneuver at 70:10:07:32Z, 48.3 seconds, Delta V
1/ 10-	The loss			Aler A	A STATE		Close				11.6 fps, orbit 259 by 312.5 nm.
4	1 Salut				a for all a	march	- Forwar	d THC -X Contac	t Lost Du	ring One Burn	- Last flight of Block IIA Engines.
								ccumulator/Hi-Lo	ad Feedlii	ne B Heater	
STS109-7	13-014 (8 M	larch 2002) Grunsfeld/N	AS STS109	331-005 (9 March 20	02)		System	2 Failure y RCS Thruster F	DOD Enilor	4 Off	
(right) and	Linnehan/M	1S during 5 th EVA complet		ated HST flies away.				leaking from EML			
HŠT upgra	ades.			· · · · · · · · · · · · · · · · · · ·			- water	ieaking nom ENIC	7 I LT99		

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				LANDING SITE/	SSME-TL						
		CREW	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(7)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW		(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-110/ ISS 8A SEQ FLT #109 KSC-109 PAD 39B-48 MLP-3 THIRTEENTH SHUTTLE FLIGHT TO ISS	OV-104 (Flight 25) Atlantis OMS PODS: LPO3-29 RPO4-25 FRC4-25 FRC4-25	CDR: Michael J. Bloomfield (FII 3 - STS-86, STS-97) P657/R227/V165/M198 PLT: Stephen N. Frick P658/R276/M242 MS1/EV2: Rex J. Walheim P659/R277/M243 MYS 2: Ellen Ochoa (FII 4 - STS-56, STS-66, STS-96) P660/R180/V113/F20 M/S 3/EV4: Lee M. E. Morin P661/R278/M244 M/S 3/EV4: Jerry L. Ross (FII 7 - STS 61-B, STS-27, STS-37, STS-55, STS-74 STS-88) P662/R89/V38/M80 MS5/EV1: Steven L. Smith (FI 4 - STS-68, STS-82, STS-103) P663/R184/V137/M161 MS6/AR184/V137/M161	LAUNCH WINDOW: 4M59S PLT (In-Plane Time) with ISS EOM PLS: KSC TAL: ZZA TAL WX: MRN, BEN SELECTED: RTLS: KSC 15/CI/N AOA: KSC 15/CI/N AOA: KSC 15/CI/N PLS: EDW 22/N/N TDEL: 0.02 -0.58/-0.2 MAX O NAV: 737 742 SRB STG: 1:59:58 PERF: NOMINAL 2 ENG TAL (BEN): 2:29 2:37 NEG RETURN: 3:53 4:02 PTA (U/S 160): 6:02 6:20 SE TAL (ZZA) 104: 6:00 6:02 SE PTM (U/S 675): 6:51 6:53 Continued	KSC 33 (KSC 59) 109:16:26:58Z 12:26:58 PM EDT Friday 12 4/19/02 (11) <u>DEORBIT BURN:</u> 109:15:18:59Z <u>XRANGE</u> : 73 NM <u>ORBIT DIR</u> : AL 30 <u>AIM PT</u> : NOMINAL <u>MLGTD</u> : 3058 FT 109:16:26:58Z VEL: 197 KGS	104/104/ 109% PREDICTED: 100/100/100/ 67/104 ACTUAL: 100/100/100/ 72/104 1 = 2048 (4) 2 = 2051 (3) 3 = 2045 (6) ALL THREE SSME'S BLOCK II M 3 EOM: WEIGHT: 201513 LBS X CG: 1085.32 LANDING: WEIGHT: 201463 LBS X CG: 1087.17 STS110-34 Canadarm2	2, operate russ from	(13)	DIRECT INSERTION POST OMS-2: 124.1 X 84.8 NM ENTRY: HA/HP 218.7 X 166 NM ENTRY VELOCITY: 25917 FPS ENTRY RANGE: 4354 NM	(1)	FUEL BIAS: 937 FINAL TDDP: 1256 RECON: 2670 PAYLOADS: PLB: ISS 8A S0 Truss and ITS RMS, ODS	Brief Mission Summary: The STS-110/8A (13th mission to ISS) was the most complex ISS assembly flight to date with four EVA's and extensive use of Shuttle and ISS robotic arms. The EVA included successful beam assemblies, botting of girders, and installing work lights and electrical connections. The ISS Canadarm2 transferred the 13.5 ton, 43-foot long S0 Truss (ISS backbone) from Shuttle payload bay for installation on U.S. Lab, Destiny. Also, the first railcar was operated on the new truss, paving the way for eventual transportation for the Canadarm2 along the length of the ISS. KSC W/D: OPF 132, VAB 6, PAD 28 = 166 days total. LAUNCH POSTPONEMENTS: -Baselined launch date to 1/17/02 on 11/15/00. -Postponed launch date to 2/28/02 on 5/4/01 and Postponed launch date to 3/21/02 on 10/4/01. -Postponed launch date to 4/4/02 on 1/10/02 due to ground processing delays requiring OMS Pod removal. LAUNCH SCRUBS: - Scrubbed 4/4/02 Launch at approximately L-8 hours, during ET Fill operations, due to a Hydrogen teak in the MLP 3 Hydrogen Vent Line which is fed by Orbiter Hi-Point Bleed line. The leak was found to be from a 1/8 in wide crack in a weld location in the 16-inch ouble walled aluminum line. Weld is more than 20 years old. Decision was made to repair using a two-piece clam-shell that was welded to the 16-inch outer line. LAUNCH WINDOW: - The Launch Window opened at 98:20:34:32Z and closed at 98:20:44:30Z for a total window of 9M58S. Using a Preferred Launch Time (In-Plane Time) of 98:20:34:32Z and closed at 98:20:34:30Z for a total window of 9M58S. Using a Preferred Launch Time (In-Plane Time) of 98:20:34:32Z and closed at 98:20:44:30Z for a total wi

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FLT ORBITE NO.	TITLE, NAMES	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION,	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE	SRB RSRM AND ET	INC	orbit Ha/HP	FSW	Payload Weights, Payloads/ Experiments	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-110/ ISS 8A Continued	& EVA'S Continued SS EVA 76 DOCKED QUEST EVA 2 SCHEDULED EVA 70 EMU/TETHERED EVA 69 DURATION 7:48 SS EVA 77 DOCKED QUEST EVA 3 SCHEDULED EVA 71 EMU/TETHERED EVA 70 DURATION 7:30 SS EVA 78 DOCKED QUEST EVA 4 SCHEDULED EVA 72 EMU/TETHERED EVA 71 DURATION 6:27 SS EVA 79 DOCKED QUEST EVA 5 SCHEDULED EVA 73 EMU/TETHERED EVA 72 DURATION 6:37 MCC WHITE FCR (39) FLIGHT DIRECTORS: FIT & ISS Ld/O2 - R. E. Castle ISS 01 - A. F. Algate ISS PLNG - N. D. Knight STS LD/O1 - J. M. Hanley O 2 - P. F. Dye O 3/PLNG - J. S. Stich A/E - L. E. Cain MOD - J. M. Heflin	Continued VI: 25821 25822 OMS-2: 96 FPS 96 FPS 38:38 38:45	PET DURATION, WINDS Continued DENS ALT: 1260 FT FLT DURATION: 10:19:42:39 S/T: 977:02:14:01 OV-104: 209:01:28:10 DISTANCE: 4,525,299 sm VIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	ENG. S.N.	ABOV crews row): CDR CDR CDR CDR CDR CDR CDR CDR CDR CDR	Lin ISS I Ellen Oc Yury I. C Daniel V E. Walz, Frick, Rc <u>FicANT A</u> aunch Sc -3 16-inct errors on (Launche S IDP-2 N S IDP-2 N S IDP-2 N S IDP-2 N Ce 63-65 Chamber I c = 63-65 of Digital 'I Problem Jpper Hat of Biomec ad Bay F	Dufrienko. F V. Bursch Exp Exp 4/FE. Fi Iss/MS, Morin NOMALIES: Tub of 4/4/02 Lat Hydrogen Ven LPS RF TLM FE ed occurred with ASU BITE and F hruster L1A Fail mber P Max 20 Pressure on Prin psia) Video from PD10 with BPSMU ch Delta Pressu I Data during EV ood Light Failure Proshare Audio	From the R Bloom rom the o 4/FE, V rom the b //MS, & S // P reload r 11 secon CW Buffer ed Off anc psia) nary RCS nary RCS 00 Camcou re Gauge A 2	A by the second	 Continued <u>RENDE ZVOUS #58:</u> Rendezvous and Dock with ISS to PMA 2 Lab Fwd Port. FIRST flight with all three Block II SSME's. First flight of FSW 01-29. First operation availability of delayed TAL. EVENTS: -MC-4 Maneuver at 100:15:04:09, 1:18:19:50, Delta V 2 fps, resultant altitude 204.0 by 211.3 nm. ISS Capture at 01/19:20:09 MET, 100:16:04:28Z. ISS Hard Dock at 1/19:34:46 MET, 100:16:19:05Z. EVENTS (Continued): EVA 1 Start at 2:17:52 MET, 101:14:36Z, duration 7H48M. Installed Port & Stbd Fwd Struts to S0 fruss and Port & Stbd avionics trays, deployed aft Umbilical tray, and installed TUS-1 cable. EVA 1 Start at 4:17:25 MET, 103:14:09Z, duration 7H30M. Installed Port & Stbd Struts, installed TUS-2 cables, installed AL handrail, Mated MT/MBS feed through cable. Reboost 1 at 501:59 MET, 104:13:48Z, duration 6H27M. Installed J300/400 panels, released capture claw, installed CID's 7 & 8, removed MT Launch restraints. Removed MT RPCM Thermal cover. EVA 3 Start at 5:17:04 MET, 104:21:44Z, Delta V 3.4 fps, alt. increase 1.0 nm, orbit 212 x 205 nm. EVA 4 Start at 7:17:45:17 MET, 106:14:29:36Z, duration 6H37M. Installed J300/400 panels, released capture claw, installed CID's 7 & 8, removed MT Launch restraints. Removed MT RPCM Thermal cover. EVA 4 Start at 7:17:45:17 MET, 106:14:29:36Z, duration 6H37M. Installed Start at 5:10:00 MET, 104:21:44Z, Delta V 3.4 fps, alt. increase 1.0 nm, orbit 212 x 206 nm. EVA 4 Start at 5:30:10 MET, 107:11:19:20Z, Delta V 12.8 fps, alt. increase orbit to 213.8 by206.3 nm. Cargo transferred to ISS = 28944 lbs (S0 ITS 26716, middeck 2228):ISS to Atlantis middeck 2607 lbs. Transfers to ISS: 0, 146 lb, N, 2 45 lb, and water 1465 lb (1397 lb in 14 CWC's +68 lbs in three PWR's) Total transfers to ISS = 30600 lbs, ne

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		CREW		LANDING SITE/	SSME-TL						
FLT	ORBITER	7 UP/7 DOWN	LAUNCH SITE, LIFTOFF TIME,	RUNWAY,	NOM-ABORT EMERG	SRB RSRM		ORBIT	FCW	Payload Weights,	MISSION HIGHLIGHTS
NO.	UKBITEK		LIFTOFF TIME, LANDING SITES,	CROSSRANGE LANDING TIMES	THROTTLE	AND	INC	HA/HP	FSW	PAYLOADS/	(LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS,
110.		TITLE, NAMES & EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
	01/ 405			WINDS	ENG. S.N.	D 1 110	51 (0	BIBEAT	01.00		
STS-111/	OV-105 (Flight 18)	CDR: Kenneth D. Cockrell	KSC 39A 156:21:22:49Z	EDW 22, CONC EDW 49, CONC 30	104/104/ 109%	BI-113	51.60 (14)	DIRECT INSERTION	OI-29 (2)	<u>CARGO</u> : 36082 LBS	Brief Mission Summary: The STS-111/UF 2 (14 th ISS mission)
ISS UF-2	,	(Flt 5 - STS-56, STS-69,	5:22:49 PM EDT (P)	170:17:57:42Z		RSRM	(17)		(2)		provided a new crew to the ISS, transfer of supplies and equipment via the Leonardo MPLM, and three EVA's for ISS
SEQ	Endeavour	STS-80, STS-98) P664/R159/V121/M140	5:22:49 PM EDT (A) Wednesday 13	10:57:42 AM PDT Wednesday 14	PREDICTED: 100/104.5/	84		<u>POST OMS-2</u> : 126.7 X 84.8		<u>Payload</u> Chargeable:	assembly. The Shuttle RMS was used to successfully install
FLT #110	OMS PODS:		6/5/02 (10)	6/19/02 (6)	104.5/72/	ET-113		NM		29712 LBS	the Mobile Remote Service Base System to the Mobile
KSC-110	LPO4-25 RPO1-32	PLT: Paul S. Lockhart	LAUNCH WINDOW:	DEORBIT BURN:	104.5	SLWT-19					<i>Transporter on the Destiny Lab. This allows the Canadarm2 to travel the length of the ISS for future construction tasks.</i>
PAD	FRC5-18	P665/R279/M245	4M39S PLT (In-Plane	170:16:50:26Z	<u>ACTUAL</u> : 100/104.5/	3LVV1-19				<u>DEPLOYED</u> : 9512 LBS	to traver the tength of the 155 for future construction tasks.
<u>740</u> 39A-62		M/S 1/EV2:	Time) ISS Planar/Phase	XRANGE: 603 NM	100/104.5/ 98/72/104.5						KSC W/D: OPF 92, VAB 7, PAD 33 = 132 days total.
MLP-1		Philippe Perrin		ORBIT DIR: AL 31	98/72/104.5	ET		DEORBIT:		<u>NON-DEPLOYED</u> : 906 LBS	LAUNCH POSTPONEMENTS:
IVILP-1		(France - CNES) P666/R280/M246	EOM PLS: KSC		1 = 2050(3)	IMPACT		HA 210.5			- Launch was scheduled for 5/2/02. - Postponed launch to 5/31/02 to the end of a Beta Cutout and
14TH			<u>TAL</u> : ZZA <u>TAL WX</u> : MRN, BEN	AIM PT: NOMINAL	2 = 2044 (7) 3 = 2054 (4)	1:13:47 MET		HP 187.1		MIDDECK: 288 LBS	allow time to train EVA crew to R&R SSRMS failed Wrist Roll
SHUTTLE FLIGHT		M/S 2/EV1: Franklin R. Chang-Diaz		<u>MLGTD</u> : 3058 FT 170:17:57:42Z				ENTRY			Joint. - Advanced launch to 5/30/02 after analysis indicated adequate
TO ISS		(Flt 7 - STS 61-C, STS-34,	<u>SELECTED</u> : <u>RTLS</u> : KSC 33/N/SFD	VEL: 197 KGS 193 KEAS	ALL BLOCK II SSME's	<u>LAT</u> : 37.3°S		VELOCITY: 25902 FPS		<u>SHUTTLE</u> ACCUMULATED	power generation using an ISS Pitch attitude bias.
		STS-46, STS-60, STS-75, STS-91)	TAL: MRN 20/N/N	HDOT: -2.2 FPS						WEIGHTS:	LAUNCH SCRUBS:
		P667/R89/V46/M81	AOA: KSC 15/CI/N PLS: EDW 22/N/N	TD NORM 195:	M 3 EOM:	<u>LONG</u> : 160.1°W		<u>ENTRY</u> RANGE:		DEPLOYED: 1130507 LBS	Scrubbed Thursday 5/30/02 Launch at L-2/M53S due to onaque
		M/S 3 UP/EXP 5 Flt Eng:		3070 FT	WEIGHT:			4360 NM		NON-DEPLOYED:	anvils within 30 nm circle while holding at T-9 minutes. PLT was 7:44:26 PM EDT with a window of 4M9S. Lightning was present throughout a wide area in Florida with occasional strike within 30
		Peggy A. Whitson	<u>TDEL</u> : 0.12 -0.058/-0.20	<u>NLGTD</u> : 6353 FT 170:17:57:53Z	220334 LBS X CG:					1534522 LBS CARGO TOTAL:	throughout a wide area in Florida with occasional strike within 30 nm circle and thunderstorms were forecast. Weather forecast 70
		P668/R281/F35		170:17:57:53Z VEL: 146 KGS	1083.62					3435911 BS	percent chance NO CO for launch due to continuing anvil clouds
		M/S 4 UP/EXP 5 CDR:	MAX Q NAV: 748 722	137 KEAS HDOT: -5.9 FPS	LANDING:					PERFORMANCE	Low is bringing in moist air from the tropics. Decision was made to hold a tanking MMT on Friday, May 31, where it was decided not to tank. Forecast included thunderstorms, anvil clouds, and
		Valery C. Korzun (Russia)			WEIGHT:					MARGINS (LBS):	to hold a tanking MMT on Friday, May 31, where it was decided
		P669/R282/M247	<u>SRB STG</u> : 2:04 2:05	DRAG CHUTE DEPLOY: 186 KEAS	220279 LBS X CG:					FPR: 3065 FUEL BIAS: 937	chance of hail During the count, the L OME GN2 Regulator
		M/S 5 UP/EXP 5 Flt Eng:		170:17:57:45Z	1085.30					FINAL TDDP: 2484	chance of hall. During the count, the L OME GN2 Regulator leaked and increased the accumulator pressure. Regulator locked up after a test. Went into a 24-hour Scrub turnaround. RTLS and
		Sergei Y. Treschev	<u>PERF</u> : NOMINAL	<u>BRK INIT</u> : 75 KGS						RECON: 1870	Range Weather Scrub
		(Russia) P670/R283/M248	<u>2 ENG TAL (MRN)</u> :	DRAG CHUTE						PAYLOADS:	- A Tanking MMT was held on Friday, 5/31/02 and a decision was made not to tank due to inclement observed and forecast weather.
			2:24 2:29	<u>JETTISON:</u> 54 KGS						PLB: ISS UF-2	I here was a tanking weather violation with observed lightning
E	E C C C C C C C C C C C C C C C C C C C	M/S 3 DN/EXP 4 Flt Eng Carl Walz	NEG RETURN:	170:17:58:23Z						(MPLM, MBS,	within 5 nm. Launch forecast was for attached anvil clouds, thunderstorms, lightning, and precipitation. Tanking, RTLS, and
e e	1	(Flt 4 - STS-51, STS-65,	3:52 3:57	BRK DECEL FPS ² :	No. 2 - 60 Te	104875	- 40 5			PDGF, SMOP, SSRMS, WRJ,	Range Weather Scrub.
<u>(17-2</u>	MBS	STS-79, STS-108 Up) P671/R170/V106/M148	<u>PTA (U/S 182)</u> :	AVE 4.4 PK 5.5	10 Mar					RMS, ODS)	- A tentative decision was made to try for a Monday, 6/3 launch but keep an eye on the weather and hold a special MMT at 6:30
	1		4:49 4:45	<u>WHEELS STOP:</u> 170:17:58:46Z	145-62			t		MIDDECK:	PM CDT (Later changed to 1:00 PM CDT) to decide whether to hold a tanking MMT on Saturday, 6/1. - At the 1:00 PM CDT MMT, it was decided to top-off the cryos and
<u>S</u>	A B	M/S 4 DN/EXP 4 Flt Eng: Daniel Bursch	DROOP (ZZA 109):	12677 FT	102	2			100	ISS UF-2	- At the 1:00 PM CDT MMT, it was decided to top-off the cryos and
947	TT PCH	(Flt 4 - STS-51,	5:23 5:24	ROLLOUT:		TAN	-		Ť	RAMBO	reload the GN ₂ (and at the same time to run another GN ₂ regulator test) with a target of a Monday evening launch. This would allow
TOP SYH WHIT	WALZ BURER	ŠTS-68, STS-77, STS-108 Up)	<u>PTM (U/S 182)</u> :	9619 FT 64 SEC	24.7	0.0.0	1	Second 1		5 CRYO TK SETS	three launch opportunities based on Range schedule on Monday
		P672/R169/V109/M147	6:11 6:06	WINDS: 3T, 4R		- Aller	- designed	0		6 GN2 TANKS	Tuesday, and Wednesday. Tentative plans were made for a tanking MMT on Monday. On Friday, the GN ₂ was reloaded and the regulator failed the leak test. At a Saturday morning
UB5	UTILIZATION		<u>SE TAL (ZZA 104)</u> :	OFFICIAL:					A Supple	RMS 67	the regulator failed the leak test. At a Saturday morning management meeting, it was decided to replace the LOME GNa
			6:03 6:06	35005p08 SS: H3, R4						RMS USED FOR	management meeting, it was decided to replace the L OME GN ₂ Regulator, and with success oriented schedule, it would lead to a
	<u></u>		<u>VI</u> :	PK: H5, R6	100004E11248	100		and the second	-	ISS MPLM	launch date of NET Tuesday 6/4/02. On Sunday morning, management decided to re-target the launch date to Wednesday,
	S. UF	2	<u>25</u> 821 25815	DENS ALT:		12246 /7	lune O			DEPLOY AND RETRIEVE AND	6/5 due to delays in completing GSE work. Wednesday launch
ROTATI	A + RESUPPLY			1260 FT				002) Endeav Irdo (MPLM)	vour	EVA SUPPORT	was confirmed later. Technical Scrub.
		Continued	Continued	Continued	supplies.	0.00	200/10				Continued
		Continueu		Sommucu							

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FLT NO.	ORBITER	CREW 7 UP/7 DOWN TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE	SRB RSRM AND ET	INC	orbit Ha/Hp	FSW	Payload Weights, Payloads/ Experiments	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-111/ ISS UF-2 Continued		Continued M/S 5 DN/EXP 4 CDR: Yury I. Onufrienko (Russia) (Fit 1 - STS-108 Up) P673/R273/R239 SS EVA 80 DOCKED QUEST EVA 6 EMU/TETHERED EVA 73 SCHEDULED EVA 74 DURATION 7:14 SS EVA 81 DOCKED QUEST EVA 7 EMU/TETHERED EVA 75 DURATION 5:00 SS EVA 82 DOCKED QUEST EVA 8 EMU/TETHERED EVA 75 SCHEDULED EVA 76 DURATION 7:17 MCC WHITE FCR (40)	Continued <u>OMS-2:</u> 38:42 38:45 98 FPS 95 FPS	WINDS Continued FLT DURATION: 13:20:34:53 S/T: 990:22:48:54 OV-105: 192:19:24:40 DISTANCE: 5,781,115 sm	shirts), and Lab. Exp 4 Bursch/FE, Cockrell, C	Exp 5 (n crew, fro & Walz/f hang-Dia , from fro	nedium om front FE. STS z/MS, P nt to ba	-111 crew, fro LT Lockhart,	ews in COnufr om front & Perri	ISS Destiny Tienko (RSA),	Continued <u>LAUNCH WINDOW:</u> - The June 4, 2002 launch window opened at 156:21:18:19Z and closed at 156:21:27:28Z glving a total window of 9M09S. Using : Preferred Launch Time of 156:21:22:49Z (5:22:49 PM EDT), the window was 4M39S. <u>LAUNCH DELAYS</u> : NONE - Launch occurred On-Time at 156:21:22:49Z (5:22:49 PM EDT) on Wednesday, June 5, 2002. <u>TAL WX</u> : - Zaragoza (Prime) was forecast and observed NO GO for precipitation. Ben Guerir was forecast and observed NO GO for precipitation. Ben Guerir was forecast and observed NO GO for precipitation. Ben Guerir was forecast and observed NO GO for Head Winds of 27 Knots. Moron (Selected) was forecast and observed GO. <u>PERFORMANCE ENHANCEMENTS</u> : - Standard Set plus: (1) PE Operational High Q TRN/MAY, (2). OMS Assist, (3) 52 NM MECO, (4) Del Psi <u>FLIGHT DURATION CHANGES</u> : - Total Extensions: 2 Days Plus 2 Revs. Planned landing at KSC on Orbit 186 at 12:59 PM EDT on June 17, 2002. Did not call up EDW. Closed PLBD's but did not fluid load crew. Wave of Orbit 186 due to forecast ceiling, precipitation, crosswinds, and thunderstorms and observed precipitation, thunderstorms within 20 nm, ceiling 2600 broken and visibility violations. Wavee of flanding at KSC on Orbit 186 at 12:59 PM EDT on June 17, 2002. Did not call up EDW. Closed PLBD's but did not fluid load crew. Wave of flanding at KSC on Orbit 186 total extensions and observed precipitation, thunderstorms within 20 nm, ceiling 2600 broken and visibility violations. Wavee of flanding at these fore and visibility violations. Wavee of flanding at the difference of the adding at the difference of the adding the precipitation theorem the precipitation forecast and precipitation. The precipitation the precipitation theorem the precipitation theorem the precipitation forecast and precipitation theorem the precipitation theorem
		FLIGHT DIRECTORS: ISS Ld/O1-R. E. LaBrode ISS O 2 - J. M. Curry ISS PLNG - B. C. Lunney STS LD/O 1 - P. S. Hill STS O 2 - A. J. Ceccacci STS O 3/PLNG - K. B. Beck A/E - J. P. Shannon MOD - R. E. Castle	S111E5095			On Kol	<mark>ufrienko</mark> rzun (Rเ	(Russia) gre	ets EXF camera	EXP 4 CDR P5 CDR a) with STS-111	 Icall up EDW. Closed PLBD's but did not fluid load crew. Wave off Orbit 186 due to forecast ceiling, precipitation, crosswinds, and thunderstorms and observed precipitation, thunderstorms within 20 nm, ceiling 2600 broken and visibility violations. Wave off landing at KSC on Orbit 187 with similar forecast and observed at landing time. Extended one day. Brought up EDW for EOM+1. Waved off landing at KSC on Orbit 201 due to forecast ceiling, precipitation, thunderstorms, and visibility violations. Waved off Orbit 202 due to similar forecasts and observed at landing the second day. EOM+2 was "pick the landing site" day. EOM-2 PLBD's were closed for Planned landing at KSC on Orbit 216 at 170:14:522. Crew not in suits and no fluid load. Waved off landing at KSC or Orbit 216 at approximately Tig -40 minutes due to forecast and observed thunderstorms, attached anvil clouds, and low ceiling within 30 nm. Waved off landing at KSC on Orbit 217 at approximately Tig -20 minutes due to thunderstorms, attached anvils, and low clouds. (Two orbits wave-off). Decision made to land at EDW 22 on Orbit 218. MLGTD at 170:17:57:422, 10:57:424 AM PDT (MET 13:20:34:57) on Wednesday, June 19, 2002. NLGTD at 170:17:57:53Z. Total Flight Duration Extensions: Two Days plus two orbits.

FLT	ORBITER	CREW 7 UP/7 DOWN	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
S-111/ S UF-2 ntinued		-5238 (11 June 2002) Remote Servicer Bas			(right for astronau	eground its Willia aft comr	d) and J am A. C nunicat	Flight Director bohn Shanno befelein and ors (CAPCC	on; alor Kenne	ng with th T. Ham,	Continued EVENTS: - MC4 Maneuver Start at 158:15:16:16Z, 1:127:53:27 MET, 1.2 ft/sec, altitude 203.3 by 211.9 nm. - ISS Capture at 158:16:24Z, 1:19:01 MET. - ISS Hard-Docked at 158:17:26:32Z, 1:20:03:43 MET - Official Transfer Time (IELK time) from Expedition 4 Crew to Expedition 5 Crew = 158:22:55Z, 5:55 PM CDT, June 7, 2001. - Expedition 4 ISS Habitant Time is 181:00:43. - MPLM installed on Node 1 by RMS at 159:14:28Z, 2:17:05 ME - EVA 1 Start at 160:15:26Z, 3:18:03 MET and End 160:22:40Z 04:01:17 MET, duration 7:14. Installed PDGF on P6 Truss, ma heater cables from MBS to MT, and installed SM debris protect on PMA1 for future installation on SM. - Photographed failed ISS CMG-1. - Reboost Maneuver 1 Start at 161:20:53:24Z, 4:23:30:35 MET, Delta V 3.0 fps, 0.8 nm altitude increase, altitude 212 by 205 nn (Connected video and data cables), attached bag with continge extension cable to MBS. - Reboost Maneuver 2 Start at 163:12:08:02Z, 6:15:45:13 MET, Delta V 3.0 fps, altitude increase .81 nm, Orbit 212.8 by 206.2 r - EVA 3 Start at 164:15:16Z, 7:17:53 MET, duration 7:17. R&F SSRMS Wrist Roll Joint (WRJ). - Reboost Maneuver 3 Start at 165:11:51:26Z, 6:14:28:37 MET, Delta V 12.5 fps, altitude increase 3.6 nm, orbit 214.4 by 211.1



JSC2002-E-23106 --- J. Milton (Milt) Heflin (standing), Chief, Flight Director's Office, along with Dan Carpenter (background), Director, Public Affairs Office, and Rob Navias, lead STS-111 PAO commentator, discuss mission in JSC MCC WFCR

SIGNIFICANT ANOMALIES:

- Right Main Engine High Pressure Fuel Pump Speed Sensor Failure

- Flash Evaporator Controller Primary B failure
 WIF Adapter Hitch Pin Anomaly
 EV2 Boot Fit Problems during EVA 1

- EVA Communications Anomaly on STS-111 EVA 3 - AVIU-Camcorder Failed
- BPSMU XMIT/ICOM Dey causes Video to Flicker LL QUAD Reflected Power Spikes
- Loss of BIOMED Data on EVA 1

 Undocked at 166:14:31Z, 9:17:08 MET
 STS-111/ISS Visitor Time is 7:31:04:28 (Docking to Undocking)
 Expedition 4 ISS Habitant Time is 181:00:43:00 (IELK S/L Xfer to IELK S/L Xfer), Expedition 4 broke U.S. Flight Time record, flight time is 195:19:38:14 (STS-108 L/O to STS-111 MLGTD).
 Carl Walz record total flight time is 230:13:02:44. Dan Bursch Table Flight Time is 230:01:440. Total Flight Time is 226:22:14:48. Sep Burn 166:16:14:27Z, 6:18:51:38 MET. Orbit Adjust Maneuver at 166:17:57:48Z, 9:20:34:59 MET, Delta V 45.6 fps, orbit was 186.1 by 211.9 nm.

- Transfers from shuttle to ISS = 9512 lbs (from MPLM = 8062 lbs and from middeck = 1450 lbs). Transfers from ISS to Shuttle = 6342 lbs (to MPLM = 4668 lbs and to middeck = 1675 lbs). Consumables transfer: Total water = 884.9 lbm (8 CWC's with 798.9 and 4 PWR's with 86.0 lbm). Total shuttle O2 transferred = 34 lbm for the 3 EVA prebreathes in JAL, N2 tank transfer of 18.9

lbm

RENDEZVOUS # 59: Rendezvous and Dock with ISS (Dock to PMA2 Lab Fwd Port)

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		LANDING SITE/ SSME-TL									
		CREW				000		ODDIT			
		(6)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(8)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
			ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S		WINDS	ENG. S.N.						
STS-112/	OV-104	CDR:	KSC 39B	KSC 33 (KSC 60)	104/104/	BI-115	51 60	DIRECT	01-29	CARGO:	Brief Mission Summary: The STS-112/9A (15th ISS mission)
	(Flight 26)	Jeffrey S. Ashby	280:19:45:51Z	291:15:43:41Z	109%	51 110		INSERTION	(3)	37441 LBS	delivered the 45-foot long, 15 ton S1 Truss for further
ISS 9A	((Flt 3 - STS-93, STS-100)	3:45:51 PM EDT (P)	11:43:41 AM EDT		RSRM	(,		(-)		assembly of ISS. The S1 Truss was attached to the
CEO	Atlantis	P674/R251/V169/M218	3:45:51 PM EDT (A)		PREDICTED:	87		POST OMS-2:		PAYLOAD	assembly of 155. The ST Truss was alloched to the
SEQ FLT #111			Monday (13)	Friday 13	100/104.5/104.5/			126.4 x 85.0		CHARGEABLE:	starboard side of the Center S0 Truss allowing for the
		PLT:	10/7/02 (11)	10/18/02 (9)	72/104.5	ET-115		NM		29502 LBS	outboard expansion of the rail system to prepare for future
KSC-111	OMS PODS:	Pamela A. Melroy									ISS growth. This truss also contains a new cooling system,
KJC-III	LPO3-30	(Flt 2 - STS-92)	LAUNCH WINDOW:	<u>DEORBIT BURN</u> :	ACTUAL:	SLWT-20				<u>DEPLOYED</u> :	S-band Comm, and the first Thermal Radiator Rotary Joint
PAD	RPO4-26	P675/R261/V175/F34	4M59S USING PLT	291:14:36:14Z	100/104.5/97/					29543 LBS	(TRRJ).
39B-49	FRC4-26		(ISS IN-PLANE	XRANGE: 21 NM	72/104.5						
0,0,1,		<u>M/S 1/EV1</u> :	TIME)		4 00.40 (5)					NON-DEPLOYED:	KSC W/D: OPF 106, VAB 6, PAD 25 = 139 days total.
		David A. Wolf		<u>ORBIT DIR</u> : AR 12	1 = 2048 (5) 2 = 2051 (4)					0 LBS	
MLP-3		(Flt 3 - STS-58, Up to Mir on STS-86, Dn on STS-89)	EOM PLS: KSC TAL: ZZA	AIM PT: NOMINAL	2 = 2051 (4) 3 = 2047 (8)					MIDDECK:	LAUNCH POSTPONEMENTS:
		P676/R173/V147/M151	TAL: ZZA TAL WX: MRN		3 = 2047 (0)					382 LBS	- Launch was postponed from June after Post-STS-110 visual
15TH		F070/K173/V147/W151		MLGTD: 3072 FT						302 LD3	inspections of OV-104 Inconel 12" MPS LH ₂ Flowliners revealed
SHUTTLE		M/S 2:	SELECTED:	291:15:43:41Z						SHUTTLE	three cracks to SSME 2. Subsequent inspections found cracks in
FLIGHT		Sandra H. Magnus	RTLS: KSC 33/N/N	VEL: 186 KGS	M 3 EOM:	ET		DEORBIT:		ACCUMULATED	other Orbiter LH ₂ Flowliners:
TO ISS	<u> </u>	P677/R284/F36	TAL: ZZA 30/N/SFD	187 KEAS HDOT: -1.0 FPS	M J LOW.	IMPACT		HA 220.0 NM		WEIGHTS:	- OV-103 - three cracks (SSME 1) - OV-105 - one crack (SSME 1) and one crack (SSME 2)
MCC WHIT	E FCR (41)	1 0777120 #1 00	AOA: KSC 33/N/N		WEIGHT:			HP 146.0 NM		DEPLOYED:	- MPTA - one crack (SSME 1) and one crack (SSME 2)
		M/S 3/EV2:	PLS: EDW 04/N/N	TD NORM 195:	202688 LBS	1:14:01				1160050 LBS	- OV-102 three cracks (SSME 1) - OV-102 three cracks (SSME 2). OV-102 flowliners are CRES.
FLIGHT DI	RECTORS:	Piers J. Sellers		2851 FT		MET		VELOCITY:		NON-DEPLOYED:	After analyses, tests, etc., including consideration of other repair
ISS Ld/O1	- A. F. Algate	P678/R285/M249	TDEL:		X CG:			25917 FPS		1534904 LBS	techniques, the decision was made to use weld-repair technique
ISS O 2 - N	A. A. Kirasich		-0.11 -0.368/-0.490	<u>NLGTD</u> : 5475 FT 291:15:43:48Z	1087.08	LAT:				CARGO TOTAL:	and polishing of Flowliner holes.
ISS PLNG	- A. P.	<u>M/S 4</u> :		VEL: 161 KGS		<u>36.9</u> 7°S		ENTRY		3473352 LBS	- Severe cracks were found in Mobile Launch Platform Crawler-
Hasbrook		Fyodor N. Yurchikhin	MAX Q NAV:	160 KFAS				RANGE:			Transporter (CT-2) jacking cylinder bearings. CT-2 was repaired
STS LD/O	1 - P. L.	(Russia)	726 725	HDOT: -6.2 FPS	LANDING:	LONG:		4342 NM		PERFORMANCE	using undamaged spare and new bearings. CT-2 bearings will
Engelauf		P679/R286/M250	ODD OTO		WEIGHT	159.3°W				MARGINS (LBS):	be replaced incrementally.
	C. A. Koerner		SRB STG:	DRAG CHUTE DEPLOY: 157 KEAS	WEIGHT:					FPR: 3065	- These postponements resulted in rescheduling STS-112 and
STS O 3/PI	_NG - J. M.		2:04 2:02	291:15:43:51Z	202021 LB2					FUEL BIAS: 937 FINAL TDDP: 2744	STS-113 ahead of STS-107. STS-112 launch date was set to
Curry A/E - J. P. S	Channan	SS EVA 83 DOCKED QUEST EVA 9	PERF: NOMINAL		X CG:					RECON: 3860	October 2, 2002.
		EMU/TETHERED EVA 76	FLKI. NOMINAL	<u>BRK INIT</u> : 86 KGS	1088.94					KLCON. 3000	
MOD - R. E	Castie	SCHEDULED EVA 77	2 ENG TAL (MRN).	DRAG CHUTE	1000.74					PAYLOADS:	LAUNCH SCRUBS:
ST	5-112	DURATION 7:01	2 ENG TAL (MRN): 2:33 2:30	IFTTISON.						<u>PLB</u> :	- Scrubbed October 2 Launch at approximately L-27 hours at an
HEY	ME			51 KGS						ISS 9A	MMT due to the threat to JSC/MCC posed by Hurricane Lili in the Gulf of Mexico. Launch delayed for at least 24 hours. At
P3	* HELROL	SS EVA 84	NEG RETURN:	291:15:44:18Z	L				L	(ITS S1 TRUSS)	approximately 1,21 hours the Space Shuttle and ISS Drograms
		DOCKED QUEST EVA 10	3:54 3:54	BRK DECEL FPS ² :			626	1	- 1	CETA CART A	approximately L-21 hours, the Space Shuttle and ISS Programs decided there was less risk to the MCC by implementing an orderly powerdown of the MCC with a launch in the
	·	EMU/TETHERED EVA 77		AVE 6.9 PK 9.1				1	2	RMS, ODS	orderly powerdown of the MCC with a launch in the
	ā V 💈	SCHEDULED EVA 78	PTA (U/S 182):					4			Sunday/Monday timeframe. Weather Scrub.
		DURATION 6:04	4:57 4:55	WHEELS STOP: 291:15:44:33Z			the party	Martin			- Early Wednesday morning, October 2, MCC-H transitioned
13	9A /3		DT14 (11/0 100)	291:15:44:33Z	Chief States	~	1	ALC: NO		<u>MIDDECK</u> :	USOS operations support to BCC HSG Moscow.
"Cu	No la	SS EVA 85	PTM (U/S 182):	11377 FT			100		1 T	100.04	- At the October 2, 6:45 AM CST MMT, the decision was made
S KOPI	чихин	DOCKED QUEST EVA 11	6:14 6:10	<u>ROLLOUT</u> : 8305 FT	- 1)	1	1.7			ISS 9A	not to launch earlier than Monday. October 7. This presumes a
.01		EMU/TETHERED EVA 78	SE TAL (77A).	8305 FT		1-1-	-			(SHIMMER, RAMBO)	GO to begin Restoration of the MCC late Wednesday or early
		SCHEDULED EVA 79 DURATION 6:36	<u>SE TAL (ZZA)</u> : 6:04 6:08	52 SEC	•	A COL	-			KAWBU)	Thursday.
		DOIXTION 0.30	0.04 0.00	WINDS:	and the second					5 CRYO TK SETS	- MCC powerup/restoration began early Thursday morning,
			MECO CMD:	11H, 5R KTS	+ THE P		1			6 GN2 TANKS	October 3. ISS operations in MCC will be resumed Thursday
	FATCS		8:21.5 8:24.5	OFFICIAL:	Star and	States of the	and the			RMS 69	night. Launch scheduled for Monday, October 7.
	ALL ALL		0.21.0	01011P17	The second second		TE T	Carlos and	all a		
1 P	The second second		VI:	AVE: 8H 11R						RMS USED FOR	
8	Land Ingen	8	25822 25815	PK: 13H 11R	STS112_ET					TV SUPPORT	
+ 5	+			DENS ALT: 1019 FT	during ascen	t from firs	st ET S	Shuttle		DURING S1	
1 the	5.112 - 94		<u>OMS-2</u> :	DENS ALL. 101711	Observation	Camera .	(Cou	rtesy MSFC E	Т	INSTALL (SSRMS	Continued
	+ 155		38:40 38:42		Project Office					INSTALL)	of him dourn
			96.1 FPS 95.9 FPS	Continued							

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			Эг	PACE SHU			5101	10 00			, ,
FLT ORE	BITER	CREW (6)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS / EXPERIME NTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-112/ SS 9A ontinued				Continued F <u>LT DURATION</u> : 10:19:57:50 <u>S/T</u> : 1001:18:46:44 <u>OV-104:</u> 219:21:26:00 <u>DISTANCE</u> : 4,513,01 5 sm		zvous ar	nd dock	antis on appring operation		to ISS	Continued LAUNCH WINDOW: - Launch window opened at 280:19:40:51Z and closed at 280:19:50:50; for a total launch window of 9m59s. In-plane time was 280:19:45:51Z for a launch window of 4m59s. LAUNCH DELAYS: NONE - Launch occurred On-Time at 280:19:45:51Z, 3:45:51 PM EDT on Monday, October 7, 2002. TAL WX: - Zaragoza (prime and selected) and Moron (2-Eng TAL Call) were forecast and observed GO. Moron earlier forecast was NO GO for showers and anvils. Ben Guerir was not available. <u>PERFORMANCE ENHANCEMENTS:</u> - Standard Set plus: (1) PE Operational High Q TRN/OCT, (2) OMS Assist, (3) 52 NM MECO, (4) Del Psi <u>FLIGHT DURATION CHANGES</u> : NONE - Planned landing at KSC on Orbit 171. MLGTD at KSC Runway 33 on Orbit 171 at 291:15:43:41Z, 11:43:41 AM EDT, 10:19:57:50 MET. NLG at 291:15:43:48Z, 11:43:48 AM EDT. STS-112 was the 75th planned landing at KSC, but the 60th actual landing at KSC, and the 36th landin on Runway 33.
		033 (12 October 20) board S1 Truss and STS112-326-033 2nd EVA. Wolf is and SS's Canadarm2 wh he airlock spur.	Canadarm2.	ers during restraint on	BELOW: STS in Destiny Lat Peggy A. Whi Sergei Y. Trec crew: Wolf/MS Sellers/MS, ar	o on ISS. tson/FE, schev/FE S, Magnu	From le Valery G (RSA). s/MS, M	ft, front row 6. Korzun/CE From left, ba elroy/PLT, A	EXP 5 c DR(RSA ack row \$	crew:), & STS-112	 FIRSTS/LASTS: First use of ET Shuttle Observation Camera during ascent. EVENTS: MC4 Start at 282:14:18:46Z, 3.2 fps, orbit 200.4 by 213.6 nm. ISS Capture at MET 1:19:30:19, 282:15:16:10Z. Hard dock to PMA2 Lab Fwd Port complete at 1:19:44:06 MET, 282:15:29:57Z. PMA/APAS Hatch Open at 282:16:40Z, 1:20:55:09 MET. ODS Hatch open at 282:16:50Z, 1:21:05:09 MET. PMA/APAS Hatch Open at 282:172, 2:19:35 MET End at 283:22:22Z, 3:02:36 MET, duration 7h01m (Attached S1 to S0 Truss using SSRMS Released CETA cart launch locks. Connected Zenith side power umbilicals and deployed S-Band Antenna. Installed S1 nadir ETVCG) First Reboost maneuver start at 285:10:52:48Z, 4:15:06:57 MET, delt of 11.9 fps, altitude increase of 3.4 nm, orbit 216 by 204 nm. EVA 2 (JAL) Start at 285:14:30Z, 4:18:44 MET, End 285:20:34Z, 05:00:48 MET, duration 6h04m. (Installed Z1/P6, Z1/Lab and RBVM SPD's. Connected ATA Umbilicals. Installed Lab ETVCG. ZCG Activation). Continued

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SPACE SHUTTLE MISSIONS SUMMARY

		CREW		LANDING SITE/	SSME-TL						
FLT	ORBITER	(6)	LAUNCH SITE, LIFTOFF TIME,	RUNWAY, CROSSRANGE	NOM-ABORT EMERG	SRB RSRM	ORBIT	F		Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION,	THROTTLE	AND ET	INC HA/		F	PAYLOADS/ XPERIMENTS	TAL WEATHER, ASCENTI-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S	Abort Himes	WINDS	ENG. S.N.				ر ا		
STS-112/ ISS 9A							1				Continued
Continued								E- Le Er Wi Fli	-41249- ead FD ngelauf	STS Phil in MCC eviewing	EVENTS (Continued): - Second Reboost maneuver (c3) start at 287:11:20:50Z, 6:15:34:59Z MET, delta V = 6.9 fps, altitude increase 1.96 nm, orbit 219.4 by 203.3 nm. - EVA 3 (JAL) Start at 287:14:11:25Z, 6:18:25:34 MET, End 287:20:47Z, 07:01:01 MET, EVA duration 6h36m. (IUA on MT R&R. S1 to S0 fluid (ammonia) jumper connections, removal of port and starboard keel pins, last of TRRJ SPD's, TRRJ bolts). - Total cargo transfers from Orbiter to ISS = 29120 lbm (S1 Segment = 27676 lbm), Total cargo transfers from ISS to Orbiter = 1351 lbm Consumables Transfer: H ₂ O Total = 1658.1 lbm, 16 CWC's with 1603.7 lbm and 3 PWR's with 54.4 lbm). Total N2 (Tank) = 68.2 lbm. - Total O ₂ = 60 lbm (Pre-Breathe: EVA 1 = 10 lbm, EVA 2 = 10 lbm, EVA 3 = 10 lbm, Tank Transfer= 28 lbm). - Undocking at 289:13:13:25Z, 8:17:27:34 MET. - Total ISS Visitor Time = 6:21:33:28. - Post-undocking initial separation maneuver began at 289:13:13Z. ISS flyaround terminated at 289:14:30Z, 8:18:44 MET.
			ber 2002) New I om departing Atlant		ISS 9A ORE						 Final Separation at 289:15:00Z, 8:19:14 MET, delta V= 5.5 fps, resulting Orbit = 200.8 nm by 219.9 nm. Orbit Adjust Maneuver at 290:20:26:51Z, 10:00:41:00 MET, delta V = 93.9 fps, Orbit 146.6 nm by 219.9 nm Note: At 291:08:35Z, using Progress engines, raised the ISS 6.9 miles. <u>RENDEZVOUS # 60:</u> Rendezvous and Dock with ISS (Dock to PMA2 Lab Fwd Port) <u>SIGNIFICANT ANOMALIES:</u> Piece of debris impacted ETA ring near IEA box on LH SRB at 33 seconds. Insulating foam was lost on ET-115 left bipod ramp (approx 4" X 5" X12") exposing bipod housing SLA closeout. Primary Thruster L4D failed off due to low chamber pressure (IFA STS-112-
											V-01). - Panel F7 SM Alert Light Brightness - Supply Water Crossover Valve Circuit Breaker did not indicate Open - System A Pyros for SRB Holddown Posts and ET Vent Arm Systems did not fire at T-0 (IFA STS-112-K-01). - EVA Glove Wrist Tether Point Torn - RPOP PGSC (STS-5) Network Problem - Emergency Egress Net Daisy Wheel Knob broke - PCS 1 O2 Supply Pressure Indication failed OSH - MADS recorder "stuck" at beginning of tape (tape came off reel) - Forward RCS Primary Thruster F3F Failed On Heater - ICOM A from Shuttle to Station not operating
	JSC MCC CAPCON	C shuttle flight co I Stephanie D. W ogo. Flight Direct	ers of MOD Planning ntrol room (WFCR) ilson holds the STS or John Curry stand	. IS S-112 Di ds to Le	SC2002-0180 S Flight Con irector Mark I eft of center, olds ISS logo	trol Rooi Kirasich ISS SPA	m (BFCR) in stands near	JSC I	MCC. F er on fro	Flight ont row.	- Handheld Microphone failed

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			<u> </u>								
		CREW	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	7 UP/7 DOWN	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.			LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		TITLE, NAMES	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S		WINDS	ENG. S.N.						
STS-113/	OV-105	CDR:	KSC 39A	KSC 33 (KSC 61)	104/104/	BI-114	51.60	DIRECT	01-29	CARGO:	Brief Mission Summary: STS-113 was the 16th American
ISS 11A	(Flight 19)	James D. Wetherbee	328:00:49:47Z	341:19:37:13Z	109%		(16)	INSERTION	(4)	38393 LBS	assembly mission to the ISS. The primary goals achieved on
100 11/1		(Flt 6 - STS-32, STS-52,	7:49:47 PM EST (P)	2:37:13 PM EST	DDEDIATED	RSRM		DOOT ONO O			this mission were to transport the EXP 6 crew to the ISS and
SEQ	ENDEAVOUR	STS-63, STS-86, STS-102) P680/R108/V80/M198	7:49:47 PM EST (A) Saturday 5	Saturday 21	PREDICTED: 100/104.5/104.5/	86		POST OMS-2: 169.9 x 125.7		<u>PAYLOAD</u> CHARGEABLE:	return the EXP 5 crew to earth after 5 months in space and to install the Port (P1) Integrated Truss Assembly. The 45-ft
FLT #112		F 000/R 100/ 000/101190	11/23/02 (EST) (14)	12/7/02 (14)	72/104.5	ET-116		NM		30217 LBS	long 14-ton P1 truss is the opposite side mate to the
100 110	OMS PODS:	PLT:	11/25/02 (201) (14)	12/1/02 (14)	72/104.5					30217 ED3	Starboard S1 truss delivered on STS-112. It is the 4th of 11
KSC-112	LPO4-26	Paul S. Lockhart	LAUNCH WINDOW:	DEORBIT BURN:	ACTUAL:	SLWT-21				DEPLOYED:	truss structures that ultimately will extend the ISS length to
PAD 39A-63	RPO1-33	(Flt 2 - STS-111)	7M08S IN 2 PANES	341:18:31:33Z	100/104.5/99/					29672 LBS	that of a football field. The P1 truss contains the Active
1710 377 03	FRC5-19	P681/R279/V176/M245	ISS PLANAR/PHASE	XRANGE: 2.1 NM	72/104.5	<u>et</u> IMPACT		DEORBIT:			Thermal Control System (to be activated later), a second UHF
		M/S 1/EV1:		ARANOL, 2.1 MM	1 = 2050 (4)	IMPACT		APOGEE: 214 NM		<u>NON-DEPLOYED</u> : 46 LBS	comm system, a second CETA cart, and a Thermal Radiator Rotary Joint (TRRJ).
MLP-2			EOM PLS: KSC	<u>ORBIT DIR</u> : AL 32	2 = 2044 (8)	1:14:10		PERIGEE:		40 LD3	Kolary John (TRRJ).
1/ 11		(Flt 3 - STS-73, STS-92)	TAL: ZZA	AIM PT: NOMINAL	3 = 2045(7)	MET		212 NM		MIDDECK:	KSC W/D: OPF 79, VAB 9, PAD 35 = 123 days total.
16TH SHUTTLE		P682/R202/V163/M175	TAL WX: MRN							MIDDECK: 288 LBS	$\frac{1}{1}$ (30 W/D. OTT 77, VAD 7, TAD 33 – 123 days total.
FLIGHT			CELECTED.	MLGTD: 2846 FT 341:19:37:13Z	M 3 EOM:	<u>LAT</u> : 36.54°S		VELOCITY:			LAUNCH POSTPONEMENTS:
TOISS		M/S 2/EV2: John B. Herrington	<u>SELECTED</u> : RTLS: KSC 33/N/N	VEL: 194 KGS	WEIGHT: 200993 LBS	36.54°S		25907 FPS		<u>SHUTTLE</u> ACCUMULATED	- Launch was postponed from July after Post-STS-110 visual inspections of OV-104 Inconel 12" MPS LH2 Flowliners revealed three cracks to SSME 2. Subsequent inspections found cracks
		P683/R287/M251	TAL: ZZA 30/N/SF	197 KFAS	X CG:	LONG:		ENTRY		WEIGHTS:	three cracks to SSME 2 Subsequent inspections found cracks
			AOA: KSC 33/N/N	HDOT: -2.8 FPS	1087.63	<u>158.67</u> °W		RANGE:		DEPLOYED:	In other orbiter LH2 Flowliners:
+ 5	+ + +		PLS: EDW 22/N/N	TD NORM 195:				4351 NM		1189722 LBS	- OV-103 - three cracks (SSME 1)
+ + +	LOCKHAN	Kenneth D. Bowersox		3009 FT	LANDING:					NON-DEPLOYED:	- OV-105 - one crack (SSME 1) and one crack (SSME 2) - MPTA - one crack (SSME 1)
WETHERBEE	LOPEZ-ALCO	(Flt 5 - STS-50, STS-61,	<u>TDEL</u> : 0.04 -0.278/-0.24		WEIGHT:					1559554 LBS	- OV-102 three cracks (SSME 2) OV-102 flowliners are CRES
HERRINGTON		STS-73, STS-82) P684/R146/V97/M130		<u>NLGTD</u> : 5814 FT 341:19:37:23Z	200939 LBS X CG:					<u>CARGO TOTAL</u> : 3547208 LBS	After analyses, tests, etc., including consideration of other repair
		F 004/R 140/ V 77/101130	MAX Q NAV:	VEL: 163 KGS 159 KEAS	1089.52					3347200 LD3	techniques, the decision was made to use weld-repair technique and polishing of Flowliner holes.
		M/S 4 UP/EXP 6 Flt Eng 1:	763 765	159 KEAS	1007.02					PERFORMANCE	- As a result, STS-113 and STS-112 moved ahead of STS-107.
MC>		Nikolai Budarin	SRB STG:	HDOT: -5.8 FPS						MARGINS (LBS):	STS-113 launch date was set to November 6, 2002 EST.
BOWERSS WHIT	TON TPELLER	(Russia)	2:04.8 2:04	DRAG CHUTE DEPLOY: 155 KEAS	100	80299				FPR: 3065	- At FRR, STS-113 Launch was postponed 1 day to November 7,
CRSOX BY	APUH PET	P685/R288/M252		<u>DEPLOY</u> : 155 KEAS 341:19:37:25Z						FUEL BIAS: 937 FINAL TDDP: 1736	2002 EST at 11:56 PM (311:04:56Z).
		M/S 5 UP/EXP 6 FIt Eng 2:	<u>PERF</u> : NOMINAL	J41.19.J7.ZJZ						RECON: 2486	LAUNCH SCRUBS:
		Donald R. Pettit	2 ENG TAL (BEN):	<u>BRK INIT</u> : 65 KGS		2R.	-	Province		112001112100	 Scrubbed Monday, November 7 Launch at approximately L-3 hours due to an O2 leak in PCS 2 between ECLSS Supply Valve
		P686/R289/M253	2:33 2:35	DRAG CHUTE			-			PAYLOADS:	
UON PI	TRUSS			JETTISON: 57 KGS		P P T	1			PLB: ISS 11A	Detection System indicated an O ₂ concentration of approximately
OTA	THE A	M/S 3 DN/EXP 5 Flt Eng 2:	NEG RETURN:	341:19:38:00Z		- Ender			-	ISS 11A (ITS P1 TRUSS)	150 ppm in the Mid-Body. Troubleshooting procedures isolated
S. 77		Sergei Y. Treschev	3:52 3:55	BRK DECEL FPS ² :				0		CETA CART B	the leak to PCS 2 outside the cabin between ECLSS O2 Supply
ë 📰	2 10 2	(Russia) (STS-111 Up)	<u>PTA (U/S 183)</u> :	AVE 3.9 PK 5.1		7	-	11		SRMS, ODS	Valve and Crew Module 5/6 bulkhead. Launch date set to NET
		P687/R283/M248	5:01 5:01	WHEELS STOP:	ĨĨ.	/					blowing leak in PCS 2 O_2 flex hose near the 576 bulkhead.
S	18-113		DTM (U/S 102).	341:19:38:287					-	MIDDECK:	and 576 Buikhead. Leak was lifst holiced when Haz Gas Detection System indicated an O ₂ concentration of approximately 150 ppm in the Mid-Body. Troubleshooting procedures isolated the leak to PCS 2 outside the cabin between ECLSS O2 Supply valve and Crew Module 576 bulkhead. Launch date set to NET Monday, November 18. Inspection/troubleshooting found a blowing leak in PCS 2 O ₂ flex hose near the 576 bulkhead. Replaced PCS 2 O ₂ and N2 flex hoses. During preparation to get access to PCS 2 O ₂ line under PLB liner, an Access Platform came in contact with the RMS damaging the TPS. Keylar
		M/S 4 DN/EXP 5 CDR:	<u>PTM (U/S 183)</u> : 6:05 6:10	13420 FT		12.12		-246 - 1 P	200	ISS 11A	get access to PCS 2 O ₂ line under PLB liner, an Access Platform
		Valery C. Korzun			ISS005-E-2154	6 (25 Nover	mber 20	002) Endeavo	ur		honeycomb with minor delamination to composite boom. Tests
		(Russia) (STS-111 Up)	<u>SE TAL (ZZA)</u> :	ROLLOUT: 10574 FT	approaches the			One (P1) truss in		5 CRYO TK SETS	and analyses proved it is OK to fly-as-is. On November 20, set launch date to 11/22/02. Technical Scrub.
		P688/R282/M247	6:00 6:01	75 SEC	cargo bay.					6 GN2 TANKS	launch date to 11/22/02. Technical Scrub.
			SE PTM (U/S 646):	WINDS:						RMS 70	- Scrubbed 11/22/02 launch planned for 8:15:30 PM EST at L-8 minutes due to unstable weather at ZZA and MRN. Early
		M/S 5 DN/EXP 5 Flt Eng 1:	6:53 6:59	H3 R7 KTS						RMS USED TO	forecasts were showers within 20nm at Zaragoza and occasional
		Peggy A. Whitson		OFFICIAL:						UNBERTH P1 ITS	overcast 1500 feet and showers at MRN. At L-1 hour, Moron
		(STS-111 Up) P689/R281/F35	MECO CMD: 8:22.4 8:22.9	0308P13 H4 R7						AND HAND-OFF	weather had improved and FD updated TAL to Moron. However, both TAL sites were forecast and observed NO GO at the L-8
		1 00 //120 //1 00	0.22.4 0:22.9							TO SSRMS FOR	minute scrub time and at TAL landing times. TAL weather Scrub.
			<u>VI</u> :	<u>DENS ALT</u> : 580 FT						MATE TO SO	Ben Gurerir was not available as a TAL site; however, Ben Guerir
		Continued	25821 25823	FLT DURATION:						TRUSS.	was observed NO GO for ceiling and showers.
		Continued		13:18:47:26							Continued
			Continued								Continueu
				Continued							
											·

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			J							
FLT	ORBITER	CREW 7 UP/7 DOWN	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM	ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION,	THROTTLE PROFILE	AND ET	INC HA/HP		PAYLOADS/ EXP	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-113/ ISS 11A Continued	NA NA		ABORT TIMES Continued <u>OMS-2</u> : 38.12 37:49.2 250 FPS 256 FPS 2:42 5:31	FLT DURATION, WINDS Continued S/T: 1015:13:34:10 OV-105: 206:14:12:06 DISTANCE: 5,735,600 sm FIRECUP (E 230 (29 November ve (right) and Exponential Sectors) Contended to the sector of the sector	PROFILE ENG. S.N.	ET EXI EXI EXI EXI EXI EXI EXI EXI EXI EXI	OWN (EXP S-113 (red s embers (left) The STS-11 on Commando on Specialists back, are ast	hirts), gather 3 crew ler; Jo 5; and ronaut	EXP	
			Officer; and c Five crew, fro astronaut Peg	owersox, Comma osmonaut Nikolai nt to back, are cos ggy A. Whitson, N schev, Flight Engi saviakosmos.	M. Budarin, smonaut Va ASA ISS Sc	, Flight Ilery G. cience (Engineer. T Korzun, Co Officer; and	ne Exp mman cosmo	bedition der; naut	 <u>EOM+3</u> - Landed at KSC Runway 33 on orbit 216 at 341:19:37:13Z, 2:37:13 PM EST, Saturday, December 7, 2002 (MET 13:18:47:26). Total extensions 3 Days (Record for three days extension due to weather, landed on EOM+4). STS-57 was extended 3 days; however, the first day extension was for science and the last 2 days were weather extensions. Record minimum crossrange of 2.1 miles Continued

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								O MAR			
FLT	ORBITER	CREW 7 UP/7 DOWN	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT SR EMERG RSF	M	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,		
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE AN PROFILE ET ENG. S.N.			PAYLOADS/ EXP	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)		
STS-113/ ISS 11A Continued	STS113-71 039 Joł B. Herringt (left) and Michael E. Lopez-Aleg s, work on the newly installed Po One (P1) truss.	nn on gria				INT ANOMALIES: htration in Mid Bod Replaced second. y GN₂ flex hoses (I S Engine Bi-Prope ndicated 96 percer ist Burn and contin pen after burn (IF/ ower Amplifier 2 pr V-04). C&W pushbutton S Bed Heater Cycle Video System vide ary B Shutdown - I STS-113-V-03) it Roll Sluggish Joi re during private m herences RPOP RS 422 ca w indicates very si leak, no performar			Continued <u>RENDEZVOUS #61:</u> - Rendezvous and Dock with ISS (PMA2 Lab Fwd Port). <u>SHUTTLE NIGHT LAUNCH #28:</u> <u>EVENTS:</u> - NC1 maneuver at 328:03:42:05Z (02:52:28 MET) resultant altitude of 170.2 by 186.7 nm. - MC4 maneuver at 329:20:27Z (01:19:37 MET) resultant altitude 203.3 by 215.5 nm. - ISS Capture (PMA 2 Lab Fwd Port) at 329:21:20:27Z (01:21:08:53 MET) - ISS Capture (PMA 2 Lab Fwd Port) at 329:21:20:27Z (01:21:08:53 MET) - ISS Hard dock at 329:22:10:49Z (01:21:21:02 MET). - ODS Upper Hatch Open (all hatches open) at 329:23:29:47Z (01:22:40 MET) - IELK S/L Transfer (Official transfer of ISS from Expedition 5 Crew to Expedition 6 Crew) at 330:02:28Z (02:01:39:13 MET) - SRMS unberth of P1 ITS at 330:15:19:51Z (02:14:30 MET) and positioned P1 over orbiter Port Wing for handoff to SSRMS. (Thereafter SRMS camera was used only for video support of EVA activities.) - SSRMS used to mate P1 ITS to S0 truss at 330:18:50:14Z (02:18:00:27 MET) - EVA 1 Start at 330:19:48Z (02:18:57 MET), EVA 1 End at 331:02:33Z (03:01:43 MET) on November 26, 2002, duration 6H45M. All three EVA's used Pre-Breathe Protocol while exercising on Shuttle Ergometer located in		
undockin northwes	ng of Endeavo stern Australia w complemen	December 2002) To bur as the two space a. The newly installed ts the Starboard On	craft flew over d Port One (P1)	group in Ho	002-01994 T portrait in the s uston's MCC. A	uttle flight con scent/Entry Fli	ntrol ro	om (WFCR)	 SSRMS used to mate P111S to S0 truss at 330:18:50:142 (02:18:00:27 MET) EVA 1 Start at 330:19:48Z (02:18:57 MET), EVA 1 End at 331:02:33Z (03:01:43 MET) on November 26, 2002, duration 6H45M. All three EVA's used Pre-Breathe Protocol while exercising on Shuttle Ergometer located in mid-deck. Crew had to use Shuttle Ergometer as the CEVAS had a problem. Made connections between P1 and S0 Trusses. Released launch restraints on CETA Cart, DLA, and TARJ Stinger, installed Node 1 WETA. Reboost 1 at 331:17:10:47Z (03:16:21 MET) delta V + 2.4 fps, altitude increase 2.4 nm, altitude 216 by 207 nm EVA 2 Start at 332:18:36Z (04:17:46 MET), EVA 2 End at 333:00:47Z (04:23:57 MET) on November 28, 2002, duration 6H10M. Installed fluid jumpers between P1 & S0. Removed P1 Port & Stbd keel pins. Installed WVS TX Assy on P1. Relocated CETA Cart from P1 to S1. Released P1/P3 line clamps. Removed & stowed Radiator beam launch locks. Reboost 2 at 333:16:50:59Z (05:16:01:12 MET) delta V = 2.56 fps, altitude increase 0.7 nm, altitude 216 by 209 nm. EVA 3 Start at 334:19:24Z (06:18:34 MET) and End at 335:02:24Z (07:01:34 MET) on November 30, 2002, duration 7H00M. Installed Z1/P6/Lab, Lab HX, and P1 RBVM SPD's. Reconfigured electrical harnesses, route power through Main Bus switching units. Reboost 3 at 335:16:36:47Z (07:15:49 MET), delta V = 8.6 fps, altitude increase 2.4 nm, final orbit 216.6 by 211.4 nm. Farewell 336:17:18Z (08:16:28 MET) ODS Upper Hatch closed at 336:17:47:47Z (08:16:58 MET), Lab Fwd Hatch (all hatches closed) closed at 326:18:15:47Z (08:17:26 MET) Undocking complete at 336:20:04:50Z (08:17:36 MET) Transfers: Shuttle to ISS 2160 lbs plus P1 ITS of 27514 lbs, 690 lbs H₂O (672 lbs in 7 CWC's and 18 lbs in one PWR), 32 lbs O₂ used during prebreathe for 3 EVA's. Plus 6 LiOH cans. Transfer ISS to Shuttle 2250 lbs. MEPSI deploy at approx. 336:22:25Z (08:21:36 MET) 		

center frame.

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FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.	ORDITER		LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP	1.500	PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
110.		TITLE, NAMES	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S		WINDS	ENG. S.N.						· ····································
SEQ FLT #113 KSC-113	OV-102 (Flight 28) Columbia <u>OMS PODS:</u> LPO5-17 RPO5-16	<u>CDR:</u> Rick D. Husband (Flt 2 - STS-96) P690/R248/V177/M216 <u>PLT:</u> William C. McCool P691/R290/M254	KSC 39A 16:15:39:00Z 10:39:00 AM EST (P) 10:39:00 AM EST (A) Thursday (34) 1/16/03 (10) LAUNCH WINDOW:	<u>DEORBIT BURN:</u> 32:13:15:18Z	104/104/ 109% <u>PREDICTED</u> : 100/104.5/72/ 72/104.5 <u>ACTUAL</u> :	BI-116 RSRM 88 ET-93 LWT-86	39.0 (8)	DIRECT INSERTION <u>POST OMS-2</u> : 156 x 147 NM	OI-29 (5)	<u>CARGO</u> : 35463 LBS <u>PAYLOAD CHARGEABLE</u> : 24316 LBS <u>DEPLOYED</u> :	<u>Brief Mission Summary</u> : The STS-107 crew carried out a 16- day mission dedicated to a mix of life and physical sciences on board the first SPACEHAB Research Double Module (RDM). The crew of seven included the first Israeli astronaut. During descent for landing at KSC at an altitude of 203,000 feet over north central Texas, a breach in the TPS on Columbia's left wing resulted in loss of vehicle and crew. Communications with the crew were lost at 9 AM EST,
MLP-1	FRC2-28 EDO FLT 15 S/H RDM 1	<u>M/S 1</u> : David M. Brown P692/R291/M255	2H30M CTOB <u>EOM PLS</u> : KSC <u>TAL</u> : MRN	Sunday, February 1, 2003	100/104.5/72/ 72/104.5 1 = 2055 (1)	<u>ET</u> IMPACT				0 LBS <u>NON-DEPLOYED</u> : 23515 LBS	Saturday, Feb. 1, 2001. Second loss of vehicle and crew in Shuttle program. KSC W/D: OPF 79, VAB 9, PAD 35 = 123 days total.
		<u>M/S 2</u> : Kalpana Chawla (Flt 2 - STS-87) P693/R230/V178/F30 M/S 3 (PAYLOAD CDR):	TAL WX: ZZA <u>SELECTED</u> : <u>RTLS</u> : KSC 15 CI/N TAL: MRN 20 N/N <u>AOA</u> : EDW 04 CI/N <u>PLS</u> : EDW 04 N/N	PLANNED LANDING: On KSC 33 at 9:15:50 AM EST ORBIT DIRECTION: DL 49	2 = 2053 (5) 3 = 2049 (7)	1:24:35 MET <u>LAT</u> : 2.28°N				MIDDECK: 801 LBS SHUTTLE ACCUMULATED WEIGHTS:	LAUNCH POSTPONEMENTS: - Baselined launch date of 1/11/01 on 11/10/99. - Postponed launch date to 2/22/01 on 3/3/00. - Postponed launch date to 4/15/01, then 6/14/01, others(?), then to 9/2/03, moved after STS-112 and STS-113 (Priority flights to HST and ISS flights that had been ppd. due to flow-liner cracks.) - Postponed launch date to 1/16/03.
		Michael P. Anderson (Flt 2 - STS-89) P694/R235/V179/M205	<u>TDEL</u> : 0.11 0.032/0.070 <u>MAX Q NAV</u> :			<u>LONG</u> : 139.42°W				DEPLOYED: 1189722 LBS NON-DEPLOYED: 1559554 LBS CARGO TOTAL:	LAUNCH SCRUBS: None LAUNCH WINDOW: - Launch Window was 2H30M (Crew Time On Back).
		M/S 4: Laurel Blair Salton Clark P695/R292/F37 P/S 1:	756 749 <u>SRB STG</u> : 2:05.4		- MORIAM			200		<u>2ARGO TOTAL</u> 3547208 LBS <u>PERFORMANCE</u> MARGINS (LBS):	LAUNCH DELAYS: NONE - KSC weather was excellent, perhaps the best launch weather experienced in Shuttle Program. - Launch occurred On-Time at 16:15:39:00Z, 10:39:00 AM EST, on Thursday, January 16, 2003.
		Ilan Ramon	PERF: NOMINAL			- See ne	s p	age.		FPR: 3047	on marsuay, january 10, 2005.
	ANDERSON	(ISRAEL) P696/R293/M256	2 ENG TAL (MRN): 2:39 2:50 NEG RETURN: 3:50 3:52 PTA (U/S 242): 5:15 5:14 SE OPS 3:	FLT DURATION: 15:22:20:32 Lost contact with	<u>El</u> : WEIGHT: 234495 LBS X CG:			DEORBIT: Ha 151.6 NM Hp 135.0 NM		FUEL BIAS: 1112 FINAL TDDP: 1335 RECON: 1348 PAYLOADS: PLB: SPACEHAB RDM FREESTAR OARE (MORE THAN 80	TAL WX: - Moron was prime and selected. Both Moron and Zaragoza were forecast and observed GO. Ben Guerir was not available. PERFORMANCE ENHANCEMENTS: - Standard Set plus: PE Operational High Q (WIN/JAN) and OMS Assist. FIRSTS/LASTS: - First flight of Space Shuttle in CY 2003. - First flight of Space Shuttle in CY 2003. - First flight of Space Shuttle in CY 2003. - First flight of Space Shuttle in CY 2003. - First flight of Space Shuttle in CY 2003. - First flight of Space Shuttle in CY 2003. - First flight of Space Shuttle in CY 2003. - First flight of Space Shuttle in CY 2003. - First flight of Space Shuttle in CY 2003. - First flight of Space Shuttle in CY 2003. - First EDO Pallet Flight Sciences, Earth and Space Science, Space & Technology Development. - First EDO Pallet Flight since STS-90 (April 17, 1998) - First flight of Israeli Astronaut - Ilan Ramon
BROWN	, Ma	MCC WHITE FCR (43) FLIGHT DIRECTORS: LD/O 2 - K. B. Beck O 1 - J. S. Stich O 3 - B. P. Austin O 4 - J. M. Hanley A/E - L. E. Cain MOD - P. L. Engelauf	5:25 <u>PTM (U/S 242)</u> : 5:54 6:05 <u>SE TAL (ZZA)</u> : 5:56 6:05 <u>SE PTM (U/S 459)</u> : <u>700</u>	Columbia at 8:59:32 AM EST <u>S/T</u> : 1031:11:54:42 <u>OV-102:</u> 300:17:39:40 <u>DISTANCE</u> : 6,649,757 sm	1078.53 <u>EI + 15 MIN</u> : WEIGHT: 234167 LBS X CG: 1077.87			VELOCITY: 25762 FPS ENTRY RANGE: 4439 NM		MIDDECK: FREESTAR - MIDDECK H/W RAMBO S/H SUPPORT EQUIPMENT 9 CRYO TK SETS (EDO PALLET) 5 GN2 TANKS NO RMS	Countermeasure's, Physical Sciences, Earth and Spáce Sčience, Space & Technology Development. - First EDO Pallet Flight since STS-90 (April 17, 1998) - First flight of Israeli Astronaut - Ilan Ramon <u>FLIGHT DURATION CHANGES</u> : - Planned landing at KSC on orbit 256 (TIG orbit 255) on Saturday, February 1, 2003. Deorbit maneuver was initiated at 32:13:15:182, 8:15:18 AM EST on Saturday, February 1, 2003 (TIG orbit 255, landing orbit 256). Planned landing time was 32:14:15:50Z, 9:15:50 AM EST. - Orbiter weight and Xcg at entry interface was 234,495 lbm, Xcg was 1078.53. - Orbiter weight and Xcg at entry interface plus 15 minutes 234,167 lbm, Xcg was 1077.87. - Flight controllers reported increased temperatures on some sensors and some failed sensors in left wing area. Off-nominal indications started at approximately 32:13:52:17Z. Columbia contact loss (Loss-of-Signal) occurred at 32:13:59:32Z, 8:59:32 AM EST (15:22:20:32 MET), 16 minutes prior to planned landing Continued

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				LANDING SITE/	SSME-TL						
		CREW	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT ORE	ITER	(7)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		CINDIT	FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.			LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
110.		TITLE, NAMES	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S		WINDS	ENG. S.N.						· · · · · · · · · · · · · · · · · · ·
STS-107	CAIB	REPORT:					. 10		1		Continued
Continued	Accid the lo Therr left w insula area vicinit panel this b super and p wing, increa	The form of the second	eading edge of the yy a piece of the left bipod ramp of Carbon-Carbon During re-entry, n System allowed ding-edge insulation n structure of the left e structure until ed loss of control.								FLIGHT DURATION CHANGES: (continued) time. Communications and tracking were lost at an altitude of approximately 203,000 feet while Columbia was traveling at approximately 12,500 miles per hour at Mach 18. - Columbia and 7 astronauts were lost over Texas. <u>RED SHIFT:</u> Rick Husband, Kalpana Chawla, Laurel Clark, Ilan Ramon. <u>BLUE SHIFT:</u> William McCool, David Brown, Michael Anderson (PL CDR) <u>STS-107 EVENTS:</u> Orbital Altitude was 150 nm.
By Mike Leinbach KSC-2010-4452 at the dawn of th STS-107 crew. In toward scientific commercial sate	ALLAUNCE (http: by the bac discover lites du		TE mr/KSC PH-2, May 20 asa.gov/index.cfr designed patches f m the Chandra X-R pmplishments includ nber crew on STS-5	The S modu shirts CDR Ramo are D P. An Dio reach of Columb ay Observatory (la e the first space si 5, first Spacelab m	bia's missions leaunched aboard huttle landing a hission and first	is showr lumbia. I ir work sl and, Lau). From I h/MS1, P DR. Columbia, ead from e d STS-93) t White Sa six-memb	n on-o From hift co rel B. eft (to 'LT W , the "f earth to repres ands wer crev	left (bottom lor, are Kalp Clark/MS4, p row), wea illiam C. Mc irst of the flee ward our rem senting Colum vith STS-3, fir w on STS-9, f	row) v pana C and II rring b Cool, a t", risin nembra nbia's c st deplo	vearing red Chawla/MS2, an lue shirts, and Michael g above earth ince of the contributions oyment of	 STS-107 FLIGHT OBJECTIVES/EXPERIMENTS: Flight was a dedicated and successful science/research mission. Primary payload is SPACEHAB Research Double Module (SHRDM) with International, NASA and SPACEHAB commercial payloads including Life Sciences, Materials, and Microgravity Science Research Experiments. Fast Reacting Experiments Enabling Science, Technology, Applications and Research (FREESTAR) is a complex Secondary Payload which is a cross bay carrier with following payloads: MEIDEX (Mediterranean Israeli Dust Experiment), Solar Constant-3 (SOLCON-3), Shuttle Ozone Limb Sounding Experiment-2 (SOLSE-2), Critical Viscosity of Xenon-2 (CVX-2), Low Power Transceiver (LPT), and Space Experiment Module-14 (SEM-14) Ram Burn Observation (RAMBO) SIGNIFICANT ANOMALIES: ET Foam loss during ascent at approximately 81 seconds (likely from Bi-pod area) (IFA). Re-design constraint to flight. RSRM Nozzle Flex Boot Separation (IFA). Constraint to flight. Oz Tank 7 Heater failed off in Manual Mode (IFA STS-107-V-02) Suspected Fuel Cell Monitoring System Data Cable problem. FCMS is suspect after same problem with backup cable. SM I/O Errors on IP Bus DSR 20 Error Message 32 (Loss of tape recording and playback) 70 mm Hasselblad Intermittent Motor Drive (Binds or jams) 2nd 70 mm Hasselblad Motor Jam STGT site outage Payload No I-COM B Transmission in Spacehab (Not being heard in Spacehab) Spacehab water loop Degradation (Flow rates decreasing) Payload No I-Com B Transmission in Spacehab (Not being heard in Spacehab) Spacehab water loop Degradation (Flow rates decreasing) Payload Ku Channel 2 Data Dropouts (Ku-Band and S-Band) AC2 Phase B "Sluggish" Current Signature on Orbiter (IFA STS-107-V-01) Forward DAP Auto A Contact Deselected by RM Spacehab Rotary Separator flooding short Loss of Columbia and crew during Entry -

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		CREW	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB	ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(7)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	Throttle Profile Eng. S.N.	AND ET	INC HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-114/ LF-1 SEQ FLT #114	OV-103 (Flight 31) Discovery OMS PODS:	CDR: Eileen Collins (Fit 4 - STS-63, STS-84, STS-93) P697/R188/V139/F24 PLT:	KSC 39B 207:14:39:00Z 10:14:39 AM EDT (P) 10:39:00 AM EDT (A) Tuesday 14 7/26/05 (8)		104/104/109% PREDICTED: 100/104.5/104.5/ 72/104.5	ET-121 SLWT-22	51.60 DIRECT (17) INSERTION <u>POST-OMS-2</u> 123.6 NM X 85.0 NM	OI-30 (1)	<u>CARGO:</u> 38652 LBS <u>PAYLOAD CHARGEABLE</u> : 29807 LBS	Brief Mission Summary: With STS-114/LF-1 (17th ISS mission), NASA initiated Return to Flight 2 years after the Columbia accident. The crew was charged with a busy to-do list that included testing new safety techniques and delivering much-needed supplies to ISS. KSC/WD: OPF 994, VAB 25, PAD 85 = 1104 days total
KSC-114 PAD 39B-50 MLP-3 17TH SHUTTLE	LPO1-34 RPO3-32 FRC3-31	James M. Kelly (Flt 2 - STS-102) P698/R263/V180/M229	LAUNCH WINDOW: 4M52S (In-Plane Time) with ISS EOM/PLS: KSC TAL: ZZA TAL: ZZA TAL WX: MRN, FMI	<u>DEORBIT BURN</u> : 221:11:06:18Z <u>XRANGE</u> : 46 NM <u>ORBIT DIR</u> : AL 33 AIM PT: NOM	ACTUAL: 100/104.5/104.5/ 72/104.5 1 = 2057 (1) 2 = 2054 (5) 3 = 2056 (3) ALL BLOCK II	ET IMPACT: 1:14:10 MET LAT: 36.56°S			DEPLOYED: 26413 LBS NON-DEPLOYED: 3231 LBS <u>MIDDECK:</u> 163 LBS	 LAUNCH POSTPONEMENTS: Baselined OV-104 Atlantis as ULF-1 Crew Rotation flight with launch date of 1/16/03 on 12/6/01 Postponed launch date to NET 3/1/03 on 9/16/02. Postponement caused by Engine Flowliner cracks. Subsequent postponements after STS-107 Accident to NET 7/21/03, NET 10/1/03, NET 12/18/03, NET 3/11/04, NET 9/12/04. Postponed launch date to NET 3/6/05 on 3/22/04. Changed flight to ISS Logistics Flight LF-1, canceled crew rotation, and changed orbiters to Discource UV 103.
FLIGHT TO ISS ISS LOGISTICS FLIGHT 1		<u>M/S 2/EV-2</u> : Stephen K. Robinson (Flt 3 - STS-85, STS-95) P700/R222/V152/M196	SELECTED: RTLS: KSC 33/N/N TAL: ZZA 30/N/SFD AOA: KSC 33/N/N PLS: EDW 22/N/SFD TDEL: 0.02 -0.178	<u>MIM P1</u> : NOM <u>MLGTD</u> : 1311 FT 221:12:11:23Z VEL: 226 KGS 222 KEAS HDOT: -5.5 FPS <u>TD NORM 205</u> :	ENGINES	<u>LONG</u> : 158.7°E	4		<u>SHUTTLE</u> <u>ACCUMULATED</u> <u>WEIGHTS:</u> <u>DEPLOYED</u> : 1216135 LBS	 To ISS Logistics Flight LF-1, canceled crew rotation, and changed orbiters to Discovery OV-103. Tanking Test 1 on 4/24/05 experienced two intermittent LH2 ECO anomalies. (ECO sensors #3 & #4 failed WET). Replaced MPS Point Sensor Box (PSB) and all Sensor #3 & #4 wiring to LH₂ monoball. Subsequent to completion of this work, the Tanking Test #2 LH₂ Sensor performance was nominal. Postponed launch date to NET 5/12/05, 5/22/05, 7/13/05 Rolled back from pad 39B to VAB on 5/26/05 to swap stacks with STS-121, due to a late all-flights requirement for a heater on the ET LO₂ Feedline upper bellows, to prevent formation of critical ascent ice debris in that area. Installation of the bellows heater was started on ET-211 (STS-114 was ET-120) in the VAB before the STS-114 stack was rolled-back.
		(Fit 4 - STS-77, Up to Mir on STS-89, Down on STS-91, STS-102) P701/R213/V149/M186 <u>M/S 4</u> : Wendy B. Lawrence	<u>MAX Q NAV</u> : 775 709 <u>SRB STG</u> : 122.4 126.76 PERF: NOMINAL:	<u>ID NORM 205</u> : 2761 FT <u>DRAG CHUTE</u> <u>DEPLOY:</u> 192 KEAS 221:12:11:31.9Z <u>NLGTD</u> : 6573 FT					NON-DEPLOYED: 1562948 LBS CARGO TOTAL: 3585860 LBS PERFORMANCE MARGINS (LBS): FPR: 3098	out-of-spec H2 diffuser
		STS-91) P702/R192/V146/F25 <u>M/S 5:</u> Charles Camarda P703/R295/M258	2 ENG TAL (ZZA): 2:43 2:44 <u>NEG RETURN</u> : 3:52 3:57 PTA (U/S 182):	221:12:11:38Z VEL: 163 KGS 156 KEAS HDOT: -6.4 FPS <u>BRK INIT</u> : 90 KGS DRAG CHUTE	125				FUEL BIAS: 1269 FINAL TDDP: 2111 RECON: 3792 PAYLOADS: PLB: ISS LF-1 MPI M	 Replaced MPS PSB after a power card failure. Rolled out to Pad 39B on 06/15/05 and set launch date of 07/13/05 on 05/22/05. <u>LAUNCH SCRUBS:</u> Scrubbed 07/13/05 launch attempt at 194:17:30Z (L-2:14:51 to Window Opening) when LH₂ ECO Sensor #2 failed WET (failed to transition to DRY with Sim Commands). This violated OMRSD and LCC MPS-22 requirements for four functional LH₂ sensors.
		EMU/TETHERED EVA 83	5:10 5:14 SE TAL (ZZA 104): 6:14 6:09 6:14 PTM (U/S 614): 6:14 6:10 6:14	<u>JETTISON:</u> 53 KGS 221:12:12:08Z <u>BRK.DECEL</u> FPS ² : AVE 5.1 PK 6.6	STS-114 <u>Retu</u> Assembly, cre	irn to Flight w patch, fir	2005) Art panel fo - Features Shuttle, I st step for humans nward to Mars &		RAFFAELLO, ESP2, LMC, RMS, ODS, OBSS <u>MIDDECK</u> : ISS LF-1 RAMBO	LAUNCH SCRUBS: - Scrubbed 07/13/05 launch attempt at 194:17:30Z (L-2:14:51 to Window Opening) when LH ₂ ECO Sensor #2 failed WET (failed to transition to DRY with Sim Commands). This violated OMRSD and LCC MPS-22 requirements for four functional LH ₂ sensors. Extensive tests were conducted that identified a degraded PSB ground and some evidence of EMI as potential causes of the false WET problem. At MMT on 07/20/05, decided to set launch for 07/26/05 (without a special tanking test), allowing sufficient time to clean up the ground and EMI. Decision was made to perform ECO Sensor #2 and #4 pin swap that provides additional troubleshoot results. (Note: ECO sensors operated normally on 7/26/05; further analyses and tests have significantly reduced the concerns about PSB grounding and EMI as causes of the STS- 114 anomalies, but this remains a UA as of February 2006). - Weather: All three TAL sites were forecast and observed GO. RTLS and AOA1 landing site KSC was forecast NO GO for precipitation and thunderstorms within 20 NM and observed NO
		SS EVA 91 EMU/TETHERED EVA 84 SCHEDULED EVA 85	<u>SE PRESS 104:</u> 6:57 7:02 <u>MECO CMD:</u> 8:24.2 8:24.9 <u>VI:</u> 25819 25819.6	<u>WHEELS STOP:</u> 221:12:12:31Z 12657 FT <u>ROLLOUT:</u> 11346 FT 68 SEC	<u>beyond.</u> <u>M 3 EOM:</u> WEIGHT: 225792 LBS X CG: 1086.58		DEORBIT: Ha 191.0 NM Hp 168.0 NM ENTRY		5 CRYO TK SETS 6 GN2 TANKS RMS 71 RMS USED FOR	concerns about PSB grounding and EMI as causes of the STS- 114 anomalies, but this remains a UA as of February 2006). - Weather: All three TAL sites were forecast and observed GO. RTLS and AOA1 landing site KSC was forecast NO GO for precipitation and thunderstorms within 20 NM and observed NO GO for thunderstorms within 20 NM (Anvil). 07/13/05 Launch Attempt was a combined Technical/Weather Scrub.
		Continued	<u>OMS-2</u> : <u>37:40</u> 38:00 100.7 FPS 99 FPS	NO BLACKOUT DURING ENTRY Continued	LANDING: WEIGHT: 225727 LBS X CG: 1088.21		<u>ENTRY</u> <u>VELOCITY</u> : 25858 FPS ENTRY <u>RANGE</u> : 4416 NM		TPS SURVEYS AND TWO GAP FILLER REMOVALS	LAUNCH WINDOW: Window opened at 207:14:34:33Z and closed at 207:14:43:52Z for a total window of 9M19S. The Preferred Launch Time (In-Plane Time) was 207:14:39:00Z resulting in a Launch Window of 4M52S. Continued

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50 44 V	TITLE, NAMES	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION,	EMERG THROTTLE PROFILE	RSRM AND ET	INC	HA/HP	FSW	WEIGHTS, PAYLOADS/ EXPERIMENTS	(LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
First use of the Orbiter Boom S laser imager an of Wing Leading	& EVA'S Linued C WHITE FCR (44) <u>SHT DIRECTORS</u> : ITTLE: - LeRoy Cain) 1 - Paul Hill - Anthony Ceccacci Plng - Catherine Koerner m 4 - Kelly Beck - Steven Stich) 2 - Mark Ferring - Bryan Lunney Plng - Joel Montalbano m 4 - Richard LaBrode - Contemportal Con	arm known as S) equipped wit th for ascent dam huttle Bottom Ti	WINDS Continued DENS ALT: 3799 FT FLT DURATION: 13:21:32:23 S/T: 1045:09:27:05 OV-103: 255:20:12:58 DISTANCE: 5,796,419 sm	ENG. S.N.	D70 (26 Joan deta ust below on ET live dicated of SRB separat	ched f v LO ₂ ve vide no imp large deb ion atted, boun = 24 to 33 ir = 10 to 14 ir hs are proje of the obje	feedline). act to Disc ris ded distance from the taches Width 1 (Width 2 (Width 2 (width 3 (exceed from the image ct may be greater the ET TPS For	LL Ram The del in phot covery.	Average of the second s	 EIRSTS, SIGNIFICANT ANOMALES, ETC.) Continued LAUNCH DELAYS: None. Launch occurred at 207:14:39:00Z, 10:39:00 AM EDT on Tuesday, 07/26/05. TAL WX: Zaragoza (Primary and Selected) was forecast and observed GO Moron was forecast and observed NO GO for Crosswind. FMI (Istres) was forecast GO but observed NO GO for Tailwind violation. PERFORMANCE ENHANCEMENTS: Standard Set plus: (1) PE Operational High Q SUM/JUL, (2) OMS Assist, (3) 52 NM MECO, (4) Del Psi FLIGHT DURATION CHANGES: On Flight Day 4, decision made to extend flight 1 day to give more time to transfer activities to and from ISS. EOM Day: Deorbit Tig on Orbit 201 was at 220:07:43Z and landing time at KSC on Orbit 202 at 12/18:07 MET 220:08:46Z (4:46 AM EDT). EDW was not called up for support on EOM day. Early weather forecast was GO except for a chance of showers. Gave crew a GO for PLBD closure at 220:05:15Z. Light rain wa observed at SLF for a few minutes. At 220:06:15Z gave crew a GO for fluid loading. Last forecast changed to NO GO at 220:0643Z with observed broken low clouds at 1000 feet in SLF area. At 220:07:16Z, due to low clouds, decision was made to wave off first opportunity at KSC. KSC was observed GO at landing time. Flight extension 1 day plus one orbit. KSC opportunity 2 Deorbit Tig on Orbit 202 was at 220:09:19Z and landing time. Flight extension 1 day plus one orbit. Last forecast at 220:08:46Z was GO. However, due to unstable conditions in low clouds, FD made decision to wave off landing it KSC on second opportunity. KSC was observed MO GO due to precipitation in SLF area. Flight extension now 2 days. EOM + 1 Day: All three EOM landing sites KSC, EDW, and NO were called up on pick-em day with Discovery landing at one of the three sites. First opportunity for a XSC landing was on Orbit 218 at 221:09:08Z with Tig at 220:08:05Z on Orbit 217. Gave a GO for FLBD closing at 221:06:55Z, waved off landing at KSC o

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FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION,	THROTTLE PROFILE	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		a LVA S		WINDS	ENG. S.N.						

STS-114/

Continued.





CDR Collins

Discovery was about 600 ft from ISS when CDR Collins performed the first R-Bar (backflip) maneuver to

allow inspection of the vehicle heat shield. Photos were analyzed on the ground to assess any damage during ascent. (Photos shown top to bottom are: iss011e11255. iss011e11257. Iss011e11260. iss011e11263. Iss011e11270)



S114-E-6751 (2 August 2005) --- Crew portrait in Destiny Lab. From left (front row) are Thomas/MS, CDR Collins, & Noguchi/MS (JAXA). From left (back row) are PLT Kelly, Camarda/MS, Robinson/MS, & Lawrence/MS.



S114-E-6062 --- Noguchi (JAXA) participates in Mission's first FVA demonstrating Shuttle thermal protection repair techniques.

Continued...

Targeted landing at EDW on orbit 220. Discovery landed with MLGTD at EDW 22 at 221:12:11:23Z, 13:22:32:23 MET, 5:11:23 AM PDT on August 9, 2005. NLGTD was at 221:12:11:38Z.

FIRSTS/LASTS

- First flight in Return-To-Flight after Columbia STS-107.
 First launch in 922 days after STS-107 launch.
 First flight with Istres, France as a TAL site.
 First flight with ET bipod redesign to eliminate large insulating foam ramps as a debris source and replace them with electric heaters.
- First use of the 50-foot-long robotic arm extension known as Orbiter Boom Sensor System (OBSS) equipped with Laser Imager and cameras to inspect Wing Leading Edges RCC and the Shuttle Bottom tiles for damage.
 First use of upgraded Ground Camera Ascent Imagery System, two WB-57 aircraft based video, and ship and ground based
- radar.
- First use of WLE instrumentation behind RCC panels to gather and downlink acceleration and temperature data during ascent phase.
- First use of orbiter back-flip pirouette (R-bar pitch maneuver) to allow ISS based photography of orbiter bottom TPS. First EVA crew to make repairs on shuttle bottom. Removed gap fillers protruding approximately 1 inch from black tiles in two areas of orbiter bottom black tiles, each extended approximately 1 inch.
- Gap fillers were removed during EVA 3. First flight with ET design change to use heater in bipod ramp area to prevent ice/frost buildup (in lieu of insulating foam in that area).
- Mandated day-time launch for STS-114 and STS-121 to provide proper lighting for video and film cameras observation of ET
- debris shedding during ascent. First flight with ET LOX Feedline upper bellows heater to prevent formation of critical ascent ice debris in that area.

EVENTS

- ET Separation at 207:14:47:00Z, 8:46 GET MC-1 maneuver at 01:17:37:53, delta V 0.44 ft/sec Orbit 199.7 by 213.1 NM

213.1 NM - FD2 SRMS/OBSS survey of Wing Leading Edges and nose cap - FD2 SRMS/OBSS survey of orbiter upper surfaces - ISS capture at 209:11:17:20Z (01:20:38:20 MET) - Hard Dock: 209:11:31:53Z (01:20:52:53 MET) - Open Lab Fwd Hatch at 209:11:51:00Z (01:21:12 MET) - Open APAS Hatch at 209:12:35:00Z (01:22:14 MET) ISS - Open ODS Hatch at 209:12:14:00Z (01:22:14 MET) ISS ingress - FD4 OBSS survey of heat-protection tiles. MPLM docked to Node 1. MPLM and Middeck transfers begin. - EVA 1 start at 211:09:45:50Z, 3:19:06:50 MET, duration 6H50M, no 107/30/05 _ Crew members performed FWA & NOAX TPS sample repair DTO 848 in PLB. Crew used OBSS to scan predamaged RCC samples on DTO pallet.

Continued.

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SPACE SHUTTLE MISSIONS SUMMARY

FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,	
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	Throttle Profile Eng. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)	
STS-114/	STS.114/ Continued											

STS-114/ LF-1 Continued.



ISS011-E-11517 (5 August 2005) --- ISS Canadarm2 grasps the MPLM for transfer from ISS Unity Node back to Discovery's cargo bay for return to Earth. James Kelly/Pilot, and Wendy Lawrence/MS controlled the transfer.



S114-E-6642 --- Robinson anchored to a foot restraint on ISS Canadarm2, participates in the mission's third EVA which included removal of two gap fillers protruding from orbiter bottom tiles.



JSC2004-E-45140 ---Lead Flight Director Paul Hill (foreground) and CAPCOM Stephen N. Frick monitor communications in the Shuttle Flight Control Room (WFCR) in JSC MCC with the STS-114 crewmembers during a fully-integrated simulation - one of many to establish readiness for Return to Flight.



JSC2005-E-32538 (5 August 2005) --- U.S. Senator Kay Bailey Hutchison (R.-Texas) and U.S. Representative Tom DeLay (R.-Texas) talk to CDR Eileen M. Collins aboard Discovery. Looking on are NASA Administrator Mike Griffin (left) and Flight Director Jeff Hanley.

EVENTS (Continued): EVA2 start at 213:08:43:00, 5:18:04:00 MET, duration 7H14M, on 08/01/05. EVA crew removed, replaced, and performed checkout of ISS CMG 1. Crew started CMG 1.

EVA 3 start at 215:08:48:002, 7:18:09:00 MET, duration 6H01M, on 08/03/05. Installed External Stowage Platform (ESP-2) on ISS airlock. Removed gap filler material (two) protruding from orbiter bottom tiles.

Orbiter undocked from ISS at 218:07:23:45Z (10:16:44:45 MET) Total Consumables transferred to ISS 1855.2 lbm (18 CWC's &

5 PWR's), $N_2 = 29$ lbm tank-to-tank; Stack-to-stack $O_2 = 60.85$ lbm (27.6 lbm atmo & 33.3 metabolic), N_2 to ISS cabin transfer = -7.7 ĺbm.

Total MPLM transfers to ISS 3695 lbs (2095 Cargo and 1600 HRF). 6600 lbs transferred to MPLM/Discovery for return to earth

ISS Visitor Time was 8D19H51M52S (Hard dock to Undock) Sep 1 Burn at 218:08:36:26Z Ha 193.5 Hp 189.3, Sep Burn 2 at 218:09:04:26Z Ha 194.1 Hp 168.1 NM

Orbit Adjust Burn at 221:11:06:18Z H

RENDEZVOUS # 62: Rendezvous and dock with ISS.

SPACE SHUTTLE NIGHT LANDING: # 20 total and sixth night landing at EDW.

 $\frac{\text{SIGNIFICANT ANOMALIES}}{\text{-} LH_2 ECO sensor \#2 stayed wet when commanded dry caused}$ launch scrub.

- ET TPS damages and TPS foam losses during ascent constraint to next flight:
- LH₂ PAL ramp, Ice/Frost ramp, Acreage, Intertank flange foam losses.

- HY thrust strut flange and -Y Bipod spindle closeout foam losses.
 +Y thrust strut flange and -Y Bipod spindle closeout foam losses.
 TPS Gap Filler Protuberances (removed during EVA 3)
 Nose Landing Gear TPS tile damage
 APU 2 momentary loss of Press & Temp Indications
 ODS Capture Latch manual release talkback showed "Open" prior to hook drive

prior to hooks drive

- Airlock Aft "B" Hatch Closure difficulties
- Airlock Depress Off-Nominal TCS repeated loss of Track
- VRCS thruster R5R Low Pc. Heater may have failed on. MPS/SSME low pressure helium decay rate exceeded WSB GN₂ Regulator outlet pressure low High O_2 concentration in aft compartment during ascent

- Loss of several Orbiter tile putty repairs during ascent
- Late release of two FRCS Thruster TYVEK rain covers during
- ascent
- Orbiter forward ET attach point NSI pyro bolt ejection after nominal NSI firing

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			<u> </u>								
FLT	ORBITER	CREW (7 up, 6 down)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-121/ ULF1.1 SEQ FLT# 115 KSC 115 PAD 39B-51 MLP-1 18th Shuttle Flight to ISS ISS Logistics Flight 2		CDR: Steven W. Lindsey (Fit 4 - STS-87, STS-95, STS-104) P704/R229/V131/M200 PLT: Mark E. Kelly (Fit 2 (STS-108)) P705/R271/V181/M237 EV2/M/S 1 (PAYLOAD CDR): Michael E. Fossum P706/R296/M259 M/S 2: Lisa M. Nowak P707/R297/F38 MYS 2: Lisa M. Nowak P707/R297/F38 MYS 2: Lisa Stephanie D. Wilson P708/R298/F39 EV1/M/S 4: Piers J. Sellers (Fit 2 (STS-112)) P709/R285/V182/M249 M/S 5 UP, stay as ISS EXP 13 FE: Thomas Reiter P710/R299/M260 (ESA - Germany) SS EVA 92	KSC 39B 185:18:37:55 Z 2:37:55 PM EDT (P) 2:37:55 PM EDT (A) Tuesday 15 7/4/06 (9) LAUNCH WINDOW: 3M43S (In-plane time with ISS) EOM PLS: KSC TAL: MRN TAL: MRN 20/CI/N AOA: KSC 15/N/N PLS: EDW 22/N/N TAL: MRN 20/CI/N AOA: KSC 15/N/N PLS: EDW 22/N/N TDEL: 0.09 .172 MAX Q NAV: 684 660 <u>SRB STG:</u> 2:03 2.02 <u>PERF</u> : NOMINAL <u>2 ENG TAL:</u> 2:49 2:52 NEG RETURN:	KSC 15 (KSC 62) 198:13:14:42 Z 9:14:42 AM EDT Monday 21 7/17/06 (11) DEORBIT BURN: 198:12:06.55 Z XRANGE: 258 NM ORBIT DIR: AL 34 AIM PT: NOMINAL MLGTD: 3273 FT 198:13:14:42 Z VEL: 198 KGS 199 KEAS HDOT: -1.8 FPS TD NORM 205: 2662 FT DRAG CHUTE DEPLOY: 189 KEAS 198:13:14:45 Z NLGTD: 6646 FT 198:13:14:53Z VEL: 149 KGS 145 KEAS HDOT: -5.8 FPS BRK INIT: 100 KGS	104/104/109% PREDICTED: 100/104.5/ 104.5/ 104.5/ 104.5/ 104.5/ 104.5/ 104.5/ 104.5/ 104.5/ 104.5 1 = 2045 (8) 2 = 2051 (5) 3 = 2056 (4) All Block II Engines M 3 EOM: WEIGHT: 226063 LBS X CG: 1084.58 LANDING: WEIGHT: 225972 LBS X CG: 1086.32	BI-126 RSRM 93 ET-119 SLWT 23 <u>ET</u> <u>IMPACT</u> MET 1:14:32 <u>LAT:</u> 35.845S <u>LONG</u> : 157.76 W	51.60 (18)	DIRECT INSERTION POST OMS-2: 123.6 NM BY 85.0 NM DEORBIT: HA 190.7 NM HP 176.7 NM ENTRY VELOCITY: 25862 FPS ENTRY RANGE: 4494 NM	OI-30 (2)	CARGO: 37736 LBS PAYLOAD CHARGEABLE: 29280 LBS DEPLOYED: 23696 LBS NON-DEPLOYED: 5426 LBS MIDDECK: 158 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 1239831 LBS NON-DEPLOYED: 1239831 LBS NON-DEPLOYED: 1568532 LBS CARGO TOTAL: 3623596 LBS PERFORMANCE MARGINS (LBS): FPR: 3519 FUEL BIAS: 825 FINAL TDDP: 2290	Brief Mission Summary: STS-121/ULF1.1 (18th ISS mission) continued the testing of new equipment and procedures for increasing Space Shuttle safety of flight. Specifically, this mission continued the testing of ET design and process changes for minimizing potentially damaging debris during launch, ground and flight camera systems for vehicle observations during launch, and techniques for on-orbit inspection and repair of vehicle TPS. The flight also delivered critical supplies and cargo for the repair and future expansion of the ISS. KSC W/D: OPF 264, VAB 7, PAD 41 = 312 days total. LAUNCH POSTPONEMENTS: Baselined OV-103 launch date of 11/15/04 on 10/26/03 Postponed launch date to NET 7/10/05 on 3/26/04. Slip due to Columbia accident Postponed launch date to NET 7/10/05 on 2/17/05 to provide on acceptable launch date to NET 7/10/05 on 5/23/05 to reflect latest planning decisions Postponed launch date to TBD on 11/15/05 Postponed launch date to TBD on 11/15/05 Postponed launch date to T1/06 LUNCH SCRUBS: Scrubbed Saturday 7/1/2006 launch attempt at 182:19:46Z (at L- 0h2m41s) while holding count at L-9 min. The window opened at 182:19:43:41 and closed at
	KATE [®] TI	SS EVA 92 DOCKED QUEST EVA 15 EMU/TETHERED EVA 85 SCHEDULED EVA 86 DURATION 7:31 SS EVA 93 DOCKED QUEST EVA 16 EMU/TETHERED EVA 86 SCHEDULED EVA 87 DURATION 6:47 SS EVA 94 DOCKED QUEST EVA 17 EMU/TETHERED EVA 87 UNSCHEDULED EVA 7 DURATION 7:11	NEG RETURN: 3:58 4.02 PTA (U/S 160): 5:42 SE TAL (FMI 104): 606 606 6:17 PTM (U/S 160): 6:45 SE PRESS 104: 7:04 7:04 7:12 MECO CMD: 8:30.1	BRK INIT: 100 KGS DRAG CHUTE JETTISON: 54 KGS 198:13:15:18 Z BRK DECEL FPS ² : AVE 5.6 PK 6.7 WHEELSTOP: 198:13:15:56 Z 12238 FT ROLLOUT: 8965 FT 74 SEC	ISS013-E approache Leonardo I (MPLM) in	s ISS for Multipurp	docki ose L	ng with ogistics Moc	lule	FINAL TDDP: 2290 RECON: N/A (sensor fail) PAYLOADS: PLB: ISS ULF1.1 ICC MPLM LMC RMS, ODS, OBSS MIDDECK: ISS ULF1.1, RAMBO, MAUI 5 CRYO TK SETS 6 GN2 TANKS RMS 72 USED FOR OBSS/LDRI ACTIVITIES	PLS3 was forecast GO but observed crosswind of 19 knots. Primary TAL Moron and alternates Zaragoza and Istres (France) were forecast and observed GO. Weather scrub for KSC RTLS, AOA1 and PLS3. - Scrubbed Sunday 7/2/2006 launch attempt at 183: 17:14Z (at L-2h12m). The window opened at 183:19:21:09Z and closed at 183:19:31:09Z. The preferred launch time was 183:19:26:09Z. At the time of the scrub, there remained 7m41s to window closure. KSC RTLS was forecast NO-GO thunderstorm anvils within 20 NM and chance of broken 3000 ft and observed thunderstorms within 20 NM. KSC AOA1 was forecast NO-GO for thunderstorms within 30 NM and chance of broken 3000 ft and observed thunderstorms. NOR AOA2 was forecast NO- GO for chance of thunderstorms within 30 NM and observed GO Primary TAL site Moron and alternate Istres (FMI) were forecast and observed GO. Zaragoza was forecast slight chance of thunderstorms within 20 NM but observed GC. All three TAL sites were observed GO. Weather Scrub - KSC RTLS, AOA. Management made the decision to go for a 48-hour turnaround so the fuel cell cryos could be topped off for a possible 1-day extension, power permitting. KSC RTLS/AOA/Launch weather scrub. Continued

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			J			100	10113 30			5
FLT NO.	ORBITER	CREW (7) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION,	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE	SRB RSRM AND ET	ORBIT	FSW	Payload Weights, Payloads/ Experiments	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-121/ ULF1.1 Continued		Continued MCC WHITE FCR (45) <u>FLIGHT DIRECTORS</u> : A/E - Steve Stich LD/O 1 - Anthony Ceccacci O 2 - Norman Knight PLNG - Paul Dye MOD - Phil Engelauf ISS	Continued <u>VI:</u> 25819 25821 <u>HaHp:</u> 123.6 x 31.1 <u>OMS-2:</u> 38:00 38:00 98.1 FPS 98.6 FPS	WINDS Continued WINDS: 21008 P10 AVE: 5H, 7R PEAK: 6H, 8R DENS ALT: 1691 FT 1691 FT 7 FLT DURATION: 12:18:36:47 OV-103: 263:14:49:45 S/T: 1058:04:03:42 DISTANCE: 5,293,923 sm	ENG. S.N.	-E-05156	(4July 2006) orbiter umbilical	ET was		Continued LAUNCH WINDOW: - The July 4th launch window opened at 185:18:32:55Z and closed at 185:18:42:56Z giving a total window of 10 minutes plus 1 second. The Preferred Launch Time (In-Plane Time) was 185:18:37:55Z. - Performance close time was 185:18:41:38Z, giving a launch window of 3m43s. LAUNCH DELAYS: - None. Launch occurred on time at 185:18:37:55Z (2:37:55 PM EDT) on Tuesday, July 4, 2006. SLF crosswinds were forecast at 16 knots but STA evaluation raised RTLS crosswind limit to 17 knots. All three TAL sites were forecast GO but Zaragoza was observed NO-GO for showers within 25 NM. TAL WEATHER: - MRN (Primary TAL), Istres, and Zaragoza were all three forecast GO. Zaragoza was observed NO-GO for showers within 25 nm. PERFORMANCE ENHANCEMENTS: - Standard Set plus (1) PE Low Q SUM/JUL, (2) OMS Assist, (3) 52 NM MECO, (4) Del Psi FLIGHT DURATION CHANGES/LANDING:
in ISS D (ESA), E N. Willia CDR Lin	estiny Lab. Exp 13 CDR ms/FE13. F dsey, & No	TS-121 (green shirts) & From left (front row): Re Pavel V. Vinogradov/Re From the left (middle row wak/MS. From the left (h/MS. & PLT Kellv.	eiter/FE13 SA, & Jeffrey v): Wilson/MS,		damage	studies t	22006) Fossuthe OBSS as a	s.	Sellers test	 FLIGHT DURATION CHANGES/LANDING: Total flight extension is 1 day. On FD4 , MMT made decision to extend flight 1 day (from 12+1+2 to 13+2) to permit additional EVA to accomplish RCC/tile repair materials DTO's. The plan was to land at one of the two EOM opportunities at KSC: (1) Deorbit 202 with landing on orbit 2023 (2) Deorbit 203 with landing on orbit 2023 (2) Deorbit 203 with landing on orbit 204. EDW was not called up. If unable to land at KSC on EOM, EDW would be called up for a "pick 'em?" KSC or EDW. TD 6-hr weather forecast for Deorbit 202 chance of showers within 30 nm. The weather forecast update at 1155Z removed showers within 30 nm and detached anvils were removed from the forecast changing the forecast to GO for deorbit. (Deorbit 203 forecast showers within 30 nm). Deorbit burn was at 198:12:06:55Z with KSC runway 33 as the preferred runway. At EI-15, an unexpected rain shower moved toward the SLF that was expected close to HAC for runway 15 at M15 (185,000 feet) to avoid the weather buildup south of the SLF. MLG touchdown was at 198:13:14:42Z (9:14:42 AM EDT) on Monday July 17, 2006 for a flight duration of 12:18:36:47. NLG touchdown was at 198:13:14:52Z. There were no further flight duration changes. Total 1 day extension for operations. EIGHTH SHUTTLE CREWMEMBER REPLACEMENT Carlos Noriega (medical issue) was replaced by Sellers in July 2004. (6th & 7th Shuttle crewmembers replacements occurred on STS-113.) RENDEZVOUS # 63: Rendezvous and dock with ISS Continued

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SPACE SHUTTLE MISSIONS SUMMARY

FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	Landing Times Flt Duration, Winds		AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)

STS-121/ ULF1.1 Continued.



S121-E-06199 (10 July 2006) --- Fossum and Sellers (partially out of frame) restored ISS Mobile Transporter rail car to full operation and delivered a spare cooling system pump.



In JSC MCC Chris Lessmann/Entry Console Operator/USA (foreground) reviewing abort entry performance predictions and John Davidson/Abort Support/USA updating the Abort Region Determinator for DOL winds & atmosphere.



JSC2006-E-27890 --- Orbit-1 Flight Control Team group portrait in the Shuttle White Flight Control Room of JSC MCC. Flight Director Tony Ceccacci holds the STS-121 mission logo.

- SIGNIFICANT ANOMALIES: L5L thruster heater fail off (first launch attempt) ET LH2 5% fill-point sensor failed wet when commanded to dry state
- (during loading attempts) FES Full up PRI B Shutdown

- FES Full up PKIB Shutdown
 Protruding Gap Fillers
 Personal hygiene hose leak
 TPS Blanket Damage
 85-ft safety tether #24 retraction issue
 Scratch reported on crewlock external hatch sealing surface
 SAFER 5000 (EV1) unlatched during EVA. Relocked by EV2
 Apt 11 Eucl Tank Loak

- APU 1 Fuel Tank Leak APU 3 GG/FU Pump Heaters cycling in over temp range Two-inch spatula inadvertently released during EVA 3 Waste Dump Nozzle Temps A&B unusual signature during condensate Waste Dump Nozzie romponent and dump
 Right Air Data Probe initial fail to deploy
 WLEIS Inadvertent Software Shutdown (GFE)
 MCC GNC ISP Server Issue
 DOLILU PLOAD Procedural error (PLOAD LOX estimate high)

Continued...

IRSTS/LASTS/NEW:

- First flight of an ET without the Protuberance Air Load ramps as a safety improvement to reduce potential for debris. First test of 50-ft robotic am boom extension as a work platform.

- First test of 50-ft robotic arm boom extension as a work platform.
 First tight with hardened tiles on NLG doors.
 First use of SRMS/OBSS/Laser Dynamic Range Imager (LDRI) to scan Orbiter WLE and Nose Cap (RCC).
 DTO 848 RCC crack repair tasks using caulk guns to dispense the NOAX (non-oxide adhesive experimental) material.
 First flight of Orbiter MLG with four new larger, smoother tires that can withstand higher loads at landing.
 New procedures developed to ensure gap fillers between heat-shielding tiles stay in place (5000 replaced prior to launch).
 First flight to take GPS to NAV (BFS). Incorporated after processing TACAN approx. 140K. Performed well.
 ISS has three crew members for first time since May 2003.

EVENTS

- ET Separation at 185:18:46:46Z, 000:00:08:51 MET. OMS-2 ignition at 185:19:15:55Z, 98.7 fps, resultant orbit 124.4
- by 85.1 nm.
- TI ignition 187:12:04:46Z, 16.8 seconds, resulting orbit 190.1 by 177.9 nm.

- 177.9 nm. SRMS/OBSS/Laser Dynamic Range Imager (LDRI) scanned both WLE and nose cap, no anomalous conditions identified. ISS captured at 187:14:51:45Z (1:20:32:33 MET). Hard dock at 187:15:10:28Z (1:20:32:33 MET). ISS Hatch Open at 187:16:29Z (1:21:51 MET). Welcomed by Expedition 13 two-person crew (Vinogradov and Williams). IELK Seat Liner transfer at 187:19:13Z (002:00:35:05 MET which is Reiter's Shuttle time). This is the official transfer of Thomas Reiter from Space Shuttle STS-121 crew to ISS Expedition 13 crew. ISS Crew increased to three persons for first time since Mav 2003.
- May 2003.
- Nay 2003. Leonardo MPLM grappled and installed on Unity **Module**. EVA 1 Start at approximately 3/18:38 MET (189:13:15:55Z) July 8. Duration 7h 31m. Blade blocker inserted into Zenith IUA of MS, OBSS/SRMS Characterization. Rerouted TUS cable. EVA from ISS Quest A/L
- from ISS Quest A/L. EVA 2 Start at approximately 5/17:36 met (191:12:13:55Z) July 10. Duration 6h 47m. Nadir IUA R&R, Pump Module (w/FGB) transferred from ICC to ESP-2, R&R TUS. Piers' SAFER became detached, Mike re-locked it. EVA 3 start 193:11:20:30Z (7:16:42:35 MET), July 12. Duration 7h 11m. Completed 5 samples of NOAX DTO & IR imaging. Grapple Bar transferred to ISS. STE 131 craw foregue to ISS.

- STS-121 crew farewell to ISS. STS-121 crew farewell to ISS crew (Commander Pavel Vinogradov, Flight Engineers Jeffrey Williams & Thomas Reiter). APAS Hatch Close at 10/13:36 MET, ODS Hatch close 10/13:38 MET (196:08:15:55Z).
- NET (190.06.15.352). STS-121 Undock from ISS at 10/15:29 MET, 196:10:06:55Z. Total consumables transferred from Orbiter to ISS: Water 1545.8 lbm (1454.9 lbm in 15 CWC's and 90.9 lbm in 4 PWR's); N2 74.2 lbm transferred to Joint Air Lock tanks. No oxygen
- transferred between tanks.
- Cargo transferred from Orbiter to ISS total 10903.35 lbs (7423.99 from MPLM, 1862.93 from Middeck, 1616.43 from ICC). Cargo transferred from ISS to Orbiter total 6450.92 lbs (4389.14 plus unplanned 241.52 lbs to MPLM and 1820.26 lbs to Middeck).
- No communications blackout during entry.

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		ODEW		LANDING SITE/	SSME-TL						
		CREW (6)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(0)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION, WINDS	PROFILE ENG. S.N.	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-115/	OV-104	CDR:	KSC 39B	KSC 33 (KSC 63)	104/104/109%	BI-127	51.60	DIRECT	OI-30	CARGO:	Brief Mission Summary: STS-115/12A (19th ISS mission), for
ISS 12A	(Flight 27)	Brent W. Jett	252.15.14.55 7	264.10.21.23 7				INSERTION		41848 LBS	the first time since late 2002, resumed assembly of the ISS.
155 12/1	Atlantis	(Flt 4 - STS-72, STS-81,	11:14:55 AM EDT (P) 11:14:55 AM EDT (A)	6:21:23 AM EDT	PREDICTED: 100/104.5/	RSRM 94		POST OMS-2:			Atlantis left ISS with a new, second pair of 240-foot solar wings attached to a new 17.5-ton truss segment P3/P4 with
SEQ	OMS PODS:	ŠTS-97) P711/R206/V132/M179	Saturday 5	9/21/06 (11)	100/104.5/	94		<u>154.0 NM X</u>		<u>PAYLOAD</u> CHARGEABLE:	batteries, electronics, and a giant rotating joint for sun
FLT# 116	LPO4-		9/9/06 (11)		104.5	ET-118		123.8 NM		35758 LBS	tracking. The new solar arrays would double the ISS on-
KSC 116	RPO	PLT: Christenber Forguson	LAUNCH WINDOW:	DEORBIT BURN: 264:09:14.23 Z	ACTUAL:	SLWT					board power when the electrical systems were brought online during the STS-116 mission to follow.
	FRC4-27	Christopher J. Ferguson P712/R300/M261	4M41S (PLT in-		100/104.5/	24				<u>DEPLOYED</u> : 35552 LBS	
PAD 39B-52			plane)	XRANGE: 225 NM	104.5/72 104.5						KSC W/D: OPF 264, VAB 7. PAD 41 = 312 days total.
MLP-2		MS1/EV1: Joseph R. Tanner	EOM PLS: KSC	ORBIT DIR: AL 35						<u>NON-DEPLOYED</u> : 0 LBS	LAUNCH POSTPONEMENTS:
19TH		(Flt 4 - STS-66, STS-82,	<u>TAL</u> : MRN <u>TAL WX</u> : ZZA, FMI	AIM PT: NOMINAL	1 = 2044 (9) 2 = 2048 (6)	<u>ET</u> IMPACT				n FR2	 Baselined OV-104 launch date of 4/10/03 on 3/7/02
SHUTTLE		STS-97) P713/R185/V136/M162			3 = 2047 (9)			DEORBIT:		MIDDECK:	 Postponed launch date to 5/23/03 on 10/8/02; delays due to engine crack repairs
FLIGHT TO			<u>SELECTED</u> : <u>RTLS:</u> KSC 33/N/N <u>TAL</u> : MRN 20/N/N	<u>MLGTD</u> : 3131 FT 264:10:21:23 Z	All 3 Block II	MET 1:13:36		HA 190 NM HP 179 NM		206 LBS	- Postponed launch date to NET 8/21/03 on 3/13/03
ISS		MS2/EV2: Daniel C. Burbank	TAL: MRN 20/N/N	VEL: 191 KGS	Engines					SHUTTLE	 Postponed launch date to NET 10/30/03 on 4/17/03
		(Elt 2 - STS-106)	AOA: KSC 33/N/N	189 KEAS	5	LAT:				ACCUMULATED	 Postponed launch date to NET 1/22/04 on 5/28/03 Postponed launch date to NET 7/24/04 on 7/29/03
B BURB	ANK STEFA	P714/R258/V183/M225	<u>PLS</u> : EDW 22/N/N	HDOT: -1.5 FPS	M 3 EOM:	37.58S		<u>entry</u> Velocity:		WEIGHTS:	 Postponed launch date to NET 2/10/05 on 10/3/03
AN AN	77 · 14	MS3/EV3:	<u>TDEL</u> :	TD NORM 195:	WEIGHT:	LONG:		25867 FPS		DEPLOYED:	- Postnoned launch date to NET 8/28/05 on 3/22/04
3		Heidimarie M. Stefanyshyn-	0.10 .062	2639 F I	199711 LBS X CG:	160.16 W		ENTRY		1275483 LBS	 Postponed launch date to NET 12/8/05 on 10/29/04 Postponed launch date to NET 2/16/06 on 5/23/04
		Piper P715/R301/F40	MAX Q NAV:	DRAG CHUTE	1084.99			ENTRY RANGE: 4378 NM		NON-DEPLOYED:	- Postponed launch date to NET 7/1/06 on 10/31/05
			731.36 723.09	DEPLOY: 181 KEAS				4378 NM		1568738 LBS	- Changed launch date to TBD on 11/15/05 - Changed launch date to NET 8/28/06 on 3/16/06
N N N		MS4/EV4: Steven G. MacLean	SRB STG:	264:10:21:26 Z	LANDING:						- Advanced launch to 8/27/06 on 8/3/06 (actual launch date was
115 2		Steven G. MacLean (Flt 2 - STS-52)	2:05 2.08	NLGTD: 5775 FT	WEIGHT: 199642 LBS					<u>CARGO TOTAL</u> : 3665444 LBS	9/9/06)
		P716/R156/V184/M138 (CSA-Canada)	PERF: NOMINAL	264.13.21.327	X CG:						LAUNCH SCRUBS:
			2 ENG TAL (MRN):	VEL: 158 KGS 156 KEAS	1086.98					PERFORMANCE MARGINS (LBS):	 Scrubbed Sunday, 8/27/06 launch scheduled for 4:30 PM EDT
		SS EVA 95	<u>2 ENG TAL (IVIRIN)</u> : 2:42 2:47	HDOT: -6.4 FPS						FPR: 2886	at approximately L-26 hours to allow all Shuttle elements time to
* 155	-12A *	DOCKED QUEST EVA 18			(Section of the sect	-				FUEL BIAS: 921	evaluate the lightning strike on Pad 39B on 8/26. Technical scrub Launch rescheduled to NET 8/28/06 at 4:04 PM EDT
Blues	* 2	EMU/TETHERED EVA 88	<u>NEG RETURN</u> : 3:52 4.00	BRK INIT: 107 KGS					60	FINAL TDDP: 1749 RECON: 349	scrub. Launch rescheduled to NET 8/28/06 at 4:04 PM EDT. The Saturday, 10:00 PM EDT MMT decision was to spend
AL >		SCHEDULED EVA 88 DURATION 6:26		DRAG CHUTE					and the second	NEGON, 347	another day analyzing the probability of damage to the SRB pics. The launch countdown was to continue for a NET Tuesday 8/29
*			PTA (U/S 155): 5:16 5:26	JETTISON: 63 KGS		-	- AL		A	PAYLOADS:	launch
		SS EVA 96		264:10:21:53 Z	10 01	2500	E T	The second		<u>PLB</u> : ISS 12A	Scrubbed Tuesday, 8/29/06 launch at approximately L-37 hours based on a KSC forecast of 50 knots, gusts to 65 with a potential of reaching the Pad maximum of 70 knots due to Tropical Storm Ernesto. Decision made at 3:45 AM EDT on 8/29/06 morning to
C ST		DOCKED QUEST EVA 19 EMU/TETHERED EVA 89	<u>SE TAL (FMI 104)</u> : 6:09	BRK DECEL FPS ² :	는 전 전 종립	AND			1	(P3/P4) Segment	based on a KSC forecast of 50 knots, gusts to 65 with a potential
		SCHEDULED EVA 89		AVE 5.8 PK 8.5		10-15		The second secon		-	Ernesto. Decision made at 3:45 AM EDT on 8/29/06 morning to
		DURATION 7:11	PTM (U/S 575): 6:19 6:24	WHEELSTOP:		-	_		-	MIDDECK: RAMBO, MAUL	roll back to the VAB with option to stop and reverse the rollback if the forecast improved. Rollback to VAB started at 10:04 AM
	EXPEDIT	SS EVA 97	0.17 0.24	264:10:22:15 Z				Construction of the local division of the lo		RMS, ODS, OBSS	if the forecast improved. Rollback to VAB started at 10:04 AM EDT. The 11 AM forecast was in fact improved. KSC would
		DOCKED OUEST EVA 20	SE PRESS 104:	10670 FT							sustain winds of less than 45 knots with gusts to 60 knots that is
		EMU/TETHERED EVA 90 SCHEDULED EVA 90	7:00 7:00	ROLLOUT:	155013679714					5 CRYO TK SETS 5 N2 TANKS	within the pad limit of 70 knots mph. The STS-115 stack was
		DURATION 6:42	MECO CMD:	7539 FT	ISS013-E-7	79714A	tlanti	s, carrying a		RMS 73	midway between Pad B and the VAB at 2:45 PM EDT when the decision was made to stop the Rollback and return the stack to
			8:23.7 8:24.8	52 SEC	crew of six					RMS USED FOR	Pad B. The launch date is under assessment. Weather Scrub.
	TER BIN				outpost wit					OBSS/LDRI	Rescheduled launch to 11:29 AM EDT on 9/6/06.
					continuing					SURVEYS AND UNBERTH P3/P4	Continued
		Continued								UNDLIVITE J/F4	

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											, and the second s
FLT NO.	ORBITER	CREW (7) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL Nom-Abort Emerg Throttle Profile Eng. S.N.	SRB RSRM AND ET	INC	orbit Ha/Hp	FSW	Payload Weights, Payloads/ Experiments	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-115/ ISS 12A Continued		CULITTIE.	Continued <u>VI</u> : 25819 25818 <u>OMS-2</u> : 37:21 37:20.7 222 FPS 220.7 FPS	Continued <u>WINDS</u> : 2H, 3R OFFICIAL: 2H, 3R 0303P04 <u>DENS ALT</u> : <u>696 FT</u> <u>FLT DURATION</u> : <u>11:19:06:28</u> <u>S/T</u> : 1069:23:10:10 <u>OV-104</u> : 231:16:32:28 <u>DISTANCE</u> : 4,910,268 sm	ESITERRA						 Continued LAUNCH SCRUBS: (continued) Scrubbed Wednesday, 9/6/06 launch at approximately L-8.5 hours due to a fuel cell 1 coolant pump phase A short. (Pump operated on two phases.) 24-hour scrub turnaround with MMT at 1 PM 9/6 to decide launch date. The MMT decision was to press for a launch attempt on Friday, 9/8. Plan was to keep Phase A cb open during ascent. Technical scrub. Scrubbed Friday, 9/8/06 launch attempt at 251:14:53Z while holding at T-9 minutes when ET LH2 ECO Sensor #3 indicated failed wet when actually sensor was dry. 24-hour scrub turnaround. ECO sensor operated normally during drainback and on Saturday launch day. GO for launch. Technical scrub. LAUNCH WINDOW: The 9/9/06 launch window opened at 252:15:10:39Z and closed at 252:15:19:36Z for a total launch window of 9 minutes 0 seconds. The Preferred Launch Time (In-Plane time) was 252:15:14:55Z giving a launch window of 4m41s.
1					from the lef Pavel V. Vir STS-115 fro Stefanyshyr	t (front ro nogradov om the le n-Piper/M	ow): TI / (RSA ft (sec IS, & (homas Reite A), & Jeffrey cond row): 1 CDR Jett; a	er/FE (/ N. Wi Fanner and from	/MS,	 LAUNCH DELAYS: None. Launch occurred on time at 252:15:14:55Z (11:14:55 AM EDT) on Saturday, September 9, 2006. TAL WEATHER: Zaragoza and Moron were forecast NO-GO for thunderstorms within 20. FMI was forecast with a 1-knot tailwind violation (average tailwind forecast to be 11 knots and peak tailwind forecast to be 16 knots). Zaragoza was observed NO-GO for thunderstorms and attached anvil. MRN and FMI were both observed GO at TAL landing time. Moron was selected as Prime TAL site.

JSC2006-E-40208 --- Mike Suffredini, ISS Program Manager, responds to a question from media during

STS-115 mission update briefing on Sept. 14, 2006, at

JSC. Shuttle Flight Director John McCullough is at left.

PERFORMANCE ENHANCEMENTS: - Standard set plus (1) PE Operational High Q SUM/AUG, (2) OMS Assist, (3) 52 NM MECO, (4) Del Psi, (5) Non-standard consumables reduction.

 <u>FLIGHT DURATION CHANGES/LANDING:</u>
 EOM landing was planned for 263:13:04Z on 9/20/06 at KSC. However, during INCO survey of the orbiter after FCS checkout, an unidentified piece of debris was observed in Camera A. Tuesday 9/19/06 MMT decided to investigate the significance of the debris. The MMT extended the flight 1 day to allow time to perform RMS and OBSS surveys. The RMS and OBSS surveys of the PLB, both WLE and flight control surfaces using the RMS elbow camera, did not identify the debris. Atlantis was cleared for landing on EOM +1 day. Deorbit burn occurred at 264:09:14:23Z (11/17:59:28 MET) Orbit 185. Main Landing Gear touchdown on KSC Runway 33 was at 264:10:21:23Z (6:21:23 AM EDT) on Thursday, 9/20/06 for a flight duration of 11/19:06:28. Nose Landing Gear touchdown was at 264:10:21:32Z. Landing winds were forecast 03003P05 and 264:10:21:32Z. Landing winds were forecast 03003P05 and observed 0303P04 (2H, 3R). Total flight duration extensions of 1 day (technical extension).

Continued.



S115-E-05623 (12 Sept. 2006) --- Piper, releases the restraints on the forward Solar Array Blanket Box (SABB) during EVA with Tanner, partially visible at top edge of frame.

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FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	Throttle Profile Eng. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)

STS-115/ ISS 12A

Continued.



S115E05801

S115-E-05801 (13Sept. 2006) --- Burbank (red leg stripes) and MacLean/CSA (above & right) complete activation of SARJ.

Continued...

RENDEZVOUS # 64: Rendezvous and dock with ISS

SPACE SHUTTLE NIGHT LANDING: 21 (landed on runway KSC 33)

FIRSTS/LASTS/NEW:

Used Airlock Campout Prebreathe Protocol for the first time. Crew spent sleep period isolated in the JAL (Quest Airlock) at reduced pressure of 10.2 psia.

EVENTS

Max Q at 252:15:15:45Z (00m50s)

- OMS Assist ignition was 252:15:17:08Z with burn duration of 2m52s
- OMS-2 ignition was at 252:15:52:16Z (37:21 MET), burn duration 2m25s
- TI at 254:08:08:08Z
- SRMS/OBSS/LDRI survey of nosecap, port, and starboard wing RCC on FD2
- ISS Docking capture at 254:10:48:27Z, 1:19:33:32 MET Docking complete at 254:11:01:01Z, 1:19:46:06 MET ISS Hatch Open at 1d21h19m; ISS crew welcoming

EVA 1 Crew began campout in ISS Airlock at 10.2 psia in prep for EVA 1.

EVA 1 Start at 255:09:19Z (3/18:01 MET) on 9/12/06, conducted from the ISS JAL (Quest Airlock). The astronauts used a new prebreathe protocol first tested during the handover of Expedition 12. EV1/Joe Tanner and EV2/Heldimarie Piper spent the night isolated in the JAL (Quest Airlock) with a reduced pressure of 10.2 psi while the ISS remains at 14.7 psi. This prebreathe protocol is called Prebreathe Campout Protocol (PBCOP). The Integrated Truss Segment (ITS) P3/P4 was attached to the Port 1 (P1) segment using the SSRMS. EVA crew connected power cables, released SABB and BGA restraints to prepare SARJ for operations. During removal of launch lock cover, a bolt/spring and a washer were accidentally released and lost. The EVA duration was 6:26. EVA 1 Start at 255:09:19Z (3/18:01 MET) on 9/12/06, conducted released and lost. The EVA duration was 6:26. EVA 2 Start at 256:09:18Z (4/17.51 MET) on 9/13/06,. EV3/Dan Burbank and EV4/Steven MacLean slept in the JAL for Spacewalk Prebreathe Campout Protocol. They completed preparations for the activation of SARJ for operations. EVA 2 duration was 7:11. EVA 3 Start at ______. EV1/Tanner and EV2/Piper used PBCOP protocol. They completed P3 and P4 tasks, R&R

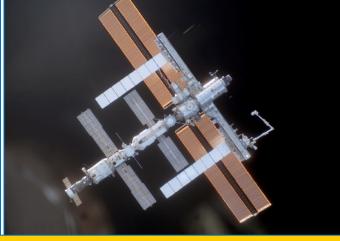
SASA on Z1 truss, and installed heat shield on Ku-band antenna group interface tube. The EVA duration was 6:42. Hatch closed at 7/19:27 MET after saying goodbyes to Expedition 13 crew.

Continued..

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FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	Throttle Profile Eng. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)

STS-115/ ISS 12A Continued.



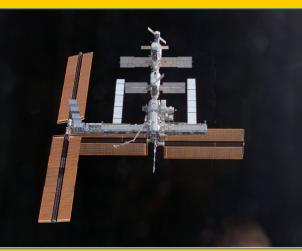
S115-E-05493 (11 Sept. 2006) --- ISS Configuration prior to docking of STS-115.



JSC2006-E-40599 --- Flight Director Bryan Lunney monitors data at his console in MOCR.



JSC2006-E-40475 --- STS-115/12A ISS Orbit 2 flight control team portrait in the MCC. Flight Director John McCullough (center right) holds the STS-115 mission logo and CAPCOM Pamela A. Melroy holds the STS-115/12A mission logo.



S115-E-06741 (17 Sept. 2006) --- ISS Configuration after undocking of STS-115

Continued...

EVENTS: (continued)

- <u>EVENTS</u>: (continued) Atlantis undocking completed at 260:12:49:50Z, 7/19:27 MET Total cargo transferred from Atlantis to the ISS was 36678 lbs (included 35552 lbs for P4/P5, but excluding water) Total cargo transferred from ISS to Atlantis was 993 lbs Total consumables transferred from Atlantis to ISS was 1110.5 Ibm of water (11 CWC's with 1043.8 lbm and four PWR's with (11 DWC) Total waven transferred to CS was 102 lbm.

- 66.1 lbm). Total oxygen transferred to ISS was 103 lbm.

- SIGNIFICANT ANOMALIES: Fuel Cell 1 Coolant Pump AC1 Phase A short caused launch scrub. (See Launch Scrubs.)
- ARD response to erroneous telemetry (ARD NO-GO) Elevon Positioning Procedure callout errors

- ASA 3 Speedbrake driver channel # erratic Starboard PLBD aft (B) closed indication ON should be OFF
- F4D Tyvek cover late release
- TPS tile and blanket anomalies (cleared for Entry)
- FES shutdown during Ascent FES shutdown during Ascent Water supply dump line heater A abnormal temperature cycling Hydraulic System 3 TVC Pitch Actuator indication Water supply dump valve leak Sequential Stills Video failure

- Sequential Stills Video failure
 APU 2 X-axis accelerometer data erratic
 S-band lower right antenna communication problems
 FES topping left duct sensor erratic/OSL
 MADS BITE indication on FDM 2 MUX D
 Nosecap expansion seal RCC damage
 Engine 2 LO2 inlet pressure transducer reading low
 PAP beater failed on

- R4R heater failed on Aft sample bottles L1 and R2 leaking Starboard radiator MMOD strike

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		CREW		LANDING SITE/	SSME-TL	000				DAVILOAD	
		(6+1 UP/6+1 DN)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(2012)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		Q LVA S		WINDS	ENG. S.N.						
STS-116/	OV-103	<u>CDR</u> :	KSC 39B	KSC 15 (KSC 64) 356:22:31:58Z	104/104/109%	BI-128		DIRECT	01-30	<u>CARGO</u> :	BRIEF MISSION SUMMARY: STS-116/12A.1
ISS 12A.1	(Flight 33) DISCOVERY	Mark L. Polansky	344:01:47:35Z	356:22:31:58Z			(20)	INSERTION	(4)	35690 LBS	(20th ISS mission) continued ISS construction
155 12/1.1	DISCOVERY	(Flt 2 - STS-98) 2 P717/R262/V185/M228	344:01:47:35Z 8:47:35 PM EST (P) 8:47:35 PM EST (A)	5:31:58 PM EST	PREDICTED: 100/104.5/	RSRM 95					with the delivery and installation of Integrated
SEO		P/1//K202/V185/WI228	8:47:35 PIVI EST (A) Saturday (6)	Friday 14	100/104.5/ 104.5/72	90		POST OMS-2: 134.7x122.7NM		PAYLOAD	Truss Segment P5 and began the process of
SEQ FLT# 117	OMS PODS: LPO1-36	PLT:	Saturday (6) 12/09/06 (8)	12/22/06(15)	104.5	ET-123		134./ 122./1000		CHARGEABLE:	reconfiguration and redistribution of the power
	RP03-34	William A. Oefelein	12/07/00 (0)	12/22/00(10)	10110	SLWT				22502 LBS	generated by the pair of U.S. solar arrays. P6 truss was relocated to its final assembly
KSC-117	FRC3-33	P718/R302/M262	LAUNCH WINDOW:	DEORBIT BURN:	ACTUAL:	25				DEPLOYED:	position after 6 years atop the Unity Module.
	1105-55		5 Minutes	356.21:30:53Z	100/104.5/			DE O D D T		5748 LBS	position after o years atop the onity module.
PAD 39B-53		MS1: Nicholas I M. Datrick	(PLT in-plane)		104.5/74	ET.		DEORBIT: HA 184.5 NM		5740 205	KSC W/D: OPF 105, VAB 8, PAD 28 = 141 days total
		Nicholas J. M. Patrick (Flt 2 - STS-105)	EOM PLS: KSC	<u>XRANGE</u> : 813 NM	104.5	<u>ET</u> IMPACT		HA 184.5 NM HP 168.1 NM		NON-DEPLOYED:	
MLP-1		P719/R303/V186/M263	TAL: ZZA	ORBIT DIR: AR 13	1 = 2050 (5)	MET				16572 LBS	LAUNCH POSTPONEMENTS:
2011		1 / 1 // (303/ 4 100////203	TAL WX: MRN, FMI	<u>ORBIT DIR</u> : AR 13	2 = 2054 (6)	1:14:00					- Baselined OV-104 launch date of 06/05/2003 on 05/05/2002
20TH SHUTTLE		MS2/EV1:		AIM PT: CLOSE IN	3 = 2058 (1)	LAT:		<u>ENTRY</u>		MIDDECK:	- Postponed launch date to 07/24/2003 on 10/08/2002; delays
FLIGHT TO		Robert L. Curbeam, Jr.	SELECTED:			36.835		VELOCITY:		182 LBS	due to engine flowliner crack repairs
ISS		(Flt 3 - STS-85, STS-98) P720/R225/V167/M195	RTLS: KSC 33 N/N	<u>MLGTD</u> : 1825 FT 356:22:31:58Z	ALL 3 SSME'S	LONG:		25837 FPS			- Postponed launch date to NET 12/18/2003 on 03/13/2003. Slip
		P720/R225/V167/W195	TAL: MRN 20 N/N	356:22:31:58Z VEL: 196 KGS	BLOCK II	159.1W				<u>SHUTTLE</u> ACCUMULATED	due to Columbia accident.
		MS3/EV2:	AOA: NOR 17 N/N PLS: EDW 22 CI	208 KEAS	M 3 EOM:			<u>ENTRY</u> RANGE:		ACCUMULATED WEIGHTS:	- Postponed launch date to NET 03/01/2004 on 04/17/2003. Slip
	A	Christer Fuglesang (ESA)	<u>1 LJ</u> . LDW 22 CI	HDOT: -2.9 FPS	WEIGHT:			4263 NM		WEIGHTS:	due to Columbia accident.
8	1 Qan	P721/R304/M264	TDEL:		226476 LBS			1200 1111		DEPLOYED:	 Postponed launch date to NET 05/13/2004 on 05/28/2003. Slip due to Columbia accident.
S			0:00 0.232	TD NORM 205:	X CG:					1281231 LBS	- Postponed launch date to NET 09/13/2004 on 07/29/2003. Slip
4 116	124.1	<u>MS4</u> :		2015 FT	1077.4 in					1201201 200	due to Columbia accident.
2		Joan E. Higginbotham P722/R305/F41	<u>MAX Q NAV</u> : 760 764	DRAG CHUTE	LANDING:					NON-DEPLOYED:	- Postponed launch date to NET 04/14/2005 on 10/03/2003. Slip
2	Real Providence	P/22/K303/F41	/00 /04	DEPLOY:	WEIGHT:					1585492 LBS	due to Columbia accident.
5		MS5 Up/EV3/EXP14:	SRB STG:	191 KEAS	224041 LBS						- Delete flight from FDRD on 03/22/2004
6		Sunita L. Williams	2:04.16 2:04.64	356:22:32:04Z	X CG:					CARGO TOTAL:	- Re-baselined STS-116 launch date to NET 02/09/2006 on
SANG	WEGINES!	P723/R306/F42			1079.6 in					3701134 LBS	12/09/2004
WIL	LIAMS		<u>Perf</u> : Nominal	<u>NLGTD:</u> 5594 FT							- Postponed launch date to NET 04/23/2006 on 05/23/2005. Slip
		MS5 Down/EXP14: Thomas Reiter	2 ENIC TAL (MDNI)	356:22:32:11Z VEL: 140 KGS						Performance Margins (LBS):	reflected latest planning decisions.
		(M/S5 Up on STS-121)	2 ENG TAL (MRN): 2:31 2:28	152 KEAS					L	FPR: 2886	- Postponed launch date to NET 10/01/2006 on 10/31/2005. Slip
		P724/R299/M260	2.51 2.20	HDOT: -7.0 FPS						FUEL BIAS: 921	reflected latest planning decisions. - Postponed launch date to NET 11/16/2006 on 03/16/2006. Slip
25	TRUST		NEG RETURN:					- 1		FINAL TDDP: 3768	reflected latest planning decisions.
		SS EVA 98	3:55 3:52	<u>BRK INIT</u> : 79 KGS						RECON: 4559	- Postponed launch date to NET 12/14/2006 on 04/04/2006. Slip
Nox		DOCKED QUEST EVA 18									reflected latest planning decisions.
		EMU/TETHERED EVA 91	<u>PTA (U/S 160)</u> : 4:55 4:56	DRAG CHUTE JETTISON:						PAYLOADS:	- Advanced launch date to NET 12/07/2006 on 09/28/2006.
		SCHEDULED EVA 91	4.00	<u>52 KGS</u>						PLB:	
E		DURATION 6:36	SE TAL (FMI):	356:22:32:36Z		FEE				ISS 12A.1 - ITS	LAUNCH SCRUBS:
XI,	ISS AND IN	SS EVA 99	6:07 6:03							SPACEHAB SM ICC (W/STP-H2	- Scrubbed Thursday 12/7/06 EST launch (12/8/06 GMT day 242) while holding at T-5 minutes. The window opened at
ALC	ONFIGUE	DOCKED QUEST EVA 19		BRK DECEL FPS ² :						UTILIZATION	while holding at 1-5 minutes. The window opened at
		EMU/TETHERED EVA 92	PTM (U/S 160):	AVE 5.3 PK 6.1	100	1. 175	NY.			PAYLOAD)	342:02:30:48Z and closed at 342:02:40:48Z with a Preferred
		SCHEDULED EVA 92	6:07 6:02	WHEELSTOP:		L				I MILONDJ	Launch Time of 342:02:35:48Z. TAL1 (ZZA) was forecast and observed GO at TAL landing time and was selected as Prime
		DURATION 5:00	SE PRESS 104:	<u>356:22:32:51Z</u>	1000		2 -12			MIDDECK:	TAL site. TAL2 (MRN) was forecast NO-GO thunderstorms WI
19	5 5	SS EVA 100	6:54 6:56	9980 FT	BINGEDISSA		12			MIDDECK: ISS 12A.1	20 NM and BKN30 and observed NO-GO BKN. TAL3 (FMI)
		DOCKED QUEST EVA 20					lion			RAMBO	was forecast and observed NO-GO BKN30/BKN35. Launch
T		EMU/TETHERED EVA 93	MECO CMD:	ROLLOUT:				om Discover		MAUAI	Director counted down and held at 5 minutes until window
XIX	t t	SCHEDULED EVA 93	8:22.5 8:23.8	8155 FT				approaching			closed. Scrubbed launch due to Range Safety violation of
-		DURATION 7:31	M	53 SEC	ISS (backg	round).	Show	n in PLB are	Э		clouds below 6000 feet, thicker than 500 feet (verified at 5500
		SS EVA 101	<u>vi:</u> 25819.0 25819.0		shuttle's do						feet). MMT opted for a 48-hour turnaround and top off cryos
M	IKC	SS EVA 101 DOCKED QUEST EVA 21	20017.0 20017.0		(foreground						and weather forecast was NO-GO. Launch date set for
		EMU/TETHERED EVA 94	<u>OMS-2</u> : 37:07.4 37:10					t RMS roboti	ic		12/09/06 EST (12/10/06 GMT). Weather Scrub
		SCHEDULED EVA 94	37:07.4 37:10						IC I		
		DURATION 6:38	187.2 FPS188.5 FPS		arm (right),						
				Continued	Sensor Sys	stem (left	, in st	owed positio	n).	Continued	Continued
		Continued									

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FLT ORBITER NO.	CREW (7) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE ENG. S.N.	SRB RSRM AND ET	INC	orbit Ha/HP	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-116/ Continued	Continued MCC WHITE FCR (47) FLIGHT DIRECTORS: SHUTTLE: A - J S. Stich E - N. D. Knight LD/O 1 - A. J. Ceccacci O 2 - M. R. Abbott O 3/PLNG - R. E. LaBrode Team 4 - R. S. Jones MOD - P. L. Engelauf ISS: TD/O 2 - J. M. Curry O 1 - J. D. Hassmann O 3 - J. R. Montalbano TEAM 4/PLNG - D. J. Weigel CAPCOMS: SHUTTLE: A/E - K. T. Ham - C. J. Ferguson (Wx) LD/O1 - K. A. Ford O 2 - K. M. McArthur O 3/PLNG - S. W. Lucid Team 4 PLNG - N/A ISS: LD/O2 - S. K. Robinson O1 - T. W. Virts O 3/PLNG - H. D. Getzelman Team 4 PLNG - N/A		Continued WINDS: 14H/2R Kts OFFICIAL: 159/14 14/2R Kts DENS ALT: 1229 FT FLT DURATION: 12:20:44:23 S/T: 1082:19:54:33 OV-103: 276:11:34:05 DISTANCE: 5,330,398 sm TOTAL SHUTTLE DISTANCE: 438,715,036 sm TOTAL SHUTTLE DISTANCE: 438,715,036 sm COLLENTING STILEEDUATE LEFT: S116-e-0 EVA1 tasks for i Cook Strait are s	S116-E-064 ISS Destiny 14FE/MS-Du Oefelein. Fro Fuglesang/N (back row): 0 Tyurin/Exp1	Lab. Fro n, Patrick om the le AS (ESA) CDR Exp 4/FE (RS 4/FE (RS 5 Truss.	m the (/MS, 6 ft (cee), & C 14 Le SA), 8 (SA),	e left (front ro Higginbotha Inter row): C DR Polansk opez-Alegria Williams/M	ow): R am/MS urbea sy. Fro a, Mik S-Up/	eiter/Exp S, & PLT m/MS, m the left hail	 Continued LAUNCH WINDOW: Total launch window was 10 minutes with window open at 344:01:42:35Z and close at 344:01:52:35Z. Preferred Launch Time was 344:01:47:35Z (In-Plane Time) for a launch window o 5m00s. NOTE: In October, the self-imposed post-Columbia daylight launch constraint was relaxed, thus clearing STS-116 for a night launch. LAUNCH DELAYS: None. Launch occurred on time at 344:01:47:35Z, 8:47:35 PM EST on Saturday, 12/09/06. TAL WEATHER:

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SPACE SHUTTLE MISSIONS SUMMARY

FLT NO.	ORBITER	CREW (7) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE ENG. S.N.	SRB RSRM AND ET	ORBIT INC HA/HP	FSW	Payload Weights, Payloads/ Experiments	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-116/ ISS 12A.1 Continued		'89 - A kink occurred in mpt to retract that arran		lar array during	Mgr Space	Shuttle M	-FD Matt Abbor dission Ops in F small satellites	CR duri		 Continued EVENTS: OMS Assist ignition at 344:01:49:50Z (duration 1m38s) SRMS OBSS/LDRI survey of nosecap, port and starboard wing RCC (WLE's) completed TI maneuver at 345:19:28:22Z (1:17:40:47 MET). Resultant altitude 176.7 by 192.4 nm R-Bar pitch maneuver started at 345:21:04:46Z and was completed 7m33s later. Photos of Discovery's tile surfaces by ISS crew Docking capture occurred at 345:22:102:33Z (1:20:38:58 MET). Hard dock occurred at 345:22:26:33Z (1:20:38:58 MET). ISS hatch open 345:23:54Z (1:22:06 MET), ISS Crew Welcoming IELK seat liner transfer at 346:01:00:00Z (1:23:12 MET). At that time, Thomas Reiter became a member (MS5) of STS-116 and Sunita Williams joined the ISS Expedition 14 as Flight Engineer 2. EVA 1: EV1 and EV2 completed nominal tasks including P5 truss installed to P4 truss and mated P4-P4 umbilicals. 5/8-in socket lost from Pistol Grip Tool. EVA 1 duration 6h36m FD5: P6 4B SAW retraction required a series of partial deploy/retract sessions into 19 bays out for P4 SARJ to be free
Shuttle Pr point durii Wayne Ha	ogram Manag ng a MMT me	Dec. 2006) John Sh Jer and Manager, MMT eting in JSC MCC. Bet tle Program Manager; irector.	, emphasizes a hind Shannon are		specially-prepa	red tape in	& Fuglesang (ou sulated tools to g			 action of the service of th

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FLT OR NO.	BITER	CREW (7) TILE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL Nom-Abort Emerg Throttle Profile FNG S N	SRB RSRM AND ET	ORBIT	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
CE	ENTER: JSC2	S115E07113	ve Stich, STS-11 Karl A. Silverma	THE JSC CONT I6 Ascent Flight n with the Space	ROL CENTER Director, moni e Flight Meteo	tors data rology G	and video at his	<mark>gh wea</mark>	ther data.	Continued EVENTS (Continued): Total cargo transferred to Discovery from ISS was 4911 lbs (to middeck 1345 lbs and to logistics module 3566 lbs). Total consumables transferred to ISS: Oxygen tank transfer 6' lbm and total nitrogen tank transfer 47.2 lbm; total water transferred to ISS was 261.6 lbm (201.9 lbm in two CWC's and 59.7 lbm in three PWR's). Undocked at 353:22:09:357 A flyaround (1/2 lap) was initiated at 353:22:35:13Z. Sep 1 and Sep 2 maneuvers resulted in orbit 171.1 by 192.5 n Micrometeoroid Orbital Debris late inspection was completed. MEPSI payload was deployed at 355:00:19:35Z (10:22:32:00 MET). ANDE was deployed at 355:10:56:46Z (11:00:09:11 MET). ANDE was deployed at 355:13:23Z (11:16:35 MET). No communications blackout during Entry. SIGNIFICANT ANOMALIES: Orbiter: Loss of RMS End Effector Auto Release Capability Fuel Cell O ₂ Flowmeter Failed A6U Aft Event Thumbwheel Failure TPS Tile And Blanket Anomalies ML94B Bogen Bracket Shoe Debonded Kodak DCS 760 Digital Camera Lost During EVA 3 Waste Water Dump Degraded Flow CPS Signal Dropout WLE IDS Sensor Unit Inadvertent Shutdown SRB: SNBE: No IFA's ET: No IFA's MOD: Erroneous Procedure Callout on OBSS LCS Cue Card NCCAutomation System (MAS) File Server Failure Integration: CE Balls Noted Hanging From The North GOX Vent Arm Duct Exit Flange Debris Release from SRB LH BSM Area Traveled Fwd And Impacted Orbiter Delaminated/missing BTA on Aft BSM Housing with Sooting

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		CREW		LANDING SITE/	SSME-TL	000				DA1/4 OAD	
		(6+1 UP/6+1 DN)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER		LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
	01/101		1/00.004	WINDS	ENG. S.N.	DI 400	F 4 (DIDEAT	01.00	01000	
STS-117/	OV-104 (Flight 28)	CDR: Frederick W. Sturckow	KSC 39A 159:23:38:04Z 7:38:04 PM EDT (P) 7:38:04 PM EDT (A)	EDW 22, CONC EDW 51, CONC 32	104/104/109%	BI-129	51.6	DIRECT INSERTION	(5)	<u>CARGO</u> : 42641 LBS	BRIEF MISSION SUMMARY: STS-117/13A (21st
ISS 13A	ATLANTIS	(Flt 3 - STS-88, STS-105)	7·38·04 PM FDT (P)	173:19:49:37Z	PREDICTED:	RSRM	(21)	INSERTION	(5)	42041 LBS	ISS mission) continued the construction of the International Space Station with the delivery
		P725/R247/V173/M215	7:38:04 PM EDT (A)	12:49:37 PM PDT	100/104.5/	96		POST OMS-2:		PAYLOAD	and installation of the second starboard truss
SEQ FLT# 118	OMS PODS:		Friday (25) 6/8/07 (11)	Friday (14)	104.5/72	FT 404		123.7x84.7 NM		CHARGEABLE:	segment (S3/S4), the deployment of the third set
FLI# II8	LPO4-28	PLT/R2/M1:	6/8/07 (11)	06/22/07 (7)	104.5	ET-124		DEORBIT:		36593 LBS	of solar arrays, and the retraction of the P6
KSC-118	RPO1-35	Lee J. Archambault P726/R307/M265	LAUNCH WINDOW:	DEORBIT BURN:	ACTUAL:	SLWT		HA 192.8 NM			starboard solar array wing, and one radiator.
	FRC4-28	1 720/10307/10/203	3M 18S (PLT IN-	173:18:43:47Z	100/104.5/	26		HP 178.8 NM		DEPLOYED: 36393 LBS	Joint (SARJ) which rotates 360 degrees for S4 &
PAD 39A-41		MS 1/EV 3/R1:	PLANE)`		104.5/72	ET.				20242 FD2	Solar arrays tracking of the sun In addition
		Patrick G. Forrester		XRANGE: 772 NM	104.5	<u>E I</u> IMPACT		ENTRY		NON-DEPLOYED:	S6 solar arrays tracking of the sun. In addition, performed unscheduled EVA repair to Port OMS
MLP-2		(Flt 2 - STS-105) P727/R269/V186/M235	<u>EOM PLS</u> : KSC TAL: FMI	ORBIT DIR: AL 36	1 = 2059 (1)	MET		VELOCITY:		0 LBS	Pod thermal blanket for damage incurred during
21ST		P121/R209/V100/WI255	<u>TAL WX</u> : ZZA (<u>MRN</u> : N/A RWY		2 = 2052(5)	1:14:15		25868 FPS			ascent.
SHUTTLE		MS 2/EV4/M2:	(MRN: N/A RWY	<u>orbit dir</u> : Al 36 <u>Aim PT</u> : Nominal	3 = 2057 (2)	LAT:				MIDDECK: 200 LBS	
FLIGHT TO		Steven R. Swanson	REPAIRS)	MLGTD: 1443 FT		36.38S		ENTRY		200 FR2	KSC W/D: OPF 125, VAB 8, PAD 17, Rollback to VAB, then VAB 72, PAD 25 = 247 Total Work Days
ISS		P728/R308/M266	SELECTED.	<u>MLGTD</u> : 1443 FT 173:19:49:37Z	M 3 EOM:	<u>LONG</u> : 158.48W		RANGE: 4226 NM		SHUTTLE	12, MAD 20 = 241 TUTAI WUIK DAYS
		MS 3/EV2/R1:	<u>SELECTED</u> : <u>RTLS</u> : KSC 15 CI/N	VEL: 219 KGS	WEIGHT:	100.1011		122011111		ACCUMULATED	LAUNCH POSTPONEMENTS:
		John D. Olivas	TAL: FMI 33 N/SFD	205 KEAS	199418 LBS					WEIGHTS:	- Baselined OV-104 launch date of 09/05/2003 on 07/18/2002.
5.00		P729/R309/M267	AOA: KSC 15 N/N	HDOT: -4.0 FPS	X CG:					DEPLOYED:	- Postponed to 10/02/03 on 10/08/02 due to SSME flowliner crack
ARCHAI	MBAULT		<u>1ST DAY PLS:</u> EDW 22 N/N	TD NORM 195:	1084.62 IN					1317624 LBS	repairs. - Postponed to NET 01/22/04 on 03/13/03 due to Columbia
	+	MS 4/EV1: James F. Reilly II		2380 FT	LANDING:						accident.
FORR	ESTER	(Flt 3 - STS-89, STS-104)	<u>TDEL</u> : 0:000(P) 0.112(A)		WEIGHT:					NON-DEPLOYED: 1585692 LBS	- Postponed to NET 03/30/04 on 04/17/03 due to Columbia
SWA	VAS	P730/R234/V172/M204	0:000(P) 0.112(A)	<u>DRAG CHUTE</u> DEPLOY:	199305 LBS					1303072 LD3	accident.
	7		MAX Q NAV:	<u>DEPLOY:</u> 196 KEAS	X CG: 1086.76 IN					CARGO TOTAL:	 Postponed to NET 07/29/04 on 05/28/03 due to Columbia accident.
ANDE	RSON	<u>MS 5 UP/EXP 15/16 FLT</u> <u>ENG</u> :	720.08(P) 719.70(A)	173:19:49:40Z	1000.70 11					3743775 LBS	- Postponed to NET 12/15/04 on 07/29/03 due to Columbia
		Clayton C. Anderson								DEDEODMANOE	accident.
		P731/R310/M268	<u>SRB STG</u> : 2:03 (P) 2:03 (A)	NLGTD: 5379 FT						PERFORMANCE MARGINS (LBS):	- Deleted flight from FDRD on 10/03/03. - Re-baselined STS-117 to NET 05/18/06 on 03/17/05.
			2:03 (P) 2:03 (A)	173:19:49:49Z VEL: 158 KGS						FPR: 2651	- Re-baselined STS-TT/ to NET 05/18/06 on 03/17/05. - Postponed to NET 07/13/06 on 05/28/05. Slip reflected latest
		MS 5 DN/EXP 14/15 FLT	PERF: NOMINAL	140 KFAS						FUEL BIAS: 1063	manifest constraints.
	L	ENG: UP ON STS-116, STAY ISS Sunita L. Williams		HDOT: -6.2 FPS						FINAL TDDP: 1306	- Postnoned to NET 12/07/06 on 11/10/05 Slin reflected latest
A REAL PROVIDENT	M									RECON: 1431	manifest constraints.
		P732/R306/F42	2:48 (P) 2:54 (A)	<u>BRK INIT</u> : 88 KGS							 Postponed to NET 02/22/07 on 04/04/06. Slip reflected latest manifest constraints.
		SS EVA 102	NEG RETURN:	DRAG CHUTE		1000	10		at s	<u>PAYLOADS</u> : PLB:	- Postponed to NET 03/16/07 on 11/02/06. Slip due to ET
	AN	DOCKED QUEST EVA 25	3:47 3:55	JETTISON:		Se 120		See Martin		ISS 13A	delivery/processing schedule
STATECHEY WIL	LIAMS KOTO	EMU/TETHERED EVA 95	<u>PTA (U/S 162)</u> :	55 KGS 173:19:50:18Z	and a sum	the West		Lu		MIDDECK:	- Launch date "under review" due to ET hail damage during
		SCHEDULED EVA 95	5:19 5:20		and the second		Secto	-	(23)	ISS 13A	 Launch date "under review" due to ET hail damage during 02/26/07 storm at the PAD. (ET sustained over 4,000 dings.) Postponed to 06/08/07 on 04/16/07 due to rollback for ET
		DURATION 6:16		BRK DECEL FPS ² : AVE 4.0 PK 6.0		2			the second	RAMBO	repairs.
		SS EVA 103	<u>SE TAL (ZZA 104)</u> :	AVE 4.0 PK 6.0		17 Par	A STATE	and the second s		MAUAI	
		DOCKED QUEST EVA 26	6:04 6:08	WHEELS STOP:	9. 19		SU	100 00001		5 CRYO TK SETS	LAUNCH SCRUBS: None
7,00		EMU/TETHERED EVA 96	PTM (U/S 180):	173:19:50:51Z	ST.C.		ALX.		1	5 GN2 TANKS	LAUNCH WINDOW:
155	13A	SCHEDULED EVA 96	<u>6:19</u> 6:23	11422 FT		Constanting of the			S.		- Total launch window was 6 minutes 29 seconds with window
		DURATION 7:16			100		78		0510	RMS 75	open at 159:23:34:53Z and close at 159:23:41:22Z. Preferred
		SS EVA 104	<u>SE PRESS 104</u> 7:02 7:03	ROLLOUT: 9979 FT	ALC: NOT THE OWNER	1000	10		- 4	ODS, OBSS	Launch Time was 159:23:38:04Z (In-Plane Time) for a launch
		DOCKED QUEST EVA 27	1.02 1:03	1:04 M:S	3 11 1 2	100				RMS USED FOR	window of 3m18s.
		EMU/TETHERED EVA 97	MECO CMD:		1000116(11785	1000	Ec; 16			RMS/OBSS SURVEYS AND	LAUNCH DELAYS:
STS STS	-117	UNSCHEDULED EVA 8	8:24.9 8:24.9							GRAPPLE/	- None. Launch occurred on time at 159:23:38:04Z, 7:38:04 PM
		DURATION 7:58						e 17.8 ton S3/	/S4	UNBERTH S3/S4,	EDT on Friday, 06/08/07.
					truss to be a	dded to th	ne stat	ion is shown		HANDOFF TO	
		Continued	Continued	Continued	berthed in th					SSRMS	Continued
		Continueu				ie Shuttle	payloa	lu bay.			

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FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-117/		Continued	Continued	Continued			· · · ·				Continued
STS-117/ ISS 13A Continued		Continued SS EVA 105 DOCKED QUEST EVA 28 EMU/TETHERED EVA 98 SCHEDULED EVA 97 DURATION 6:29 MCC WHITE FCR (48) FLIGHT DIRECTORS: SHUTTLE: A/E - N. D. Knight LD/O1 - C. A. Koerner O2 - B. C. Lunney O3/PLNG - R. S. Jones MOD - P. L. Engelauf Team 4 - M. L. Sarafin ISS: LD/O2 - K. B. Beck O1 - A. P. Hasbrook O3/PLNG - H. E. Ridings Team 4 - S. P. Davis CAPCOMS: SHUTTLE: A/E - D. A. Antonelli - T. W. Virts (Wx) LD/O1 - T. W. Virts O2 - K. A. Ford O3/PLNG - R. S. Kimbrough Team 4 - N/A ISS: LD/O2 - K. M. McArthur O1 - S. G. Bowen O3/PLNG - R. M. Davis Team 4 - N/A	<u>VI</u> : 25819.0 25818.5 OMS-2:	Continued WINDS: 1.917/0.5R KTS OFFICIAL: 08002P06 KTS 5T/3L KTS <u>DENS ALT</u> : <u>5169 FT</u> <u>FLT DURATION:</u> 13:20:11:33 <u>S/T</u> : 1096:16:06:06 <u>OV-104</u> : 245:12:44:01 <u>DISTANCE</u> : 5,809,363 sm <u>TOTAL SHUTTLE</u> <u>DISTANCE</u> : 444,524,399 sm <u>S117-E-0768</u> portrait in Du 15, Williams/ Kotov/FE Ex Archambault (back row) F	estiny Lab. F /MS/STS-117 p 15 (Russia /STS-117 an	From the 7, Exp 15 I). From t Ind STS-1	left (fr CDR he lef 17 CE	ont row): A Yurchikhin t (middle ro)R Sturckov	nderso (Russi w): PL w. Fro	on/FE Exp a), & T m the left	 Continued TAL WEATHER: Launch Day Synopsis: "Showers and thunderstorms will develop during the daylight hours on Friday across Spain and France but are expected to diminish rapidly after sunset. TAL landing times are well after sunset." ZZA and FMI TAL Sites were forecast and observed GO. ZZA was selected as Prime TAL Site. MRN was not available. <u>PERFORMANCE ENHANCEMENTS:</u> Include the standard set plus: (1) PE Operational High O SUM/JUN, (2) OMS Assist, (3) 52 nm MECO, Del Psi, and (4) Non-standard Consumables Reduction. <u>FLIGHT DURATION CHANGES/LANDING:</u> STS-117 was planned as an 11+2+2 duration flight. FD4: The MMT concurred with the recommendation to repair the Port OMS Pod thermal blanket damage incurred during ascent. An additional 2 days, docked to the ISS, and a 4th EVA were added to conduct the repair. FD14: Two KSC landing attempts (12:55 pm & 2:30 pm CDT) were waved due to weather. After wave-off, an Orbit Adjust Maneuver was added to the timeline. This 11 FPS burn brought in an additional landing opportunity (total of 3) for Edwards AFB on Friday, FD15. FD15: KSC landing attempt at 1:18 pm CDT was waved due to weather. Landing site was switched to Edwards AFB for a successful landing on Orbit Rev 219 at 2:49 pm CDT (12:49 pm PDT). (PAO: "It's a good day to land in California") FIRSTS/LASTS: First flight of Advanced Health Monitoring System (AHMS) on all three Sesame's. One flew in Active Mode. Two flew in Monitor Mode. In active mode, AHMS provides safe engine shutdown for excessive turbopump vibrations. Sunita Williams sets new female long duration spaceflight record of 195 Days 18 Hours 58 Min, breaking Shinned Lucid's record of 198 Days 14 Hours. Willimams surpassed Lucid's record of 198 Days 14 Hours. Williams
											Continued

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FLT NO.	ORBITER	CREW (7) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL Nom-Abort Emerg Throttle Profile Eng. S.N.	SRB RSRM AND ET	INC	orbit Ha/Hp	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-117/ ISS 13A								-		and the second sec	Continued

Continued...

S117-E-06886 --- Reilly/EV1(center) Olivas/EV2 (right) connect power, data & cooling cables to S1 & S3, and deploy solar array blanket boxes on S4.



iss015e12948 -- EVA Repair: Anchored to a foot restraint on the RMS robotic arm, astronaut John "Danny" Olivas moves toward port OMS pod thermal blanket damage during EVA 3. Skin stapler and pins were used to make the repair.



S117-E-07789 Forrester/EV3 (left) Swanson/EV4, participate in 4th EVA as construction continues on ISS. Among other tasks, Forrester and Swanson continued activation of the station's new starboard 3 and 4 (S3/S4) truss segments.

EVENTS (continued):

TI maneuver at 161:17:00:57Z: Resultant orbit was 181.2 by 179.4 nm orbit

Rbar Pitch Maneuver was performed. Photos of Atlantis' tile surfaces and the damaged OMS POD thermal blanket were taken by ISS crew. The thermal blanket damage was later determined to be from ET foam/ice shedding from LO2 line bracket during ascent.

Docking Capture occurred at 161:19:36:10Z

Hard Docking occurred at 161:19:47:48Z.

ISS Hatch open 161:21:20:00Z, 4:20 pm CDT, Sunday, June 10, 2007, IS'S crew welcoming

IELK Seat Liner transfer at 162:00:55Z (7:55 PM CDT, June 10, 2007). At that time, Sunita Williams became a member of STS-120 and Daniel Tani joined the ISS Expedition 16 as Flight Engineer.

STS-117 delivered new set of solar arrays on 21st flight to ISS; P6 Starboard array was retracted for over 3 days.

"Suni" Williams was replaced by Clay Anderson on Expedition 15 and returned home on STS-117 with long duration space record for a female (see Firsts above).

FD4 - Station robotic arm used to install S3/S4 truss on S1 truss.

<u>ED4 EVA 1</u>: Reilly/EV1 & Olivas/EV2 completed the following tasks for S3/S4 Power Generation work: connected 13 power & data umbilicals, unstowed & deployed 1A & 3A solar arrays, and uncinched/unwinched photovoltaic radiator (PVR) for deployment. SARJ work included: installing 4 alpha joint I/F structure (AJIS) struts, installing drive lock assembly (later, EVA 2 determined a problem, see below), removed 6 SARJ locks, and released all swing bolts along SARJ. EVA 1 duration: 6h16m.

FD4 - MMT Management Decisions Summary: On 06/11/07, the MMT concurred: (1) that the Port OMS Pod TPS Blanket is considered [to be] suspect in case of a contingency deorbit, (2) with performing a repair of the OMS Pod Blanket, and (3) with adding 2 extension days and a 4th EVA.

- 8 bays retracted. Array behavior similar to 4B retraction on STS-116 (sticking grommets, asymmetric folding). <u>FD6</u>: Russian central and terminal computers failed during docked operations at GMT 164:15:15:00Z and were restored with jumper cables bypassing power monitoring devices. <u>FD6 EVA 2</u>: Forrester/EV3 & Swanson/EV4 conducted partial retraction of P6 2B Solar Array (including cut leader). Inspected P6 aft radiator starboard PIP pin (only one confirmed). SARJ work included: Installed 4 SARJ brace beams, installed DLA 1 (discovered DLA's were cross wired on the ground), removed 10 SARJ launch locks, and broke torgue on 3 SARJ launch restraints. EVA 2 duration: 7h16m.

Continued.

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FLT NO.	ORBITER	CREW (7) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL Nom-Abort Emerg Throttle Profile Eng. S.N.	SRB RSRM AND ET	INC	orbit Ha/Hp	FSW	Payload Weights, Payloads/ Experiments	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-117/ ISS 13A Continued			08006ISS-earth.jpg: v ISS configuration i		the blackness		and Ea	rth's horizon			 Continued EVENTS (Continued): FD8 EVA 3: Conducted by Reilly/EV1 & Olivas/EV2: Removed Lab H2O Vent & installed Lab H2 Vent, repaired OMS POD thermal blanket with skin stapler and pins, relocated 1 of 3 APFR's for 13A.1, and finished retraction of P6 2B Solar Array. This was unscheduled EVA added by MMT. EVA 3 duration: 7h58 m. FD10 EVA 4: Conducted by Forrester/EV3 & Swanson/EV4: Activated SARJ for rotation, cleared S3 Mobile Transporter path, relocated 2 of 3 APFR's for 13A.1, released torque on S4 MMOD Shield bolts, moved VSSA to Camera Port 1, cleared Node 1 Port for 10A Node 2 temporary stowage, and opened Lab H2 Vent. EVA duration: 6h 29m. Transfers: Mid-deck resupply cargo transfer to ISS from Atlantis was 1277 lbs. Mid-deck return cargo transfer to Atlantis from ISS was 1528 lbs. Supply Water total to ISS was 751 L (1,656 lbm) Oxygen (net) to ISS was 89 lbm Nitrogen to ISS: to A/L tanks 17.3 lbm; into stack for repress 16 lbm Undocked at 170:14:42:00Z followed by a fly-around (1/2 lap). Sep 1 & Sep 2 maneuvers resulted in orbit of 185.0 x 177.1 nm Micrometeoroid Orbital Debris late inspection was completed. No communications blackout during Entry. SIGNIFICANT ANOMALIES: Orbiter: MDM OA2 CARD 5 Failed - Invalid Data MADS.
	CENTER & FDs No	C2007-E-31063 Or JSC2007-E-28303 - orm Knight & Steve St SC2007-E-29876	bit 1 FCT: FD/Cat A "fish-eye" pers ich.	spective of MOC	& CAPCOM R activity: (It t	Ferry W. o rt) CAF	Virts C PCOM	s Terry Virt			 MADS Recorder Tape Speed Went To 120 IPS (Nom is 15) at Nose Wheel TD E3 LH₂ Inlet Pressure Transducer Went OSH at T+ 3.5 Min SRB: None. RSRM: Gas Penetration Through Nozzle Joint 2 RTV, RSRM-96A&B SSME: None. ET: Post-Launch Camera & Film Rev Loss of LH2 Acreage Foam at Stations 1160, 1623 & 1871 MOD: GDR Data Dropouts During Ascent Ascent LOC Push Button Inoperative LCC Activation Turning Off WLES PGSC Integration: Tile Piece Liberated From Aft Fuselage Body Flap I/F During Ascent FOD Found In Aft Compartment Port OMS Pod Blanket Damage During Ascent Rope-Like Material Noted Moving In Umbilical Well Imagery Propellant Use During FDS Extended Shuttle Attitude - Hold Approx 3 Times Higher Than Predicted

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				LANDING SITE/	SSME-TL						
		CREW	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(7)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		U.L.	FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
				WINDS	ENG. S.N.						
STS-118/	OV-105	CDR:	KSC 39A	KSC 15 (KSC 65) 233:16:32:17Z	104/104/109%	BI-130	51.6	DIRECT INSERTION	01-30	<u>CARGO</u> : 37390 LBS	BRIEF MISSION SUMMARY: STS-118/13A (22nd ISS mission)
ISS 13A.1	(Flight 20) ENDEAVOUR	Scott J. Kelly (Flt 2 - STS-103)	220:22:36:42Z 6:36:42 PM EDT (P) 6:36:42 PM EDT (A)	12:32:17 PM EDT	PREDICTED:	RSRM	(22)	INSERTION	(6)	37390 LBS	continued the assembly and resupply of the International
SEQ		(Flt 2 - STS-103) P733/R253/V187/M220	6:36:42 PM EDT (A)	Tuesday (21) 08/21/07 (8)	100/104.5/	97		<u>POST OMS-2</u> : 172.2X124.2 NN		PAYLOAD	Space Station and fulfilled a long-standing teacher's legacy. The new assembly included the delivery of the S5 Truss
FLT# 119	OMS PODS:		Wednesday (14) 8/8/07 (8)	08/21/07 (8)	104.5/72/ 104.5	ET-117		1/2.2X124.2 NN	1	CHARGEABLE:	segment, installation of a spare parts platform, and
100 110	LP03-31	PLT: Charles O. Hobaugh		DEORBIT BURN:		SLWT		<u>DEORBIT</u> : HA 187.2 NM		23899 LBS	segment, installation of a spare parts platform, and changeout of a failed gyroscope. This was the last shuttle resupply mission using the SPACEHAB module. In addition, Barbara R. Morgan, who had served as backup to
KSC-119	RPO4-27 FRC5-20	(Flt 2 - STS-104) P734/R268/V188/M234	LAUNCH WINDOW: 4M 14S	233:15:25:12Z	<u>ACTUAL</u> : 100/104.5/	27		HA 187.2 NM HP 22.8 NM		DEPLOYED:	addition, Barbara R. Morgan, who had served as backup to
PAD 39A-42	T KC5-20	P734/R268/V188/M234	(PLT IN-PLANE)	XRANGE: 697 NM	104.5/74/	ET				11830 LBS	Christa McAuliffe in the Teacher in Space Project 21 years earlier, flew as the first Educator Mission Specialist.
		MS 1/R:	. ,		104.5	IMPACT				NON-DEPLOYED:	earlier, flew as the first Educator Mission Specialist. McAuliffe was a member of the crew that lost their lives in
MLP-1		Tracy E. Caldwell P735/R311/F43	<u>EOM PLS</u> : KSC TAL: ZZA	ORBIT DIR: A/L 37	1 = 2047 (10)	MET				11740 LBS	the 1986 Challenger accident.
22ND		P730/R311/F43	TAL WX: MRN, FMI	<u>aim pt</u> : Nominal	2 = 2051 (6)	MET 1:14:03		<u>ENTRY</u>			
SHUTTLE		<u>MS 2/EV1</u> :			3 = 2045 (9)	LAT:		VELOCITY: 25860 FPS		MIDDECK: 329 LBS	KSC W/D: OPF 1332+64+63+18 = 1477, VAB 9, PAD 25 = 1511 Total Work Days (OPF Processing occurred over a total time
FLIGHT TO		Richard A. Mastracchio (Flt 2 - STS-106)	SELECTED:	MLGTD: 1628 FT 233:16:32:17Z		<u>LAT:</u> 36.9S		2000 FP3		527 605	period of 1665 days.)
155		P736/R257/V189/M224	<u>SELECTED</u> : <u>RTLS</u> : KSC 15	VEL: 210 KGS				ENTRY		SHUTTLE	LAUNCH POSTPONEMENTS:
		MS 3/EV2:	<u>TAL:</u> ZZA 30L (<u>FMI</u> : NO-GO)	212 KEAS HDOT: -3.1 FPS	M 3 FOM:	<u>LONG</u> : 159.2W		RANGE: 4343 NM		ACCUMULATED WEIGHTS:	 Added STS-118 to FDRD - launch date of 10/09/03 on 08/01/02.
	<u> </u>	David R. Williams (Canada)	AOA: KSC 15 1ST DAY PLS:		M 3 EOM: WEIGHT:					DEPLOYED:	 Postponed to NET 11/13/03 on 10/08/02 due to engine flowliner
KELLY I	HOBAUGH	P737/R312/M269	<u>TST DAY PLS</u> : EDW 22	TD NORM 205: 2302 FT	221740 LBS X CG:					1329454 LBS	crack repairs. - Postponed to NET 05/06/04 on 03/13/03 due to Columbia
		<u>MS 4</u> :			1078.1 IN					NON-DEPLOYED:	accident.
THE AL		Barbara R. Morgan	<u>TDEL</u> : 0:000(P) 0.312(A)	DRAG CHUTE DEPLOY:	LANDING:					1597761 LBS	 Postponed to NET 06/01/04 on 04/17/03 due to Columbia accident.
		P738/R313/F44	0.000(F) 0.312(A)	163 KEAS	WEIGHT:						 Deleted flight from FDRD on 05/28/03.
		<u>MS 5</u> :	MAX Q NAV:	233:16:32:30Z	221660 LBS					<u>CARGO TOTAL</u> : 3781165 LBS	 Re-baselined to NET 09/14/06 on 07/14/05. Revised to "TBD" on 11/10/05. Slip reflected latest manifest
8		B. Alvin Drew P739/R314/M270	707.47(P) 699.34(A)	NLGTD: 5619 FT	X CG: 1079.8 IN						constraints.
MASTR	TACCHIO	1 7 3 7/1(314/10/270	<u>SRB STG</u> : 2:02.56(P) 2:03.04(A)	233:16:32:29Z						PERFORMANCE	 Postponed to NET 06/11/07 on 04/04/06. Slip reflected latest mentions and the second se
L			2:02.56(P) 2:03.04(A)	VEL: 169 KGS 165 KEAS						<u>MARGINS (LBS)</u> : FPR: 2651	- Postponed to NET 06/28/07 on 11/02/06. Slip due to ET
		DOCKED QUEST EVA 29 EMU/TETHERED EVA 99	<u>Perf</u> : Nominal	HDOT: -6.3 FPS						FUEL BIAS: 1063	delivery/processing schedule. - Postponed to NET 08/09/07 on 04/16/07. Slip due to STS-117
		SCHEDULED EVA 98	2 ENG TAL (MRN*):	BRK INIT: 123 KGS						FINAL TDDP: 1913 RECON: 2435	- Postponed to NET 08/09/07 on 04/16/07. Slip due to STS-117 rollback.
100		DURATION 6:17								RECON. 2430	 Advanced to 08/07/07 on 06/28/07. Provide an adequate number of launch opportunities before a range conflict. Launch delayed to 08/08/07 on 08/03/07 due to "cabin leak
		SS EVA 107	2:34 (P) 2:40(A) *ZZA prime TAL site;	DRAG CHUTE	H	100 MB	an T	-		PAYLOADS:	number of launch opportunities before a range conflict.
		DOCKED OUEST EVA 30	Call made off MRN (GO site)	<u>JETTISON:</u> 54 KGS	6	1	*	2- 3		<u>PLB</u> : ISS 13A.1-ITS S5	checks and other processing work."
CONVER AND	ANI VERSON UNTO B	EMU/TETHERED EVA 100		233:16:32:59Z		and and	-	1 200		SPACEHAB SM,	LAUNCH SCRUBS: None
		SCHEDULED EVA 99 DURATION 6:28	<u>NEG RETURN</u> : 3:53 3:56	BRK DECEL EPS ^{2.}			-	Mart	A.	ESP-3	
				BRK DECEL FPS ² : AVE 6.1 PK 9.1			1	STATE -		MIDDECK:	LAUNCH WINDOW:
		SS EVA 108 DOCKED QUEST EVA 31	<u>PTA (U/S 167 FPS)</u> : 5:04 5:10	WHEELS STOP:			-			ISS 13A.1	 Total launch window was 8 minutes 11 seconds with window open at 220:22:32:45Z and close at 220:22:40:56Z. Preferred
		EMU/TETHERED EVA 101		233:16:33:16Z		~	1			RAMBO	Launch Time was 220:22:36:42Z (In-Plane Time) for a launch
		SCHEDULED EVA 100	<u>SE TAL (ZZA 104)</u> : 5:58	11862 FT				0	3	MAUI	window of 4m14s.
		DURATION 5:28		ROLLOUT:			-	12 M	-	5 CRYO TK SETS	LAUNCH DELAYS:
-1-		SS EVA 109	PTM (U/S 179 FPS):	10234 FT		Den 1	100				 None. Launch occurred on time at 220:22:36:42Z, 6:36:42 PM EDT on Wednesday, 08/08/07.
		DOCKED QUEST EVA 32	6:16 6:23	46 SEC					e -	RMS 76 ODS, OBSS	
·.**	555	EMU/TETHERED EVA 102 SCHEDULED EVA 101	<u>SE PRESS 104</u> 6:56 6:58		100053621211						TAL WEATHER: Forecast: Pressure gradient between a surface high over northern
	FSP3	DURATION 5:02	6:56 6:58	Continued	ISS015-E-2	1711 - En	deavo	ur delivers a i	new	RMS USED FOR RMS/OBSS	Spain and low over northern Italy will keep NW winds at FMI and
	NES C		<u>MECO CMD</u> : 8:25.0 8:25.4					o inside the		SURVEYS AND	Spain and low over northern Italy will keep NW winds at FMI and ZZA Wednesday through Friday. Peak winds at FMI are forecast
	IT21	Continued	8:25.0 8:25.4					ter of bay), ar		GRAPPI F/	to be above headwind limits all 3 days, but remain within limits at ZZA. MRN weather is forecast "GO" all 3 days.
	LU.		Continued							UNBERTH S5, HANDOFF TO	
	-				the external	slowage	plation	III 3 10 ISS.		SSRMS	Continued
				1							1

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			U.								
		CREW (7)	LAUNCH SITE,	Landing Site/ Runway,	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(7)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
			ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S		WINDS	ENG. S.N.						
STS-118/ ISS 13A.1		Continued	Continued	Continued			· · · ·				Continued
ISS 13A.1											
Continued		MCC WHITE FCR (49)	<u>VI</u> : 25819.0 25817.4	<u>WINDS:</u> 6H 4L KTS							PERFORMANCE ENHANCEMENTS: Include the standard set plus: 1) PE Operational High Q
		FLIGHT DIRECTORS:	25819.0 25817.4	OFFICIAL:							WIN/DEC, 2) OMS Assist, 3) a 52 nm MECO, and 4) Del Psi
		SHUTTLE:	<u>OMS-2</u> :	11909P13 KTS							WINDEC, 2) OWS ASSIST, 3) a 32 TITT WECO, and 4) Del PSI
		A/F - I S Stich	37.00 37.00 7	10H 8L KTS							ELIGHT DURATION CHANGES/LANDING
		A/E - J. S. Stich LD/O1 - M. R. Abbott	253.9 FPS252.6 FPS								FLIGHT DURATION CHANGES/LANDING: On 8/12/07, FD5, the MMT concurred with extending the Mission
		O2 (FD1-FD6) - R. S. Jones O2 (FD7-EOM) - M. L. Sarafin		<u>DENS ALT</u> : 1973 FT							to 14+2 days and adding EVA 4.
		O2 (FD7-EOM) - M. L. Sarafin		1973 FT							······································
		O3/PLNG (FD1-Undock) -									FIRSTS/LASTS
		M. P. Moses O3/PLNG/Prelaunch/Post-		FLT DURATION: 12:17:55:35							FIRSTS/LASTS: - First flight of Endeavour in 5 years
		Undock - P. F. Dye		12.17.00.00							- First flight test of new system to monitor ECO circuit voltage to
		MOD - P. L. Engelauf		S/T: 1109:10:01:41							fuel sensors. System allows Flight Controllers to recommend
		Team 4 - R. E. LaBrode									manual engine shutdown by the crew if sensor voltage has
		100		<u>OV-105</u> : 219:08:07:41							failed.
		ISS: LD/O2 - J. R. Montalbano		219:08:07:41		0001 F	1 Г	0 CTC 110			- First flight of Automated Meteorological Profiling System (AMPS) High Resolution (HR) as primary system for DOLILU wind measurements - replacement for Jimspheres.
		O1 - K. L. Alibaruho		DISTANCE						n ISS Destiny	(AIVIPS) HIGH RESOLUTION (HR) as primary system for DULILU wind measurements, replacement for timespheres
		O3/PLNG - G. Kerrick		DISTANCE: 5,274,977 sm	Lab: Front ro	ow, from l	eft: C	layton C. And	derson/	'FE Exp15,	- First flight that Station Shuttle Power Transfer System (SSPTS)
		Team 4 - J. D. Hassmann			CDR Exp15						available to provide extended duration capability to shuttle
				TOTAL SHUTTLE							- First flight that three-string Global Positioning System (GPS)
				<u>DISTANCE</u> : 449,799,376 sm	(RSA). STS-						was used to replace landing TACAN System - previously flown
		CAPCOMS:		449,799,376 SM	Morgan/MS,	Williams	/MS (C	CSA), & CDR	R Kelly.	Back row,	single string only.
		SHUTTLE:			from left: PL	T Hobau	ah Ma	astracchio/M	S & Ca	aldwell/MS	 First flight of SRB Command Receiver/Decoder (CRD). Replaced Integrated Receiver/Decoder (IRD) and Range Safety Distributor (RSD) due to obsolescence concerns Last flight of SPACEHAB resupply module. First and last flight of Educator Mission Specialist Barbara R. Morgan. She left NASA and returned to Boise State University
		- I P Dutton (Wx)					gii, me		0, 0 00		Replaced Integrated Receiver/Decoder (IRD) and Range Safety
		A/E - C. J. Ferguson - J. P. Dutton (Wx) LD/O1 - S. K. Robinson	Г								Distributor (RSD) due to obsolescence concerns
		O2 - R. S. Kimbrough			And the second second		Children and a second				- Last flight of SPACEHAB resupply module.
		Q3/PLNG - S. W. Lücid				1100	- A 16 A				- FIISE driu Idse IIIgril of Educator Mission Specialist Barbara R. Morgan She left MASA and returned to Reise State University
		Team 4 - N/A			Dr B	- AL			-1-1 -1-1		in 2008.
		·221			Diac BL	ARE			STIL.	1 1 1 1	11 2000.
		ISS: LD/O2 - S. Walker						1. C		Cart Mar	NIGHT LAUNCH - N/A
		O1 - D. A. Antonelli					125	REER	A.	To Lan	
		O3/PLNG - L. McCullough Team 4 - N/A			Carles Carles	-	N	NEA			<u>RENDEZVOUS #67</u> : Rendezvous and dock with ISS
				Na a M	C DM		A			DEL	NINTH SHUTTLE CREWMEMBER REPLACEMENT
					h e aa		1				- Clay Anderson was replaced by Drew in August 2007 (8th
										4 A	Shuttle crewmember replacement occurred on STS-121.)
					-	20	F	1000	1 1 C		
						1000	210	178	-		EVENTS: - OMS 2 ignition at 220:22:47:15Z resulted in a 172.2 by 124.7 pm orbit
				1 2	ma	. 10	all.	PIE	1 A		- UNIS 2 ignition at 220:22:47:15Z resulted in a 172.2 by 124.7
					6 1 3					1	nm orbit. - SRMS OBSS/LDRI survey of nosecap and port and starboard
				And			A	IN ALL		A	wing RCC (WI F's) was completed
				P		10 000		1/1	-		wing RCC (WLE's) was completed. - TI maneuver at 222:15:15:19Z - resultant orbit was 186.5 by
							-1	2 and	375-10		180.4 nm
					and the		ana di	MAR			 During R-Bar Pitch Maneuver, a gouge in the heat shield below the right wing (site 3) was identified. Docking contact occurred at 222:18:01:54Z.
											the right wing (site 3) was identified.
							1900				- Hard Dock occurred at 222:18:01:542.
					A STATE	12-	9			-129	- Hain Duck ucculled at 222.10.27.442.
				5 1		Olli-	-	- MA		100	
				ISS015E23031							Continued
		-									

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SPACE SHUTTLE MISSIONS SUMMARY

FLT NO.	ORBITER	CREW (7) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE ENG. S.N.	SRB RSRM AND ET	INC	orbit Ha/Hp	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-118/ ISS 13A.1 Continued		4 - Barbara R. Morgan fission Specialist	Flew as first		ATTENDED TO A STATE	astracchio	o (out c	of frame), R8	&R a fau	ulty control	 Continued EVENTS (Continued): ISS Hatch open 222:20:04:00Z, 3:04 pm CDT, Friday, August 10, 2007, ISS crew welcoming ED4: MMT, per Flight Rule 13A.1_A2-6 concurred that TPS was considered to be damaged. FD4, EVA 1: EV1 and EV2 installed S5 on S4, relocated S5 PVRGF to S5 Keel (ground strap bott would not seat again, like P5), retracted and cinched P6 Forward PVR, and retrieved EVA ratchet from STBD 21 toolbox. EVA 1 duration 6h17m. FD5: MMT concurred that TPS was considered to be damaged and authorized focused TPS inspection. Mission was extended to 14+2 and EVA4 (preplanned) was added. FD6, EVA 2: EV1 and EV2 completed R&R of faulty CMG 3 into ISS 21 truss, installed old CMG3/FSE/FRAM on nadir ESP-2 FRAM Site #5 with ML1 cover (no straps), and retrieved EVA ratchet from PORT 21 toolbox. The failed CMG will remain at its temporary stowage location until it is returned to Earth on a later shuttle mission. The new gyroscope is one of four CMG's used to control Station attitude on orbit. EVA 2 duration 6h28m. FD8, EVA 3: EV1 and EV3 (Exp 15/16) relocated P6 SASA to P1 zenith, installed P1 S-band BSP and Xpdr, moved CETA cart 1 to STBD of MT (connected to CETA 1), and removed P6 S-band Xpdr (dummy box plate installed). EV1 EVA terminated early to EMU glove damage at EVA Phase Elapsed Time (PET) 4:20. The damage did not cause leakage; the suit pressure was unaffected. Due to the early termination, the S-band Antenna Structural Assembly (SASA) Spare Gimbal Locks and Materials International Space Station Experiment (MISSE) 3 and 4 tasks were not completed. EVA 3 duration 5h28m. FD8: EVA 4 delayed from FD9 to FD11 by MMT for potential tile repair. FD9: MMT decided that the TPS repair issue required a Programmatic assumption of risk and that the MMT was willing to assume that risk. The preponderance of data (including ground analysis and arc jet testing) indicated acceptable margins to fly as is. MMT decided that no TPS repair

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FLT NO.	ORBITER	CREW (7) TITLE, NAMES	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES	SSME-TL NOM-ABORT EMERG THROTTLE	SRB RSRM AND FT	INC	orbit Ha/Hp	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXDEDIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, EIRSTS SIGNIEICANT ANOMALIES, ETC.)
STS-118/ ISS 13A.1 Continued	viewed from Caribbean mph. MOI	& EVA'S 18-E-07918 - Category In Endeavour, was mov nearing Jamaica with s 0 contingency evacuation but not needed.	ABORT TIMES / 4 Hurricane Dean, ring westerly in the sustained winds of 1	FLT DURATION, WINDS 50 51 52 53 54 55 55 56 57 58 50 50 51 52 53 54 55 55 56 57 58 59 50 50 50 50 50	PROFILE ENG. S.N.	ET	© Merce and a set and and a set and and and and and and and and and and	The STS pose for a ector Steve M Chris Fe	group Stich I ergusoi	EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.) Continued EVENTS (Continued): 1 Transfers: - Hardware transferred to ISS (outside and inside): 14,740 lbs - Hardware/supplies returned from ISS: 3,297 lbs - Water delivered to ISS: 918.6 lbm - Oxygen to ISS: 77 lbm - Nitrogen to ISS: 77 lbm - Nitrogen to ISS: 33.8 lbs - Lithium Hydroxide (LiOH) cans from ISS to STS: 12 cans (9 old, 3 used) - LiOH new cans from STS to ISS: 30 cans - Power transferred from ISS to orbiter using the SSPTS was 1186 kWh. - Undocked at 170:14:42:00Z followed by a flyaround (1/2 lap) Sep 1 and Sep 2 maneuvers resulted in orbit 185.2 by 183.5 nm. - Micrometeoroid Orbital Debris late inspection was completed. No issues. - No communications blackout during Entry. SIGNIFICANT ANOMALIES: Orbite: - A Magenta Hue Appeared On Camera (GFE). - STS-118 Drag Chule Reefing Line Cutter Failure to Cut (GFE). SRB: - None. RSRM: - Gas Penetrations through Nozzle Joint 2 RTV, RSRM-97A&B SSME: - 3 Com Card/Cable Failed (GFE). ET: - 2007 ET-117 Film Review Found TPS Loss at Sta. 1623 Outboard LO ₂ - Feedline Support Bracket and TPS Orb Impact - XT 1973 Inboard LO ₂ Feedline Bracket Base Fitting TPS Crack on ET-117 - Post-Launch Camera and Film Review Showed Loss of LH ₂ Acreage Foam MOD: - B30M Power Failure B-C Power Feeds - Margi Output Error - ET Umbilical Door Closure Timing - SSRMS Movement Prior To Shuttle Ku Mask - OBSS Sensor Mode Change From 6 to 2 per MCC - Procedure Error on PGSC Setup Integration: - Partial Tyvek Cover Release - SSRMS Movement Prior To Shuttle Ku Mask - BFS Loss of Class III Alert from Spacehab E

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		CREW	LAUNCH SITE.	LANDING SITE/ RUNWAY.	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(6+1 UP/6+1 DN)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		UKBII	FSW	WEIGHTS.	(LAUNCH SCRUBS/DELAYS.
NO.	UKDITEK		LIFTOFF TIME,	LANDING TIMES	THROTTLE	AND	INC	HA/HP	FSW	PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
NO.		TITLE, NAMES	ABORT TIMES	FLT DURATION,	PROFILE	ET	INC	TA/TP		EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S	ADUKT HIVES	WINDS	ENG. S.N.	EI				EAPERIMENTS	FIRSTS, SIGNIFICANT ANOWALIES, ETC.)
STS-120/	OV-103	CDR:	KSC 39A		104/104/109%	BI-131	E1 4	DIRECT	01.22	CARGO:	DDIEF MICCION CUMMADY, CTC 120/104 (22rd ICC mission)
ISS 10A	(Flight 34)	Pamela A. Melroy	296:15:38:19Z	KSC 33 (KSC 66) 311:18:01:17Z	104/104/109%	BI-131	21.0 (23)	INSERTION	(1)	40872 LBS	BRIEF MISSION SUMMARY: STS-120/10A (23rd ISS mission) provided for expansion of the ISS with delivery of the
155 104	DISCOVERY	(Flt 3 - STS-92, STS-112)	11:38:19 PM EDT (P)	01:01:17 PM EST	PREDICTED:	RSRM	(23)		• •	40072 LD3	Italian-built U.S. multi-port Node 2 connecting module
SEQ	DIGGGTEIT	P740/R261/V175/F34	11:38:19 PM EDT (A)	Wednesday (15)	100/104.5/	98		<u>POST OMS-2</u> : 169.9X123.8 NM		PAYLOAD	named Harmony. Installation of Harmony allows for
FLT# 120	OMS PODS:		Tuesday (16) 10/23/07 (12)	11/07/07 (12)	104.5/72/	ET-120		169.9X123.8 NM		CHARGEABLE:	attachment of research labs from the European Space
100 400	LPO1-37	PLT: George Zamka	10/23/07 (12)	DEORBIT BURN	104.5	E1-120				33813 LBS	Agency (Columbus) and the Japan Aerospace Exploration
KSC-120	RPO3-35	P741/R315/M271	LAUNCH WINDOW:	DEORBIT BURN: 311:16:58:49Z	ACTUAL:	SLWT				DEPLOYED:	Agency (Kibo) to be delivered on subsequent flights. The P6 truss segment and solar arrays were replaced from a
PAD 39A-43	FRC3-34		7M 17S		100/104.5/	28				33474 I BS	temporary location (on Z1) to a permanent location on P5
1 AD 37A-43		<u>MS 1/EV1:</u>	(PLT IN-PLANE)	XRANGE: 196 NM	104.5/72/ 104.5					UUTIT EDU	truss. In this new location, the solar arrays were
MLP-2		Scott E. Parazynski	EOM PLS: KSC	ORBIT DIR: D/R 21	104.5					NON-DEPLOYED:	redeployed to maximize needed power generation for
		(Flt 5 - STS-66, STS-86, STS-95, STS-100)	TAL: MRN		1 = 2050 (6)	ET				280 LBS	inclusion of the future research labs. Also on this mission,
23RD		P742/R187/V144/M165	<u>TAL WX</u> : FMI	<u>AIM PT</u> : CLOSE IN	2 = 2048 (7)	İMPACT					a 1-day extension was added to extend EVA 4 for starboard
SHUTTLE				MLGTD: 1247 FT	3 = 2058 (2)	MET		DEORBIT:		MIDDECK: 59 LBS	SARJ inspections, but the EVA was later reworked for a successful repair of P6 4B solar power array damaged
FLIGHT TO ISS		MS 2/R: Stephanie D. Wilson	SELECTED:	<u>311:18:01:17Z</u>	M 3 EOM:	1:14:06		HA 188.0 NM		57 205	during deploy.
133		(Flt 2 - STS-121)	<u>SELECTED:</u> <u>RTLS</u> : KSC 15 N/N	VEL: 204 KGS				HP 12.1 NM		SHUTTLE	aaning aopioj.
		P743/R298/V190/F39	TAL: MRN 20 N/N	220 KEAS	WEIGHT:	LAT:				ACCUMULATED	KSC W/D: OPF 234, VAB 7, PAD 23 = 264 Total Work Days
MEL	TOY		(<u>ZZA</u> : NO-GO) <u>AOA</u> : NOR 35 N/N	HDOT: -5.4 FPS	203067 LBS	36.749S		ENTRY		WEIGHTS:	(OPF Processing occurred over a total time period of 273 days.)
THEN	3	MS 3/EV2: Douglas H. Wheelock	1ST DAY PLS:	TD NORM 195:	X CG:	LONG:		VELOCITY:		DEPLOYED: 1362928 LBS	LAUNCH POSTPONEMENTS:
** <		P744/R316/M272	EDW 04 CI/N	3249 FT	1081.0 IN	158.983W		25850 FPS		1302920 LD3	- Added STS-120 to FDRD - launch date of 02/19/04 on 01/23/03.
TOCK	S		TRE							NON-DEPLOYED:	 Postponed to NET 09/23/04 on 03/13/03 due to Columbia
	Ĩ	MS 4/R:	<u>TDEL</u> : 0:000(P) 0.162(A)	DRAG CHUTE DEPLOY:	LANDING: WEIGHT:			<u>ENTRY</u> RANGE:		1598100 LBS	accident.
TH T		Paolo A. Nespoli (ESA) P745/R317/M273	0.000(I) 0.102(A)	189 KEAS	202989 LBS			4436 NM			 Deleted flight from FDRD on 05/28/03. Re-baselined to NET 08/09/07 on 06/01/06.
STS	-120	1 743/10317/10/273	MAX Q NAV:	311:18:01:26Z	X CG:			4430 1000		CARGO TOTAL: 3822037 LBS	- Postponed to NET 09/07/07 on 11/02/06. Slip due to ET
L		MS 5 UP/EXP 16 FLT ENG:	719.02(P) 701.56(A)	O and the set of	1083.0 IN					3822037 LBS	delivery/processing schedule - Advanced to 08/26/07 on 02/08/07 to avoid spacing problem
		Daniel M. Tani	SRB STG:	Continued						PERFORMANCE	 Advanced to 08/26/07 on 02/08/07 to avoid spacing problem with Sovuz and ATV.
		(Flt 2 - STS-108) P746/R272/V191/M238	2:02.56(P) 2:03.20(A)	Y						MARGINS (LBS):	- Postponed to 10/20/07 on 04/16/07. Slip due to STS-117
VII		1740/1272/0171/10/230				20				FPR: 2651	rollback.
		<u>MS 5 DN/EXP 15/16 FLT</u>	<u>PERF</u> : NOMINAL							FUEL BIAS: 1063	- Postponed to 10/23/07 on 08/07/07. Slip to maintain standard
		ENG: Clayton C. Anderson	2 ENG TAL (MRN):	/	1. 10/0	Lastre 3	-			FINAL TDDP: 2091 RECON: 1880	minimum interval between Soyuz undocking (changed for landing opportunities) and orbiter docking to the ISS.
		(LIP on STS-117 Stay on	2:37 (P) 2:45(A)		1195	Tom	-			RECON. 1000	and ing opportunities) and orbiter docking to the 155.
		ISS) P747/R310/M268		2	O . En					PAYLOADS:	LAUNCH SCRUBS: None
		P747/R310/M268	<u>NEG RETURN</u> : 3:51 3:55			10 th	Part			PLB:	
			3.01 3.00		- Cob	DINT.	-			ISS 10A (NODE 2),	LAUNCH WINDOW: - Total launch window was 11 minutes 19 seconds with window
		SS EVA 110 DOCKED QUEST EVA 33	PTA (U/S 167 FPS): 5:16 5:26	1						PDGF, MBSU, SASA	open at 296:15:34:17Z and close at 296:15:45:36Z. Preferred
		EMU/TETHERED EVA 103	5:16 5:26	1 Martine						SASA	Launch Time was 296:15:38:19Z (In-Plane Time) for a launch
HARN	AONY	SCHEDULED EVA 102	SE TAL (ISTRES			- CAR	Y	1		MIDDECK:	window of 7m17s.
		DURATION 6:14	<u>SE TAL (ISTRES</u> <u>104)</u> : 6:04 6:12			CSIV/==	A ST			ISS 10A	LAUNCH DELAYS:
12	5		<u>6:04</u> 6:12		EX/	150	TRO	CONSENT		RAMBO	- None. Launch occurred on time at 296:15:38:19Z, 11:38:19 AM
15		Continued			a set	270	ONE S	No the	-	MAUI	EDT on Tuesday, 10/23/07. (PAO: "It's a nice day in Florida")
		oontinucu	PTM (U/S 181 FPS): 6:16 6:27			and and	a ser h	A 1 /0	1.	5 CRYO TK SETS	
NOC	DE 2		0.10 0.27				-	JA De B	a Or		Continued
			Continued	S120-E-006397 (25		torical first s	nacom	eeting of female		RMS 77	
				Women Commande					am	ODS, OBSS	
				Melroy, STS-120 C		in (ingin), iSt		io obri, greets r	an		

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FLT	ORBITER	CREW (6+1 UP/6+1 DN)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM	ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-120/ ISS 10A		Continued	Continued	Continued				-		Continued
ISS 10A Continued		SS EVA 111 DOCKED QUEST EVA 34 EMU/TETHERED EVA 104 SCHEDULED EVA 103 DURATION 6:33	<u>SE PRESS 104</u> 7:06 6:57 <u>MECO CMD</u> : 8:25.6 8:25.8	<u>NLGTD</u> : 5419 FT 311:18:01:30Z VEL: 150 KGS 163 KEAS HDOT: -5.9 FPS						TAL WEATHER: The weather model data for Europe continued to show an area of low pressure near Italy, with high pressure over central France. Windy conditions at ZZA and FMI were expected to contribute to pockets of turbulence in the region. Weakening high pressure was forecast over southern Spain, with partly cloudy skies and southwest winds at MRN Tuesday. All three TAL sites were forecast and observed GO. Moron was selected as Prime TAL
MCC WHITE FLIGHT DIRE SHUTTLE:	ECTORS:	SS EVA 112 DOCKED QUEST EVA 35 EMU/TETHERED EVA 105	<u>VI:</u> 25819 25817 OMS-2:	<u>BRK INIT</u> : 109 KGS <u>DRAG CHUTE</u> JETTISON:						southwest winds at MRN Tuesday. All three TAL sites were forecast and observed GO. Moron was selected as Prime TAL Site.
A/E - N. D. Kr LD/01 - R. E. 02 (ED2-ED1	. LaBrode	SCHEDULED EVA 104 DURATION 7:08 SS EVA 113 DOCKED QUEST EVA 36	37:22 37:19.6 232.8 FPS230.9 FPS	52 KGS 311:18:01:53Z BRK DECEL FPS ² :						PERFORMANCE ENHANCEMENTS: Include the standard set plus: 1. PE Operational High Q TRN/OCT, 2. OMS Assist, 3. 52 nautical mile MECO, and 4. Del Psi.
Moses O2 (FD1, FD1 Waveoff) - M. O3/PLNG (FD M. L. Sarafin PLNG (Prelau FD14, and Wa	. R. Abbott D1-FD13) - unch. FD1.	EMU/TETHERED EVA 106 SCHEDULED EVA 105 DURATION 7:19		AVE 6.3 PK 10.5 WHEELS STOP: 311:18:02:11Z 9593 FT	\$120-E-0076	608 ST	6-120 & Exp16 cr	ews ISS	Harmony	FLIGHT DURATION CHANGES/LANDING: On FD7, MMT concurred with adding a docked extension day to the mission to extend EVA 4 for starboard SARJ inspections for cause of vibrations and drag.
Ceccacci ENT - B. C. Li MOD - P. L. E Team 4 - P. F	unney Engelauf ⁻ . Dye	JSC2007-E- 095788 In MCC, FDs, Knight (left) &		ROLLOUT: 8346 FT 54 SEC <u>WINDS</u> : 10.6H 2.8R KTS	node. From I Whitson, Yui From left (ce	left (botton ri I. Malenc nter): Wils left (top):	n): Anderson/MS henko/FE/Exp16 on/MS, CDR Pan Daniel Tani/FE/E	(DN),CE (RSA) & n Melroy,	OR Peggy A. PLT Zamka. & Nespoli/MS	FIRSTS: - Historical first meeting of two spacecrafts commanded by women: Peggy Whitson, the first woman to command the ISS, and Pamela A. Melroy, the second woman space shuttle commander. - Successful first time operation of OV-103 Station-to-Shuttle
(Wx)	ingen I. L. Rarick Kerrick 'irts 'chambault	Lunney, monitor EVA repair of ISS solar panel shown in photos at right &		OFFICIAL: 35013P22 KTS 21H 6R KTS <u>DENS ALT</u> : 771 FT <u>FLT DURATION</u> : 15:02:22:58				ARAN DI DI		 Power Transfer System (SSPTS) First ET LO2 IFR bracket pockets filled with BX (replaces PDL in pockets) to minimize void formation. First flight of OI-32 Flight Software. Standard capability release included changes for enhanced crew safety and situational awareness, improved mated control of ISS, and other enhancements for ground and flight operations and safety. First High-definition TV coverage of Launch (by CNN) NIGHT LAUNCH: (N/A)
LD/O1 - C. J. O2 - D. A. Ant O3/PIng - S. V Team 4 - N/A	itonelli W. Lucid	bottom .		<u>S/T</u> : 1124:12:24:39 <u>OV-103</u> : 291:13:57:03					SUMPLY TO DO	RENDEZVOUS #68: Rendezvous and dock with ISS EVENTS
ISS: LD/O2 - K. A. O1 - H. Getze O3/PLNG - Z. Team 4 - N/A	elman Jones 			<u>DISTANCE</u> : 6,249,432 sm <u>TOTAL SHUTTLE</u> <u>DISTANCE</u> : 456,048,808 sm			7 (3 Nov. 2007)			 OMS 2 ignition at 296:15:48:44Z resulted in a 159.9 by 123.8 NM orbit. SRMS OBSS/LDRI survey of nosecap and port and starboard wing RCC (WLE's) was completed. TI maneuver at 298:09:55:25Z resulted in a 188.7 by 179.7 NM orbit. D. Reg Ditch Maneuver was performed. Na cignificant issues.
ISS016-E- Close-u the repaire array.	up view of	<u> </u>	ÊM		OBSS,	Parazyns	ot restraint on ti ski/EV1 assesse y is fully deploy	es his re	pair work	 R-Bar Pitch Maneuver was performed. No significant issues Docking Capture occurred at 298:12:39:57Z. Hard Dock occurred at 298:12:52:50Z. Continued

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FLT NO.	ORBITER	CREW (6+1 UP/6+1 DN) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE ENG. S.N.	SRB RSRM AND ET	ORBIT INC HA/HP	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-120/ ISS 10A Continued	In JSC MC shown talk George W	n JSC MCC, Ed Gonza CC, FD Mike Moses (st king to Shuttle & ISS cr J. Bush greets returning he background.	anding) escorted	former Presider RIGHT: JSC20	nt George H.W 07-E-097963-	ch data. On No	nd former First L ov.8 at Ellington I	.ady Ba Field, F	arbara Bush President	 Continued ISS Hatch opened at 9:39 AM (CDT) on10/25/07 (298:14:39:00Z) - Shuttle Crew welcomed by ISS Crew - Historical first meeting of two spacecrafts commanded by women. IELK Seat Liner Transfer at 298:16:12Z (11:12 AM CDT, Oct. 25, 2007). At that time Clayton Anderson became a member of STS-120 and Daniel Tani joined the ISS Expedition 16 as Flight Engineer. FD4 EVA 1: (EV1 and EV2) Removed the failed SASA from Z1; installed SASA in PLB sidewall carrier; prepped Node 2 (Harmony) for removal from bay; demated P6/Z1 fluid QD's; used Station robot arm (PDGF) to install Node 2 to temporary location on Node 1 (Unity). [NOTE: Node 2 was moved to its permanent location at the front of the U.S. Lab using the ISS robotic arm after shuttle departure.] EVA1 duration 6h14m FD6 EVA 2: EV1 and EV3 conducted P6 truss demate from temporary location on Z1: EV3 performed inspection of suspected sharp edge on S1 CETA rail; initial stbd SARJ inspection; Node 2 Outfitting (EV1 completed all of this solo); structurally installed the Node 2 PDGF; successfully deployed the two outboard S1 radiators between EVA 2 and EVA 3 (so all three are now deployed). EVA 2 duration 6h33m FD7: MMT concurred with adding a docked extension day to the mission to extend EVA 4 for starboard SARJ inspections for cause of vibrations and drag.
and Earth		v. 2007) Back-dropped en new ISS configuration		of space departing	On STS-120/OV-11 approximately 184 Wissing debris RB: Nonlinear separati for STS-120/BI-13' STS-120/ET-120 I& showed loss of foa SRM: Gas penetrations th GAS penetrations th SME: None DI: Wissing step in PD Typo - IMU align in RMS Joint Angle C TEGRATION: LH ₂ Umbilical ice n GUCP ice bridged ET LH ₂ Tank foam Unexpected debris clearance (liftoff de	Blanket R& Arrowhead P Jap Filler (H= left (Port) OI 1 LO2 Inlet T 03, Measure degrees F on on LH SR aunched on - m at two loc hrough Nozz rough RTV, RS STBD st Orb Ops Ch bround Displa- to ET Interta acreage los Jexpected de bris)	late (H-0.38) -0.21 & H=0.29) WS Pod Temperature failed off s ment V62T0519A was B of the Frustrum/Forv 10/23/07: Post Launch ations. de Joint 2 RTV, RSRM- Nozzle Joint 5, RSRM- urvey procedure necklist ay Error	erratic, d ward Skirt camera -98A&B -98B	verged from Ordnance Ring and film review prior to pad	 <u>FD7</u>: MMT concurréd with adding a docked extension day to the mission to extend EVA 4 for starboard SARJ inspections for cause of vibrations and drag. <u>FD8 EVA 3</u>: EV1 and EV2 attached P6 truss to P5 (permanent location). The 2B solar array was 100% deployed. The 4B array was aborted at 25 bays, with a tear in the right blanket (guide wire snag). EVA 3 duration 7h 8m <u>FD11</u>: MMT concurred with new plan for EVA4 to repair the Solar Array Wing (SAW) 4B repair. The Tile Ablator Dispenser DT0 was postponed. <u>FD12 EVA4</u>: (EV1 & EV2) EV1 repaired the P6 4B array using the OBSS on the SSRMS with a WIF-E. As reported by the Rocky Mountain News: "Parazynskiperformed what NASA is calling on e of the greatest 'space saves' in the history of manned spaceflight[He] floated outside with wire cutters, pliers, and homemade tools to fix the torn wing" [restoring maximum power capability to the ISS.] EVA 4 duration 7h 19m Transfers: Hardware transferred ISS (outside and inside): 33,834 lbs Hardware/supplies returned from ISS: 2,020 lbs Water delivered to ISS: 939.1 lbm Oxygen transferred to ISS: 30:9710:32:03Z (4:32 am CST, 11705/07) Sep 1 & Sep 2 maneuvers resulted in orbit 189.6 by 181.9 nm. Micrometeoroid Orbital Debris late inspection was completed. No issues. Anderson returned home after 152 days in space. Communications blackout time during Entry: 1m

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		007		LANDING SITE/	SSME-TL						
		CREW (6+1 UP/6+1 DN)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER		LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES,	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION, WINDS	PROFILE ENG. S.N.	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-122/	OV-104	CDR:	KSC 39A	KSC 15 (KSC 67)	104/104/109%	BI-132	51.6	DIRECT	01-32	CARGO:	BRIEF MISSION SUMMARY: STS-122/1E (24th ISS mission)
ISS 1E	(Flight 29)	Stephen N. Frick	038.19.45.307	051:14:07:09Z			(24)	INSERTION	(2)	40296 LBS	delivered the European Space Agency's Columbus
SEQ	ÁTĽANTÍS	(Flt 2 - STS-110) P748/R276/V192/M242	2:45:30 PM EST (P) 2:45:30 PM EST (A)	9:07 AM EST Thursday (11)	PREDICTED: 100/104.5/	RSRM 99		POST OMS-2:		PAYLOAD	research laboratory module to the ISS. Columbus, measuring 23 ft in length and 15 ft in diameter, is ESA's
FLT# 121	OMS PODS:		Tuesday (35)	Thursday (11) 02/21/08 (7)	104.5/72/			<u>POST OMS-2</u> : 124.0X118.8 NM		CHARGEABLE:	largest contribution to the expansion of the ISS. Also
KCO 101	LPO4-29	PLT: Alan G. Poindexter	2/07/08 (9)	DEORBIT BURN:	104.5	ET-125				32941 LBS	delivered were FSA experiments and two FSA astronauts
KSC-121	RP01-36	P749/R318/M274	LAUNCH WINDOW:	051:12:59:52.0Z	ACTUAL:	SLWT				DEPLOYED:	with one of them to join the ISS crew for operation of Columbus research. This mission also saw the Columbus
PAD 39A-44	FRC4-29	MC 1/D	5M1S (PLT IN-PLANE)	XRANGE: 408 NM	100/104.5/ 104.5/74/	29				30657 LBS	Control Center in Oberpfaffenhofen, near Munich, Germany,
MLP-1		MS 1/R: Leland D. Melvin	· /		104.5					NON-DEPLOYED:	brought on-line for initial checkout and future operations of the laboratory.
		P750/R319/M275	<u>EOM PLS</u> : KSC TAL: ZZA	ORBIT DIR: A/L 38	1 = 2059 (2)	FT				2162 LBS	,
24TH		MS 2/EV1:	TAL WX: MRN, BEN	<u>aim pt</u> : Nominal	1 = 2059 (2) 2 = 2052 (6)	IMPACT					KSC W/D: OPF: 121, VAB HB-3: 7, PAD A: 76 = 204 Total Work Days (+1 holiday @ OPF Processing + 10 holidays + 4
SHUTTLE FLIGHT TO		Rex J. Walheim		<u>MLGTD</u> : 2344 FT	3 = 2057 (3)	MET				MIDDECK: 122 LBS	contingency days @ PAD)
ISS		(Flt 2 - STS-110) P751/R277/V193/M243	<u>SELECTED</u> : <u>RTLS</u> : KSC 15 N/N	051:14:07:09Z		1:14:07					LAUNCH POSTPONEMENTS:
		MS 3/EV2:	<u>RTLS</u> : KSC 15 N/N <u>TAL</u> : ZZA 30L N/N	VEL: 197 KGS 194 KEAS		LAT:				<u>SHUTTLE</u> ACCUMULATED	 Added STS-122 to FDRD - launch date of 10/17/07 on 10/05/06.
		Hans Schlegel (Germany) (Flt 2 - STS-55)	AOA: NOR 23 N/N	HDOT: -2.1 FPS		<u>36.6</u> 19S				WEIGHTS:	- Postponed to 12/06/07 on 04/16/07 due to STS-117 rollback.
		(Flt 2 - STS-55) P752/R163/V194/M143	<u>1ST DAY PLS:</u> EDW 04 N/N	TD NORM 195:		LONG:		DEORBIT:		DEPLOYED:	 After 12/06/07 scrub, see <u>LAUNCH SCRUBS</u> below, launch was reset for 24-hr turnaround on Friday, 12/07/07.
15				2200 FT	<u>M 3 EOM</u> :	158.796W		HA 187.6 NM		1393585 LBS	reset for 24-hr turnaround on Friday, 12/07/07. - Later, on 12/06/07, during MMT Scrub Turnaround Meeting, it was decided to extend to a 48-hr turnaround for Saturday, 12/08/07 launch to allow additional time to address all concerns. - At Friday, 12/07/07 MMT, it was determined that necessary discussion could not be finished in time for Saturday 12/08/07 launch attempt. The launch was moved to Sunday 12/08/07 with a new Launch Commit Criteria (for this launch only) requiring four of four valid ECO sensor readings (rather than three of four) prior to launch. In addition, the following two conditions were added: 1) Launch Window was limited to in- plane +1 minute (to provide additional ascent fuel margin), and 2) utilization of new in-flight ECO circuit voltage readings (successfully tested on STS-118 and STS-120 by ground flight controllers to recommend manual engine shutdown by the crew,
122 ALD TO	15	MS 4/EV3: Stanley G. Love	<u>TDEL</u> : 0:000(P) 0.212(A)	DRAG CHUTE	WEIGHT:			HP 23.1 NM		NON-DEPLOYED:	12/08/07 launch to allow additional time to address all concerns.
ALITER A	A A A	P753/R320/M276		DEPLOY:	207295 LBS					1600348 LBS	- At Friday, 12/07/07 MMT, it was determined that necessary
102	HUSSE	MS 5 UP/EXP 16 FLT ENG:	<u>MAX Q NAV</u> : 756.21(P) 755.17(A)	188 KEAS 051·14·07·107	X CG:			<u>ENTRY</u> VELOCITY:		CARGO TOTAL:	launch attempt. The launch was moved to Sunday 12/09/07
A COLOR	Jul 1	Leopold Eyharts (ESA)			1078.2 IN			25860 FPS		3862333 LBS	with a new Launch Commit Criteria (for this launch only)
No.	are a	(also flew on MIR Feb 1998) P754/R321/M277	<u>SRB STG</u> : 2:04.16(P) 2:04.16(A)	<u>NLGTD</u> : 5175 FT 051:14:07:177	LANDING:			ENTRY		PERFORMANCE	three of four) prior to launch. In addition, the following two
-				VEL: 157 KGS				RANGE:		MARGINS (LBS):	conditions were added: 1) Launch Window was limited to in-
		MS 5 DN/EXP 16 FLT ENG: Daniel M. Tani	<u>Perf</u> : Nominal	155 KEAS HDOT: -4.9 FPS	WEIGHT: 207215 LBS			4403 NM		FPR: 2651 FUEL BIAS: 1063	2) utilization of new in-flight ECO circuit voltage readings
		(Flt 2 - STS-108, STS-120	2 ENG TAL (MRN):							FINAL TDDP: 2402	(successfully tested on STS-118 and STS-120 by ground flight controllers to recommend manual engine shutdown by the crew,
XV		up) P755/R272/V191/M238	2:35(P) 2:38(A)	<u>BRK INIT</u> : 91 KGS	X CG: 1080.4 IN					RECON: 3435	if required.
		P/00/KZ/2/V191/WI200	NEG RETURN:	DRAG CHUTE	1000.111					PAYLOADS:	 After second scrub on 12/09/07, see <u>LAUNCH SCRUBS</u> below, launch was rescheduled to NET 01/02/08 contingent on
		SS EVA 114	3:51 3:54	<u>JETTISON:</u> 54 KGS						PLB:	development and implementation of fuel ECO sensor system
		DOCKED QUEST EVA 37 EMU/TETHERED EVA 107	<u>PTA (U/S 161 FPS)</u> :	051:14:07:46Z			44	8. A	N	ISS 1E (COLUMBUS	troubleshooting plan. Destroaned to 01/10/08 on 12/12/07 dependent on resolution of
		SCHEDULED EVA 106	5:04 5:05	· · · · · · · · · · · · · · · · · · ·						MODULE)	the problem with the fuel sensor system. Slip was to allow "as
		DURATION 7:58	<u>SE TAL (ZZA 104):</u>	BRK DECEL FPS ² : AVE 4.6 PK 6.9	and the second			all a		ICC-LITE ECSH	Postponed to 01/10/08 on 12/13/07 dependent on resolution of the problem with the fuel sensor system. Slip was to allow "as many people as possible to have time with family and friends at the time of year when it means the most." Tanking test using add-on Time Domain Reflectivity (TDR) instrumentation on 12/18/07 isolated ECO Sensor System failures to open circuit in the time or ad "aces therwise connector." TDS removal on the
		SS EVA 115	6:04 6:082		1	-		N.P.		PDGF	add-on Time Domain Reflectivity (TDR) instrumentation on
		DOCKED QUEST EVA 38	PTM (U/S 167 FPS):	WHEELS STOP:		1	1 ·	A Big			12/18/07 isolated ECO Sensor System failures to open circuit in the three-part "pass-through connector." TPS removal on the
		EMU/TETHERED EVA 108 SCHEDULED EVA 107	5:58 6:02	051:14:08:07Z 10911 FT	- Cardina	1	1	S DI		<u>MIDDECK</u> : ISS 1E	tank was authorized at the pad to begin moving toward removal of the hardware, if required, to solve the problem. Launch date
		DURATION 6:45	Continued			C. O.A.				MAUI	of the hardware, if required, to solve the problem. Launch date
UMBUS	S MODI			ROLLOUT: 8567 FT		Con la	1			5 CRYO TK SETS	remained unchanged. - Postponed to TBD on 01/03/08; however, PRCB established a
60° · · · ·	12:50	Continued		58 SEC			14	- Aline	-		 Postponed to <u>TBD</u> on 01/03/08; however, PRCB established a "work to" launch date of 02/02/08 dependent on testing of removed ECO connector, installation of replacement connector,
							A K			RMS 78	and replacement and retesting procedures of Ascent Thrust
	and and and			Continued		16				ODS	Vector Control (ATVC) unit.
Iss	11			Continued	S122-E-00787	3 (11 Feb. 20	(800	Photographed from n2 moves the	om	OBSS SSPTS	
					Columbus labo	ns robotic Ca pratory from A	anadarr Atlantis'	nz moves the payload bay to the	he	5515	Continued
					starboard side	of the Harmo	ony mo	payload bay to ti dule.			

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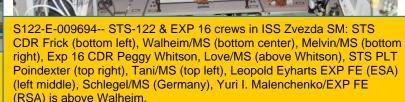
FLT NO.	ORBITER	CREW (6+1 UP/6+1 DN) TITLE, NAMES, & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL Nom-Abort Emerg Throttle Profile Eng. S.N.	SRB RSRM AND ET	INC	orbit Ha/HP	FSW	Payload Weights, Payloads/ Experiments	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-122/ ISS 1E Continued CAPCOMS: SHUTTLE: A/E - J. P. E	outton	EMU/TETHERED EVA 109 SCHEDULED EVA 108 DURATION 7:25 MCC WHITE FCR (51) FLIGHT DIRECTORS:	Continued <u>SE PRESS 104</u> 6:55 6:55 <u>MECO CMD</u> : 8:22.9 8:22.8 <u>VI:</u> 25819 25818 <u>OMS-2</u> : 37:46 37:40 159.6 FPS158.1 FPS	Continued <u>WINDS</u> : 1.9T 0.6R KTS OFFICIAL: 31003P05 KTS 5H 2L KTS <u>DENS ALT</u> : 77 FT <u>FLT DURATION</u> : 12:18:21:39 <u>S/T</u> : 1137:06:46:18 <u>OV-104</u> : 258:07:05:40 DISTANCE:							 Continued New "work to" launch date of NET 02/07/08 established on 01/14/08. Testing of removed ECO connector confirmed problem in the connector. Officially postponed launch to 02/07/08 on 01/28/08. Slip was due to ECO sensor problems experienced during December launch attempt and implementation of ECO sensor connector soldered mod. (Also, LCC went back to the standard three of four valid ECO sensor readings.) LAUNCH SCRUBS: Thursday, 12/06/07 launch attempt was terminated 2 hours in tanking when two of four engine cutoff (ECO) low-level LH2 fu sensors failed wet/dty test. (The 5% sensor also failed wet during drain-back.) The ECO sensors are required for backup engine shutdown command to avoid catastrophic failure in the work of action to the problem of the failure in the subtle during drain-back.)
- 1. W., LD/O1 - K. / O2 - S. K. R PLNG - S. V Team 4 - N/ ISS: OT - H. Get LD/O2 - C., O3/PLNG - Team 4 - N/	obinson V. Lucid A zelman J. Cassidy C. E. Zajac	MOD - P. L. Engeláuf Team 4 - M. R. Abbott ISS: DJ/O2 - S. P. Davis O1 - R. C. Dempsey O3 - J. R. Spencer Team 4 - K. L. Alibaruho IP FD - A. P. Hasbrook (I/F w/Columbus CC, Oberpfaffenhofen, Germany)		5,296,842 sm TOTAL SHUTTLE DISTANCE: 461,345,650 sm	S122-E-0089 Walheim, per laboratory. M shared this E	23 (15 Fe forms wor lission Sp VA with W	b. 2008 k on th ecialist /alheim	8) Mission e outside of f , Stanley Lov	Specia the Colu re (out o	list, Rex umbus of frame),	event of early fuel depletion. Launch was scrubbed at 8:56 an CST. Technical Scrub. - Sunday, 12/09/07 launch attempt was terminated when one of previously failed sensors failed again during tanking, a couple minutes into fast-fill. Engineers stated that the ET feedthrough and connector assembly was the most likely source of the problems. The 12/06/07 and 12/09/07 launch attempts produced previously unavailable time trending data that shows sensor faults occurring shortly before and after the feedthroug and connector were immersed in the super-cold propellants. Technical Scrub.
											LAUNCH WINDOW: - Total launch window was 10m1s with window open at 038:19:40:29Z and close at 038:19:50:30Z. Preferred Launch Time was 038:19:45:30Z (In-Plane Time) for a launch window 5m1s. LAUNCH DELAYS: - None. Launch occurred on time at 038:19:45:30Z, 1:45:30 PM CST on Thursday 02/07/08. TAL WEATHER:

TAL WEATHER: Weather for the Transoceanic Abort Landing (TAL) sites during launch was benign. High pressure at the surface and aloft produced clear skies and light winds for Moron, Spain (MRN), Zaragoza, Spain (ZZA), and Istres, France (ISTRES). All three TAL sites were forecast GO throughout the launch count.

Continued...



S122-E-008911--- Schlegel/MS (ESA Germany) continues work aimed toward readying the new Columbia lab for duty



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SPACE SHUTTLE MISSIONS SUMMARY

FLT ORE NO.	CREW (6+1 UP/6+1 DN) TITLE, NAMES,	LAUNCH SITE, LIFTOFF TIME, LANDING SITES,	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES	SSME-TL Nom-Abort Emerg Throttle Profile	SRB RSRM AND ET	INC	ORBIT HA/HP	FSW	Payload Weights, Payloads/ Experiments	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-122/ ISS 1E Continued	& EVA'S	ABORT TIMES	FLT DURATION, WINDS	ENG. S.N.		sep.				Continued PERFORMANCE ENHANCEMENTS: Include the standard set plus: 1) PE Operational High Q WIN/FEB, 2) OMS Assist, 3) a 52 nm MECO, and 4) Del Psi. FLIGHT DURATION CHANGES/LANDING: On FD4, MMT concurred with formally changing mission duration from 11+1+2 to 12+0+2 to honor ISSP request for extra docked day for commissioning Columbus. (Activity did not fit 11-day mission.) On FD7, MMT concurred with extending the mission duration to 13+0+2 to provide additional time needed to complete the activation of the Columbus module. Landing day was moved to 02/20/08. FIRSTS/LASTS: - First flight ECO sensor connector soldered mod - First flight of new RSRM Nozzle-to-Case J-leg Joint insulation configuration - New Annex Flight Rule in place to outline operational use of ECO sensor voltage measurements - Addition of the Modified Adjustable Protective Mitten Assemblies (APMA's) or Overgloves - First reboost of ISS since December 2002 - Last Shuttle Mission for Shuttle Program Manager N. Wayne Hale, Jr., a 30-year veteran of NASA who helped lead the space agency's recovery from the 2003 Columbia Disaster.
Lunney, & Ric Shuttle FCR o	0344 FD's Norm Knight hard Jones monitor data in the JSC's MCC during launch of hundred miles away at KSC	he Space countdown	JSC2008 Shuttle Pr Director, represent	-E-010460 (8 For rogram Manage participate in ar latives at JSC. For for for the briefing	eb. 2008) er; and Mil I STS-122 Rob Navia	ke Sar 2 press	nn Shannon afin, Lead S s briefing wil	huttle F	light	Mementos carried aboard STS-122 included three green starter flags celebrating the 50th anniversary of NASA and the 50th running of the Daytona 500 NASCAR Race, a dried red rose to be woven into a NASA-themed 50th anniversary float for the Tournament of Roses Parade, and 20 ESA flags whose use will be to commemorate the addition of Columbus to the ISS. <u>NIGHT LAUNCH</u> : N/A <u>RENDEZVOUS #69</u> : Rendezvous and dock with ISS <u>EVENTS</u> : OMS 2 ignition at 038:20:23:09.9Z resulted in a 124.4 by 118.7 nm orbit. SRMS OBSS/LDRI survey of nosecap and port and starboard wing RCC (WLE's) was completed. T I maneuver at 040:14:37:28Z resulted in a 184.0 by 176.0 nm orbit. R-Bar Pitch Maneuver was performed. No significant issues Docking Capture occurred at 040:17:17:20Z. Hard Dock occurred at 040:17:20;20Z (above the South Australian coast - Columbus reached its permanent home). ISS Hatch Open 12:40 PM CST, Saturday, 02/09/08 - welcoment by ISS Crew.

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FLT NO.	ORBITER	CREW (6+1 UP/6+1 DN) TITLE, NAMES, & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL Nom-Abort Emerg Throttle Profile Eng. S.N.	SRB RSRM AND ET	INC	orbit Ha/HP	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-122/ ISS 1E Continued	pose for a p Director Mik BELOW: JS JSC MCC. logo. Crew	C2008-E-01293 The ortrait in the Space Shu te Sarafin (center right) C2008e020392 STS-1 FD Norm Knight (left) & pictured are CDR Frick, S, & Schlegel/MS. (Not	ttle FCR at the JSC holds the STS-122 r 22 Ascent FCT pos CAPCOM Jim Dutto PLT Poindexter, Me	light Control Team MCC. Flight nission logo.	NOTES: - Landing 46 years Earth. - Daniel T SIGNIFIC. Orbite: - Overexp - Fuel Cel - During fl approxim - SSOR # - Suspect - CCTV bl - Mid Port - SRB: - One of tl damage RSRM: - Missing SSME: Ni ET: - ET-124 - foam los - A crack id tranking tl #4 failed - STS-122 losses a MOD: - High-spec - Trajector Integration - Stinger t - Ku-Banc - Unexpect to pad cl - UT to LH - 2 location - LO ₂ Umal	to the day a ani returned ANT ANOM, osed video (1 3 O ₂ flowm ight, Port AF nately 11 ho 1 intermitter indication o ack and whi Payload Ba the three main in the canop piece of forvone Post Launce s at Sta. 114 in the +Y SG kin the the the est on 12/18 in the +Y SG kin the the the set on 12/18 in the the the the set on 12/18 in the the the set on 12/18 in the the the the the set on 12/18 in the the the the set on 12/18 in the the the the the the set on 12/18 in the	Alter the home a ALIES: due to s eter is e T MPM urs after t comm f possible te video y Floodi n paraciony. vard fact b durin B Pal R 3/07. ngeron 6 the ET h attem nched c acreage ost Lauk k to Lh2 pouts di S time falling a Hi Powe xpected of debri seout fo eign ma Tray foa ailure i of + Y b	I Pedestal Stow r actual stow. dropouts le IML crack on shows intermit light not illumina hutes on BI-132 tory joint weather ra and film revie g Launch. tory joint weather ra and film revie g Launch. tamp was obser Closeout was o -125 tanking tes pt of ET-125 on on 02/07/08. Po- foam loss at St inch camera an 2 flange closeou uring Launch misconfiguratio after SSME star er d debris exceed is) am loss aterial located on am loss (aft of X o Xt 1129 LO ₂ F	indication noted tile tent color ting 2 LH show er seal, R ew showe ved prior bserved c ton 12/1 12/06/07 st Launch a. 1145 cd d film rev tt at two li n tup ing mass fsRB (t-2058) Feedline b	nn, orbited the ns came on wed significant SRM-99B rd LH2 acreage to the ET-125 during the post- 8/07. 7, ECO/S #3 and n camera and film luring Launch. iew showed TPS pocations.	 Continued IELK Seat Liner Transfer at 040:23:20Z (5:20 PM CST, Feb. 9, 2008). At that time Daniel Tani became a member of STS-122 and Leopold Eyharts/ESA joined the ISS Expedition 16 as Flight Engineer. Due to crew health issue, EVA1 postponed from FD4 to FD5 FD5 EVA 1: EV1 and EV3 (sub for EV2, health issue) performed Columbus prep activities: connected data, power, and communications lines; removed LTA cable and CBM seal cover; installed PDGF; performed NTA prep activities; and stowed OTSD. Columbus second stage bolting completed at 3:44 PM CST Monday, 02/11/08. EVA1 duration 7h58m FD7 EVA 2: EV1 and EV2 completed primary task to R&R a spent Nitrogen Transfer Assembly, outfit Columbus with trunnion covers, and repair Lab MMOD shield. EVA 2 duration 6hr45m The OMS Pod stinger tile was cleared for entry. FD9 EVA 3: EV1 and EV3 transferred SOLAR to Columbus, installed Columbus keel pin cover and handrail, transferred CMG to PLB, transferred EuTEF, and performed Airlock handrail damage swatch test. EVA 3 duration 7h25m EVA NOTE: One EMU glove from STS-122, S/N 6197, had a 3/16-inch hole in the Vectran of left thumb that wasn't seen until postflight inspections on the ground. S/N 6197 was Rex Walheim's left glove worn on all three EVA's (per STS-123 03/11/08 MMT notes). European Flight Controllers told the crew they had successfully completed initial activation of Columbus with the module's computer systems. German Chancellor Angela Merkel called to congratulate the crew. FD9: To clear the path to shoot down a crippled spy satellite, MASA agreed to open its California landing strip on Wednesday, 02/20/08 so Atlantis could land that day, even if weather was bad at KSC. "The reason is to give the military the biggest possible window and maximum flexibility to ensure the success of the satellite intercept" per Lead Shuttle Flight Director Sally Davis. Transfers: Hardware/supplies transferred from ISS: 3585 l

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		CREW		LANDING SITE/	SSME-TL						
FLT	ORBITER	(6+1 UP/6+1 DN)	LAUNCH SITE, LIFTOFF TIME,	RUNWAY, CROSSRANGE	NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS
NO.	URBITER		LIFTOFF TIME,	LANDING TIMES	THROTTLE	AND	INC	HA/HP	FSW	PAYLOADS/	(LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS,
10.		TITLE, NAMES & EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET	1110	10,011		EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
070 400/				WINDS	ENG. S.N.						
	0V-105 (Flight 21) ENDEAVOUR OMS PODS:	<u>CDR</u> : Dominic L. Gorie (Flt 4 - STS-91, STS-99, STS-108) P756/R242/V157/M211	Tuesday (17)	KSC 15 (KSC 68) 087:00:39:06Z 8:39:06 PM EDT Wednesday (16) 03/26/08 (9)	104/104/109% <u>PREDICTED</u> : 100/104.5/104.5		51.6 (25)	DIRECT INSERTION POST OMS-2: 124.9X84.8 NM	OI-32 (3)	<u>CARGO:</u> 38915 LBS <u>PAYLOAD</u> CHARGEABLE:	BRIEF MISSION SUMMARY: STS-123/1JA (25th ISS mission) delivered the first pressurized component of the Japanese Kibo Laboratory to ISS, delivered a Canadian robotic device called Dextre, and provided five spacewalks. Endeavour's 16- day flight was the longest shuttle mission to the ISS. The
	LPO3-32 RPO4-28 FRC5-21	PLT: Gregory H. Johnson P757/R322/M278	3/11/08 (9) <u>LAUNCH WINDOW</u> : 4M54S	DEORBIT BURN: 086:23:33:13.9 Z	72/104.5 <u>ACTUAL</u> :	ET-126 SLWT 30				30762 LBS <u>DEPLOYED</u> : 29442 LBS	Japanese Experiment Logistics Module Pressurized Section (ELMPS or JLP), the smaller of two pressurized modules of Kibo. was attached temporarily to a docking port on the
K3C-122			(PLT IN-PLANE)	<u>XRANGE</u> : 187.7 NM	100/104.5/99/ 72/104.5						space-facing side of Harmony. Kibo, which means "hope," is the major Japanese (JAXA) contribution to the Station, and
PAD 39A-45		MS 1/EV2: Robert L. Behnken P758/R323/M279	<u>EOM PLS</u> : KSC <u>TAL</u> : ZZA TAL WX: BEN	<u>ORBIT DIR</u> :A/R (14) AIM PT: NOMINAL	1 = 2047 (11)	<u>ET</u> IMPACT:		<u>DEORBIT</u> : HA 190.0 NM HP 22.5 NM		NON-DEPLOYED: 1132 LBS	will increase its research capability in a variety of disciplines. The robot Dextre is designed somewhat like the human form with a torso, a head area (camera), and arm appendages. It
MLP-3		MS 2/EV3: Michael J. Foreman		<u>MLGTD:</u> 2174 FT 087:00:39:06Z	2 = 2044 (10) 3 = 2054 (7)	MET 1:14:05		HP 22.5 NM <u>ENTRY</u> VELOCITY:		MIDDECK: 188 LBS	rides on the SSRMS as a "dexterous tool for ORU changeout without requiring a space walk." This mission included representation of all five Station partner interests - the U.S.,
25TH SHUTTLE FLIGHT TO		P759/R324/M280 MS 3: Takao Dai: JAXA	<u>TAL</u> : ZZA 30L N/N (MRN: NO-GO)	VEL: 202 KGS 200 KEAS	<u>M 3 EOM</u> : WEIGHT:	<u>LAT</u> : 36.723S		25859 FPS		<u>SHUTTLE</u> ACCUMULATED WEIGHTS:	representation of all five Station partner interests - the U.S., Japan, Canada, Russia, and the European Space Agency (ESA).
ISS		Takao Doi, JAXA (Flt 2 - STS-87) P760/R231/V195/M201	<u>AOA</u> : NOR 23 N/N <u>1ST DAY PLS</u> : EDW 04 N/N	HDOT: -1.8 FPS TD NORM 195: 2707 FT	208629.5 LBS X CG:	<u>LONG</u> : 158.957W		<u>ENTRY</u> <u>RANGE</u> : 4402 NM		<u>DEPLOYED</u> : 1423027 LBS	KSC W/D: OPF: 159, VAB HB-1: 7, PAD A: 23 = 189 Total Work Days (+ 14 holidays @ OPF)
		<u>MS 4/EV1:</u> Richard M. Linnehan (Flt 4 - STS-78, STS-90,	<u>TDEL</u> : 0.000 (P) -0.288 (A)		1080.57 IN LANDING:					<u>NON-DEPLOYED</u> : 1601668 LBS	LAUNCH POSTPONEMENTS: - Added STS-123 to FDRD - launch date of NET 12/08/07 on
OREMAN	OF LUMERIES ST	STS-109) P760/R214/V150/M187	<u>MAX Q NAV:</u> 754.38 (P) 758.53 (A)	087:00:39:10Z <u>NLGTD</u> : 5351 FT 087:00:39:167	WEIGHT: 208762 LBS					<u>CARGO TOTAL</u> : 3901248 LBS	11/14/06 - Postponed to 02/14/08 on 04/16/07. Slip due to STS-117 rollback
		MS 5 UP/EV4/EXP 16/17 FLT ENG: Garrett E. Reisman P761/R325/M281	<u>SRB STG</u> : 2:05.44 (P) 2:04.64 (A)	VEL: 161 KGS 158 KEAS HDOT: -4.6 FPS	X CG: 1081.8 IN					PERFORMANCE MARGINS (LBS): FPR: 2651 FUEL BIAS: 1063	 Postponed to 03/11/08 on 01/28/08. Slip due to ECO sensor problems experienced during December launch attempt of STS-122
XVI		MS 5 DN/EXP 16 FLT ENG:	<u>PERF</u> : NOMINAL	BRK INIT: 57 KGS						FINAL TDDP: 2109 RECON: 5128	LAUNCH SCRUBS: None
		Leopold Eyharts, ESA (UP on STS-122, Stay on ISS. Also flew on MIR Feb 1998.)		DRAG CHUTE JETTISON: 58 KGS 087:00:39:55Z				i i		<u>PAYLOADS</u> :	LAUNCH WINDOW: Total launch window was 9 minutes 44 seconds with window open at 071:06:23:20Z and close at 071:06:33:04Z. Preferred Launch
		P762/R321/M277	<u>NEG RETURN:</u> 3:54 (P) 3:55 (A)	<u>BRK DECEL FPS²:</u> AVE 2.7 PK 4.1						<u>PLB:</u> ISS-1JA (JAXA LOGISTICS MODULE)	Time was 071:06:28:14Z (In-Plane Time) for a launch window of 4m54s.
		SS EVA 117 DOCKED QUEST EVA 40	<u>PTA (U/S 158 FPS)</u> : 5:04 (P) 5:01 (A) SE TAL (ZZA 104):	WHEELS STOP: 087:00:40:36Z 13629 FT						MIDDECK: ISS-1JA	Chief Astronaut Steve Lindsey flying the Shuttle Training Aircraft said, "It's a really nice night out here." PAO: "Florida's east coast is about to get an early sunrise!"
		EMU/TETHERED EVA 110 SCHEDULED EVA 108 DURATION 7:01	5:57 (P) 6:04 (A) PTM (U/S 181 FPS):	<u>ROLLOUT</u> : 11455 FT			n.	- Marcon		5 CRYO TANK SETS	LAUNCH DELAYS: None. Launch occurred on time at 2:28 a.m. EDT, Tuesday, March 11, 2008. An eclipse of the GOES-East
The second		SSA EVA 118 DOCKED QUEST EVA 41	6:05 (P) 6:03 (A)	1:30 M:S			to the	all an		RMS (79)	weather satellite prevented using any satellite imagery in the hour prior to launch. Fortunately, the low clouds remained well behaved as skies were cloudy but above the range safety and
	515-123 1J/A	EMU/TETHERED EVA 111 SCHEDULED EVA 109 DURATION 7:09	6:56 (P) 6:57 (A)			Overcast clo	uds at	March 2008) 6500 ft provided a		ODS OBSS SSPTS	Return to Launch Site (RTLS) cloud ceiling limits.
		Continued	Continued	Continued				hage as the cloud uttle 's exhaust.	ds		

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									•
FLT ORBIT	CREW (6+1 UP/6+1 DN)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM	ORBIT	FSW	payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.	TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-123/ ISS 1JA Continued	& EVA'S Continued SS EVA 119 DOCKED QUEST EVA 42 EMU/TETHERED EVA 112 SCHEDULED EVA 110 DURATION 6:47 SS EVA 120 DOCKED QUEST EVA 43 EMU/TETHERED EVA 110 DURATION 6:47 SS EVA 120 DOCKED QUEST EVA 43 EMU/TETHERED EVA 111 DURATION 6:24 SS EVA 121 DOCKED QUEST EVA 44 EMU/TETHERED EVA 111 DURATION 6:22 MCC WHITE FCR (52) FLIGHT DIRECTORS: SHUTTLE: ASC - B. C. Lunney LD/O1 - M. P. Moses O2 - R. E. LaBrode PLNG - M. R. Abbott ENT - R. S. Jones MOD - P. L. Engelauf		FLT DURATION, WINDS Continued <u>WINDS:</u> 1.5T 1.3L KTS OFFICIAL: 01002P03 KTS 2H 2R KTS DENS ALT: -336 FT	PROFILE ENG. S.N.	ET	March 2008) T and the Japanese ur's cargo bay on	e Kibo lal	EXPERIMENTS	
	Team 4 - R. S. Jones/ A. J. Ceccacci ISS: LD/O2 - D. J. Weigel O1 - K. L. Alibaruho O 3 - G. Kerrick Team 4 - H. L. Rarick IP FD - E. J. Nelson (//F w/CSA & JAXA) CAPCOMS: SHUTTLE: A/E - J. P. Dutton K. A. Ford (Wx) LD/O1 - T. W. Virts O2 - N. J. Patrick PLNG - B. A. Drew Team 4 - N/A Continued		ISS CDR Pegg front), and Gar Eyharts/ESA (crew. Leaving (second left, re Doi/JAXA MS	gy Whitson (seo rrett Reisman/F right rear), form I ISS with Eyha ear), PLT Grego (right front), Rio	cond right, E (left rea her Exp16 rts are the ory H. Joh ck Linneha	reen shirts) & ISS rear), Yuri Maler y). Also in green s FE, who has move Endeavour crew naon (behind Mal an/MS (behind Do benken/MS (far let	nchenko/ shirt is Le ved over CDR Do enchenk i); Mike I	FSA FE (left, eopold to the STS-123 ominic Gorie o), Takao Foreman/MS	 First hight of a lighting system derived from an off-the-shelf flash (Nikon SB800) was added to a digital camera (in orbiter umbilical well) to capture photos of ET after separation for about 130 ft away. This is the last modified tank (before Columbia) and the next will be a tank built with all mods done in line. First on-orbit test of orbiter tile repair technique. First time the OBSS was left on the Station so that the next flight can deliver the large JAXA Kibo module. This mission marks a significant milestone with the inauguration of the JAXA IP support to real-time operations, adding them to the fold with ESA, CSA, and Russia. "We have reached a new pinnacle in the 'international' part of the Space Station operations." Spacelab Logistics Pallet (SLP) used by Dextre made its fourth and final flight to space, "concluding a long history that can be traced back before the first shuttle left the launch pad." - PAO. First flight with John Shannon as Shuttle Program Manager. NOTE: The unmanned cargo ship Jules Verne, the ESA's first Automated Transfer Vehicle (ATV), launched toward ISS on March 7. It was parked well away from ISS at a safe distance until Endeavour's departure.

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FLT	ORBITER	CREW (6+1 UP/6+1 DN)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	Landing Times Flt Duration, Winds	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		Payloads/ Experiments	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-123/ SS 1JA Continued		Continued <u>ISS</u> : 01 - Z. Jones LD/O2 - S. K. Robinson O3 - M. T. Vande Hei Team 4 - R. C. Dempsey									Continued <u>NIGHT LAUNCH #30:</u> Shannon: "We are launching in the dark." <u>NIGHT LANDING KSC #16:</u> (#22 in Shuttle history) <u>RENDEZVOUS #70:</u> Rendezvous and dock with ISS
											 EVENTS: OMS2 ignition at 071:07:06:44.0Z resulted in a 124.9 by 84.8 nm orbit. SRMS OBSS/LDRI survey of nosecap and port and starboard wing RCC (WLE's) was completed. TI maneuver at 073:00:42:21.9Z resulted in a 186.3 by 180.6 nm orbit. R-Bar Pitch Maneuver was performed. No issues Docking contact occurred at 073:03:46:54Z. Hard Dock occurred at 073:04:02:11Z ISS Hatch opened at 073:05:36:00Z, 12:36 AM CDT, Thursday, March 13, 2008, ISS crew welcoming IELK Seat Liner Transfer at 073:07:50Z (2:50 AM CDT, March 13, 2008). At that time Leopold Eyharts/ESA became a member of STS-123 and Garrett Reisman joined the ISS Expedition 16/17 as Flight Engineer. The first transfer item after hatch opening was swapping Garrett Reisman/MS for Leopold Eyharts (ESA)/Expedition 16/FE. The previous of the text of the text of the text of text of the text of text of the text of the text of the text of text of the text of text of text of the text of text of the text of text of the text of the text of text of the text of te
		hehan & Foreman asser attaching its two arms d		S123-E-00708 shown in the c	8 (18 March 2 rasp of the sta	008) C ition's rob	canada otic Ca	's two armec anadarm2.	i robot,	Dextre, is	 16/17 as Flight Engineer. The first transfer item after hatch opening was swapping Garrett Reisman/MS for Leopold Eyharts (ESA)/Expedition 16 FE. The transfer was official when the form-fitting Soyuz seatliners were swapped. Eyharts spent 33 days as a member of ISS Expedition 16. With the on-time landing of March 26, Eyharts spent a total of 48 days in space. FD4/5: EVA 1: EV1 & EV4: JLP prepped for unberthing, shuttle robot arm grappled JLP, Orbital Replacement Unit (ORU and Tool Changeout Mechanism installed on the Canadian Special Purpose Dexterous Manipulator (SPDM or Dextre) arm 2 and arm 1, shuttle arm unberthed JLP, and shuttle arm installed JLP onto Harmony zenith port (temporary location until Kibo delivery on STS-124). Unable to provide keep-alive power to SPDM (later determined to be flawed cable in pallet). EVA 1 duration 7:01
S122.E.00		sman, Exp 16 & Linneha	an (out-of frame)	S123-F-006	729 Linneha	an (right)	& Reh	nken installe	spare	Poarts	 duration 7:01 FD6: While Expedition 16 and STS-123 crewmembers brought the Kibo logistics module to life, Dextre's power supply unit was brought to life via the SSRMS. FD6: EVA 2: EV1 & EV3: EVA ran long due to problems with the SPDM Arm Expandable Diameter Fasteners (EDF's) not releasing per procedure. Crew ended up using a pry bar. Time didn't permit removing some of the SPDM blankets. EV3 experienced RTV delamination. Per Rule (1JA_C2-105), EMU OVERGLOVE EXCEPTIONS, crew continued the SPDM assembly task without donning overgloves due to the thermal constraints on SPDM. EV3 donned overgloves once the thermal critical tasks were complete. ISS multimeter was repaired and would later be swapped with shuttle multimeter prior to hatch closure. Installed the Node 2/JLP vestibule barrie assembly. EVA 2 duration 7:09
		it mechanisms on Dextro			tool-handling					parto	assembly. EVA 2 duration 7:09 Continued

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SPACE SHUTTLE MISSIONS SUMMARY

FLT	ORBITER	CREW (6+1 UP/6+1 DN)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	Throttle Profile Eng. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)

STS-123/ ISS 1JA Continued...



assembly 70% complete.

LI ORBUTE LAUNOS 15TE BUNNAY, LUTION 15M, COSSNA OABAD TI END 15M, COSSNA SR8 OFBIT PAVLOAD MISSION HIGHLIGHTS LUNCES NO. TILL MARS LAUNOS STES. LAUNOS TILS STES. LAUNOS STES. LAUNOS TILS STES. PAVLOAD TILL MARS LAUNOS STES. LAUNOS TILS STES. PAVLOAD			00514		LANDING SITE/	SSME-TL						
Hit Users in a start in the st				LAUNCH SITE,			SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
Intra-works AGGRT TWRES IT D UNATION PORPHIE FT End State		ORBITER								FSW		
No. Open Start Open Start <td>NO.</td> <td></td> <td>TITLE, NAMES</td> <td></td> <td></td> <td></td> <td></td> <td>INC</td> <td>HA/HP</td> <td></td> <td></td> <td>A second /td>	NO.		TITLE, NAMES					INC	HA/HP			A second
SIS-124 SIS-1			& EVA'S	ABORT TIMES			EI				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
SIS-124 (PU-03) (SC-129)(PU-107)(PU-107)(PU-1			CDR:	KSC 39A	KSC 15 (KSC 69)		BI-134	51.6	DIRECT			BRIFF MISSION SUMMARY: STS-124/11 (26th ISS mission)
Decourse Decourse Product / Information Saturation (information) Constraint (STS-124/	OV-103	Mark E. Kelly				DCDM	(26)	INSERTION	(4)	41997 LBS	delivered the second and main segment of the Japanese
Party 122 Des FDDS PLT Des FDDS	ISS 1J	(Flight 35)		5:02:12 PM EDT (A)	Saturday (22)				POST OMS-2:		ΡΔΥΙΟΔΠ	
PI 19 103 DS 1026 Control T, Ham Bry Herk Rob Comparison and matches An	SEO	DISCOVERY	1 /05/12/1/ 101/10237	Saturday (7)	06/14/08 (8)		FT 100		170.3x125.0 NM		CHARGEABLE:	
KSC-123 Max Handlin Law Law (H) (H) (H) Mark (H) Handlin Law Class (H) MA 33 MA 15 Mark (H) M	FLT# 123	OMS PODS:		05/31/08 (7)	DEORBIT BURN:	104.5	E1-128				33969 LBS	36.7 feet long. The Kibo complex also includes: An airlock
PAD 3046 FIG3 35 MS Methodiss: MS Methodiss: Proprint Newson Proprint Newson Proproprint Newson Proprint Newson Proprint Newso	100 100		P764/R326/M282	LAUNCH WINDOW:	166:14:10:12Z	ACTUAL:					DEPLOYED [.]	and two robotic arms also delivered on this flight; the
PAD 30A-40 PM2 INCOMES	KSC-123			6M 47S (PLT IN- PLANE)	XRANGE: 270.2 NM		31				33890 LBS	Section (launched on STS-123): and an exterior platform for
MLP3 M2 Structure MAX Flight Control Team activated and controlled and activation data of space and space activation of the space of the sp	PAD 39A-46	FRC3-30		,								experiments exposed to space, scheduled for delivery on
MS_EVE2 TAL_W2: FM MALET: NOMINAL 2-208 (8) MET SHUTTLE P/64R328/R283 SELECT2 MAPE: NOMINAL SELECT2 VIELGHT D SELECT2 SELECT2 SELECT2 SELECT2 VIELGHT MAPE: NOMINAL SELECT2 SELECT2 VIE					ORBIT DIR: A/L 39	1 - 2051 (7)	FT				<u>NON-DEPLOYED</u> : 01BS	STS-127. The STS-124 mission is the first in which the
Bit III E Micro Control	MLP-3		MS 2/EV/2		<u>AIM PT</u> : NOMINAL	2 = 2048 (8)					0 200	module from Kibo Mission Control in Tsukuba, Japan.
SHUTTLE Productave and the standard of the stand	26TH		Ronald J. Garan			3 = 2058 (2)	МЕТ				MIDDECK:	Also, as the STS-124 launch countdown got underway, a
FLIGHT TO M3 3EV/L (2004 KSC 15 N/L) (12 - STS 121) (12 - STS 121	SHUTTLE		P766/R328/M283								19 LBS	special Russian pump was added to Discovery's manifest
SS Michaele F-cossum (P12, STS-12) Ac. ECR (P2, STS-12) (P12, STS-12) Ac. ECR (P12, STS-12) Ac. EC			MS 3/EV1:	TAL: MRN 20 N/N	VEL: 209 KGS		1 A T				SHUTTLE	to lix a balky tollet off the 155.
Profinzación/ib/m/259 IST DAY PLS EDT TAGENTIAL DORM 195 3172 FT MS 4/RODORISIS Alablo Moshine (Japan) Profinzación/ Profinzación/ (Japan) Profinzación/ (Japan) Profinzación/ (Japan) Profinzación/ Profinzación	155		Michael E. Fossum	(ZZA NO-GO) AOA: KSC 15 N/N	208 KEAS HDOT: -2 1 FPS		<u>LAT:</u> 36.3625					
Weight is an interval in the in		· · · · · · · · · · · · · · · · · · ·	(FILZ - STS-121) P767/R296/V/196/M259	1ST DAY PLS: EDT		<u>M 3 EOM</u> :						Days (+ 13 Hulldays @ OPF)
Image: Subject of the set of the se				22 N/N		WEIGHT	LONG: 158.449W					
Image: Constraint of the second of the se	19.00		MS 4/Robotics:			203604.5 LBS	130.44700		DEORBIT:			- Ppd_to 04/24/08 on 04/16/07 Slip due to STS-117 rollback
Image: Product 29/M264 MAX C NAV: To 5 (0P) 701.98(A) MAX C NAV: To 5 (0P) 701.98(A) Image: Product 29/M264 MAX C NAV: To 5 (0P) 701.98(A) Image: Product 20/M264 Product 29/M264 Product 20/M264			(Japan)	0:000(P) -0.508(A)	DRAG CHUTE	V CC·			HA 190.6 NM		1601747 LBS	- Ppd. to 05/25/08 on 03/07/08. Slip due to ET delivery delay and
MS.5 UP[stay as EXP 17/18 P1_LINC T15.16(P) 701.98(A) 16:15:15.20Z ANDING: FITTER P1 FITTER P1 (20358.95 LBS ENTRY FUNCTIVE E	The second	and the second s	P768/R329/M284		194 KEAS	1088.03 IN						Beta Angle restriction. - Pnd to 05/31/08 on 04/03/08 Slin due to adverse weather
HLRS: MIGD: 5601 FT WEIGH: MIGD: 5601 FT WEIGH: MIGD: 5601 FT MIGD: 5			MS 5 UP/Stay as EXP 17/18	715.16(P) 701.98(A)	166:15:15:20Z						<u>CARGO TOTAL:</u> 39/32/51 BS	conditions affected on dock delivery date of ET-128.
Bits Description Descrin Descrin Descr			FLT ENG:	SRB STG:	NLGTD: 5601 FT	LANDING.			VELOCITY:		3743243 ED3	
WS 5 DNEXP 16/17 FLT Correct L, Reisman (Up on STS-123, stay ISP) PT AUX25M0281 PERE: NOMINAL 2 ENG TAL (ZZA): 2.48(P) 2.47(A) 14 & KEAS BRK INIT: 77 KGS X CG: 1090.00 IN PPR: 2651 4396 NM FPR: 2651 FLE BIAS: 1063 FLUE BIAS: 1063 FLUE BIAS: 1023 FPR: 2651 FLUE BIAS: 1063 FLUE BIAS: 1023 SPECIAL EDUCATOR "Buzz" Lightyear (UP/EXP 18) See "Firsts" PER: NOMINAL 2.48(P) 2.47(A) PTA (U/S 159 PFS): 5:19 DRAG CHUTE 5:4KGS 5:19 X CG: 1090.00 IN PRAG CHUTE 4396 NM FPR: 2651 FLUE BIAS: 1063 FLUE BIAS: 1023 FPR: 2651 FLUE BIAS: 1023 SPECIAL EDUCATOR "Buzz" Lightyear (UP/EXP 18) See "Firsts" PEG RETURN: 5:19 3:55 5:23 DRAG CHUTE 5:4KGS 5:19 X CG: 1090.00 IN PATLOADS: PAYLOADS: 5:4KGS PAYLOADS: FLUE BIAS: 1023 PAYLOADS: FLUE BIAS: 1023 VEG RETURN: 10:02 M: 50 SE FLU (FMI 104): 6:08 NEG RETURN: 5:19 SE FLU (FMI 104): 6:08:115:15:92 NEG RETURN: 5:4KGS NEG RETURN: 5:512 NEG RETURN: 5:512 NEG RETURN: 5:512 NEG RETURN: 5:512 NEG RETURN: 5:512 NEG RETURN: 5:512 NEG RETURN: 5:512 <t< td=""><td></td><td></td><td>P769/R330/M285</td><td>2:03:36(P) 2:02.56(A)</td><td></td><td></td><td></td><td></td><td>25866 FPS</td><td></td><td></td><td></td></t<>			P769/R330/M285	2:03:36(P) 2:02.56(A)					25866 FPS			
Image: Construction of the construc				PERF: NOMINAL	148 KEAS	203558.5 LBS			ENTRY			
Garrett E. Reisman Carcett E. Reisman BRK INIT: 77 KGS BRK INIT: 77 KGS Imme van 1522:102:122 (in-Plane 1ime) for a launch window of a damaged flame trench and blasted bricks and other debris beyond a perimeter fence some Imme van 152:102:122:102:122 (in-Plane 1ime) for a launch window of a damaged flame trench and blasted bricks and other debris beyond a perimeter fence some Imme van 152:102:102:122:102:122 (in-Plane 1ime) for a launch window of a damaged flame trench and blasted bricks and other debris beyond a perimeter fence some	AND THE	1 MELSMANY.	MS 5 DN/EXP 16/17 FLT FNG:		HDOT: -7.0 FPS				RANGE		FUEL BIAS: 1063	at 152:21:01:14Z and close at 152:21:08:59Z. Preferred Launch
Image: Constraint of the constraint	<u>افرا :</u>		Garrett E. Reisman		BRK INIT: 77 KGS	1090.00 IN	1/1/1 // 1/ 1/		4396 NM			
New Price			(Up on STS-123, stay ISS) P770/P325/M281	., .,				-			RECON: 2513	6m47S.
SPECATOR PTA (U/S 159 FPS): 5:19 54 KGS UP/EXP 18) See "Firsts" TA (U/S 159 FPS): 5:19 54 KGS See "Firsts" SE TAL (FMI 104): 6:03 54 KGS MIDDECK: MIDDECK: WILL Saturday, May 31, 2008. On launch day, the sea breeze pushed across KSC with showers just west of the launch pad several hours before launch time. However, the sea breeze had pushed west of KSC by early afternoon with near ideal conditions for launch. Thunderstorms were occurring over central Florida but were well outside the 20 nautical mile thunderstorm flight rule limit "Nice day to send 'Hope' to the ISS" - PAO. Cain: "If you watched today, you saw a flawless countdown." MECO CMD: B224 8:26.3				NEG RETURN:			E MADE	9		and the second second		LAUNCH DELAYS: None.
Image: Construction of the problem		the state			54 KGS			Y	MUL SERIE		PLB:	
See *Firsts* S. TY			(UP/FXP 18)		166:15:15:59Z	A CONTRACT					133-13	Saturday, May 31, 2008. On launch day, the sea breeze pushed
SE TAL (FMI 104): AVE 4.8 PK 6.3 G:08 6:13 PTM (U/S 180 FPS): 166:15:16:192 11421 FT 166:15:16:192 11421 FT 080531"Shuttle launch exhaust thrust damaged flame trench and blasted bricks and other debris beyond a perimeter fence some SK 10 MAUAI News of KSC but end uafter non-with new ideal conditions for launch. Thunderstorms were occurring over central Florida but were well outside the 20 nautical mile thunderstorm flight rule limit Nice day to send 'Hope' to the ISS" – PAO. Cain: "If you watched today, you saw a flawless countdown."					BRK DECEL FPS ² :		and the second	-			MIDDECK:	
Image: Second					AVE 4.8 PK 6.3	Contractor I	-					
PTM (U/S 180 FPS): 166:15:16:192 1:421 FT SE PRESS 104 7:01 7:07 MECO CMD: 8:26.3 080531*Shuttle launch exhaust thrust damaged flame trench and blasted bricks and other debris beyond a perimeter fence some Scravo TK SETS Were well outside the 20 nautical mile thunderstorm flight rule limit	10	20	A		WHEELS STOP	and and	in the star	and the second second				
SE PRESS 104 7:01 7:07 MECO CMD: 8:24 8:26.3 ABCO CMD: 8:24 B:26.3 Continued in the presence of the control of the presence /li>	(Second	JIJ		PTM (U/S 180 FPS):	166.15.16.197					The second	5 CRYO TK SETS	were well outside the 20 nautical mile thunderstorm flight rule limit.
SE PRESS 104 7:01 ROLLOUT: 9321 FT 1:02 M:S MECO CMD: 8:24 8:26.3 080531"Shuttle launch exhaust thrust damaged flame trench and blasted bricks and other debris beyond a perimeter fence some		× 1 845)		6:18 6:29	11421 ET				A IT -	1-	SBMS (80)	
100 100 <td></td> <td>STS-NA</td> <td></td> <td>SE PRESS 104</td> <td></td> <td>Rit</td> <td>the second</td> <td></td> <td>A THE SAL</td> <td>9</td> <td>ODS, OBSS (Return</td> <td>watched today, you saw a flawless countdown."</td>		STS-NA		SE PRESS 104		Rit	the second		A THE SAL	9	ODS, OBSS (Return	watched today, you saw a flawless countdown."
MECO CMD: MECO CMD: 8:24 8:26.3 damaged flame trench and blasted bricks and other debris beyond a perimeter fence some				7:01 7:07	9321 FT		At an		the state of the		Only)	
8:24 8:26.3 damaged flame trench and blasted bricks and other debris beyond a perimeter fence some				MECO CMD:	1.02 101.3						33713	Continued
				8:24 8:26.3								
1,800 feet from pad. No damage to Shuttle."												
Continued				Continued	Continued	1,800 feet fr	rom pad. N	o dam	age to Shuttle."			
Continued Continued			Continued	Continuea	Continuea							

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FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT	SRB RSRM	ORBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS
NO.	ORBITER	TITLE, NAMES & EVA'S	LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	EMERG THROTTLE PROFILE ENG. S.N.	AND ET	INC HA/HP	FSW	PAYLOADS/ EXPERIMENTS	(LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-124/ ISS 1J Continued		Continued SS EVA 122 DOCKED QUEST EVA 45 EMU/TETHERED EVA 115 SCHEDILED EVA 113	Continued <u>VI:</u> 25819 25820 <u>OMS-2</u> : 37:20 37:21 250.7 FPS 249.1 FPS	WINDS Continued WINDS: 0 KT 5 L KTS OFFICIAL: 07007P12 KTS 1H 12L KTS DENS ALT: 1748 FT FLT DURATION: 13:18:13:06 S/T: 1166:19:10:16 OV-103: 305:08:10:09 DISTANCE: 5,735,643 sm TOTAL SHUTTLE DISTANCE: 473,659,150 sm	S124E005921 S124-E-0059 the Kibo Japa	nese Pre	the grasp of ISS ro essurized Module (ay to the port side of	JPM) is	moved from	Continued TAL WEATHER: The TAL weather conditions were rather challenging. An upper low had been spinning over Spain for several days, drifting slowly to the northwest. Timing differences in the models made forecasting where precipitation would develop difficult. Initially on L-2 day, NO-GO forecasts were issued for Moron and Zaragoza, Spain with a GO forecast for Istres, France. Shuttle launches require only one of the three TAL sites have GO weather. As the upper low began to finally move to the northwest, forecasts were updated to GO for Moron, but a NO-GO for Istres. On launch day Moron weather remained favorable and conditions at Istres improved and were GO. Zaragoza was observed NO-GO at TAL landing time. <u>PERFORMANCE ENHANCEMENTS</u> : Include the standard set plus: 1) PE Operational High Q TRN/JUN, 2) OMS Assist, 3) A 52 nautical mile MECO, and 4) D Psi. <u>FLIGHT DURATION CHANGES/LANDING</u> : None
		Team 4 - R. E. LaBrode <u>ISS:</u> LD/O2 - A. P. Hasbrook O1 - R. C. Dempsey O3 - E. J. Nelson Team 4 - B. T. Smith IP FD - H. E. Ridings (I/F w/JAXA) Continued			the JPM, inst	alling cov I thermal	Ssum & Garan outfers and external tecovers and insulated	elevision	n equipment	 First Bight of an ET built from scratch with all of the safety modifications stemming from the 2003 Columbia accident. "Ti essentially is the completed return-to-flight tank," Shannon. First docking of Shuttle while ATV also docked to ISS. First OBSS transfer from ISS to Orbiter. First D2 Inspection" done on previous missions. First flight of Modified EMU gloves: includes addition of Turtleskin™ patches to thumb and index finger – to provide increased protection against cuts. A first: NASA and Disney joined forces for education. "Buzz Lightyear," a 12-inch tall action doll, based on the cartoon character from the Pixar Studios Toy Store animated movies was delivered to the ISS for a 6-month stay. While on ISS, Lightyear will demonstrate zero gravity to elementary school children. NIGHT LAUNCH: N/A RENDEZVOUS: #71 - Rendezvous and dock with ISS Continued

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FLT NO.	ORBITER	CREW (7) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION,	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE	SRB RSRM AND ET	ORBIT	FSV IP	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-124/ ISS 1J Continued		Continued CAPCOMS: <u>SHUTTLE:</u> A/E - T. W. Virts - K. A. Ford (Wx) LD/O1 - N. J. Patrick O2 - B. A. Drew PLNG - S. W. Lucid Team 4 - N/A <u>ISS:</u> O1 - M. T. Vande Hei LD/O2 - C. J. Cassidy O3/PLNG - M. C. Jensen Team 4 - N/A								 Continued <u>EVENTS:</u> Shuttle launch sent asbestos 1,800 feet from pad. The 6 million pounds of thrust from Discovery's engines, channeled by the flame trench, blasted bricks, concrete rubble, and asbestos beyond a perimeter fence some 1,800 feet away. Bricks and some asbestos landed in a retention pond behind the fence. No damage to Shuttle. OMS2 ignition at 152:21:39:32.5Z resulted in a 170.3 by 125.0 NM orbit. NOTE: SRMS OBSS/LDRI survey of nosecap and port and starboard wing RCC (WLE's) was not performed until post undocking (no OBSS on Shuttle). <u>FD2</u>: TI Maneuver at 154:15:16:26.0Z resulted in a 183.9 by 182.2 NM orbit. R-Bar Pitch Maneuver was performed. No issues
docking. L CDR Kelly	_eft Foregrour y & PLT Ham;	5615 STS-124 & Exp 1 1d: EXP17 CDR Sergei V Fossum/MS (center left), RSA (right), Garan/MS, C	olkov (RŠA). Left, p Reisman/MS (cen	eartially obscured ter right); Oleg	0	E	2	P		 FD3: Docking Contact occuⁱred at 154:18:03:20Z Hard Dock occurred at 154:18:16:30Z. ISS Hatch opened at 154:19:30:00Z, 2:30 PM CDT, Monday, June 02, 2008; welcomed by ISS crew. IELK Seat Liner Transfer at 154:22:35Z (5:35 PM CDT, June 2,

BELOW: Hoshide/MS (JAXA), not in photo at right, works in newly installed Kibo JPM.







ABOVE: S124-E-009982 (11 June 2008) --- View of ISS configuration post Shuttle sep shows Kibo attached to Harmony at bottom center with first ESA ATV Docked at top center. AT LEFT: S124-E-010186 --- The Kibo laboratory (center left) is shown after attachment to port side of Harmony Node with: Kibo logistics module at bottom left, Columbus lab at center right, and at top center is Dextre along with two docked Russian spacecrafts.

June 02, 2008; welcomed by ISS crew. IELK Seat Liner Transfer at 154:22:35Z (5:35 PM CDT, June 2, 2008). At that time Garrett Reisman became a member of STS-124 and Greg Chamitoff joined the ISS Expedition 17 as Flight Engineer.

ED4: EVA 1: Egress was delayed by about 1 hour to reconnect Fossum's comm cap - lost comm during pre-breathe. Fossum & Garan, prepared the Kibo (JPM) for its removal from the Shuttle payload bay, disconnecting cables and removing covers. JAXA MS/Hoshide and MS/Nyberg robotically removed Kibo from the Shuttle P/L bay and latched it to Harmony, Node 2. Hoshide noted: "We have a new 'Hope' on the ISS." EV1 & EV2 assisted in the transfer of the OBSS from its ISS stored position (since STS-123) back to the Shuttle. The OBSS would be used with the shuttle robotic arm on FD12 to inspect the Orbiter heat shield. EV1& EV2 also demonstrated a technique that could be used to clean the starboard SARJ, which has had limited capability for several months. EV2 installed a new bearing and EV1 verified by inspection that a spot on earlier EVA's was a divot. This will feed into further analysis of the origin of the damage. EVA 1 duration 6:48.

FD4: Based on review of launch imagery, the MMT decided that the focused inspection of the Orbiter heat shield was not required.

FD6: EVA 2 - Fossum & Garan outfitted the outside of the JPM, installing covers and external television equipment and removing thermal covers and insulation on the JAXA RMS and top hatch. They also loosened bolts holding two Nitrogen Tank Assemblies in place on the Station's truss. Those tanks will be swapped during EVA 3. They also retrieved a failed external television camera from the port truss. In addition, Fossum inspected the left SARG, which had been performing perfectly. No shavings or debris were found, but photos were taken to be sent to the ground for review. EVA 2 duration 7:11.

Continued...

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FLT ORBITER NO.	CREW (7) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL Nom-Abort Emerg Throttle Profile Eng. S.N.	SRB RSRM AND ET	INC	orbit Ha/HP	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-124/ ISS 1J Continued Mosaic of the Zenith and of the ISS During Flyarou 1J/STS-124 Image: Continued of the ISS During Flyarou P6 Truss Image: Continued of the ISS During Flyarou Director Office, part Continued of the ISS Director and Bryan Lunney, Flight mission manager obsection Image: Continued of the ISS During Flyarou Director Office, part Continued of the ISS Director and Bryan Lunney, Flight Image: Continued of the ISS During Flyarou During Flyarou Director Office, part Continued of the ISS Director and Bryan Lunney, Flight Image: Continued of the ISS During Flyarou During Flyarou Director Office, part Continued of the ISS Director and Bryan Lunney, Flight	nd P5 Truss P4 Trus P4 Trus P4 Trus	P3 Truss P3 Truss P3 Truss STS124-S-072 Discovery post lance left: KSC Director B Bill Gerstenmaier, N Administrator for Sp At right: JAXA Director Management & Inter Yamaura & VP Kao	PI Truss S0 Truss	Mode 2 SIGNIFIC/ Orbite: - TCS Dro - TCS Dro - TCS Dro - Imagery Tyvek R - MUU 1 Z - The Left - Rudder S - A buildup - Closed 2 - Crew rep to Undoc KSC: - STS-124 SRB: - STS-124 SRB: - STS-124 SRB: - STS-124 SRB: - STS-124 SRB: - STS-124 SRB: - STS-124 SRB: - STS-124 SRB: - STS-124 Obtained RSRM: No ET: - STS-124 SRB: - STS-124 Obtained RSRM: No ET: - STS-124 SRB: - STS-124 Obtained RSRM: No ET: - STS-124 Obtained RSRM: No ET: - STS-124 Obtained RSRM: No ET: - STS-124 Obtained RSRM: No ET: - STS-124 - STS-	Gyro excess Hand ET Do Speed Brake p of ceramic 2 Indication fa boorted difficul cking 4 Pad debris i 4/BI-134rh Da 1 erroneous A one. SSME: 4/ET-128 Pos 30971008428 t 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1:	LLES: Rendee of (V070 leleaser ive drift adhesis alled to ty latch items ata Acqq cccelerc None. .st-Laund cst-Laund pebris ver rele RB Tai Rick N	File Damage 421558-024) ard 1 Late 18 Tile V070-39 al Tab found disi re identified und transfer On whe ing the External uisition System f meter data MOD: None th Camera Film n Xt 1129 LO2 f	5055-255 lodged are er the Th en door w Airlock L railed to m Review s Feedline ing Mass	V070-421558-025) 5 nd floating ermal Barrier vas closed Upper Hatch prior ecord video and showed two foam Support Fitting 5 Allowable prior to	 Continued ED9: EVA 3: Fossum & Garan began the EVA 30 minutes ahead of schedule. The EVA was highlighted by Garan's dramatic robot ride some 80 feet over the top of the ISS to replace a 550 lb nitrogen tank on the starboard truss. The ride was dubbed the "windshield wiper maneuver" or as Mark Carreau (Houston Chronicle) headlined it. "Wild robot-arm ride caps workday at Space Station." Fossum returned to the port SARJ (inspected on EVA 2) taking particulate matter from inside the joint, using a strip of tape that was returned to the port SARJ (inspected on EVA 2) taking particulate matter from inside the joint, using a strip of tape that was returned to Earth for analysis. He also removed thermal insulation from the Kibo robolic arm's wrist and elbow cameras and launch locks from one of the Kibo windows and deployed debris shields on Kibo. Other tasks by the pair included: The repaired video camera retrieved on EVA 2 was re-installed and several extra tasks (installation of thermal cover on Harmony, relocation of foot restraint aid, and removal of SARJ launch lock) were conducted. EVA 3 duration 6:33. Transfers: Hardware transferred to ISS (outside & inside): 34,353 lbs Hardware transferred to ISS (inside): 1,787 lbs Hardware transferred to ISS (inside): 1,807 lbs Hardware transferred to ISS (inside): 1,807 lbs H2O delivered to ISS: 569 lbs O2 used for the 3 EVA's: 92 lbs D212: Undocked at 163:11:41:54Z followed by a fly-around (1/2 lap). Conducted the late inspection of the Shuttle's heat shield using the OBSS. No issues. <u>ED14</u>: Rudder/Speedbrake thermal spring tab was seen floating away from the vehicle during the FCS checkout. The function of the tab is to prevent a flow path for ascent heating and is not required for entry. The TPS was cleared for entry. PrOst-flight,

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SPACE SHUTTLE MISSIONS SUMMARY

		CREW		LANDING SITE/	SSME-TL				_		
FLT	ORBITER	(6+1 UP/6+1 DN)	LAUNCH SITE, LIFTOFF TIME,	RUNWAY, CROSSRANGE	NOM-ABORT EMERG	SRB RSRM			FSW	PAYLOAD WEIGHTS.	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.	UNDITER		LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP	1.500	PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		TITLE, NAMES & EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
CTC 10//	01/ 105		KCO 204	WINDS	ENG. S.N.	DI 107	F1 4	DIRECT	OI-33	04000	Diff.Mission Commune #Extension Items Incommune to #
		<u>CDR:</u> Chris Ferguson	KSC 39A 320:00:55:39Z	EDT04 CONC EDW 52 CONC 33	104/104/109%	BI-136	(27)	INSERTION	(1)	<u>CARGO</u> : 39471 LBS	Brief Mission Summary: "Extreme Home Improvements" STS-126/ULF2 (27th ISS mission) outfitted the ISS to
	ENDEAVOUR		7:55:39 PM EST (P)	335:21:25:09Z	PREDICTED:	RSRM		POST OMS-2:		57471 205	increase accommodations from a crew of three to six. Life
SEQ		P771/R300/V197/M179	7:55:39 PM EST (A)	1:25:09 PM PST	100/104.5/104.5/	104		125.7x 84.6NM		PAYLOAD	support and habitability additions included: an advanced
FLT # 124	OMS PODS:	PLT	Friday (26) 11/14/08 (15)	Sunday (15) 11/30/08 (13)	72/104.5	ET-129				CHARGEABLE: 32403 LBS	resistive exercise device, a second toilet, a galley, two sleep stations and an integrated water recycling system.
KSC-124	LP03-33	Eric Boe		11/30/06 (13)	ACTUAL:	E1-129				32403 LD3	The mission also included EVA's for lubricating the
	RPO4-29	P772/R331/M286	LAUNCH WINDOW: 4M 39S (PLT in-	DEORBIT BURN:	100/104.5/104.5/	SLWT				DEPLOYED:	sluggish Solar Alpha Rotary Joints (SARJ) and installation
PAD 39A	FRC5-22	1104	plane)	335:20:19:29Z	72/104.5	32				30432 LBS	of other external systems.
(47)		<u>MS1</u> Donald Pettit	. ,	XRANGE: 169.6 NM	1 = 2047 (12)					NON-DEPLOYED:	Endeavour was originally rolled to Launch Pad 39B as the
MLP- 3		Flt 2 (STS-113 Up –	TAL: ZZA	<u>/////////////////////////////////////</u>	2 = 2052(7)					1760 LBS	Launch on Need (LON) vehicle in support of STS-125 HST
				<u>ORBIT DIR</u> : A/L (40)	3 = 2054 (8)	<u>ET</u>		DEODDIT			servicing mission. Last minute complications with HST caused
27 th SHUTTLE		P773/R289/V198/M253	SELECTED:	AIM PT: Close-In	M 3 EOM:	<u>IMPACT</u>		<u>DEORBIT</u> : HA 193.1 NM		MIDDECK: 211 LBS	an indefinite delay for STS-125. Endeavour was rolled to Launch Complex 39A and prepared for the STS-126 November
FLIGHT		MS2	RTLS: KSC15	AINT L. CIUSE-III	WEIGHT:	MET		HP 21.9 NM		211 LD3	launch date. (Shuttles have only moved from one spaceport
TO ISS		Steve Bowen	CI/NOM	<u>MLGTD</u> : 2040 FT	221787 LBS	1:14:18		ENTRY		<u>SHUTTLE</u>	launch pad to another twice before in the program's history, in
		P774/R332/M287	TAL: ZZA30L N/N	335:21:25:09Z VEL: 219 KGS	X CG: 1087.2 IN	L A.T.		<u>VELOCITY</u> : 25863 FPS		ACCUMULATED WEIGHTS:	1990 and 1993.)
		<u>MS3</u>	AOA: KSC15 CI/N 1 ST DAY PLS: EDT22	211 KEAS	1007.2 11	<u>LAT</u> : 36.202 S				DEPLOYED:	KSC W/D
THE PARTY OF		Heidemarie	N/SFD	HDOT: -1.1 FPS	LANDING:	001202 0		<u>ENTRY</u> RANGE:		1487349 LBS	The Orbiter prep days are 162 workdays (W/D) + 3 holidays
HOD		Stefanyshyn-Piper			WEIGHT: 221712 LBS	LONG:		4400NM		NON-DEPLOYED:	+ 3 weather days in the OPF. VAB ops = 7 W/D + 1 weather day
		Flt 2 (STS-115) P775/R301/V199/F40	Continued	<u>TD NORM 205</u> : 2482 F	X CG:	158.215W				1603708 LBS	Pad B ops = $19 \text{ W/D} + 15 \text{ contingency days}$
				Continued	1089.0 IN						Pad A ops = 18 W/D + 5 contingency days
		<u>MS4</u>								CARGO TOTAL: 3982716 LBS	Total W/D = 206
Atha		Shane Kimbrough P776/R333/M288								3902/10 LD3	LAUNCH POSTPONEMENTS
L		1 770/1(333/10/200								PERFORMANCE	- Added STS-126 to FDRD - launch date of 09/18/08 on
		MS5 UP Stay ISS								MARGINS (LBS):	08/15/07. - Ppd. to 10/16/08 on 02/14/08. Slip due to ECO sensor
SUFER CHA		EXP 18/FLT ENG Sandra Magnus								FPR: 2651 FUEL BIAS: 1063	problems experienced during December launch attempt of STS-
		Flt 2 (STS-112)		2						FINAL TDDP: 1682	122.
atine of		P777/R284/V200/F36								RECON: 2329	- Ppd. to 11/10/08 on 05/27/08. Slip due to delays in delivery of
		MS5 DN EXP 17/Flt ENG								PAYLOADS:	ET-127 & ET-129 for STS-125 & STS-400, respectively. - Ppd. to 11/12/08 on 09/08/08. Slip due to Hurricane Faye
		Greg Chamitoff								PLB:	impacts to HST payload readiness.
		(UP ON STS-124, stay ISS)								ISS-ULF2 (MPLM, LMC),SSPL/PSSC	- Ppd. to 11/16/08 on 09/24/08. Slip due to STS-125 slip to
		P778/R330/M285								LINIC),331 L/1 330	from 10/10/08 to 10/14/08 caused by Hurricane lke. - Launch moved forward to 11/14/08 on 10/19/08. Move due to
										<u>MIDDECK</u> : ISS-ULF2, MAUI	critical path adjustment. STS-126/ULF2 now "prime crew" as
	IE-2		A second second		and an a start of the stream					SEITE	STS-125 postponed to NET Mid-Feb 2009 on 10/02/08.
		SS EVA 125				.	4				LAUNCH SCRUBS: None.
H /		DOCKED QUEST EVA 48 EMU/TETHERED EVA 118								5 CRYO TANK SETS	
2 I		SCHEDULED EVA 116		and the second	and the second se	and the second second	Marrie Prove	and the same datage	Project.	RMS (81) SRMS, ODS, OBSS, SSPTS	Continued
W.		DURATION 6:52	STS-125 (HST	Service) & LON V	ehicle on Pads	39A & 39	B. LO	ON Vehicle		UDS, UBSS, SSPTS	
50		Continued		26 when STS-125							
1.76	ABC		Ostoski/KSC-U								

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				LANDING SITE/	SSME-TL					
		CREW (7)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB	ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(7)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION,	THROTTLE PROFILE	AND ET	INC HA/HP		PAYLOADS/ EXP	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S	ADOICT TIMES	WINDS	ENG. S.N.	L1			LAI	TIKSTS, SIGNITICANT ANOWALIES, ETC.
STS-126/		Continued	Continued	Continued						Continued
ISS- ULF2						Y and			Same Same	
Continued		SS EVA 126	TDEL:	DRAG CHUTE						LAUNCH WINDOW:
		DOCKED QUEST EVA 49 EMU/TETHERED EVA 119	0.000 (P) 0.192 (A)	<u>DEPLOY</u> : 193 KEAS	17 -		9			Total launch window was 9 minutes 26 seconds with window open at 320:00:50:52Z and close at 320:01:00:18Z. Preferred Launch Time was 320:00:55:39 (In-Plane Time) for a
			MAX Q NAV:	335:21:25:12Z		14		6	1 Co 12.	launch window of 4m39s.
		DURATION 6:45	757.6 (P) 750.2 (A)			2000	- ent	Mage C	1	
		SS EVA 127		<u>NLGTD</u> : 6761 FT 335:21:25:20Z		66 3 387	5 Er ~	200 B		LAUNCH DELAYS: None. Launch occurred on time at 320:00:55:39Z, 7:55:39 p.m. EST, Friday, November 14, 2008. Weather on launch day was acceptable. Isolated
			<u>SRB STG</u> : 2:04.32(P) 2:06.24(A)		Dorodo of c	torme du	ring CTC 1		TC 104	afternoon showers were observed at 60 miles south of KSC along the sea breeze late in
		EMU/TETHERED EVA 120	2.01.02(1) 2.00.21(1)	146 KEAS	Parade of s launch prep					the day. The showers diminished by sunset - not a threat for the evening launch time or
			<u>PERF</u> : NOMINAL	HDOT: -6.2 FPS	Gustav (inla					RTLS.
		DURATION 6:57	2 ENG TAL (MRN):	BRK INIT: 124 KGS	by Hanna, I					TAL WEATHER
		SS EVA 128	2:38 (P) 2:39 (A)		Harvey/DA		seprine. (i	10111.1		Weather at the TAL sites was forecast/observed GO.
		DOCKED QUEST EVA 51		DRAG CHUTE	Пагусульна	0)				
			NEG RETURN:	<u>JETTISON</u> : 53 KGS			The	12000	Image Index ISEP01/17-45-00UTC	PERFORMANCE ENHANCEMENTS:
		SCHEDULED EVA 119 DURATION 6:07	3:52 3:54	335:21:25:42Z			1 de la	27 2200 2200 2200	ISEP03/20-45-00UTC ISEP04/22-45-00UTC ISEP04/00-45:00UTC	Include the standard set plus: 1) PE Operational High Q TRN/NOV, 2) OMS Assist, 3) a 52 nautical mile MECO, and 4) Del Psi
			PTA (U/S 157 FPS):					4 2008 7 2008 8 2008 9 2008	SEP07004500UTC SEP00/204500UTC SEP10/004500UTC SEP12004500UTC	
			5:08 5:14	BRK DECEL FPS ² : AVE 6.2 PK 9.3	n star	2		10200	RSEP14064500LTC RSEP14064500LTC	FLIGHT DURATION CHANGES/LANDING:
		MCC WHITE FLIGHT FCR	<u>SE TAL (ZZA 104)</u> :	AVE 0.2 TK 7.3	Con the	Y			1	- FD 11 MMT decision made for a one-day extension for additional on-orbit time for the Urine Processing Assembly (UPA) troubleshooting & processing or possible Distillate
		(54)	<u>6:01 6:04</u>	WHEELS STOP:		A-1-	4			Assembly (DA) return.
				335:21:26:02Z	a mark	ホンショ	200	-	and	- Weather for landing was quite complex. Both KSC and EAFB were activated on
			PTM (U/S 168 FPS):	11180 FT	San I.			a deal and	1.	Sunday, November 30, 2008, as possible landing sites. A large upper level low pressure
		<u>SHUTTLE:</u> ASC- Bryan Lunney	6:07 6:18	ROLLOUT:					4	system over the eastern US with a cold front moving across FL were concerns for landing at KSC on Sunday (EOM) & Monday (EOM+1). Spaceflight Meteorology Group (SMG)
		LD/O1- Mike Sarafin	SE PRESS 104	9140 FT						weather forecasts were "NO GO" for KSC with crosswind, ceiling, precipitation, and
		O2- Tony Ceccacci FD 1-12	6:54 6:59	0:53 M:S	3 80	and the second	see la strande San	2		thunderstorm flight rule violations. Also, two Tornado Watches were issued for central FL
		- Paul Dye FD 13-EOM Planning- Paul Dye FD 1-3	MECO CMD:	WINDS:	IKE08-notra	ack aif: U	lurricano IV	E track	ving	and a third Watch included KSC. A squall line moving east at 20 kts combined with an unstable air mass across south and central FL generated numerous thunderstorms and
		Kwatci Alibarufa	8:22.1 8:23.0	4H KT 0 KTS	Category 2					isolated tornadoes by mid day. The weather continued to deteriorate across central FL,
		ENT- Bryan Lunney		OFFICIAL: 04004P06 KTS	Galveston S					prompting the MMT to assess the possibility of staying on orbit and attempting EOM+1
			<u>V</u> I: 25819.0 25818.8	6H 0CROSS KTS	Roundup N				,	landing at KSC. The SMG forecasts for that day indicated marginal conditions for a safe
		Team 4- Richard Jones	25819.0 25818.8		hurricanes				son	return to KSC. After waving off the first opportunity to KSC and with weather conditions deteriorating
			<u>OMS-2</u> :	<u>DENS ALT</u> : 3234 FT	numeanes	COSTINAL		5 5003		through the day at KSC, the decision was made to land at EAFB. Weather conditions at
		<u>ISS</u>	38:20 38:19.3	FLT DURATION:		-	Ant Burn			EAFB were nearly ideal with light northeast surface winds and mostly clear skies.
		OT - Hony Ridings	97.4 FPS 95.9 FPS	15:20:29:30		-	and the			Endeavour touched down at 335:21:25:09Z (3:25 PM CST, November 30, 2008) on temporary runway 04. This runway was built due to construction and resurfacing of the
		LD/O2- Ginger Kerrick		S/T:	TAGE	al de			A.	primary runway.
		O3 – Brian Smith		1183:15:39:46 OV-105:	1 State	300	199	Na		Continued
		Team 4- Courtenary		274:03:35:10			n la			
		McMillan		DISTANCE:		1 - 16	XI			At Left: STS126-S-044 NASA Administrator
				6,615,109 sm	5		11		>	Michael Griffin (front) & Associate
				TOTAL SHUTTLE DISTANCE:			12-		5	Administrator for Space Operations Bill
				480,274,259 sm				5	1	Gerstenmaier watch the launch of the Space
		Continued			IN ME					Shuttle Endeavour from KSC Launch Control
						Non-		X		Center on Nov. 14, 2008.

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		CREW		LANDING SITE/	SSME-TL					
FLT	ORBITER	(7)	LAUNCH SITE, LIFTOFF TIME,	RUNWAY, CROSSRANGE	NOM-ABORT EMERG	SRB RSRM	ORBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC HA/HP		PAYLOADS/ EXP	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-126/ ISS- ULF2 Continued		Continued <u>CAPCOMS:</u> <u>SHUTTLE</u> A/E – Alan Poindexter - Greg (Box) Johnson (Wx) LD/01 – Steve Robinson 02 – Jim Dutton Planning – Shannon Lucid Team 4 - N/A <u>ISS</u> 01- Terry Virts LD/02- Mark Vande Hei 03 – Robert Hanley Team 4 – N/A	on Kin visi	26-E-012247 E middeck: At top C bbrough/MS, PLT ble behind Loncha amitoff/MS, Stefar	enter, Magnu Boe, Yury Loi akov), Pettit/M	s /STSL nchakov 1SDn, E	Jp/FE Exp18. //FE Exp 18, E xp 18 CDR M	Clockv 3owen/ ichael	vise from her: MS (partially Fincke,	Continued FIRSTS/SECONDS: First water regeneration system to recycle urine into drinking water delivered and installed on ISS. First flight OI-33 Flight Software. Several minor changes made to improve Post MECO attitude control and reduce the risk of recontact with the ET. First flight of new SSME controller S/W to downlink Advanced Health Management System (AHMS) data on-orbit - provides backup to MADS data. First flight of redesigned EVA Prime Flight Glove TMG, a Turtleskin® reinforcement layer sandwiched between molded palm and RTV on thumb and index finger and new RTV-3145. First flight of ET redesigned LO ₂ -to-Intertank Flange closeout per RTF B/L Plan First flight of SM Forward Segment Grain Redesign - eliminated waiver. First flight of SRB Installed Enhanced Data Acquisition System (EDAS) Units and Instrumentation. First flight of SRB Redesigned Frangible Nut with Pyrotechnic Crossover Assembly to help prevent stud hang-up. A Second: "World Toilet Organization (WTO) is a global nonprofit organization committed to improving toilet and sanitation conditions worldwide. World Toilet Day November 19 th - During this mission the crew did their bit for WTD with installation of a new second toilet facility on ISS."
Launch cutting Cabana	Director M ceremony of in LCC Fil	After STS-126 successi like Leinbach (right) pert on KSC Center Director ring Room. Cabana exp nch as Center Director.	^f orms tie- Bob		Piper (left)) and Ki debris a	20 Nov. 2008) mbrough durin and applying lo	ng EVA	2 continue	NIGHT LAUNCH: # 31 NASA Test Director Charlene Blackwell-Thompson, "Endeavour is ready to go. And we're really excited to share our version of a sunrise with you" RENDEZVOUS: #71 Rendezvous and dock with ISS. EVENTS: - At L-1 hr NASA Security was informed of an inbound threat to the Shuttle about two miles off shore. Security sweeps came up all clear. At L-5 min officials determined no threat and cleared Shuttle for launch. The perpetrator of the hoax was later arrested, found guilty and sentenced to jail in November 2010. • FD1: OMS2 ignition at 320:01:33:58:3Z resulted in a 125.7 by 84.6 NM orbit. • FD2: RCC inspection found no areas of concern - focused inspection cancelled on FD4. • T1 maneuver at 321:19:26:48:0Z resulted in a 192.4 by 184.3 NM orbit • FD3: R-Bar Pitch Maneuver was performed. No issues. • Docking Contact occurred at 321:22:01:17Z • Hard Dock occurred at 321:22:44:35Z • ISS Hatch opened at 321:24:16:00Z (6:16PM CST, Nov 16, 2008) welcomed by ISS crew. Continued

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	LE, NAMES & EVA'S		THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
ISS- ULF2									
					1	•			EVENTS: Continued - IELK Seat Liner Transfer at 322:02:50:00Z (8:50 PM CST, Nov 16, 2008). At that time Greg Chamitoff became a member of STS-126 and Sandra Magnus joined the ISS Expedition 18 as Flight Engineer - FD5: Based on review of launch imagery, the MMT decided that the focused inspection of the Orbiter heat shield was not required. -FD5: EVA 1: Piper & Bowen transferred the Nitrogen Tank Assembly (NTA) from the External Stowage Platform (ESP)-3 to Lightweight MPESS Carrier (LMC), followed by the Flex Hose Rotary Coupler (FHRC) transfer from LMC to ESP-3. JEM EFBM Multi-Layered Insulation (MLI) Cover was removed in prep for c/o of EFBM (to be installed on 2JA later in 2009). Stbd SARJ trundle bearing assembly (TBA) #10 and #6 were replaced, and the stbd race ring was partially cleaned and lubed. A crew equipment bag was inadvertently released during the EVA, but there was sufficient
Water Recover	78 (18 Nov. 2008) Pettit bry System (WRS) rack in E	Destiny lab.	Pawel-Warch Impressive p after Shuttle/ Orbiter: -The Fuel Cell 1 Measurement B - MER-02, LV57 Line Shows a D - MPS Helium B 60 Psi Max. (ME - GNC Bypass o - Tile Damage o KSC: - RDUnassigned - IRAMS Failed SRB: - STS126/Bi136 Containment Fa <u>RSRM, SSME, MOD</u> : - Updating Minir - Loss of Crewlo - Over Torque o - Middeck Retur - Debris Release Integration: - SM GPC Failu	ANOMALI ANOMALI S/N P760 Began Drift 7 E2 GH ₂ F rop of 200 bottle Lost ER-10) of Ku-Banc on Edge .6 d - Columr at GMT R both Calumr at GMT R both Squawk -1 silure & <u>ET</u> : Non mum EPS both Bag du for Trundle I rn Item W& ed Near th	ES: 0106 Hyi ing High CV, Afti Psi 140 Psi 140 Psi 140 Psi 140 Psi 140 Psi 126-001: ie. 126-001: ie. Consum uring Eva Bearing Eights Mi ie LH2 T	Polish a g. drogen Fl a And Erra er Engine During A Data w × .05d errors on : HDP 3 E hables a #1 Assembly issing -0 Plate	owmete tic At 3 Throttl all ME F last Co	omer just 20/12:36 GMT. e up E2 GH ₂ DMRSD Allows FEPs. ntainer Debris	 Equipment bag was indivertently released during the LVA, but there was sufficient redundant cleaning and lube equipment to finish scheduled tasks. EVA 1 duration 6:52. FD6: Home improvements continued aboard ISS with installation of two new bedrooms and preparations to activate the water recycling facility. FD7: EVA2: Piper & Kimbrough relocated the CETA carts in prep for 15A install of S6 solar array upcoming in Feb. 2009; SSRMS Latching End Effector (LEE) A snares were lubricated; all stbd SARJ cleaning and lube objectives were completed except for cleaning under covers 11 and 12; & 4 more trundle bearing assemblies were replaced. EVA was terminated slightly early due to high CO2 readings in Kimbrough's' suit. EVA2 duration 6:45. [During this EVA the ISS marked the 10th Anniversary of launching its first element - the Russian-built Zarya control module. "It's hard to believe it's been 10 years," said Kirk Shireman, NASA's Deputy Manager for ISS, who remembers it being a cold day on the steppes of Kazakhstan.] FD9: EVA3: Piper & Bowen continued cleaning of ISS stbd SARJ; R&R'ed the remaining TBA; and cleaned area around SARJ's drive lock assemblies. EVA3 duration 6:57. FD11: EVA4: Bowen & Kimbrough completed stbd and port SARJ lube tasks; P1 lower inboard camera installed in camera port 7; external facility berthing mechanism latch bolt retracted via EVA override and cover reinstalled; JEM GPS A installed and heaters checked out ok, JEM GPS B deferred to stage or next flight; and, no get-ahead radiator imagery was taken. EVA4 duration 6:07. SARJ put back in autotrack at 330/00:35 GMT (post-EVA). FD12: UPA processing was completed for the docked mission. Transfers: 16,390 lbs of hardware transferred to ISS (Leonardo & middeck) 26 lbs of hardware transferred to ISS to Endeavour (inside) 25 lbs O2 transferred to ISS FD15: Undocked at 333:14:47:26Z followed by Sep-1, Sep-2 and Sep-3; OBSS s

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		CREW		LANDING SITE/	SSME-TL						
F1 T		(6+1 UP/6+1 DN)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT	FOW	PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	() ()	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION, WINDS	PROFILE ENG. S.N.	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-119/	OV-103	CDR:	KSC 39A	KSC 15 (KSC 70)	104/104/	BI-135	51.6	DIRECT	01-33	CARGO:	Brief Mission Summary: ISS United States Operational
	(Flight 36)	Lee Archambault	074:23:43:44Z	087:19:13:26Z	109%	DI-133	(28)	INSERTION	(2)	39088 LBS	Segment (USOS) assembly was completed with installation of
	DISCOVERY	Flt 2 (STS-117)	7:43:44 PM EDT (P)	2:13:26PM CDT	10770	RSRM		POST OMS-2:	. ,		<i>S6 truss with final set of power generating Solar Arrays on</i>
SEQ		P779/R307/V201/M265	7:43:44 PM EDT (A)	Saturday (23)	PREDICTED:	103		126.0x84.9 NM		PAYLOAD	Shuttle's 28 th ISS Mission. This additional power prepares the
FLT # 125			Sunday (12)	03/28/09 (10)	100/104.5/					CHARGEABLE:	ISS with the capability of housing six member crews in the
	OMS PODS	<u>PLT</u>	03/15/09 (10)		104.5/72/104.5	ET-127		<u>DEORBIT</u> : HA 184.8 NM		32546 LBS	near future.
	LPO1-39	Tony Antonelli	LAUNCH WINDOW:	DEORBIT BURN:		0		HP 21.6 NM			
	RPO3-37	P780/R334/M289		087:18:08:14Z	ACTUAL:	SLWT- 33				<u>DEPLOYED</u> : 32489 LBS	<u>KSC W/D</u> : OPF = 191+13H+3Wx, VAB = $6 + 0C$, PAD = $47 + 140$, Tabel Wark David - 244 (ODE December 2004)
PAD 39A (48)	FRC3-36	MS1	4M 14S (PLT in-plane)	XRANGE: 222.2 NM	100/104.5/ 104.5/72/104.5			<u>ENTRY</u> VELOCITY:		32489 LBS	14C: Total Work Days = 244 (OPF Processing occurred over a total time period of 207 days.)
(40)		Joseph Acaba		ARANGE. 222.2 NIVI	104.3/12/104.3			25849 FPS		NON-DEPLOYED:	total time period of 207 days.)
MLP-1		P781/R335//M290	EOM PLS: KSC	ORBIT DIR: A/R (14)	1 = 2048 (9)					0 LBS	LAUNCH POSTPONEMENTS
			TAL: ZZA	<u></u>	2 = 2051 (8)			<u>ENTRY</u> RANGE:			- Added STS-119 to FDRD - launch date of 01/15/04 on 01/23/03
28 th		<u>MS2</u>	TAL WX: MRN	<u>AIM PT</u> : Close-In	3 = 2058 (3)			4377 NM		MIDDECK:	- Ppd. to NET 06/10/04 on 03/13/03 due to Columbia accident.
SHUTTLE		Steve Swanson	SELECTED:							57 LBS	- Ppd. to NET 06/30/04 on 04/17/03 due to Columbia accident.
FLIGHT		Flt 2 (STS-117)	RTLS: KSC15 CI/NOM	MLGTD: 2705 FT				1			- Deleted from FDRD on 05/28/03 pending Columbia accident
TO ISS		P782/R308/V202/M266	TAL: ZZA30L N/N	087:19:13:26Z						SHUTTLE	investigation outcome.
		<u>MS3</u>	AOA: KSC15 CI/N	VEL: 188 KGS 203 KEAS			inner 202	N		ACCUMULATED WEIGHTS:	- Re-Baselined in FDRD - Launch date of 11/06/08 on 10/04/07 - Ppd. to 12/04/08 on 02/14/08. Slip due to ECO Sensor problems
		Richard Arnold	1st DAY PLS: EDW22	HDOT: -2.7 FPS						DEPLOYED:	during STS-122 launch attempt.
		P783/R336/M291	N/N	10012.7113				2.		1517781 LBS	- Ppd. to 02/12/09 on 07/03/08. Slip due to ET delivery schedule.
154				TD NORM 195:							- Ppd. to NET 02/19/09 on 02/04/09. Slip due to additional testing
2111		<u>MS4</u>	TDEL:	3473 FT		THE R		- 5		NON-DEPLOYED:	& analysis required to resolve MPS flow control valve issue
	119	John Phillips	0.000 (P) -0.008 (A)							1603765 LBS	- Ppd. to NET 02/22/09 on 02/09/09. Slip due to additional testing
		Flt 2 (STS-100)	MAX Q NAV:	DRAG CHUTE		40 a 24	·				& analysis required to resolve MPS flow control valve issue
SWANSON	ACABA	P784/R266/V203/M232	739.4 (P) 722.9 (A)	DEPLOY: 194 KEAS		THE REAL PROPERTY IN				CARGO TOTAL:	- Ppd. to 02/27/09 on 02/14/09. Slip due to additional testing &
			10/11(1) 122.7 (1)	087:19:13:29Z		. 1		A REAL PROPERTY AND		4021804 LBS	analysis required to resolve MPS flow control valve issue
		<u>MS5 UP Stay ISS</u> EXP 18FLT ENG	SRB STG:	<u>NLGTD</u> : 5369 FT	STS-11		in a fa			PERFORMANCE	- Ppd. to TBD at STS-119 "Continuation" FRR on 02/20/09. Managers could not reach a consensus.
		Koichi Wakata (JAXA)	2:04.00 (P) 2:05.12 (A)	087:19:13:34Z						MARGINS (LBS):	- Ppd. to tentative date of 03/12/09 on 02/25/09. MPS flow control
		Flt 3 (STS-72, STS-92)		VEL: 152 KGS				onstellation		FPR: 2651	valve U/R.
108 -0		P785/R208/V164/M181	<u>PERF</u> : NOMINAL	167 KEAS	(It will be a	long wait	- Pres	sident directed on in 2010.)	1	FUEL BIAS: 1063	- Launch date set for NET 03/11/09 on 03/04/09. MPS flow control
and a second			2 ENG TAL (MRN):	HDOT: -6.7 FPS	317861ma					FINAL TDDP: 1746	valve U/R.
3		MS5 DN EXP 18/Flt ENG	2:35 (P) 2:37 (A)		710STS11			0-10-		RECON:2016	- Launch date set for 03/11/09 at Delta FRR on 03/06/09.
	TANK T	Sandra Magnus		<u>BRK INIT</u> : 40 KGS							- Officially ppd. launch to 03/15/09 on 03/12/09 after Scrub on
	R.	Flt 2 (STS-112) (UP ON STS-126, stay ISS)	NEG RETURN:	DRAG CHUTE	<u>M 3 EOM</u> :	<u>E I</u> IMPACT				<u>Payloads:</u> PlB:	03/11/09. Scrub was due to gaseous hydrogen leak in vent line.
		P786/R284/V200/F36	3:54 3:55	JETTISON: 60 KGS	WEIGHT:	1:14:30				ISS 15A (S6)	LAUNCH SCRUB:
		1 / 00/11204/ 1200/1 30	PTA (U/S 166 FPS):	087:19:13:59Z	201795 LBS	MET				100 107 (00)	Mar.11, 2009, Wednesday, with fewer than 20 minutes left in
		SS EVA 129	5:12 5:15		X CG:					MIDDECK:	tanking process launch was scrubbed due to a gaseous hydrogen
	L	DOCKED QUEST EVA 52		BRK DECEL FPS2:	1082.8 IN	LAT:				ISS 15A, MAUI	vent line leak. This line connects the Ground Umbilical Carrier
			SE TAL (ZZA 104):	AVE 3.1 PK 4.2	LANDING:	35.725 S				SEITE, SIMPLEX	Plate (GUCP), attached to ET, to the "flare stack" for burn-off of
	11 .	SCHEDULED EVA 120 DURATION 6:07	6:00 6:00	WHEELS STOP:							vented gaseous hydrogen. Launched scrubbed at 1:37 PM CDT.
	a in	DURATION 0:07	PTM (U/S 181 FPS):	87:19:14:43Z	WEIGHT:	LONG:				5 CRYO TANK	Technical Scrub.
N X		SS EVA 130	6:13 6:16	12050 FT	201713 LBS	157.56 W				SETS	LAUNCH WINDOW:
	1///8/	DOCKED QUEST EVA 53	0.10	ROLLOUT:	V 99					RMS (82)	Total launch window was 8M 27S with window open at
l V			SE PRESS 104	10345 FT	X CG:					(02)	074:23:39:31Z and close at 074:23:47:58Z. Preferred Launch
	\checkmark	SCHEDULED EVA 121	6:56 6:57	1:17 M:S	1084.7 IN					SRMS, ODS,	Time was 074:23:43:44Z (In-Plane Time) for a launch window of
L		DURATION 6:30	Continued	Continued						OBSS, SSPTS	4M 14S.
		Continued	Continucu	S STRITUOU							Continued

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FLT NO.	ORBITER	CREW (7) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL Nom-Abort Emerg Throttle Profile Eng. S.N.	SRB RSRM AND ET	INC	orbit Ha/Hp	FSW	Payload Weights, Payloads/ Experiments	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-119/ ISS- 15A Continued		Continued SS EVA 131 DOCKED QUEST EVA 54 EMU/TETHERED EVA 124 SCHEDULED EVA 122 DURATION 6:27 MCC WHITE FCR (55) FLIGHT DIRECTORS: SHUTTLE: ASC/ENT- Richard Jones LD/01- Paul Dye 02- Mike Sarafin (FD1- FD12) 02-Tony Ceccacci (FD13-EOM) 03- Richard LaBrode (Prelaunch – FD1) 03- Norman Knight (FD2-FD8 03- Bryan Lunney (FD9-EOM) Planning- Norm Knight - Bryan Lunney (FD9-EOM) Planning- Norm Knight - Bryan Lunney (MOD – John Mccullough Team 4 - Tony Ceccacci Continued	Continued <u>MECO CMD</u> : 8:23.6 8:23.8 <u>VI:</u> 25819.0 25819.6 <u>OMS-2</u> : 38:00 38:30.0 97.7 FPS 96.1 FPS	Continued WINDS: 15H KT 0.3L KTS OFFICIAL: 15017P23 KTS X1P1H17P23 KTS DENS ALT: 1718 FT FLT DURATION: 12:19:29:42 S/T: 1196:11:09:28 OV-103: 318:03:39:51 DISTANCE: 5,304,106 sm TOTAL SHUTTLE DISTANCE: 485,578,259 sm	ABOVE: STS Ryan R. Smith http://www.ry BELOW: S111 Harmony. Fro Archambault, Exp 18 CDR & Koichi Wak Swanson/MS	h (KSC-B ansmithpl 9-E-0077 om left (bo & Acaba Michael F ata/Exp18	OE-K2 1000 47 0ttom 1 /MS. F incke, 8FE (J	2) aphy.com/ STS-119 & E row): PLT An From left (mid Yury Loncha (AXA). From 1	xp18 c tonelli, (Idle row akov/Ex	rews in ISS CDR): Magnus/MS, p18FE(RSA),	Continued LAUNCH DELAYS: None. Launch occurred on time at 074:23:43:442, 7:43:44 p.m. EST, Sunday, March 15, 2009. Launch weather was relatively benign at KSC. A sea breeze developed at KSC and moved west of the Banana River about 3 hours prior to launch. The movement of the sea breeze inland produced favorable weather conditions with widely scattered clouds. TAL WEATHER TAL sites at both Zaragoza and Moron, Spain were acceptable for launch due to a high pressure system. Winds at Istres were out of limits following the passage of a cold front the day prior to launch, but launch proceeded with two acceptable TAL sites. PERFORMANCE ENHANCEMENTS: Include the standard set plus: 1) PE Operational High Q WIN/MAR, 2) OMS Assist, 3) 52 nautical mile MECO, & 4) Del Psi FLIGHT DURATION CHANGES/LANDING: • When STS-119 launch was slipped to March 15, 2009, (due to earlier scrub) the mission duration was reduced from 14 to 13 days to accommodate a Russian Soyuz mission to ISS later in the month. This also reduced number of EVA's from 4 to 3. • For first KSC landing opportunity weather was no go with cloud decks building in at lower than anticipated broken (5/8) at 3000. Weather improved as did the wind direction. Discovery was given "Go" to land on second KSC opportunity. Landing occurred at 087:19:13:26Z (2:13:26 PM CDT Saturday, 03/28/09). FIRSTS/SECONDS/LASTS: • SSME ECP 1514 – LPOTP Bearing Ball Process Change • SRB Hold Down Post Debris Containment mod • S&MA: Orbiter LH ₂ T-0 Umbilical Ice: Update to IDBR-01 and NSTS-60559 to reflect new expected debris source. • Last to be installed on ISS, the 45-foot S6 aluminum girder weighing more than 31,000 pounds was the first truss segment built (stored at KSC for six years). • Second time a bat attempted to fly into space on Space Shuttle ET; coincidentally Koichi Wakata was on both flights. • Discovery served as a hypersonic test bed during entry for new heat shield tiles in development for NASA's next-generation spacecraft. Continued

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FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM	ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.	ondiren	TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
TS-119/ IS- 15A ontinued		Continued ISS LD/O1 - Kwatsi Alibaruho O2 - Heather Ranick O3 - David Korth Team 4 - Robert dempsey <u>CAPCOMS:</u> <u>SHUTTLE</u> A/E – George Zamka Asc (Wx) - C. Hobaugh Ent (Wx) - Al Poindexter LD/01 – George Zamka O2 – Greg (Box) Johnson Planning – Shannon Lucid Team 4 - N/A <u>ISS</u> LD/O1 – Rick Davis		SIL	96007312	Swanson ((center) and Arnol		Ily obscured	Continued FIRSTS/SECONDS/LASTS: - March 27, 2009: In a rare example of overlapping space missions, a U.S. space shuttle [STS-119] is set to return to Earth on Saturday just a few hours after a Russian Soyuz arrives at the ISS. Together the crews of the three craft total 13 people, tying the record for humans in space, first set 14 years ago this month. [Robert Pearlman - collectSPACE.com] MCC ROSES: This was the 100 th flight since the Challenger accident that a beautiful bouquet of roses was delivered to the Houston MOCR to celebrate each mission since the landing of STS-26 in 1988. In 1989 it was determined that the roses were sent by the Shelton family (Mark, MacKenzie & Terry) of Bedford, TX. On March 27, 2009, the Sheltons personally delivered their 100 th bouquet in recognition of STS-119. They received a warm welcome in the MOCR, led by James "Milt" Heflin, JSC Associate Director, Technical. They also received several JSC mementos for their kindness and dedication to the Space Program. NIGHT LAUNCH: # 32 (Into twilit sky)
complete a Billion Pict	as seen duri ture" by ISS	02- Lucia McCullough 03 – Jay Marschke Team 4 – N/A larch 2009) ISS USOS ing Shuttle fly-around [labe Lead Flight Director Kwats reasures 361 feet - longer t	led the "\$100 si Alibaruho]. The	and r	ed in power an eadied new sol	d data cor ar arrays. ROSES	Above right ur Column	d a radia		 RENDEZVOUS: #72 Rendezvous and dock with ISS. EVENTS: FD1: OMS2 ignition at 075:00:22:14Z resulted in a 126.0 by 84 NM orbit. FD2: RCC inspection found no areas of concern T1 maneuver at 076:18:35:39.0Z resulted in a 196.8 by 183.3 NM orbit FD3: R-Bar Pitch Maneuver was performed. No issues. Docking Contact occurred at 076:21:19:49Z, St. Patrick's Day Hard Dock, hooks closed, occurred at 076:21:33:59Z ISS Hatch opened at 076:23:22:59Z (6:09 PM CDT, March17, 2009) welcomed by ISS crew. IELK Seat Liner Transfer at 077:02:00Z (9:00 PM CDT) March 17, 2009). At that time Sandra Magnus became a member of
		"\$100 BILLION PICTUR ASA estimates its total dire at \$58.5 billion since 1985	ct cost of							STS-119 and Koichi Wakata joined the ISS Expedition 18 as Flight Engineer. - FD5: Based on review of launch imagery, MMT cancelled FD6 focused inspection of Orbiter heat shield. - FD5: EVA 1: Steve Swanson & Ricky Arnold: Activities include S6 Connected to ISS, SABB Unstow, PCDF-PU Transfer, PVR Deploy, and 1B & 3B solar arrays deployed EVA1 duration 6:07. Continued

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FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	Throttle Profile Eng. S.N.	AND ET	INC	HA/HP		Payloads/ Experiments	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)

STS-119/ ISS- 15A Continued



JSC2009-E-060960 (20 March 2009) --- Group portrait of Shuttle STS-119 Orbit 1 Flight Control Team in JSC MCC. FD Paul Dye (left) is visible on the front row.



JSC2009-E-060959 (20 March 2009) --- Group portrait of STS-119/15A ISS Orbit 1 Flight Control Team in JSC MCC. FD Kwatsi Alibaruho (right) is visible on the front row.



In JSC MCC at Landing Support Officer (LSO) console: On left, Marty Linde/USA, Lt. Col. Dave Impiccini/USAF (standing), Wayne Hensley/USA (on phone), & Brenton Hartung (student observer in rear). Laughter caused by photographer always catching Wayne on telephone.

Continued... SIGNIFICANT ANOMALIES:

- Ground Imagery Showed That When Thruster F4D's Tyvek Rain Cover Released at 5:28 Sec Met (~93fps Or 63 Mph), A ~21 Inches \times ~7.4 Inches Piece Remained Attached to the Thruster Lip as Shown In Figures 1 and 2. KSC:

- STS-119 Post Launch Debris <u>SRB</u>: <u>RSRM</u>: <u>SSME:</u> None. ET:

-During Initial Launch Attempt of STS-117/Et-127, a GH_2 Leak was Detected at Approximately One Minute After Start of LH_2 Topping

MOD: -Inadvertent Abort Light Command Sent from FDO Integration:

-Unexpected Debris/Expected Debris Exceeding Mass Allowable Prior to Pad Clearance (Liftoff Debris) -High GH₂ Concentrations at the Ground Umbilical Carrier Plate (GUCP -MPS LH₂ ORB Umbilical Plate Gap Pressure LCC Violation -Stub Tile Damage

Continued ... EVENTS:

Downlinked, P3 UCCAS Deploy unsuccessful, temporary tethers installed, S3 PAS Deploy deferred to EVA3, and Z1 Patch Panel Reconfig unsuccessful. EVA2 duration 6:30.

- FD8: CDR Lee Archambault maneuvered the Shuttle-ISS "stack" to avoid a 9-year-old piece of Chinese space junk (4" fragment) that could have been a close encounter during upcoming EVA3. (A 4' fragment from a Russian satellite had previously passed at a safe distance prior to Shuttle/ISS docking.)

- FD9: EVA3: Joe Acaba & Ricky Arnold: Activities included: UCCAS troubleshooting; tethered in place, CETA cart relocation and SSRMS LEE B lube completed. Numerous get aheads accomplished: CETA coupler, S1/S3 SSAS panel BBC reconfig, S1 FHRC outboard p-clamps released 2 of 6 (#5, #6), and retrieved bungee caddy from Nadir STBD A/L toolbox. EVA3 duration 6:27.

- Transfers:

- 32,962 lbs of hardware transferred to ISS (S6 Truss & Middeck)

- 1963 lbs of hardware returned from ISS to Discovery (middeck)

- 1142 lbs of water transferred to ISS

FD11: Undocked at 084:19:53:26Z Flvaround initiated 084: 20:19Z

Flyaround initiated 084: 20:19Z

- Communications blackout during Entry occurred at GMT

87:18:47 to 87:18:52 d:h:m due to plasma effect.

SIGNIFICANT ANOMALIES:

Orbiter: - Galley Water Leakage. - WLES Group 2 Sensor S/N# 1033 Time Slip - During MM/OD Monitoring With Group 2 Sensors, Sensor S/N 1024 On The Port Wing Unexpectedly Dropped Out Of On-Orbit Mode After 5-6 Hrs Of Monitoring. - AVIU S/N 1031 Failure - Failed Camera Shutter Actuation. - Incorrect SORG Needle Installed - V07P9379A Dropped To Lower Limit (Unit Step) During STS-119 Ascent - Aft Stub Tile on the Upper Body Flap Was Suspect to be Damaged During FD3 On-Orbit Inspection. During Post-Flight Inspection the V070-395018-144 Tile Was Verified As Damaged.

Continued at left...

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				LANDING SITE/	SSME-TL						
		CREW	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(7)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		ORDIT	FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.	ondricht		LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		TITLE, NAMES	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
		& EVA'S		WINDS	ENG. S.N.						
STS-125	OV-104	CDR:	KSC 39A	EDW22 CONC	104/104/109%	BI-137			01-32	CARGO:	Brief Mission Summary: STS-125 was the 5th and final
	(Flight 30)	Scott Altman	131:18:01:56Z	EDW 53 CONC 34			(51)	INSERTION	(5)	32418 LBS	service mission (SM) visit to the 19 year old Hubble Space
	ATLANTIS	(Flt 4 - STS-90,STS-106,	2:01:56 PM EDT (P)	144:15:39:04Z	PREDICTED:						Telescope (HST) deployed on STS-31 in 1990. This was the
SEQ		STS-109)	2:01:56 PM EDT (A)	10:39:04 AM CDT	100/104.5/104.5/	RSRM		POST OMS2:		PAYLOAD	4th planned SM for HST. (The 3rd SM was conducted in two
FLT # 126		P787/R237/V161/M207	Monday (14)	Sunday (16)	72/104.5	105		298.1 NM		CHARGEABLE:	parts, 3A on STS-103 & 3B on STS-109.) HST improvements
	OMS PODS		05/11/09 (8)	05/24/09 (11)				X 106.8 NM		22254 LBS	included a new camera, a new spectrograph , repair of two
KSC-126	LPO4-30	<u>PLT</u>			ACTUAL:	ET-130					other instruments, and replacement of six batteries and six
	RPO1-37	Gregory C. Johnson	LAUNCH WINDOW:	DEORBIT BURN:	100/104.5/94/					DEPLOYED:	gyroscopes. These improvements resulted in a higher
PAD 39A	FRC4-30	P788/R337/M292	59M 45S (Total)	144:14:24:41.0Z	72/104.5	SLWT				4694 LBS	definiton view of the universe and HST life extension into the
(49)		100	41M 50S (Preferred)		4 0050 (0)	34					next decade. A launch- on-need (LON) vehicle, STS-400, was
		<u>MS1</u> Michael Good	EOM PLS: KSC	<u>XRANGE</u> : 405.6 NM				DEORBIT:		<u>NON-DEPLOYED</u> : 17560 LBS	readied on Pad B for potential crew rescue since there was no ISS safe haven on this misssion. STS-400 release from
		P789/R338//M293		Orbit dir: D/L	2 = 2044 (11) 3 = 2057 (4)	<u>ET</u>		HA 294.3 NM		1/200 LB2	rescue duty occurred on May 21st , 2009, as the STS-125 crew
MLP-2		P / 09/K330//WI293	<u>TAL</u> : MRN <u>TAL WX</u> : None.	(50)	5 = 2037 (4)	<u>ET</u> IMPACT		HP 26.4 NM		MIDDECK:	prepared for the first deorbit/landing opportunity.
		MS2	TAL WA. NORE.	(50)	M 3 EOM:	1:27:55				0 LBS	
5 [™] & Final		Megan McAuthur	SELECTED:	AIM PT: Nominal	WEIGHT:	MET		<u>ENTRY</u> VELOCITY:		0 LD3	KSC W/D:
HST Service Flight		P790/R339/F46	RTLS: KSC15 N/N		225509.5 LBS	11121		26046 FPS		SHUTTLE	OPF Run 1: 178+2H+3Wx OPF Run 2: 120+11H
Flight			TAL: MRN20 CI/N	MLGTD: 3863 FT	X CG:	LAT:		20040 FP3		ACCUMULATED	VAB Run 1: 12+0C VAB Run 2: 8+0C
		MS3	AOA: KSC15 N/N	144:15:39:04Z	1078.3 IN	16.699 N		ENTRY		WEIGHTS:	PAD Run 1: 40+2C PAD Run 2: 38+4C
		John Grunsfeld	1 ST DAY PLS: NOR17	VEL: 192 KGS				RANGE:		DEPLOYED:	Total Work Days = 396 (OPF Processing occurred
		(Flt 5-STS-67, STS-81,	N/N	200 KEAS	LANDING:	LONG:		4267 NM		1524432 LBS	over a total time period of 314 days.)
		STS-103, STS-109)		HDOT: -2.5 FPS	WEIGHT:	147.375 W					
		P791/R191/V133/M167	TDEL:		225898 LBS					NON-DEPLOYED:	POSTPONEMENTS:
			0.000 (P) -0.448 (A)	Continued	X CG:					1621371 LBS	- Added STS-125 to FDRD - launch date of 08/07/08
		<u>MS4</u>			1080.9 IN					CARGO TOTAL:	on 06/29/07. - Ppd. to 08/28/08 on 02/14/08. Slip due to ECO
		Mike Massimino	MAX Q NAV:				-			4054222 LBS	sensor problems experienced during December
LT MA	JOHNS	(Flt 2 - STS-109)	740.95 (P) 734.75 (A)	Color	JAC	-	-	~		4004222 LDS	launch attempt of STS-122.
20	· 6 65	P792/R275/V204/M241			+ + + +	ANIC MARK	123			PERFORMANCE	- Ppd. to 10/08/08 on 05/27/08. Slip due to delays in
2 + + +	++++	MCE	SRB STG:		****	0	ALCONALS.			MARGINS (LBS):	delivery of ET 127 & ET-129 (STS-400).
		MS5 Andrew Feustel	2:04.16(P) 2:04.32(A)	181 - Care	1++*001 -	22		A SIGN		FPR: 2651	- Ppd. to 10/10/08 on 09/08/08. Slip due to Hurricane
6		P793/R340/M294	PERF: NOMINAL		***		-		2	FUEL BIAS: 1063	Faye impacts to HST payload readiness.
1 125	2 😼 🕴	1 7 73/1(3+0/10/27+	<u>F LKI</u> . NOWINAL		1000	1 Parts		5		FINAL TDDP: 1689	- Ppd. to 10/14/08 on 09/24/08. Slip due primarily to
EUS	2		2 ENG TAL (MRN):							RECON:2499	training time lost in the aftermath of Hurricane Ike.
1. 27		SS EVA 132	2:48 (P) 2:55 (A)				13		4		- Ppd. to NET Mid-Feb 2009 on 10/02/08. Slip due to
MG	ARTHU	EMU/TETHERED EVA 125				ALC:	Y			PAYLOADS:	HST on-orbit failure of A-side of Control Unit Science
-		SCHEDULED EVA 123	NEG RETURN:				-	-	1	PLB:	Data Formatter.
		DURATION 7:20	3:53 (P) 3:56 (A)					AC VOT		HST SM4, ICBC 3D	- Ppd. to NET Mid-May 2009 on 10/30/08. Slip due to
				AR	1			The second		MIDDECK:	checkout problems with HST spare control unit.
		SS EVA 133	PTA (U/S 483 FPS):							MIDDECK: HST SM4	- Selected May 12, 2009 launch date on 12/04/08.
		EMU/TETHERED EVA 126	4:11 (P) 4:12 (A)	4			- Tak	and a second		1131 31014	- Advanced from 05/12/09 to 05/11/09 on 05/01/09.
		SCHEDULED EVA 124 DURATION 7:56		S125E012154		Se ant	and and			5 CRYO TANK	Advancing one day provided a 3rd launch opportunity before range conflicts.
		DURATION 7.30	PTM (U/S 500 FPS): 5:09 (P) 5:12 (A)	S125-E-01215	4 HST Se	vice Crev		e on middeo	ck .	SETS	טפוטופ דמוועפ כטוווווכוז.
			5.07 (P) 5:12 (A)	Front row (left						RMS (83)	LAUNCH SCRUBS: None.
		Continued	Continued	McArthur/MS.					×	SRMS, OBSS	LINKON SONODO. NONC.
			Sontinuou	Massimino/MS							Continued
				Massimino/Mc		io, and r	Jusie	<i>,</i>			

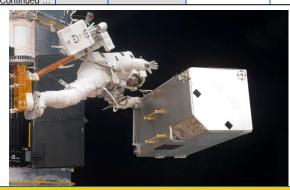
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FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM	OI	RBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.	UNDITER	TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP	1.500	PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-125		Ontinued	Continued	Continued							Continued
Continued		SS EVA 134 EMU/TETHERED EVA 127 SCHEDULED EVA 125	5:39 (P) 5:46 (A)	<u>TD NORM 205</u> : 3201 FT				N 1107			LAUNCH WINDOW: Total launch window was 59M 45S with window open at 131:17:44:01Z and close at 131:18:43:46Z. Preferred Launch Time was 131:18:01:56Z (In-Plane
		DURATION 6:36 SS EVA 135	5:59 (P) 6:02 (A)	DRAG CHUTE DEPLOY: 189 KEAS 144:15:39:06Z	S125E007221						Time) for a launch window of 41M 50S. <u>LAUNCH DELAYS:</u> None. Launch occurred on time at 131:18:01:56Z, 2:01:56 p.m. EDT, Monday, May 11, 2009. The Spaceflight Meteorology
		EMU/TETHERED EVA 128 SCHEDULED EVA 126 DURATION 8:02	MECO CMD:	<u>NLGTD</u> : 7134 FT 144:15:39:15Z	7221	-38.14		A A			2:01:56 p.m. EDT, Monday, May 11, 2009. The Spaceflight Meteorology Group (SMG) forecast no flight rule violations for launch or RTLS. The SMG also tracked a large wildfire 18nm northwest of KSC that stayed north of the orbiter track for an RTLS if needed.
		SS EVA 136 EMU/TETHERED EVA 129 SCHEDULED EVA 127 DURATION 7:02	$\frac{VI}{26089}$ 0 (D)	VEL: 137 KGS 141 KEAS HDOT: -6.3 FPS							TAL WEATHER At Moron, the only TAL site for the HST low inclination orbit, a trough of low pressure initially resulted in a "NO GO" with a slight chance of showers within
		MCC WHITE FLIGHT FCR (56)	26086.0 (A) <u>OMS-2</u> : 43:46 (P) 43:45.0 (A)	BRK INIT: 96 KGS DRAG CHUTE JETTISON:							20nm. Balloon data showed the atmosphere was too dry for showers and the forecast was updated to "GO" at 1636Z. Peak crosswinds of 15.5 kts surpassed the 15kt limit for a brief time at TAL landing, however, the FD had previouly stated a peak crosswind of 17kts was acceptable.
		<u>FLIGHT DIRECTORS:</u> ASC/ENT- Norm Knight LD/O1- Tony Ceccacci	142.5 (P) 139.7 (A) FPS	144:15:39:40Z			1		10		PERFORMANCE ENHANCEMENTS: Include the standard set plus: PE Operational High Q TRN/MAY
		O2- Rick LaBrode Planning- Paul Dye MOD – John Mccullough Team 4- Bryan lunneyi		AVE 2.8 PK 7.4 <u>WHEELS STOP</u> : 144:15:40:13 Z				i	4		FLIGHT DURATION CHANGES/LANDING: - For both KSC landing opportunities on Friday, May 22 nd the unstable weather was no go with low ceilings and thunderstorms expected. Landing was postponed to Saturday (EOM + 1).
		<u>CAPCOMS:</u> A/E - Greg (Box) Johnson	right FLT DURATION:	12367 FT <u>ROLLOUT</u> : 8504 FT					THE P		 KSC weather was no go for EOM+1 with broken low ceilings and thunderstorms. Little change was expected for Sunday (EOM+2) and Monday (EOM+3) as moisture remained abundant over KSC. KSC landing for Sunday (EOM+2) waived off due to weather. Next
		- Eric Boe (Wx) LD/01 – Dan Burbank O2 – Alan poindexter		1:09 M:S WINDS:			<u>q</u>	NR.		and the second second	opportunity to EDW's was selected on EOM +2 with typical summer weather and mostly clear skies. Landing occurred at 144:15:39:04Z (10:39:04 AM CDT Sunday, 05/24/09).
		Planning – Janice Voss Team 4 - N/A		16H KT 0 KTS OFFICIAL: 23016P20 (X 2 PK 2 HD 16 PK 20)		07221 (14 Ma	y 2009)	Gru	unsfeld & ng first HST	FIRSTS/LASTS: - First mission post-STS-107 incident without ISS safe haven. LON STS-400 mission was on standby on PAD 39B. "First time since 2001 that two such
			TOTAL SHUTTLE	<u>DENS ALT</u> : 3848 FT	EVA. Acti WFC3 and	vities ir	nclude	d install			birds have simultaneously perched on NASA's twin shuttle launch pads" - Todd Halvorson, Florida Today. - 116 new EVA tools (GSFC) were developed to meet unique demands of this HST SM.
				Continued @ left							 First flight of food bars and Metamucil wafers First ET build with elimination of "Hand Pack Ablator (SLA)"
											Continued

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FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM	0	rbit	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	Throttle Profile Eng. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)

STS-125 Continued.



S125-E-008120 (16 May 2009)-- Andrew Feustel moves Corrective Optics Space Telescope Axial Replacement (COSTAR) in 3rd EVA to upgrade HST.



JSC2009-E-120479 --- In MCC: Members of the STS-125 Hubble Space Telescope Planning and Orbit Flight Control Team.



S125-E-009918 (18 May 2009) "Hugging the Hubble!" -Grunsfeld, on end of RMS, and Feustel, conduct mission's fifth and final HST service EVA: Replaced batteries, a Fine Guidance Sensor, and three thermal blankets (NOBL). <u>NOTE</u>: Dr. John M. Grunsfeld was later appointed Deputy Director of the Space Telescope Science Institute (STScI) in Baltimore, Md. effective January 4, 2010.



JSC2009-E-118819 --- In MCC: John McCullough (seated foreground), Chief Flight Directors Office; Brent Jett (seated right), Director, Flight Crew Operations; Lead Flight Director Tony Ceccacci (standing, left);and Asc/Des Flight Director Norm Knight (standing, right).

Continued... FIRSTS/LASTS:

First flight of ATK BSM's in both forward and aft positions
SRB Frangible nut redesigned with pyrotechnic crossover assembly
Mike Massimino first to 'Tweet' from space, through email to JSC to his Twitter.
First job offer in space: John Grunsfeld, while flying high in space, was named an adjunct professor at the University of Colorado at Boulder
Fifth & last HST Service mission.

NIGHT LAUNCH: N/A

RENDEZVOUS: #73 Rendezvous with HST.

EVENTS:

- FD1: OMS2 ignition at 131:18:45:40.9Z resulted in a 298.1 by 106.6 NM orbit.
- T1 maneuver at 133:14:41:56.0Z resulted in a 303.2 by302.9 NM orbit
- FD2: RCC inspection found no areas of concern - no requirement for Focused Inspection.

 FD3: HST Grapple by McArthur occurred at 133:17:14Z. Timeline was about 20 min. behind schedule due to a comm. problem with HST that delayed HST prep for capture.

 FD4: EVA 1: Grunsfeld & Feustel: Activities included installing and completing good aliveness tests for new WFC3 and SI C&DH unit. The HST can now see farther into space and across a wider spectrum of colors. EVA ran 50 min longer than planned as the crew encountered difficult (aging) latches and bolts. EVA1 duration 7:20.
 FD5: EVA 2: Massimino & Good: Activities included Rate Sensor Unit changeouts

& Bay 2 Battery checkout. EVA ran long due to the challenges for seating and bolting of RSU's. EVA2 duration 7:56.

- FD6: EVA 3: Grundsfeld & Feusel: Activities included replacement of the COSTAR instrument with the Cosmic Origins Spectrograph and repair of the Advanced Camera for Surveys. EVA3 duration 6:36.

- FD7: EVA 4: Massimino & Good: Activities included refurbishment of Space Telescope Imaging Spectrograph and replacement of 6 Gyros. EVA 4 duration 8:02 (6th longest in program history).

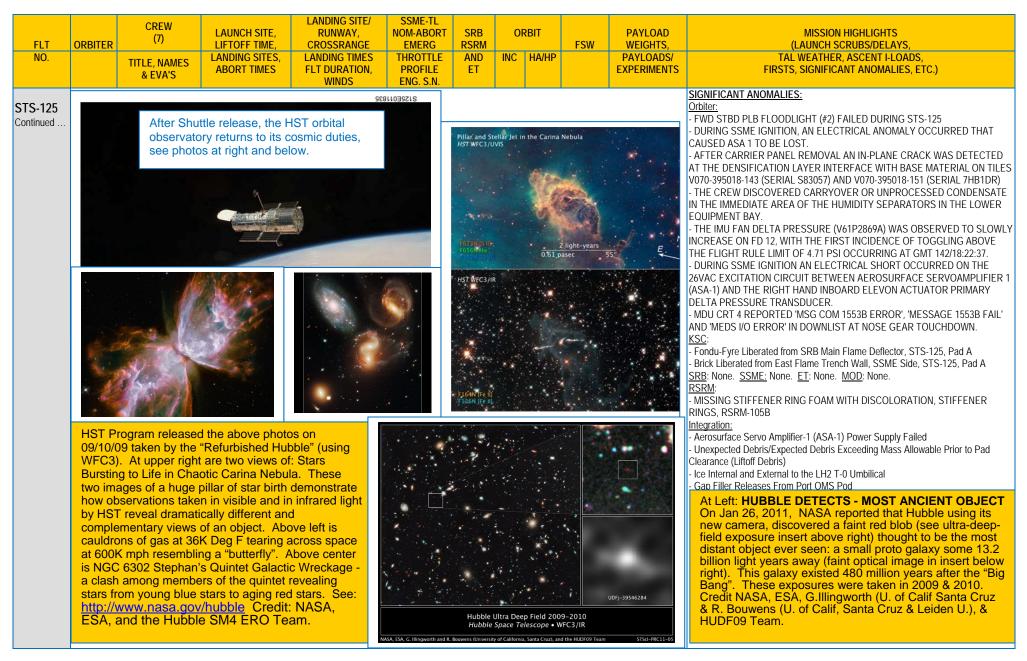
- FD8: EVA 5:Grundsfeld & Feustel: Activities included Bay 3 battery changeout and FGS 2 changeout . On way back to A/L crew found debris liberated from carrier and head under HST. On retrieving the debris, PLSS contact damaged the TPS cover on the Low Gain Aantenna (LGA). The LGA cover was reinstalled. The HST was in a good configuration for long term exposure to space. EVA5 duration 7:02.

- On departing the telescope, astronaut Grunsfeld called the week a "tour de force of tools and human ingenuity." He also added: "Hubble Isn't Just a Satellite, It Is About Mankind's Quest for Knowledge".

- FD9: HST was released at 139:12:57:00Z. This was followed shortly by OBSS late inspection of Atlantis TPS.

- During Entry comm blackout occurred at GMT 144/1513 - 1517 due to plasma effect.

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Page 2-209 - STS-127/2JA

				LANDING SITE/	SSME-TL						
		CREW	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(6+1 UP/6+1 DN)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
				WINDS	ENG. S.N.						
STS-127/	OV-105	CDR:	KSC 39A	KSC 15 (KSC 71)	104/104/109%	BI-138	51.6	DIRECT	OI-33	CARGO:	Brief Mission Summary: STS-127 (29th mission to ISS) was a
ISS-2JA	(Flight 23)	Mark Polansky (Flt 3 - STS-98,STS-116)	196:22:03:09Z	212:14:48:07Z 09:48:07 AM CDT	PREDICTED:	RSRM	(29)	INSERTION	(3)	36253LBS	"16 day marathon construction mission". The final pieces of the Japanese Kibo Complex including an Experiment
	ENDEAVOUR	(Fil 3 - 515-98,515-116) P794/R262/V185/M228		Friday (15)	100/104.5/104.5/					PAYLOAD	Exposed Facility ("Porch in Space" - PAO) and the
SEQ		1 7 74/12/02/ 0 103/10/220		07/31/09 (12)	72/104.5	100		POST OMS-2:		CHARGEABLE:	unpressurized Experiment Logistics Module were delivered
FLT # 127	OMS PODS	PLT	Wednesday (15)	0//0//0/ (12)	12/10/10	ET-131		123.8x32.3 NM		24682 LBS	along with spare equipment intended to keep ISS
	LPO3 -33	Doug Hurley	07/15/09 (10)	DEORBIT BURN:	ACTUAL:			DEODDIE		DEPLOYED:	operational long after Shuttle is retired. Five EVA's and
KSC-127	RPO4 29	P795/R341/M295		212:13:41:09.9Z	100/104.5/100//	SLWT		<u>DEORBIT:</u> HA 184.5 NM		24266 LBS	operations of three robotic arms were conducted for
PAD 39A	FRC5-22		LAUNCH WINDOW:		72/104.5	35		HA 184.5 NM HP 22.2 NM		24200 LD3	completion of all objectives.
(50)		MS 1	10M 0S (Total) 5M 0S (Preferred)	<u>XRANGE</u> : 672.5 NM		FT				NON-DEPLOYED:	
(50)		Christopher Cassidy	· · · · ·		1 = 2045 (10)	<u>ET</u> IMPACT		ENTRY		290 LBS	KSC W/D:
		P796/R342/M296	<u>EOM PLS</u> : KSC	ORBIT DIR: A/L (41)	2 = 2060 (1) 3 = 2054 (9)	1:14:27		VELOCITY:		MIDDECK:	OPF: 109 + 9H VAB: 7 + 0C
MLP-3		MS 2	TAL: MRN	AIM PT: Nominal	5 = 2054 (7)	MET		25855 FPS		126 LBS	PAD B: 32 + 10C + 1 SD (STS-125 launch) + 1 CR (Crew Rest
		Julie Payette (Canada)	TAL WX: ZZA.	<u>Aiwr r</u> . Norninar	M 3 EOM:					120 200	Dav)
29 th		(Flt 2-STS-96)		MLGTD: 1797 FT	WEIGHT:	LAT:		ENTRY		<u>SHUTTLE</u>	PAD A: 42 + 3C + 1H
SHUTTLE		P797/R249/V205/F33	SELECTED:	212:14:48:07Z	215899.5 LBS	35.889 S		RANGE:		ACCUMULATED	Total Work Days = 190 (OPF processing occurred
FLIGHT			<u>RTLS</u> : KSC15 N/N		X CG:			4334 NM		WEIGHTS:	over a total time period of 118 days.)
TO ISS		<u>MS 3</u>	TAL: MRN20 N/N	209 KEAS	1089.8 IN	LONG:				<u>DEPLOYED</u> : 1548698 LBS	POSTPONEMENTS:
		Tom Marshburn	AOA: NOR 17 N/SFD	HDOT: -2.8 FPS		157.79 W				1040090 LDS	- Added STS-127 to FDRD - launch date of 04/23/09 on 04/24/08.
		P798/R343/M297	з Б 1 st DAY PLS: EDW	TD NORM 195:	LANDING:					NON-DEPLOYED:	- Ppd. to 05/15/09 on 07/03/08. Slip due to ET deliveries.
	W HURLEY CAL	Sec. Sec.	22L N/N	2045 FT	WEIGHT:					1621661 LBS	- Ppd. to 06/13/09 on 03/10/09. Slip due to interim changes while
ALL	Sky				215816.5 LBS X CG:					CARGO TOTAL:	Cx and SSP schedules were assessed and prioritized.
and	1 + 7	-10	TDEL:	DRAG CHUTE	1091.7 IN					4090475 LBS	
12 12	27 + 1	. +	0.000 (P) -0.308 (A)	<u>DEPLOY</u> : 186 KEAS	1071.7 11					407047J LDJ	LAUNCH SCRUBS:
(= 1	121	2		212:14:48:13Z				And the second second second		PERFORMANCE	- Launch scrubbed officially on Saturday, 06/13/09 at 12:26 a.m.
		\$	MAX Q NAV:	NLGTD: 5842 FT					F #	MARGINS (LBS):	EDT due to GH ₂ leak at the GUCP – the same type of leak that scrubbed STS-119 in March. Launch rescheduled for 06/17/09.
	Can t - auto		722.7 (P) 705.3 (A)	<u>NLGTD</u> : 5842 FT 212:14:48:19Z					38	FPR: 2651	Technical Scrub.
	ASSIDY MARSIN		SRB STG:	VEL: 152 KGS						FUEL BIAS: 1059	- Launch scrubbed officially on Wednesday 06/17/09 at 1:55 EDT
			2:04.2 (P) 2:03.8 (A)	150 KEAS		and the second			88	FINAL TDDP: 2553 RECON:2734	with the reoccurrence of the same type of GUCP leak as
		MS 4		HDOT: -5.0 FPS				a teller		NECON.2/34	previous scrub. Launch rescheduled for 07/11/09. Technical
		Dave Wolf	<u>PERF</u> : NOMINAL					E.A.		PAYLOADS:	Scrub.
		(Flt 4 - STS-58, Up to Mir		<u>BRK INIT</u> : 71 KGS				624		<u>PLB</u> :	- Launch officially scrubbed during L-11 Hour Hold at MMT
INTER	STATIONAL	on STS-86, Dn on STS-89,	<u>2 ENG TAL (MRN)</u> :				X	Ser.	1.1	ISS-2J/A, ANDRE-	meeting on Saturday morning, 07/11/09, due to unstable weather
ICC-VLD		STS-112)	2:29 (P) 2:35 (A)	<u>DRAG CHUTE</u> JETTISON:			and P		84	2, DRAGONSAT	and lightning strikes overnight in KSC area. Seven strikes hit the lightning protection system, but none hit the vehicle. Launch
	ELM-ES	P799/R173/V147/M151		<u>JETTISON</u> : 56 KGS			11			MIDDECK:	rescheduled for 07/12/09. Weather Scrub.
	JEM-EF	MS 5 UP Stay ISS	<u>NEG MRN (2@ 104):</u> 2:52 (D) 2:59 (A)	12:14:48:52Z			A	1211		ISS-2A,MAUI,	- Launch scrubbed during a final hold at T-9 minute mark on
		EXP20/FLT ENG	3:53 (P) 3:58(A)			RATIT L	14	and the second second		SEITE, SIMPLEX	Sunday 07/12/09 due to predicted thunderstorms within 20 nm
		T1m Kopra	PTA (U/S 158 FPS):	BRK DECEL FPS2:	Gaseous hyd	drogen vei	nt line	leak caused S	STS-		limit of SLF. Launch rescheduled for 07/13/09. Weather Scrub.
	2J/A	P800/R344/M298	5:02(P) 5:10(A)	AVE 4.8 PK 6.3				so caused two		5 CRYO TANK	- Launch scrubbed at 6:39 PM EDT on Monday 07/13/09 due to
								e connects the	е	SETS	weather violations in KSC area. Launch rescheduled for
		Continued			Ground Umb					ODS, SRMS (84), OBSS.SSPTS,	07/15/09. Weather Scrub.
			Continued	Continued	vented gase			k" for burn-off	OT	ECSHS(2).ROEU.	
					vented gase	ous nyurc	igen.			PPSUS(2)	Continued

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FLT	ORBITER	CREW (6+1 UP/6+1 DN)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	Landing Times Flt Duration, Winds	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-127/ ISS-2JA Continued		DURATION 5:32	Continued <u>SE TAL (ZZA 104)</u> : 6:03(P) 6:08(A) <u>PTM (U/S 181 FPS)</u> : 6:01(P) 6:14(A) <u>SE PRESS 104</u> 6:52(P) 7:01(A) <u>MECO CMD</u> : 8:22.4(P) 8:24.9(A) <u>VI</u> : 25819(P) 25820(A) <u>OMS-2</u> : 35:45 (P) 38:30(A) 98.7(P) 96.9(A) FPS	Continued WHEELS STOP: 212:14:49:13Z 11856 FT ROLLOUT: 10059 FT 1:06 M:S WINDS: 7H KT 6R KTS OFFICIAL: 19008P13KT (X5P7 H7P11) DENS ALT: 1916 FT FLT DURATION: 15:16:44:58 S/T: 1212:01:31:44 OV-105: 266:15:33:01 DISTANCE: 6,547,853 sm TOTAL SHUTTLE DISTANCE: 497,402,218 sm	JSC2009-E Robert Sied for Space O Room durin	ck, right, Dperation ng a built	talks v ns Bill -in lau	vith Associa Gerstenma nch countd	ate Adri ier in K own ho En Kibo la	deavour's boratory	Continued LAUNCH WINDOW: Total launch window was 10M 5S with window open at 196:21:58:10Z and close at 196:22:08:10Z. Preferred Launch Time was 196:22:03:10Z (In-Plane Time) for a launch window of 5M 0S. LAUNCH DELAYS: - None. Launch occurred on time at 196:22:03:10Z, 6:03:10 p.m. EDT, Wednesday, July 15, 2009. The Spaceflight Meteorology Group (SMG) forecast was challenged by thunderstorms along the east coast breeze throughout the day. However, the weather improved at the SLF and within the 20nm limit prior to launch for a "Go". TAL WEATHER: TAL weather also cooperated for a Go for launch. A high pressure system produced dry and stable conditions across southern Spain. The two Spanish TAL sites were forecast for clear skies and winds within flight rule limits. Istres was forecasting a slight chance of a ceiling below flight rule limits for launch day. PERFORMANCE ENHANCEMENTS: Include the standard set plus: 1) PE Operational High Q SUM/JUL, 2) OMS Assist, 3) a 52 nautical mile MECO, and 4) Del Psi FLIGHT DURATION CHANGES: NONE - Planned landing at KSC on orbit 248. Landed at KSC Runway 15 on orbit 248 at 212:14:48:07Z on Friday, July 31, 2009. FIRSTS/SECONDS/LASTS: - Five launch scrubs is second highest number: STS-73 in 1995 & STS-61C in 1986 had six. - Koichi Wakata, first Japanese astronaut to have engaged in long- duration on-orbit, returned to Earth after 4 1/2 months. - First flight of SSME controller constant updates, an updated MPS propellant inventory, and an updated CMR. - Record-size space crew of thirteen (ISS & Shuttle). NIGHT LAUNCH: N/A RENDEZVOUS: #74 Rendezvous and dock with ISS.

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FLT	ORBITER	CREW (6+1 UP/6+1 DN)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM	ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-127/		Continued								Continued

MCC WHITE FLIGHT FCR (57)

ISS-2JA

Continued

FLIGHT DIRECTORS: SHUTTLE: A/E- Bryan Lunney LD/O1- Paul Dye O2- Kwatsi Alibaruho Planning- Gary Horlacher - Mike Sarafin MOD – John Mccullough Team 4- Richard Jones

<u>ISS</u>

01 - Brian Smith LD/02 – Holly Ridings 03 – Derek Hassmann Team 4 - Ron Spencer

CAPCOMS:

SHUTTLE A/E – Alan Poindexter - Eric Boe (Wx) LD/O1 – Greg (Box) Johnson O2 - Janice Voss Planning - Stan Love - Shannon Lucid Team 4 - N/A

<u>ISS</u>

O1 – Hal Getzelman LD/O2-Akihiko Hoshide O3 – Jason hutt Team 4 – N/A



S127-E-009733 (28 July 2009) --- **Record Size Space Crew:** The STS-127 and Expedition 20 crew members pose for a group portrait in ISS Harmony Node. From left (front row) are NASA astronauts Michael Barratt, Exp 20 FE; Mark Polansky, STS-127 CDR; cosmonaut Gennady Padalka, Exp 20 CDR; and NASA astronaut Dave Wolf, STS-127 MS. From left (middle row) are JAXA astronaut Koichi Wakata, STS-127 MS; Canadian astronauts Julie Payette, STS-127 MS and Robert Thirsk, Exp 20 FE; and NASA astronaut Tom Marshburn, STS-127 MS. From left (back row) are cosmonaut Roman Romanenko, Exp 20 FE; NASA astronauts Christopher Cassidy, STS-127 MS; Doug Hurley, STS-127 Pilot; Tim Kopra, Exp 20 FE; and ESA astronaut Frank De Winne, Exp 20 FE.

EVENTS:

 During liftoff several pieces of foam insulation came off the ET. Shuttle was hit two or three times, said Bill Gerstenmaier. Some scuff marks were spotted on the belly, but that probably is coating loss and considered minor, he said. That was later determined to be the case.

FD1: OMS2 ignition at 196:22:41:40.0.9Z resulted in a 125.4 by 85.1 NM orbit.
 FD2: RCC inspection found no areas of concern

- T1 maneuver at 198:15:17:25.9Z resulted in a 188.7 by184.0 NM orbit

FD3: R-Bar Pitch Maneuver was performed. No issues.

- Hard Dock, hooks closed, occurred at 198:15:47:10Z (12:47 CDT, July 17, 2009)

- ISS Hatch opened at 198:17:48:10Z (2:48 PM CDT, July 17, 2009) welcomed by ISS crew.

- IELK Seat Liner Transfer at 198:19:22:10Z (9:00 PM CDT March 17, 2009). At that time Koichi Wakata became a member of STS-127 and Tim Kopra joined the ISS Expedition 20 as Flight Engineer.

- Reboost - -2.5 fps posigrade delta V. Increased altitude approx 4700 ft . Cleared vehicles of conjunction with Object 84180.

- FD4: Based on review of launch imagery, MMT cancelled FD5 focused inspection of Orbiter heat shield.

- FD4: EVA 1: David Wolf & Tim Kopra: Activities included: JPM berthing mechanism prep and install, CETA cart mods, and the P3 Nadir UCCAS deploy. EVA was shortened due to suit consumables. The PAS deploy was ppd. EVA1 duration 5:32.

- Using the SSRMS and SRMS the JEM Exposed Facility (JEF) was successfully unberthed from the Shuttle P/B and captured on the Japanese Experiment Module (JEM).

- FD6: EVA2: Dave Wolf & Tom Marshburn: Activities included: Transfer of ORU's (Space-to-Ground Antenna, Linear drive Unit & Pump Module) from the Integrated Cargo Carrier (ICC) to the External Stowage Platform. Installation of the JEF forward Vision Equipment [VE] was deferred. EVA2 duration 6:53.

 FD8: EVA3: Dave Wolf & Chris Cassidy: Activities included: Node 2 WIF 14 removal and installation to COL WIF 2, JLE payload prep, completion of 2 Lab FPP grounding sleeves, changeput of 2 of 6 batteries on P6 (batts A & B from the ICC-VLD) and positioning of ICC-VLD in overnight parking configuration.
 EV2's LiOH performance caused early termination. EVA3 duration 5:59.
 FD10: EVA4: Chris Cassidy & Tom Marshburn: Activities included: successful R&R of all batteries and successful latching of the ICC-VLD back into the Shuttle P/L bay for return. EVA4 duration 7:12.

Continued...

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FLT	ORBITER	CREW (6+1 UP/6+1 DN)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL Nom-Abort Emerg	SRB RSRM		RBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	Landing Times Flt Duration, Winds	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
Paul Dye docking o backgrou Gorie (fa	e (foreground of STS-127 E und are CAP r left) and Gr	Orbit 1 Lead FD l) on console during Endeavour to ISS. In COM's Dominic reg Johnson.	5127E011200						 EVENTS: Continued FD13: EVA5: Chris Cassidy & Tom Marshburn: Activities included: completion of Z1 patch panel reconfig, SPDM covers, JEF Vision Equipment installation and several get-aheads (JEM handrail and WIF installation, Lab cable tiedowns, Node 2 Gap Spanner installation, and relocating two APFR's for STS-128). The S3 Zenith Outboard PAS task was not performed due to lack of time based on predicted METOX capability. EVA5 duration 4:54. -Transfers: 24,638 Pounds of hardware transferred to ISS (inside & out) 10,479 Pounds of hardware returned aboard Endeavour 2,175 Pounds of middeck items delivered to ISS aboard Endeavour 1,980 Pounds of middeck items returned from ISS to Endeavour 1,225 Pounds of water transferred to ISS 45 Pounds of Oxygen used for "stack maintenance" 12 Pounds of Nitrogen transferred to ISS - ISS Mass in space 685,986 mass - pounds - FD14: Undocked at 209:17:26:00Z (12:26 PM CDT, July 28, 2009) - After undocking, Hurley initiated Endeavour at a distance of 400 feet from ISS and completed Sep-maneuver at 209:19:09:00Z (2:09 PM CDT, July 28, 2009) - During Entry comm blackout occurred at 212:14:34:05Z - 212:14:36:24Z due to plasma effect. 		
Marshbu MS's, pa	rn (left) & Ca rticipate in fif tion and mair	Site (27 STS-127 its and final EVA as intenance continue	S127-E-01120	ET: - POST-I FOAM A - POST- FOAM IN AT STAT - ET TPS <u>MOD</u> : NC Integratic - Unexpe Pad Clea - LH ₂ Lea	AUNCH CAMER AUNCH CAMER T SEVERAL LOC/ LAUNCH CAMER THE AFT INBOA ION 718 Loss Outboard S ine.	S: Conti A AND FI ATIONS A & FILM RD COR ection of cted Debr ris) mbilical (ILM R ON TH A REV NER ris Exc Carrie	EVIEW SI EVIEW SI IE INTER IEW SHO OF THE L ' Bipod Cl : ceeding M r Plate (G	DN. HOWED TANK. DWED LO LO ₂ ICE loseout fass Allo	0 LOSS OF OSS OF FROST RAMP owable Prior to	SIGNIFICANT ANOMALIES: Orbiter: - MICROBIAL REMOVAL ASSEMBLY LEAKAGE - FUEL CELL 3 SN 121 SUSTAINING HEATER TURNED ON WHEN THE FC STACK OUT TEMPERATURE REACHED A VALUE OF 185 DEG F - DURING THE RCS HOTFIRE TEST, FORWARD RCS THRUSTER F2F EXHIBITED LOW PC (V42P1542A) OF APPROXIMATELY 16 PSI. F2F WAS DECLARED FAILED OFF AND AUTO DESELECTED BY RCS RM AT MET 14/10:45:40 (GMT 211/08:48:50). KSC: - The Istres Backup Azimuth system is in a Hard Overscan Alarm - STS-127 Post Launch Debris SRB: - TOP LAYERS OF MSFC CONVERGENT COATING (MCC-1) MISSING ON AFT SKIRT TPS ACREAGE (BOTH LEFT & RIGHT HAND)POST FLIGHT OF STS- 127/BI-138 - LEFT-HAND SOLID ROCKET BOOSTER ENHANCED DATA ACQUISITION SYSTEM (EDAS) ASSEMBLY CHANNEL 4 DID NOT RECORD NOMINAL STRAIN RESPONSE. RSRM: None. SSME: None. Continued at left

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FLT NO.	ORBITER	CREW (6+1 UP/6+1 DN) TITLE, NAMES & EVA'S	Launch Site, Liftoff Time, Landing Sites, Abort Times	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE ENG. S.N.	SRB RSRM AND ET	INC	ORBIT HA/HP	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-128 (17A) SEQ FLT # 128 KSC-128 PAD 39A (51) MLP-2 30 th SHUTTLE FLIGHT TO ISS	OV-103 (Flight 37) DISCOVERY OMS PODS LPO1 -40 RPO3-38 FRC3-37	CDR: Rick Sturckow (Flt 4 - STS-88,STS-105 STS-117) P802/R247/V173/M215 PLT Kevin Ford P803/R345/M259 MS 1 Patrick Forrester (Flt 3 - STS-105, STS-117) P804/R269/V186/M235 MS 2 Jose Hernandez P805/R346/M300 MS 3 Danny Olivas (Flt 2-STS-117) P806/R309/V207 /M267 MS 4 Christer Fuglesang (ESA) (Flt 2 - STS-116) P807/R304/V208/M264	KSC 39A 241:03:59:37Z 11:59:37 PM EDT (P) 11:59:37 PM EDT (A) Friday (27) 08/28/09 (9) <u>LAUNCH WINDOW:</u> 9M 36S (Total) 4M 48S (Preferred) <u>EOM PLS</u> : KSC <u>TAL</u> : MRN <u>TAL WX</u> : FMI.(NO GO) ZZA (NO GO) <u>SELECTED</u> : <u>RTLS</u> : KSC33 N/N <u>TAL</u> : MRN20 N/N <u>AOA</u> : NOR 17 N/SFD S B <u>1ST DAY PLS</u> : EDW 22L N/SFD <u>TDEL</u> : 0.000 (P) -0.078 (A) MAX Q NAV:	7:53:20 PM CDT Friday (16) 09/11/09 (12) <u>DEORBIT BURN</u> : 254:23:47:37Z <u>XRANGE</u> : 374.6NM <u>ORBIT DIR</u> : A/L (42) <u>AIM PT</u> : Nominal <u>MLGTD</u> : 1515 FT 255:00:53:20Z VEL: 220 KGS 199 KEAS HDOT: -4.3 FPS <u>TD NORM 195</u> : 1753 FT	3 = 2047 (13) <u>M 3 EOM</u> : WEIGHT: 222200 LBS X CG: 1088.4 IN <u>LANDING</u> : WEIGHT: 222271 LBS X CG: 1090 IN	BI-139 RSRM 107 ET-132 SLWT 36 <u>ET</u> <u>IMPACT</u> 1:14:26 MET <u>LAT:</u> 35.875 S <u>LONG</u> : 157.761 W	51.6 (30)	DIRECT INSERTION POST OMS-2 127.5x84.4 NM DEORBIT: HA 192.1 NM HP 22.5 NM ENTRY VELOCITY: 25863 FPS ENTRY RANGE: 4399.1 NM	OI-34 (1)	CARGO: 40605LBS PAYLOAD CHARGEABLE: 33056 LBS DEPLOYED: 30572 LBS NON-DEPLOYED: 2331 LBS MIDDECK: 153 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 1579270 LBS NON-DEPLOYED: 1579270 LBS NON-DEPLOYED: 1623992 LBS CARGO TOTAL: 4131080 LBS	Brief Mission Summary: The STS-128 (30th mission to ISS), dubbed "Racking Up New Science" by PAO, main objective was to deliver science and environmental racks to dramatically enhance the scientific capability of the ISS. These racks were carried in the Leonardo MPLM. Included in the cargo was the highly publicized Combined Operational Load Bearing External Resistance Treadmill (COLBERT) named after TV comedian Stephen Colbert. Three EVA's were conducted and included replacement of the massive ammonia tank used by the ISS Thermal Control System. KSC W/D OPF: 117+ 2H VAB: 9 + 0C PAD A: 25 + 0C Total Work Days = 151 (OPF processing occurred over a total time period of 119 days.) POSTPONEMENTS: - Added STS-128 to FDRD - launch date of 07/30/09 on 06/23/08. - Ppd. to 08/06/09 on 12/10/08. Interim manifest while HST final placement is considered. - Ppd. to 08/07/09 on 06/08/09. Slip due to MA direction. - Ppd. to 08/25/09 on 08/20/09. Slipped to support KSC processing. LAUNCH SCRUBS:
MSRR MELEL EUTEF FIR NJ. ARS	MISSE GA & 6B CQ ATA ZSR 1-2	MS 5 UP Stay ISS EXP20/FLT ENG Nicole Stott P808/R347/F47 <u>MS 5 DN EXP 20</u> FLT ENG Tim Kopra Up on STS-127 stay ISS) P809/R344/M298	Introduction 752.76 (P) 738.70 (A) SRB STG: 2:02.2 (P) 2:02.6 (A) PERF: NOMINAL 2 2:02.2 (P) 2:02.6 (A) 2:38 (P) 2:38 (P) 2:41 (A) NEG MRN (2@ 104): 3:52 (P) 3:52 (P) 3:53(A) PTA (U/S 157 FPS): 5:09(P) 5:12(A) Continued	NLGTD: 4854 FT 255:00:53:29Z VEL: 185 KGS 161 KEAS HDOT: -6.3 FPS BRK INIT: 113 KGS DRAG CHUTE JETTISON: 54 KGS 255:00:54:06Z BRK DECEL FPS ² : AVE 4.8 PK Continued	STS128-S-011 Banana River V toward Earth o launch #33.	Viewing Site	e, the S	Viewed from the bace Shuttle hear s with ISS. Night		PERFORMANCE MARGINS (LBS): FPR: 2908 FUEL BIAS: 1059 FINAL TDDP: 1707 RECON: 2077 PAYLOADS: PLB: ISS-17A (MPLM,LMC), MISSE 6, TRIDAR AR&D SENSOR,DTO- 701A Continued	 - 08/25/09 weather did not cooperate, systems looked good. Setting up for the next opportunity, window open at 12:05am CDT tomorrow with the in-plane time at 12:10am. Weather Scrub. - 08/25/09 the 2nd launch attempt was scrubbed officially at 4:52 p.m. CDT (5:52 Eastern) by Launch Director Pete Nickolenko due to stuck "fill & drain valve during ET loading. Based on the results of a technical review of the MPS Hydrogen Fill & Drain Valve data, a 48 hour scrub turnaround was initiated. Technical scrub. - 08/27/09 Official no go for launch today. Launch postponed to allow engineers additional time to develop flight rationale based on testing of F&D valve. Moses, "Will try tomorrow night if we get there." Next opportunity is Friday at 10:59 pm CDT (11:59 Eastern). - 08/28/09 MMT Summary at 12:55 PM: Reviewed LH₂ valve (PV12) and agreed to plan for tonight's launch attempt. MMT is go to proceed for launch.

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FLT NO.	ORBITER	CREW (6+1 UP/6+1 DN)	LIF	JNCH SITE, TOFF TIME, DING SITES,	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES	SSME-TL NOM-ABORT EMERG THROTTLE	SRB RSRM AND	INC	orbit Ha/Hp	FSW	PAYLOAD WEIGHTS, PAYLOADS/	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS,
NO.		TITLE, NAMES & EVA'S		ORT TIMES	FLT DURATION, WINDS	PROFILE ENG. S.N.	ET	INC			EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-128 (17A) Continued	ews Conf:	Continued <u>SPECIAL EDUCATOR</u> "Buzz" Lightyear (DN/EXP 20, see below left)		lights over I	eather scrubs launch Launch Pad 39A con rike. Photo source: N	npete with the	1					Continued <u>LAUNCH WINDOW</u> : Total launch window was 9M 36S with window open at 241:03:54:49Z and close at 241:04:04:25Z. Preferred Launch Time was 241:03:59:37Z (In-Plane Time) for a launch window of 4M 48S.
News 13 I "Buzz Lig doing oka Suffredini: are big pl	Flordia: phtyear y?" : "There lans for	SS EVA 142 DOCKED QUEST EVA 60 EMU/TETHERED EVA 135 SCHEDULED EVA 133 DURATION 6:35										LAUNCH DELAYS: - None. Launch occurred on time at 241:03:59:37Z, 11:59:37 PM EDT, Friday, August 28, 2009. The Spaceflight Meteorology Group (SMG) gave a "Go" for weather.
him. He's stowed, so talk to him	o I didn't	SS EVA 143 DOCKED QUEST EVA 61 EMU/TETHERED EVA 136 SCHEDULED EVA 134 DURATION 6:39										TAL WEATHER: SMG Forecast: A frontal system is approaching Istres and a upper level shortwave is dropping into northern Spair and southern France. Result in very windy conditions at Istres an breezy conditions at Zaragozal. Istres winds will be violating fligh rule limits while Zaragoza will be very near the headwind limit. Moron weather is looking very favorable with clear skies and
		SS EVA 144 DOCKED QUEST EVA 62 EMU/TETHERED EVA 137 SCHEDULED EVA 135 DURATIO N 7:01		-	-			-				relatively light winds. PERFORMANCE ENHANCEMENTS: Include the standard set plus: 1) PE Operational High Q - SUM/AUG, 2) OMS Assist, 3) a 52 nautical mile MECO, and 4) Del Psi
A REAL PROPERTY OF THE REAL PR		MCC WHITE FLIGHT FCR (58) <u>FLIGHT DIRECTORS:</u> <u>SHUTTLE:</u> A/E- Richard Jones LD/O1- Tony Ceccacci O2- Kwatsi Alibaruho Planning- Gary Horlacher MOD – John Mccullough Team 4- Mike Sarafin	6:05(P) <u>PTM (l</u> 6:09(P)	<u>L (FMI 104)</u> :) 6:08(A) <u>J/S 181 FPS):</u>) 6:16(A)				- Water T	ower Strike		Continued MIDDECK: ISS-17A,MAUI, SEITE,SIMPLEX 5 CRYO TANK SETS	FLIGHT DURATION CHANGES: - Thursday, Sep 10, 2009, first deorbit opportunity waved off for violations of showers within 30nm & crosswind violations at 17 kts Second opportunity also waved off; showers, instability, broken cloud deck and crosswind violation. Flight extended for EOM +1 day to Friday, 4 opportunities available. First & second opportunities at KSC were again waved off due to weather. EDW had no violations and low winds, first opportunity shows winds 23 8p12 kts. GO for EDW given. Landed on EDW Runway 22 at 255:00:53:20Z, Friday, Sep 11, 2009.
		<u>ISS</u> O1 - Ron Spencer LD/O2 – Heather Rarick O3 – Royce Renfro Team 4 - Derek Hassmann	6:57(P) <u>MECO</u> 8:24.0(VI:	, , ,		D.	And the server of the server o			le	ODS, SRMS (85), OBSS,SSPTS	FIRSTS: RSRM Improved Resiliency O-rings, Nozzle-to-Case Joint. Fly with higher margins. RSRM Inactive Stiffener Stub Removal - Eliminated four debris liberation/debris impact causes NIGHT LAUNCH: #33
		Continued	Contin		Google Earth From: Aug 15	Plots of StrikeNet 5, 2009 Daily PRCI	and CGLSS B, John Apfe	S Coordi elbaum/K	nates. SC PHI10			Continued

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			J							UWIWART	1 age 2-210 - 010-120/17A
FLT NO.	ORBITER	CREW (6+1 UP/6+1 DN) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION,	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE	SRB RSRM AND ET	ORBI		FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
(left) & To The laund	ny Cecca h was late 's main pr	Continued CAPCOMS:	unch attempt. ssue in	WINDS Continued WHEELS STOP: 255:00:54:33Z 13109 FT ROLLOUT: 11594 FT 1:13 M:S WINDS: -6.5T KT -2.5L KTS OFFICIAL: 09007P08KT (X4P4 T6P7) DENS ALT: 5489 FT FLT DURATION: 13:20:53:43 S/T: 1225:22:25:27 OV-103: 332:00:33:34: DISTANCE: 503,104,934 sm	S128E007229 Construction ABOVE: S FE, during Activities in truss . BELOW: S	128-E-(EVA 1) ncluded	007229 (with Dani removal	I Sept ny Oliv of an 5 Sept	2009) /as/MS empty t. 2009]	ed on the ISS. Nicole Stott/EXP 20 3 (out of frame). ammonia tank from ISS) Olivas/MS3 (left) & ate in EVA3 activites.	 Continued RENDEZVOUS: #75 Rendezvous and dock with ISS. EVENTS: FD1: OMS2 ignition at 241:04:38:36.92 resulted in a 127.5 by 84.4 nm orbit. FD2: RCC inspection found no areas of concern T1 maneuver at 242:22:26:17Z resulted in a 193.2 by181.6 NM orbit FD3: R-Bar Pitch Maneuver was performed. No issues. Docking Contact occurred at 243:00:53:56Z Hard Dock, hooks closed, occurred at 243:01:07:23Z ISS Hatch opened at (9:32 PM CDT, Aug 30, 2009) welcomed by ISS crew. IELK Seat Liner Transfer at (10:50 PM CDT, Aug 30). At that time Tim Kopra became a member of STS-128 and Nicole Stott joined ISS EXP 20. MMT FD3 reported VRCS jet F5R experienced a jet fail leak at 004:37 MET. ISS to perform all attitude control & maneuvers during the docked mission. MMT FD5 concurred that no Focused Inspection of Orbiter was required. FD5: "Leonardo" MPLM transferred to ISS, Zero-G stowage rack t "Harmony" node & COLBERT treadmill transferred. FVA 1: Olivas & Stott successfully completed: Prep of P1 truss Ammonia Tank Assembly (ATA) for removal, EUTEF & MISSE experiment removal from Columbus module. EVA1 duration 6:35. FD7: EVA2: Olivas & Fuglesang: EVA was about 51 min late due to Olivas' comm. cap chin strap came undone while in prebreathe. The ATA task was completed early & 3 get ahead tasks were completed: CLA cover installation, APFR 4 tool stanchion relocation, & CLPA cover installation, APFR 4 tool stanchion relocation, Without intact helmet lights he headed to the A/L before sunset. His PET was 6:22. Olivas performed cleanup. EVA3 duration (PET) 7:01. Continued

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FLT NO.	ORBITER	CREW (6+1 UP/6+1 DN) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE ENG. S.N.	SRB RSRM AND ET	INC	orbit Ha/Hp	FSW	Payload Weights, Payloads/ Experiments	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
flight po front ro Forrest Fuglesa left, Ko schedu Clockw Roman	ortrait on IS w, from left, er; middle r, ang (ESA). pra, who joi led to returr ise from hin Romanenk	STS-128 & Exp 2 S. STS-128 red-clar CDR Sturckow, Her ow in red, PLT Ford, EXP 20 crew (in blue ned ISS crew in July to Earth with STS- n are: Stott, Robert T o/RSA, Frank De W RSA, and Michael B	d crew are: rnandez, & , Olivas, & e) are: bottom /, now 128. Thirsk/CSA, inne/ESA,	S128-E-0099 blackness of their relative :	98 (8 Sept. 200 space, ISS as s	seen from 09) Si ng was div	huttle D	very as the s	two spa	cecraft begin	ContinuedTransfers: 18,548 Lbs of hardware transferred to ISS 1,705 Lbs "New" ATA (with 600 lbs of ammonia) to ISS 1,295 "Old" ATA to Discovery 5,223 Lbs hardware returned to Discovery 1,705 Lbs of middeck items transferred to ISS 861 Lbs of middeck items transferred to ISS 861 Lbs of middeck items returned from ISS to Discovery 1,243 Lbs of water transferred to ISS 861 Lbs of water transferred to ISS 710,966 Mass in space of the ISS (lbs) 84 Percentage complete of ISS assembly - FD12: Undocked at 251:19:26:22Z - During Entry comm blackout occurred at 255:00:38:39Z - 255:00:39:02Z due to plasma effect FD15: Deorbit burn on orbit 219 for EDW landing. SIGNIFICANT ANOMALIES: Orbiter: - EV2 UNACCEPTABLE COMM DURING EVA 2 Vernier Thruster F5R Indicates Leak In Flight - APU 3 EGT 2 R&R - Vernier Thruster F5R Indicates Leak In Flight KSC: - HANDLES ON BULK HEAD PLATES ARE LIBERATING - STS-128 Post Launch Debris SRB: - DEBRIS OBSERVED NEAR HOLD DOWN POST (HDP-4) DURING ASCENT RH MAIN CHUTE CANOPY DAMAGED WITH A VERTICAL TEAR EXTENDING FROM THE TOP VENT BAND TO THE CANOPY BOTTOM SKIRT BAND DURING STS-128 ON BI-139 RSME: None. SSME: None. ET: - STS-128/ET-132 REVIEW SHOWED FOAM LOSS BETWEEN +Y JACKPAD/-Y BIPOD CLOSEOUTS AT LH2/IT FLANGE MOD: None. Integration: - LH2 PV-12 Inboard Fill and Drain valve did not indicate closed when commanded

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		CREW (6 UP/6+1 DN)	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER		LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	Landing Times Flt Duration, Winds	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-129/ ULF3 SEQ FLT # 129 KSC-129 PAD 39A (52) MLP-3 31 th SHUTTLE FLIGHT TO ISS	(Flight 31) ATLANTIS OMS PODS LPO4-30 RPO1-38 FRC4-31	CDR: Charles O. Hobaugh (Fit 3 - STS-104, STS-118) P810/R268/V188/M234 PLT Barry E. Wilmore P811/R348/M301 MS 1 Leland Melvin (Fit-2 - STS-122) P812/R319/V209/M275 MS 2 Randy Bresnik P813/R349/M302 MS 3 Mike Foreman (Fit 2 - STS-123) P814/R324/V210/M280 MS 4, EV2 Robert Satcher, Jr. P815/R350/M303 MS 4, EV2 Robert Satcher, Jr. P815/R350/M303 MS 5 DN EXP20/21 FLT ENG Nicole Stott (UP STS-128) P816/R347/F47 SS EVA 145 DOCKED QUEST EVA 63 EMU/TETHERED EVA 138 SCHEDULED EVA 136 DURATION 6:37 SS EVA 146 DOCKED QUEST EVA 64 EMU/TETHERED EVA 137 DURATION 6:08	KSC 39A 320:19:28:10Z 1:28:01 PM CST (P) 2:28:01 PM EST (A) Monday (15) 11/16(09 (15) LAUNCH WINDOW: 9M 01S (Total) 4M 28S (Preferred) EOM PLS: KSC TAL: ZZA TAL WX: MRN, FMI (Cloud Ceiling) SELECTED: RTLS: KSC33N/N TAL: ZZA 30L N/SFD AOA: KSC 33 N/N TAL: ZZA 30L N/SFD AOA: KSC 30 N/N AOA: KSC 30 N/N AOA: KSC 30 N/N AOA: K	KSC 33 KSC (72) 331 / 14:44:21Z 8:44:21 AM CST Saturday (24) 11/7/09 (14) <u>DEORBIT BURN</u> : 331:13:37:09Z <u>XRANGE</u> : 344.1NM <u>ORBIT DIR</u> : A/L (43) <u>AIM PT</u> : (Close-In) <u>MLGTD</u> : 2971 FT 331:14:44:20Z VEL: 184 KGS 197 KEAS HDOT: -2.1 FPS <u>TD NORM 195</u> : 2989 FT <u>DRAG CHUTE</u> <u>DEPLOY</u> : 189 KEAS 331:14:44:24Z Continued	104/104/ 109% PREDICTED: 100/104.5/104.5/ 72/104.5 ACTUAL: 100/104.5/100/ 72/104.5 1 = 2048 (10) 2 = 2044 (12) 3 = 2058 (4) M 3 EOM: WEIGHT: 206917 LBS X CG: 1083.8 IN LANDING: WEIGHT: 207200 LBS X CG: 1084.6 IN DTE: Ares Progra	NAS/ rocket la as STS- 2009 lat	09-594 A's neu aunche 129 rec unch a	DIRECT INSERTION POST OMS-2 125.0x84.8 NM DEORBIT HA 191.9 NM HP 23.3 NM ENTRY VELOCITY: 25867 FPS ENTRY RANGE: 4390.31 NM 15 (28 Oct. 200 v Ares I-X test is from PAD 39 adies for Nov. t PAD 39A. 10.	B	CARGO: 38893LBS PAYLOAD CHARGEABLE: 29372 LBS DEPLOYED: 27615 LBS NON-DEPLOYED: 1404 LBS MIDDECK: 353 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 1606885 LBS NON-DEPLOYED: 1606885 LBS NON-DEPLOYED: 1605896 LBS CARGO TOTAL: 4131080 LBS PERFORMANCE MARGINS (LBS): FPR: 2908 FUEL BIAS: 1059 FINAL TDDP: 2228 RECON: 2041 PAYLOADS: PLB: ISS-ULF3 (ELC 1, ELC 2, SASA, MISSE 7A, MISSE 7A, MISSE 7B) Continued	Brief Mission Summary: The STS-129 (31th mission to ISS), dubbed "Stocking the Station" by PAO, main objective was to deliver nearly 14 tons of ISS systems spares. The most critical spares being transferred were two 600 lb. control moment gyros. "They've done a tremendous job of really outifitting station with all the spares that are going to be needed, essentially through its lifetime," Bill Gerstenmaier, NASA Associate Administrator for Space Operations. KSC WID OPF: 113 days + 10 non-workdays + 1 holiday VAB: 7 days + 10 contingency day Total Work Days = 152 (OPF processing occurred over a total time period of 124 days.) POSTPONEMENTS: • Baselined STS-129 to FDRD - launch date of 10/15/09 on 10/06/08. • Ppd. to 11/12/09 on 12/04/08. Interim manifest while HST final placement is considered. • Ppd. to 11/16/09 at10/29/09 FRR. Slip due to latest SSP planning. LAUNCH SCRUBS: None. LAUNCH WINDOW: Total launch window was 9M 01S with window open at 320:19:23:37Z and close at 320:19:32:38Z. Preferred Launch Time was 320:19:28:10Z, (In-Plane Time) for a launch window of 4M 28S. LAUNCH DELAYS: • None. Launch occurred on time at 320/19:28:10Z, 2:28:10 PM EST, Monday, November 16, 2009. A cloud ceiling below 5000 feet developed early in the morning, violating flight rule limits. The ceiling lifted to above flight rule limits about 5 hours prior to launch, but continued to violate US Air Force Range Safety cloud criteria. Astronaut Steve Lindsey, flying weather reconnaissance, provided measurements of the cloud thickness for the 45th Space Wing's Launch Weather Officer and found the thickness to be acceptable about 3 hours prior to launch (Courtesy
		Continued	Continued		1		1				

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FLT NO.	ORBITER	CREW (6 UP/6+1 DN) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE ENG. S.N.	SRB RSRM AND ET	ORBIT		FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)	
STS-129/ ULF3 Continued		Continued SS EVA 147 DOCKED QUEST EVA 65 EMU/TETHERED EVA 140 SCHEDULED EVA 138 DURATION 5:42	SE PRESS 104 6:56(P) 6:56 (A) MECO CMD: 8:24.2(P) 8:24.2(P) 8:24.3	Continued <u>BRK DECEL FPS</u> ² : AVE 6.4 PK 7.9 <u>NLGTD</u> : 5810 FT 331:14:44:30Z VEL: 140 KGS 150 KEAS HDOT: -5.1 FPS <u>BRK INIT</u> : 100 KGS <u>DRAG CHUTE</u> <u>JETTISON</u> : 51 KGS 331:14:44;25Z <u>BRK DECEL FPS</u> ² : AVE 6.4 PK 7.9 <u>WHEELS STOP</u> : 331:14:45:04Z 9557 FT	mission man	agers mor Bill Gerste r for Space	enmaier, NAS e Operations	aunch A Asso is at	DC.	Continued <u>PAYLOADS:</u> <u>MIDDECK</u> : ISS-ULF3, MAUI, SEITE, SIMPLEX, RAMBO-2 5 CRYO TANK SETS ODS, SRMS (86), OBSS	Continued TAL WEATHER: Weather on launch day caused a couple minor issues at back-up site, Istres. Weather conditions at Zaragoza, the prime TAL site, and Moron were observed and forecast acceptable throughout the countdown. However, a cloud ceiling developed at Istres 2 hours prior to launch limiting the use of that landing site. (Courtesy NWS SMG Post-Mission Summary.) Istrest became GO close to launch update. PERFORMANCE ENHANCEMENTS: Include the standard set plus: 1) PE Operational High Q - TRN/NOV, 2) OMS Assist, 3) a 52 nautical mile MECO, and 4) De Psi FLIGHT DURATION CHANGES: None. Landed on KSC Runway 33 at 331:14:44:21Z, Friday, November 27, 2009, at8:24:21 CST. FIRSTS/SECONDS/LASTS: Second child born while astronaut dad in space. Randy Bresnik's wife, Rebecca, gave birth to Abigail Mae Bresnik, 6 lbs 13 oz, at 11:04 p.m. Saturday, Nov. 21st, in Houston. First "dad while in space" was Mike Fincke in 2004 on ISS during a 6 mo tour- a girl.	
		MCC WHITE FLIGHT FCR (59) <u>FLIGHT DIRECTORS:</u> <u>SHUTTLE:</u> A/E- Bryan Lunney LD/O1- Mike Sarafin O2- Gary Horlacher Planning- PaulDye MOD – John Mccullough Team 4- Kwatsi Alibaruho <u>ISS</u> O1 - Emily Nelson LD/O2 – Brian Smith O3 – Jerry Jason Team 4 - Heather Rarick Continued		ROLLOUT: 6586 FT 0:44 M:S 11H KTS -1L KTS OFFICIAL: 33011P17KTS (X1P2H11P17) DENS ALT: - 473 FT FLT DURATION: 10:19:16:14 S/T: 1236:17:41:41 OV-104: 281:23:59:12 DISTANCE: 4,490,138 sm TOTAL SHUTTLE DISTANCE: 507,595,072 sm	ISS021-E-C with spares Expedition 35P space	is photò 21 crew i	graphed on member. Th	appro he Rus	ach to	o ISS by an	 H.G. P.H. Satuday, Nov. 2131, IFT Houston. First Gud while in space" was Mike Fincke in 2004 on ISS during a 6 mo tour- a girl. First Orthopedic Surgeon in space: Dr. Robert Satcher, Jr. First flight of new variable Alt DAP First flight ET replaced LH2 ice Frost Ramp (IFR) base TPS with NCFI at 14 locations First Flight SSME Nozzle Corrosion Inhibitor Application Change First Monarch Butterflies delivered to ISS. Butterflies took flight or 12/09/09 as monitored by thousands of students back on Earth. Super Bowl XLIV opening-toss coin flown to ISS & returned. NIGHT LAUNCH: N/A RENDEZVOUS: #76 Rendezvous and dock with ISS. EVENTS: FD1: OMS2 ignition at 320:20:06:25Z resulted in a 125.0 by 84.8 NM orbit. FD2: RCC inspection found no areas of concern T1 maneuver at 322:14:05:57Z resulted in a 185.6 by179.5 NM orbit FD3: R-Bar Pitch Maneuver was performed. No issues. Docking Contact occurred at 322:16:51:16Z Continued 	

SDACE SHITTI E MISSIONS SUMMARY

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			JF		JIILE	1122		13 30			1 age 2-213 -010-123/0E1 3
FLT NO.	ORBITER	CREW (6 UP/6+1 DN) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE ENG. S.N.	SRB RSRM AND ET	INC	orbit Ha/HP	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-129/ ULF3 Continued		Continued <u>CAPCOMS:</u> <u>SHUTTLE</u> A/E - Chris Ferguson - Steve Frick (Wx) LD/O1 - Stan Love O2 - Megan McArthur Planning - Aki Hoshide Team 4 - N/A <u>ISS</u> O1 - Drew Feustel LD/O2- Steve Swanson O3 – Ryan Lien Team 4 – N/A	astronauts and STS-129 astro Melvin, Satche	724 (24 Nov. 2 d cosmonauts sp nauts CDR Hoba er, & Bresnik, plu obert Thirsk/CS4	end time toge augh, PLT Wi s the five ISS	ther in sp Imore; & crewmei	pace. Missi mbers	The group on Specialis s; Jeffrey Wi	include ts Stor Iliams,	es the seven tt, Foreman, , Frank De	Continued EVENTS: Continued Hard Dock, hooks closed, occurred at 322:17:03:49 - ISS Hatch opened at 12:28 PM CST, Nov. 18, 2009, welcomed by ISS crew. At that time Stott ended her stay as EXP 21 FE and became an STS-129 MS FD4: EVA 1: Foreman & Satcher successfully completed all ISS maintenance and spares transfer tasks ahead of schedule. A get- ahead task was the most difficult. In releasing a cargo platform, a spring loaded device jammed and had to be manhandled to achieve release. EVA1 duration 6:37 MMT concurred that no Focused Inspection of Orbiter was required FD6: EVA2: Russian false depress event overnight, but EVA2 was conducted on time. Foreman & Bresnik completed all nominal tasks plus the following get-aheads: S3 Nadir/Inboard PAS Deploy, SGANT Y-cable check (CHIT 8025), Tool stanchion relocation to P1 WIF 3, & APFR 5 retrieve. EVA2 duration 6:08. - FD8: EVA3: Satcher & Bresnik: EVA-3 started one hour late due to EV2's drink bag valve coming loose. All tasks successfully completed included: transfer of HPGT & MISSE & from ExPRESS Logistics Carrier 2 to Quest airlock. Towards the end of the EVA two [unknown] items were lost overboard at 327:17:37Z. All tools were accounted for. EVA3 duration (PET) 5:42. - Hard Dock, hooks closed, occurred at 322:17:03:49 - ISS Hatch opened at (12:28 PM CST, Nov. 18, 2009) welcomed by ISS crew. At that time Stott ended her stay as EXP 21 FE and

----- SPACEMEN AT WORK ------



ISS021-E-030165 (19 Nov. 2009) Foreman installing a spare S-band antenna structural assembly to the Z1 segment of the station's truss. EVA 1.



S129-E-007762 "New Dad In Space", Bresnik, installing a Grappling Adaptor to On-Orbit Railing Assembly (GATOR) on Columbus Lab. EVA 2. (21 Nov. 2009)



S129-E-008103 (23 Nov. 2009) Satcher moves debris shields from Quest airlock to the External Stowage Platform #2. EVA 3.

-Transfers:

- 31,789 Pounds of hardware transferred to station (inside & out) 40 Pounds of Oxygen "transferred" (pumped) into ISS cabin 11 Pounds of Nitrogen transferred into ISS tanks
- 2,211 Pounds of middeck items delivered to ISS
- 2,110 Pounds of middeck items returned from ISS
- ~1.400 Pounds of water transferred to ISS
- Mass in space of the ISS 759,222 pounds ISS assembly: 86 Percentage complete FD10: Undocked at 329:09:53:02Z During Entry there was no RF blackout. It was avoided by a handover to the Eastern TDRS early, then a handover to the ground station.

Continued..

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SPACE SHUTTLE MISSIONS SUMMARY

FLT	ORBITER	CREW (6 Up/6+1 DN)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS		AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)

STS-129/ ULF3 Continued...



S129-E-009497 (24 Nov. 2009) --- Nicole Stott/MS takes one of her final "strolls" through the ISS modules on the eve of her departure from the orbital outpost.

JSC2009e240939 --- In MCC, Tim Oram with the Space Flight Meteorology Group gathers data for weather forecast.

JSC2009-E-244757 ---In MCC, Joshua Byerly/PAO narrates mission post undocking activities.







S129-E-009228 (25 Nov. 2009) --- ISS, post Shuttle sep, is shown against the background of Earth's horizon and the blackness of space.



JSC2009-E-243548--- The members of the STS-129 Ascent Flight Control Team pose for a group portrait in MCC at JSC. Flight Director Bryan Lunney and Flight Controller Christi Worstell hold the STS-129 logo. Continued...

SIGNIFICANT ANOMALIES:

Orbiter:

- WASTE DUMP STOPPED PREMATURELY. THE WASTE WATER DUMP INITIATED POST-UNDOCK AT APPROX. 329/12:07:38 GMT, EXHIBITED A NOMINAL WASTE DUMP RATE (APPROX. 2.0 %//MIN) UNTIL APPROX. 329/12:19:36 GMT WHEN THE WASTE DUMP RATE DEGRADED TO 0.3/ %/MIN. WASTE DUMP WAS TERMINATED BY CLOSING THE DUMP VALVE AND NOZZLE WAS REHEATED TO APPROX. 258 DEG F. DUMP VALVE WAS THEN OPENED AT 329/12:35:34 GMT FOR CONTINUATION OF THE DUMPING OPERATION. THE OBSERVED DUMP RATE CONTINUED OFF-NOMINALLY AT NEAR 0 %/MIN AND THE WASTE DUMP WAS TERMINATED AFTER 19 MINUTES. This IFA is considered a constraint to STS-132/ULF4 (next flight of OV-104), but is expected to be resolved with a dump line filter change. APU water tank heater A (50V46HR01A) did not operate at expected temp. APU water tank temp LRCS BFS FUEL AND OXIDEZER QUANTITIES INCREASED

- LRCS BES FUEL AND OXIDEZER QUANTITIES INCREASE OFF NOMINAL

<u>KSC</u>: None. SRB:

RH SOLID ROCKET BOOSTER AFT SKIRT FOAM ON THE OUTBOARD SIDE OF HOLDDOWN POST M2 NEAR THE GN2 PURGE LINE IS OBSERVED TO CRACK DURING LIFTOFF <u>RSRM</u>: None. <u>SSME:</u> None. ET: None.

MOD: None.

Integration:

Unexpected Debris/Expected Debris Exceeding Mass Allowable
Prior to Pad Clearance (Liftoff Debris)
 Single Transient SRB I/O Error at Liftoff

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		CREW	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB		ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(6)	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM		SILDIT	FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	Landing Times Flt Duration, Winds	Throttle Profile Eng. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-130/ 20A	OV-105 (Flight 24) ENDEAVOUR	<u>CDR</u> : George D. Zamka (Flt 2 - STS-120) P817/R315/V211/M271	KSC 39A 39:09:14:07Z 4:14:07 AM EST (P) 4:14:07 AM EST (A)	KSC15 KSC (73) 053:03:20:29Z 9:20:29 PM CST Sunday (17)	104/104/ 109% PREDICTED:	BI-141 RSRM 109	51.6 (32)	DIRECT INSERTION <u>POST OMS-2</u> 124.0x110.08	OI-34 (3)	<u>CARGO</u> : 40956 LBS <u>PAYLOAD</u>	Brief Mission Summary: The STS-130 (32nd mission to ISS) main objectives were to deliver and assemble the final U.S. module (Tranquility) and the Italian built Cupola Node plus delivery of ISS equipment, supplies, and experiments. Tranquility provides additional room for the ISS crew and life
SEQ FLT # 130	OMS PODS LPO3 - 34	<u>PLT</u> Terry W. Virts, Jr. P818/R351/M304	Monday (16) 02/08/10 (10)	02/21/10 (8)	100/104.5/104.5/ 72/104.5	ET-134 SLWT		NM		<u>CHARGEABLE</u> : 34931 LBS	support systems. The Cupola is a robotic control station and provides a panoramic view of earth through 7 windows, "A Room With a View" - PAO. The mission included 3 EVA's.
KSC-130 PAD 39A	RPO4 30 FRC5-23	<u>MS 1</u> Kathyrn P. Hire (Flt 2 - STS-90) P819/R238/V212/F31	LAUNCH WINDOW: 11M 57S (Total) 7M 32S (Preferred)	DEORBIT BURN: 053:02:14:47Z XRANGE: 336.9NM	<u>ACTUAL</u> : 100/104.5/100/ 74/104.5	38		<u>DEORBIT</u> HA 190.3 NM HP 23.3 NM		DEPLOYED: 34648 LBS NON-DEPLOYED:	KSC W/D OPF-2: 130 days + 3 holidays VAB-1: 9 days + 5 contingency days +11 holidays
(53)		MS 2 Stephen K. Robinson (Filt 4 - STS-85, STS-95,	<u>EOM PLS</u> : KSC <u>TAL</u> : ZZA TAL WX:	ORBIT DIR: A/L (44) <u>AIM PT</u> : (Close-In)	1 = 2059 (4) 2 = 2061 (1) 3 = 2057 (5)	<u>ET</u> <u>IMPACT</u> 1:13:54		ENTRY VELOCITY: 25866 FPS		0 LBS MIDDECK:	PAD A: 31 days + 3 contingency days Total Work Days = 170 (OPF processing occurred over a total time period of 133 days.)
MLP-2 32nd SHUTTLE		STS-114) P820/R222/V152/M196 <u>MS 3</u>	MRN (NO GO), FMI (NO GO)	<u>MLGTD</u> : 2760 FT 053:03:20:29Z	<u>M 3 EOM</u> : WEIGHT: 201138 LBS	MET <u>LAT</u> : 37.192 S		<u>ENTRY</u> RANGE:		283 LBS	POSTPONEMENTS: - Baselined STS-130 to FDRD - launch date of 12/10/09 on 11/17/08.
FLIGHT TO ISS		Nicholas J. M. Patrick (Flt 3 - STS-105, STS-116) P821/R303/V186/M263	<u>SELECTED</u> : <u>RTLS</u> : KSC15 N/N <u>TAL</u> : ZZA 30L N/N AOA: KSC 15 N/N		X CG: 1082.8 IN	<u>LONG</u> : 159.603		4367.5 NM		ACCUMULATED WEIGHTS: DEPLOYED: 1641533 LBS	 Ppd. to 02/04/10 on 03/10/09. Interim change while Cx and SSP schedules were assessed and prioritized. Ppd. to 02/07/10 on 12/17/09. Launch date change supports
Tanga a		<u>MS 4</u> Robert L. Behnken (Fit 2 - STS-123) P822/R323/V213/M279	<u>TST DAY PLS</u> : EDW 22R N/N <u>TDEL</u> : 0.000 (P) 0.232 (A)		<u>LANDING</u> : WEIGHT: 201084 LBS X CG: 1084.8 IN	W				<u>NON-DEPLOYED</u> : 1626311 LBS <u>CARGO TOTAL</u> :	efficient use of KSC ground operation resources. <u>LAUNCH SCRUBS</u> : Sunday, 02/07/10 launch attempt was terminated about an hour before scheduled launch of 4:40 AM EST. Launch scrub was due to a massive area of low cloud
LOB CONTROL		SS EVA 148 DOCKED QUEST EVA 66 EMU/TETHERED EVA 141	<u>MAX Q NAV</u> : 757.6 (P) 756.6 (A)	053:03:20:31Z <u>NLGTD</u> : 5219 FT				iss022e0626	672	4210929 LBS <u>PERFORMANCE</u> MARGINS (LBS):	ceilings that blanked the northern half of Florida launch was reset for 02/08/10. WEATHER SCRUB. LAUNCH WINDOW: Total launch window was 11M 57S with
		SCHEDULED EVA 139 DURATION 6:32 SS EVA 149	<u>SRB STG</u> : 2:05.9 (P) 2:07.2 (A) PERF: NOMINAL	53:03:20:36Z VEL: 157 KGS 158 KEAS HDOT: -6.2 FPS						FPR: 2908 FUEL BIAS: 1059 FINAL TDDP: 1188	window open at 39:09:09:42Z and close at 39:09:21:39Z. Preferred Launch Time was 39:09:14:07Z (In-Plane Time) for a launch window of 7M32S.
NODE 3		DOCKED QUEST EVA 67 EMU/TETHERED EVA 142 SCHEDULED EVA 140 DURATION 5:53	<u>2 ENG TAL (ZZA)</u> : 2:42 (P) 2:43 (A)	BRK INIT: 113 KGS						RECON: 2828 <u>PAYLOADS:</u> <u>PLB</u> :	LAUNCH DELAYS: None. Launch occurred on time at 39:09:14:07Z on Monday 02/08/10.
	CUPOLA	SS EVA 150 DOCKED QUEST EVA 68	<u>NEG ZZA (2@ 104):</u> 3:52 (P) 3:54(A)	<u>JETTISON</u> : 54 KGS 255:00:54:06Z	Shuttle appro	aches ISS	S with	Node 3/Cupo		ISS-20A (NODE 3 W/CUPOLA) MIDDECK:	TAL WEATHER: Spaceflight Meteorology Group (SMG) reported "quite challenging" weather for TAL sites: low clouds & showers at Moron & showers in 20 circle at ZZA. Recon aircraft at ZZA reported moisture (not rain droplets) so TAL "rain shower rule " una invited for "CO".
		EMU/TETHERED EVA 143 SCHEDULED EVA 141 DURATION 5:48		<u>BRK DECEL FPS²</u> : AVE 2.7 PK 10.1						iss-20a, maui, Seite, Simplex,	was invoked for "GO". Istres changed form "GO" to "NO GO" (Low cloud ceiling) late in launch count. PERFORMANCE ENHANCEMENTS:
		Continued	<u>SE TAL (ZZA 104)</u> : 6:02(P) 6:00(A) Continued	<u>WHEELS STOP</u> : 053:03:22:00Z 12966 FT		1				RAMBO-2 5 CRYO TANK SETS	Include the standard set plus: 1) PE Operational High Q - WIN/FEB, 2) OMS Assist, 3) a 52 nautical mile MECO, and 4) Del Psi
				Continued	ISS022E068832	40	is	s022-e-06883		ODS, SRMS (87), OBSS, SSPTS, SPDUS	Continued

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FLT NO.	ORBITER	CREW (6) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION,	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE	SRB RSRM AND ET	INC	orbit Ha/Hp	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
LD/O1 - Da - Ri (Flt O2 - Mike M Planning - S Lucid Team 4 - N ISS O1 - Rober LD/O2- Hal O3 – Kathy	Sturckow E Frick (Wx) Inny Olivas ck Sturckow Days 3 & 12) Massimino Shannon /A t Hanley Getzelman Bolt Folt	& EVA'S Continued MCC WHITE FLIGHT FCR (60) FLIGHT DIRECTORS: SHUTTLE: A/E. Norm knight LD/01- Kwatsi Alibaruho 02- Gary Horlacher Planning- Chris Edelen MOD – John Mccullough Team 4- Paul Dye ISS 01 - Royce Renfrew LD/02 - Bob Dempsey 03 - Mike Lammers Team 4 - Dana Weigel Feam 4 - Dana Weigel OCR, Flight	ABORT TIMES Continued PTM (U/S 181 FPS): 6:10(P) 6:12(A) SE PRESS 104 6:57(P) 6:56 (A) MECO CMD: 8:22.5 (P) 8:21.4 (A) VI: 25819(P) 25817(A) OMS-2: 37:44 (P) 37:42(A) 143.4(P) 142.1(A) FPS	FLT DURATION, WINDS	ENG. S.N.	in time la Bridge in	Ponte	Vedra, FL	., 115 N	Viles from	 FIRSTS, SIGNIFICANT ANOMALIES, ETC.) Continued FLIGHT DURATION CHANGES: On FD6 MMT agreed to add +1 day to nominal flight plan to facilitate complete transfer of the regen ECLSS racks to Node 3 as well as assist with accomplishing other flight objectives. Landed on KSC Runway 15 at 053:03:20:29Z, Sunday, February 21, 2010 at 9:20:29 CST. FIRSTS/LASTS: Shuttlie's last nlight launch. Last U.S. on-orbit Segment (Node 3) installed on ISS. Orbiter: First flight of Main Engine Ignition Overpressure Acoustic Instrumentation. First lunar rock returned to space. The sample was collected on Apollo 11 by Neil Armstrong in 1969 and carried by Scott Parazynski (Shuttle astronaut) in 2009 on his climb of Mt. Everest. Now on ISS, it orbits Earth once again. NIGHT LAUNCH: # 34 NIGHT LANDING KSC #17: (#23 in Shuttle history) RENDEZVOUS: #77 Rendezvous and dock with ISS. EVENTS: FD1: OMS2 ignition at 039:09:51:49Z resulted in a 124.0 by 110.0 NM orbit. FD2: During RCC surveys the crew downlinked some views of pulled up portion of port wing upper surface flapper door seal area. Area was cleared. T1 maneuver at 041:02:28:25Z resulted in a 187.4 by180.7 NM orbit FD3: R-Bar Pitch Maneuver was performed. No issues. MMT concurred no focus inspection required. Docking Contact occurred at 041:05:05:56Z Hard Dock, hooks closed, occurred at 041/05:54:12Z ISS Hatch opened at 1:16 AM CST Wednesday, Feb. 10, 2010, welcomed by ISS crew. FD4: EVA 1: Behnken & Patrick successfully completed preparations for unberthing Tranquility (Node 3). ISS arm unberthed Node 3 & installed in on Node 1 port side followed by crew activation. EVA1 duration 6:32. FD7: EVA2: Behnken & Patrick All planned activities were completed including installation of the ammonia jumpers, integrating Node 3 to EATCS Loop A, and installing the Node 3 port center disc

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Continued.

plannning.

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FLT	ORBITER	CREW (6)	LAUNCH SITE, LIFTOFF TIME.	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM	ORBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-130/				Continued						Continued
20A Continued				ROLLOUT: 10206 FT 1:31 M:S		X				EVENTS: Continued - FD8: Cupola unberthed and moved from forward end to nadir port of Tranquility. - FD10: EVA3: Behnken & Patrick All planned and a number of
				<u>WINDS</u> : 5H KTS 0.3R KTS OFFICIAL: 16007P10KT (X1P1 H7P10)						get ahead tasks were completed including Loop B QD opening (integration of EATCS Loop B with Node 3 heat exchanger), PMA- 3 cable installation, Cupola MLI removal, and VSC video cable routing. EVA3 duration (PET) 5:48.
			AP TANK	<u>DENS ALT</u> : 410 FT <u>FLT DURATION</u> : 13:18:06:22 <u>S/T</u> : 1250:11:48:03						-Transfers: 36,130 Pounds of hardware transferred to ISS (inside & out) 29,788 Tranquility Node 3 weight in pounds (as installed) 3,594 Cupola 757 Integrated Stowage Platform cargo 24 Pounds of Oxygen transferred into ISS Airlock tanks 0 Pounds of Nitrogen transferred (N2 was used to
ISS constr	ruction and	maintenance continue	^{NS} TANK-0003	<u>OV-105:</u> 280:09:39:23 DISTANCE: 5,738,991 sm	in Harmony r Williams, Pat row: Exp 22 Creamer/FE.	node, Fron trick/MS, C Soichi Nog Back row	rews for STS-130 t row (It to rt): Exp DR Zamka, & Be guchi/FE (JAXA), : Maxim Suraev & n Robinson/MS &	22 CDI hnken/M Hire/MS Oleg Ko	R Jeffrey IS. Middle , & Exp 22 T.J. otov, both Exp	repress the stack) 1,991 Pounds of middeck items delivered <u>to</u> ISS aboard Endeavour 1,803 Pounds of middeck items returned <u>from</u> ISS to Endeavour ~1,095 Pounds of water transferred <u>to</u> ISS
Above: IS	S022-E-062	2844 Patrick during 5750 Behnken durin	EVA1.	TOTAL SHUTTLE DISTANCE: 513,386,662 sm		, dong ma				799,045 Mass in space of the International Space Station (in pounds) - FD13: Undocked at 051:00:53:52Z
										- During entry a manual handover to TDRS-46 early avoided rolling on to a lower antenna and prevented a comm blackout period. Continued
ISS022E065750			and the second se		with member	ers of Cor	U.S. Preside agress and mide nuttle crew from	lle scho	ol pupils,	

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FLT NO.	ORBITER	CREW (6) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE ENG. S.N.	SRB RSRM AND ET	INC	orbit Ha/HP	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)	
STS-130/ 20A Continued			Quoting Oscar Wilde's "Life imitates art far more than art imitates life", Dave Zani - CinemaBlend.com, sees the Cupola window as the inside window of a Star Wars T Fighter. Image: Comparison of the cupola window as the inside window of a Star Wars T Fighter.							Zani - Vars TIE	Continued SIGNIFICANT ANOMALIES: Orbiter: During STS-130 Ascent monitoring, WLE Sensor Unit S/N 1155 experienced two (2) off-scale high data spikes. MUX bypass switch will not switch to Bypass front for OCA 48Mbps downlinks. Audio drop-out during EVA 1. Trajectory Control Sensor (TCS) had trouble transitioning to CW mode. CW data became ratty and unusable. KSC: 12 IFA's entitled "STS-130 Post Launch Debris" SRB: None. SSME: None. ET: POST-FLIGHT REV. IDENT. 2 FOAM LOSSES +Z SIDE INTERTANK NCFI 24-124 ACREAGE, 19 FOAM LOSSES ?Z SIDE OF THE INTERTANK NCFI 24-12 ACREAGE	
Patrick r	emoving insu	- Behnken (left) & ulation blankets & pola's windows.		80 Soichi Nogu Exp 22, takes ea v in Cupola.		ISS022 view fro		8724 CD Ipola.	R Zaml	ka tries out	MOD: - INCORRECT TAL RUNWAY SURFACE IN FLIGHT RULE Integration: None.	
							·					
MCC: Fr	om left: Chris	Flight Directors in J s Edelen, Norm Knight, l Gary Horlacher.	C S130-E-012188 ISS as seen by Endeavour post- undocking and separation. Tranquility & Cupola are located just left of center.					1	STS130-S-128 Drag chute is deployed at MLGTD on KSC Rur 15 at 10:20:29 PM EST on Feb. 21, 2010. It was the 23rd night landing in Shuttle history and the 17th at KSC.			

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SPACE SHUTTLE MISSIONS SUMMARY

		CREW		LANDING SITE/	SSME-TL						
FLT	ORBITER	(7)	LAUNCH SITE, LIFTOFF TIME.	RUNWAY, CROSSRANGE	Nom-Abort Emerg	SRB RSRM		ORBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.	URBITER		LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC	HA/HP	FSW	PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
NO.		TITLE, NAMES & EVA'S	ABORT TIMES	FLT DURATION,	PROFILE	ET	in to	10,011		EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
				WINDS	ENG. S.N.	51.4.40	51 (BUREAT	01.04		
STS-	OV-103	CDR: Alan G. Poindexter	KSC 39A	KSC33 KSC (74)	104/104/ 109%	BI-142	51.6 (33)	DIRECT INSERTION	OI-34 (4)	<u>CARGO</u> : 39516 LBS	<u>Brief Mission Summary</u> : The STS-131 (33rd mission to ISS),
131/19A	(Flight 38) DISCOVERY	(Flt 2- STS-122) P823/R318/V214/M274	95:10:21:25Z	110:13:08:34Z	109%	RSRM	(/		(.)	34210 LB2	dubbed "Experiment Express" by PAO, main objectives were to bring some 8 tons of supplies and scientific equipment to
		P823/R318/V214/W214	6:21:25 AM EDT (P)	8:08:34 AM CDT	PREDICTED:	110		POST OMS-2 140.0x123.8		PAYLOAD	ISS, remove & replace a depleted Ammonia tank, and return a
SEQ FLT # 131	OMS PODS	PLT James D. Dutten, Jr.	6:21:25 AM EDT (A) Monday (17)	Tuesday (18) 04/20/10 (12)	100/104.5/104.5/			140.0x123.0 NM		CHARGEABLE:	large load of experiments and no longer useful gear back to
FLI#IJI	LPO1 -41 RPO3-39	James P. Dutton, Jr. P824/R352/M305	04/05/10 (16)	04/20/10 (12)	72/104.5	ET-135 SLWT				32131 LBS	earth.
KSC-131		MS 1		DEORBIT BURN:	ACTUAL:	39		DEORBIT		DEPLOYED:	KSC W/D
		MS 1 Rick Mastracchio	LAUNCH WINDOW: Dual pane day with	110:12:02:59Z	100/104.5/100/			HA 190.6 NM HP 14.2 NM		30512 LBS	OPF: 142 days + 11 holidays
PAD 39A (54)		(Flt 3 - STS-106, STS-118) P825/R257/V189/M224	window open at	XRANGE: 20.4 NM	72/104.5			111 17.2 1400			VAB: 9 days + 0 contingency days
(01)			95:10:18:40Z and		1 = 2045 (11)	<u>et</u>		<u>ENTRY</u>		NON-DEPLOYED: 1388 LBS	PAD A: 32 days + 2 contingency days Total Work Days = 183 (OPF processing occurred
		MS 2 Dorthy Metcalf-Lindenburger	close at 95:10:27:17Z	<u>ORBIT DIR</u> : D/L (50)		IMPACT		VELOCITY: 25862 FPS			over a total time period of 153 days
MLP-3		P826/R353/F48	5M 52S (Preferred)	<u>aim pt</u> : Nominal	3 = 2054 10)	1:13:55 MET		2002113		MIDDECK:	
33rd		<u>MS 3</u>	EOM PLS: KSC	<u>MLGTD</u> : 3559 FT	<u>M 3 EOM</u> :			<u>ENTRY</u>		231 LBS	POSTPONEMENTS:
SHUTTLE		Stephanie Wilson (Flt 3 - STS-121, STS-120)	<u>TAL</u> : ZZA	110.12.00.247	WEIGHT:	LAT:		<u>RANGE:</u> 4480 NM		SHUTTLE	- Baselined STS-131 to FDRD - launch date of 03/18/10 on 02/05/09.
FLIGHT TO ISS		P827/R298/V190/F39	<u>TAL WX</u> : MRN FMI (NO GO)	VEL: 198 KGS	224257 LBS X CG:	37.233 S		4400 1000		ACCUMULATED	- Ppd. to 04/05/10 on 03/09/10. Due to cold weather conditions,
10155		MS 4		198 KEAS	1089.0 IN	LONG:				<u>WEIGHTS:</u> <u>DEPLOYED</u> :	Orbiter rollover from the OPF to VAB was delayed such that the
		Naoko Yamazaki (JAXA) P828/R354/F49	SELECTED:	HDOT: -1.6 FPS		159.667				1672045 LBS	March 18, 2010 launch date could not be met.
			<u>RTLS</u> : KSC33 N/N TAL: MRN20 N/N	TD NORM 195:	<u>Landing</u> : Weight:	W					LAUNCH SCRUBS: None
		MS5 Clayton Anderson	<u>AOA</u> : KSC33 N/N		224206 LBS					NON-DEPLOYED: 1627930 LBS	
		Clayton Anderson (FIt 2-UP ON STS-117STAY	1st DAY PLS KSC15	DRAG CHUTE	X CG:					1027730 LD3	LAUNCH WINDOW: Dual pane day with window open at 95:10:18:40Z and close at 95:10:27:17Z. Preferred Launch Time
		ISS, DN ON STS-120) P829/R310/V215/ M268	N/N	DEPLOY: 191 KEAS	1090.7 IN					CARGO TOTAL:	was 95:10:21:25Z (In-Plane Time) for a launch window of 5M52S.
			TDEL:	110:13:08:36Z						4250445 LBS	
		SS EVA 151 DOCKED QUEST EVA 69	0.000 (P) 0.142 (A	<u>NLGTD</u> : 6398 FT						PERFORMANCE	LAUNCH DELAYS: None. Launch occurred on time at
		EMU/TETHERED EVA 144		110:13:08:43Z						MARGINS (LBS):	95:10:21:25Z on Monday 04/05/10.
<u></u>	131 100	SCHEDULED EVA 142	<u>MAX Q NAV</u> : 708.0 (P) 700.5 (A)	VEL: 157 KGS						FPR: 2908 FUEL BIAS: 1059	TAL WEATHER: Spaceflight Meteorology Group (SMG) reported a pressure gradient between a high & a departing low contributed
	TTO A TO	DURATION 6:27	700.0 (I) 700.3 (A)	160 KEAS HDOT: -4.4 FPS	1735	A los	1-2			FINAL TDDP: 1133	to winds at lstres above headwind limits. Only high cirrus clouds
	Se 🔊 🚯	SS EVA 152	<u>SRB STG</u> :					8		RECON: 1491	prevailed at both Zaragoza & Moron with winds well within flight
		DOCKED QUEST EVA 70 EMU/TETHERED EVA 145	2:04.8 (P) 2:05.8 (A)	<u>BRK INIT</u> : 107 KGS		a It	1			PAYLOADS:	rule limits. Weather was "GO".
	XXX 📶	SCHEDULED EVA 145	PERF: NOMINAL	DRAG CHUTE	Sec.	-				PLB: ISS-19A	PERFORMANCE ENHANCEMENTS:
		DURATION 7:26		JETTISON:	12.37					(MPLM,LMC),	Include the standard set plus: 1) PE Operational High Q - TRN/APR, 2) OMS Assist, 3) a 52 nautical mile MECO, and 4)
CC NO	19A	SS EVA 153	<u>2 ENG TAL (MRN)</u> : 2:36 (P) 2:41 (A)	58 KGS 110:13:09:31Z		1	Manager St.	1.		TRIDAR AR&D SENSOR DTO-	Del Psi
		DOCKED QUEST EVA 71	2.30 (P) 2:41 (A)	110.13.07.312	e - fer	1.00	1 194		110	701A	
	19A	EMU/TETHERED EVA 146	<u>NEG MRN (2@ 104):</u>	BRK DECEL FPS2:	CLA 3	1-			10	MIDDECK:	FLIGHT DURATION CHANGES:
		SCHEDULED EVA 144 DURATION 6:24	3:47 (P) 3:54(A)	AVE 5.2 PK 7.0	S. Sala		4-	1	AGAL	ISS-19A, MAUI,	- FD 4: MMT approved plan for conducting a docked late inspection using +1 day - extended mission from 12 to 13 days.
			PTA (U/S 157 FPS):	WHEELS STOP:			and the second	This is a second se		SEITE,	- Landing postponed 1 day due to unstable weather. Weather
8		Continued	5:17(P) 5:206(A)	110:13:09:32Z						SIMPLEX, RAMBO-2	was still unsatisfactory next day with fog and area showers for first opportunity. Weather cleared for "Go" on 2nd opportunity at KSC.
ABATI			SE TAL (77A 10A).	11886 FT	ISS023-E-0					RAIVIDU-2	Landing occurred at 110:13:08:34Z, Tuesday, April 20, 2010, at
			<u>SE TAL (ZZA 104)</u> : 6:02(P) 6:03(A)	<u>ROLLOUT</u> : 8327 FT				onardo (MPI	· · ·	5 CRYO TANK	8:08:34 AM CDT
1 A A	and			0:58 M:S	from Disco		B to	port on		SETS	
	131		Continued	Continued	Harmony n	ode.				ODS, SRMS (88), OBSS, SSPTS,	Continued
		1		L		1				0000,00010,	ļ

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			J					10 00			
FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	Throttle Profile Eng. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
LD/O1 - Ric O2 - Aki Ho Planning - Megan M - Chris Ca Team 4 - N/ <u>ISS</u> O1 - Mike J LD/O2 - Sta O3 - Marcu Team 4 - N	sturckow le Zamka/Wx k Sturckow shide AcArthur ssidy A ensen n Love s Reagant /A	MOD – John Mccullough	SE PRESS 104 6:58(P) 7:01 (A) MECO CMD: 8:22.5 (P) 8:23.5 (A) VI: 25819(P) 25816(A) OMS-2: 37:16 (P) 37:14(A) 197.2(P) 196.5(A) FPS 796.5(A) VI: 2000000000000000000000000000000000000	Continued <u>WINDS</u> : 2.1H KTS 2.2R KTS OFFICIAL: 02003P05KT (X0P0 H5P6) <u>DENS ALT</u> : 908 FT <u>FLT DURATION</u> : 15:02:47:09 <u>S/T</u> : 1265:14:35:12 <u>OV-103</u> : 347:03:20:09 <u>DISTANCE</u> : 6,232,235 sm <u>TOTAL SHUTTLE</u> <u>DISTANCE</u> : 519,613,765 sm	STS131-S-C astronaut K Firing Room	athryn (K h 4 at KS h 4 at KS h 4 at KS h 5 at K h 5 at K	Cay) H SC.	ire discuss interest of the second second br>second second second second second second second second second second second second second second second second se	launch launch 23 crew rs pictur 7 Duttor calf- mazaki/ g Kotov der Sky J. Crea	rs gather in red (light); (MS (JAXA). (RSA), ortsov/FE	 Continued FIRSTS/LASTS: Last return trip for MPLM Leonardo. After STS-133 it will remain on ISS as a permanent fixture. First time for four women living in space. First stime for two Japanese astronauts in space together. First special cookies from the Italian Café in Seabrook, TX, requested originally by Col. Timothy Creamer after a 6-month ISS tour, were delivered to ISS. The sand tarts passed NASA tests with the request to go light on the powdered sugar. NIGHT LAUNCH: N/A RENDEZVOUS: #78 Rendezvous and dock with ISS. EVENTS: FD1: OMS2 ignition at 095:10:58:39Z resulted in a 140.0 by 123.8 NM orbit. FD2: During RCC surveys showed no areas of concern. T1 maneuver at 097:05:06:44Z resulted in a 189.3 by181.7 NM orbit Ku Band failed. FD3: R-Bar Pitch Maneuver was performed. Four areas of interest were identified: 1) RSB Trailing Edge Tile, 2) FWD Gap Filler, 3) Port ET Door Tile Chip, 4) three closely grouped OMS POD tile damage sites. The Damage Assessment Team later cleared these areas for entry and MMT concurred no focus inspection required. Crew executed the radar fail procedures for rendezvous after the system failed to respond to a last attempt early in the rendezvous. Docking Contact occurred at 097:07:58:52Z ISS Hatch opened at 4:11 AM CDT April 7, 2010, welcomed by ISS crew. FD4: MPLM was grappled, unberthed, and installed on the Node 2 Nadir without issue. FD5: EVA 1:Mastracchio & Anderson remove old ATA and handover new ATA to SSRMS, retrieve JEM SEED, & R&R RGA. EVA1 duration 6:27.

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F	:LT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
N	10.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS		AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)

STS-131/19A





AT LEFT: S131-E-008710 --Mastracchio (left) & Anderson conduct 2nd EVA during which they unhooked and removed depleted ammonia tank and installed a 1,700pound ammonia tank on ISS Starboard 1 truss. Crew had problems with bolting down the new ATA tank on S1. They eventually got all 4 bolts secured, however, the time required to do this resulted in several tasks dropping off this EVA.

EVENTS: Continued

Continued...

 FD6&7: EVA2: Mastracchio & Anderson had difficulty installing new ATA onto S1 truss due to sticky plungers on bolt 4.
 Numerous workarounds were employed and eventually the bolt did cooperate. Alignment of the bolts and soft dock mechanisms are orientation sensitive and the task took much more time than booked. Several tasks were not completed & were rescheduled to EVA 3. EVA2 duration 7:26.

 FD9: EVA3: Mastracchio & Anderson completed: S1 ATA Fluid connectors (from EVA 2), Retrieve A/L MMOD shields (from EVA 2), Old ATA transfer to the LMC in Shuttle payload bay (all 4 bolts were engaged, though the last bolt required extra time due to some alignment challenges), & S1 ATA FGB install. EVA3 duration (PET) 6:24.

- FD9; Monday, April 12th celebrated the 49th Anniversary of the Soviet cosmonaut, Yuri Gagarin, first human to orbit the earth in 1961 and the 29th Anniversary of the first U.S. Space Shuttle launch in 1981.

Transfers:

- -15,222 Lbs of hardware transferred to ISS (inside & out)
- -12,060 Lbs of MPLM supplies & logistics transferred to ISS
- 4,109 Lbs of MPLM supplies & logistics returned from ISS
- 1,702 Lb Ammonia Tank Assembly (ATA) delivered to ISS
- 1,295 Lb ATA (old) returned from ISS
- 94.5 Lbs of O2 used to repress the stack
- 1,460 Lbs middeck items delivered to ISS
- 1,235 Lbs of middeck items returned from ISS to Discovery
- 6,639 Lbs of total hardware returned aboard Discovery
- 975 Lbs of water transferred to ISS

- 806,282 Mass (Lbs) of ISS now in space

- 98 Percentage complete of ISS assembly (pressurized volume)

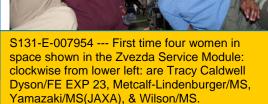
- FD13: Undocked at 107:12:52:10Z

 During entry comm blackout times were approx 110/12:49:15 to 12:54:34 (~ 5.5 min). Early H/O to TDRS 46 was not an option as TDRS 46 stayed on a lower antenna. INCO prediction of LOS was in error due to DOL PAD error, noted in Significant Anomalies below. Also, see Ascent/Entry Flight Techniques Panel #255 of April 30, 2010.

Continued...



S131-E-009456 --- Mastracchio (right) & Anderson conduct 3rd & final session of EVA. Activities included fluid lines hookup of new 1,700-pound ammonia tank and prepared cables on the Zenith 1 truss for a spare Space to Ground Ku-Band antenna.



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FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	Landing Times Flt Duration, Winds	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS- 131/19A Continued		41.5			2nd LANDING O Helens, MT Wol C	1		RBIT 238	CENTER	M	Continued <u>SIGNIFICANT ANOMALIES:</u> <u>Orbiter:</u> - CCTV Camera C zoom not functioning - DURING STS-131, KU-BAND FAILED FROM POWER UP FOR BOTH COMM AND RADAR OPERATIONS. - NIRD 131-005, D-131-RPM-410-001: DEBRIS EVENT DURING ACCENT AT 42SEC MET FROM PORT UPPER RSB TRAILING EDGE. TILE HAS BROKEN AWAY, APPEARS TO
				Discov	ery's planned ental U.S. Pho	approact	For Tures	Aontgomery, AL E of Calr	nesville	KSC SS the	BE PARTIAL LIBERATION. VISIBLE CHARRING ALONG THE AFT EDGE. - LRCS fuel helium ISO B valve slow to close during post wave off system reconfigure. - FRCS fuel helium ISO A valve slow to close during post entry valve test. <u>KSC</u> : - STS-131 Post Launch Debris <u>SRB</u> : - UPLOADED ACCELEROMETER DATA FROM THE S/N 2000003 DAS SHOWED 446 SECONDS OF PREFLIGHT TESTING FOLLOWED BY THE FIRST 94 SECONDS OF FLIGHT DATA <u>RSRM</u> : None.
131/19A Paul Dy BELOW	: From the le e, Richard Jo : JSC2010-E- Team pose in	045167 Flight Dir oft are Tony Ceccacc nes, Ginger Kerrick a 051978 STS-131 (JSC MCC. FD Mike	i, Bryan Lunney, and Mike Sarafin. Orbit 2 Flight								<u>SSME:</u> - ME-2 HPFTP 21 DEGREE ACCEL DISQUALIFIED @ T+7:19 <u>ET</u> : None. <u>MOD</u> : - INCORRECT COMM PREDICTS DUE TO PADS ERROR <u>Integration</u> : - Base Heat Shield TPS Liberation - Windows 5, 6 Missing/Protruding Ceramic Plugs - Rudder Speedbrake TPS Liberation
				Runwa	LE051109 04 y 33 on April 2 ain on first op	20, 2010	, after	weather wa		h to KSC on April 19th	

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FLT	ORBITER	CREW (6)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	Throttle Profile Eng. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS- 132/ULF4 SEQ FLT # 132 KSC-132 PAD 39A (55) MLP-2 34th SHUTTLE FLIGHT TO ISS	OV-104 (Flight 32) ATLANTIS' LAST SCHEDULED FLIGHT OMS PODS LPO4-31 RPO1-39 FRC4-31	CDR: Kenneth T. Ham (Fit 2- STS-124) P830/R326/V216 /M282 PLT Dominic A. Antonelli (Fit 2 - STS-119) P831/R334/V217M289 MS 1 Garrett Reisman (Fit 2 - Up on STS-123, stay) SS, DN STS-124) P832/R325/V 218/M281 MS 2 Michael Good (Fit 2 STS-125) P833/R338/V219/M293 MS 3 Steve Bowen (Fit 2 - STS-126) P834/R332/V220M287 MS 4 Piers Sellers	Friday (28) 05/14/10 (9) 10M 01S (Total) 5M 01S (Preferred) EOM PLS: KSC TAL: ZZA TAL WX: MRN FMI (NO GO) SELECTED: RTLS: KSC33 N/N TAL:ZZA30 CI/N AOA: KSC33 N/N 1 ST DAY PLS EDW22 N/N	KSC33 KSC (75) 146:12:48:08Z 7:48:08 AM CDT Saturday (25) 05/26/10 (12) <u>DEORBIT BURN</u> : 146:11:41:59Z <u>XRANGE</u> : 611.3 NM <u>ORBIT DIR</u> : A/L (45) <u>AIM PT</u> : Close-In <u>MLGTD</u> : 2919 FT 146:12:48:08Z VEL: 193 KGS 194 KEAS HDOT: -1.9 FPS <u>TD NORM 195</u> : 3174 FT Continued	104/104/ 109% PREDICTED: 100/104.5/104.5/ 72/104.5 ACTUAL: 100/104.5/72/ 104.5 1 = 2052 (9) 2 = 2051 (8) 3 = 2047 (14) M 3 EOM: WEIGHT: 210434 LBS X CG: 1081.0 IN LANDING: WEIGHT: 210370 LBS X CG:	BI-143 RSRM 111 ET-136 SLWT 40 <u>ET</u> <u>IMPACT</u> 1:14:24 MET <u>LAT:</u> 35.906S <u>LONG</u> : 157.809W		DIRECT INSERTION <u>POST OMS-2</u> 125.1x85.2 NM <u>DEORBIT</u> HA 195.4 NM HP 23.6 NM <u>ENTRY</u> <u>VELOCITY</u> : 25877 FPS <u>ENTRY</u> <u>RANGE:</u> 4334 NM		CARGO: 35963 LBS PAYLOAD CHARGEABLE: 26740 LBS DEPLOYED: 26619 LBS NON-DEPLOYED: 0 LBS MIDDECK: 121 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 1698664 LBS NON-DEPLOYED: 1628051 LBS	Brief Mission Summary: The STS-132 (34th mission to ISS), dubbed "Finishing Touches" by PAO, main objectives were to conduct three Eva's, deliver & install the 2nd Russian Mini- Research Module, a complement of batteries, a backup Ku- band antenna, and other ISS supplies. This was the last scheduled flight of Atlantis; however ,Congress later approved one more flight, see STS-135. KSC W/D OPF: 127 days + 9 holidays VAB: 7 days + 2 Wx days PAD A: 22 days + 1 contingency day Total Work Days = 156 (OPF processing occurred over a total time period of 136 days. POSTPONEMENTS: - Baselined STS-132 to FDRD - launch date of 05/13/10 on 04/02/09. - - Ppd. to 05/14/10 on 05/04/09. ISS request to de-conflict dynamic vehicle events of a Soyuz undocking and Orbiter docking on the same day. LAUNCH SCRUBS: None
	The start is a st				RC	oberts -	ease via Laura London Telegr the good ship	aph	CARGO TOTAL: 4286408 LBS PERFORMANCE MARGINS (LBS): FPR: 2908 FUEL BIAS: 1059 FINAL TDDP: 5074 RECON:4326 PAYLOADS: PLB: ISS-ULF4 (MRM1,ICC-VLD, ICAPC/PDGF0 MIDDECK: ISS-ULF4, MAUI, SEITE, SIMPLEX, RAMBO-2 5 CRYO TANK SETS, ODS, SRMS (89), OBSS, SSPTS	LAUNCH WINDOW: Window open at 134:18:15:09Z and close at 134:18:25:10Z. Preferred Launch Time was 134:18:20:09Z (In-Plane Time) for a launch window of 5M01S. LAUNCH DELAYS: None."It's a beautiful day in Florida to bid 'Bon Voyage' to the good ship Atlantis on its sunset cruise. " -KjH (Space Shuttle Program Public Affairs). Launch occurred on time at 134:18:20:09Z on Friday 05/14/10. TAL WEATHER: Spaceflight Meteorology Group (SMG) reported a high pressure ridge provided benign weather at KSC for launch and RTLS. Things were trickier for TAL Sites with low pressure system resulting in breezy conditions at ZZA & MRN. By launch winds decreased below Flight Rule limits. At Istres rains remained outside of 20 NM watch area . Weather was "GO". PERFORMANCE ENHANCEMENTS: Include the standard set plus: 1) PE Operational High Q - TRN/MAY, 2) OMS Assist, 3) a 52 nautical mile MECO, and 4) Del Psi FLIGHT DURATION CHANGES: None. Continued	

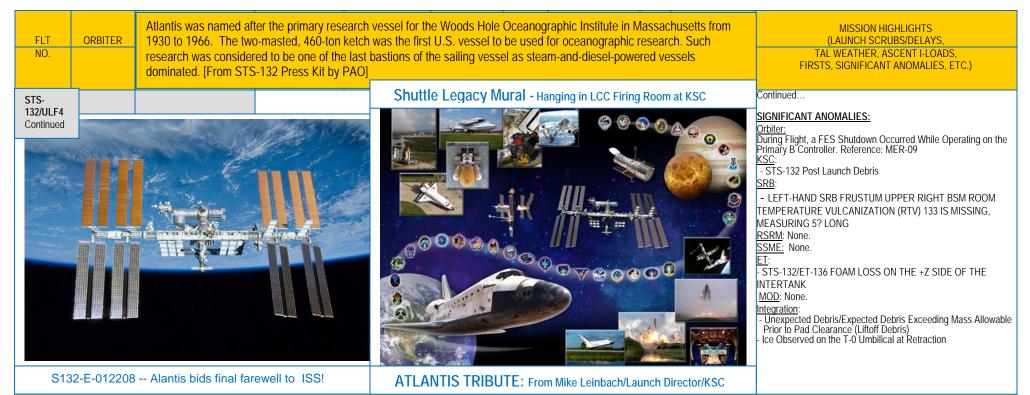
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				ACL SIIC							
FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.	ORDITER	TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP	1.500	PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
LD/O1 - Chr O2 - Stan Lo Planning - S Lucid Team 4 - N/A ISS O1 - Zach Jo LD/O2 - Stee O3 - Rob Ha Team 4 - N/A ISS State State Stat	e Hobaugh Frick (Wx) is Cassidy ove hannon A ones ve Swanson ayhurst /A	Continued MCC WHITE FLIGHT FCR (62) FLIGHT DIRECTORS: SHUTTLE: Ascent- Richard Jones LD/01- Mike Sarafin O2- Chris Edelen Planning- Ginger Kerrick Entry - Tony Ceccacci MOD – John Mccullough Team 4 - Paul Dye ISS O1 - Holly Ridings LD/O2 - Emily Nelson O3 - Dina Contella Team 4 - Royce Renfrew	Continued <u>SE TAL (ZZA 104)</u> : 6:02(P) 6:02(A) <u>PTM (U/S 181 FPS)</u> : 5:48(P) 5:59(A) <u>SE PRESS 104</u> 6:51(P) 6:53 (A) <u>MECO CMD</u> : 8:24.1 (P) 8:25.6 (A) <u>VI</u> : 25819(P) 25819(A) <u>OMS-2</u> : 37:47 (P) 38:15(A) 98.8(P) 97.4(A) FPS	Continued DRAG CHUTE DEPLOY: 190 KEAS 146:12:48:10Z NLGTD: 6227 FT 146:12:48:19Z VEL: 135 KGS 141 KEAS HDOT: -5.0 FPS BRK INIT: 59 KGS DRAG CHUTE JETTISON: 57 KGS 146:12:48:47Z BRK DECEL FPS ² : AVE 2.7 PK 4.1 WHEELS STOP: 146:12:49:27Z 12019 FT ROLLOUT: 9100 FT 1:19 M:S WINDS: 8 H KTS 2 L KTS OFFICIAL: 31508P11 (X 3p4 HD 8p10) DENS ALT: 1652 FT FLT DURATION: 1277:09:03:11 OV-104: 294:18:27:11	ABOVE: ISS 23 crews (re (ctr It), CDR Good/MS, A Reisman/MS Dyson/FE E:	d shirts) o Ham (otr lexander 5 5. Back (f sp 23, Pie LT Antono While prej 5 on FD2, ne sensor rring EVA 5. Photo o	on ISS. rt), with Skvorts rom It): ers Sell elli, & S paring f crew di packag 2 the c	Front: Exp ((from It) T.J ov (RSA)/FE Bowen/MS, ers/MS, Mikt oichi Nogucl for the routin scovered a p ge pan and ti rew success	CDR OI Crean E Exp 23 Tracy (hail Kor hi (JAX, hi (JAX,	eg Kotov/RSA ner/FE Exp 23, 3, & Caldwell nienko A)/FE Exp 23. ction of I cable rom moving	Continued FIRSTS/LASTS: - Last scheduled flight of Atlantis The Mini Research Module 1 (MRM1), aka Rassvet, is first & only major piece of Russian H/W that U.S. hauled to ISS First evaluation of Commercial Compression Garments to prevent post-spaceflight Orthostatic Intolerance First RSRM incorporation of V1288 fluorocarbon O-rings in nozzle joints 4 and 5. TENTH SHUTTLE CREWMEMBER REPLACEMENT - Karen Nyberg (medical condition) was replaced by Michael Good in August 2009. (9th Shuttle crewmember replacement occurred on STS-118.) NIGHT LAUNCH: N/A RENDEZVOUS: #79 Rendezvous and dock with ISS. EVENTS: - Gerst: The entire team gave us a great launchnice ET [only] one small piece of foam late in ascent." - FD1: OMS2 ignition at 134:18:58:24Z resulted in a 125.1 by 85.2 NM orbit FD2: During RCC surveys a camera cable was wedged between camera & OBSS structure limiting tilt capability. This left gaps in RCC survey. Ops team developed plan to get docked imagery and cable assess during EVA. [Post mission:] It was determined that the snag was attributed to cable S/N unique memory characteristics. Cable was replaced with a different S/N cable.] - T1 maneuver at 136:11:40:09Z resulted in a 189.7 by184.8 NM orbit - FD3: R-Bar Pitch Maneuver was performed Docking Contact occurred at 136:14:28:25Z Hard Dock, hooks closed, occurred at 136:14:40:49Z ISS Hatch opened at 11:18 AM CDT May 16, 2010, welcomed by ISS crew FD4: EVA 1: Reisman & Bowen installed SGANT & EOPT EVA1 duration 7:25 FD5 Russian MRM1 successfully unberthed and docked to ISS FD6: EVA2: Bowen & Good successfully completed all tasks: cleared cable from the Orbiter LDRI tilt axis, installed 4 new batteries in truss 3 old batteries into pallet, & stowed a temp. EVA2 duration r1:9.
Approach	n' to ISS wit	h Russian MRM1.		Continued	STAR PROPERTY	1	1	1			Continued

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			J.							
FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM	ORBIT	FSW	PAYLOAD WEIGHTS,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
Russian permar for "da pressur	n-built Mini-Res nent attachmen wn," the mod rized cargo sto	In the grasp of I search Module 1 (MRM- t to ISS FGB. Named F ule is the second in a prage components for tional docking port.	-1) is moved for Rassvet, Russian a series of new	Continued <u>DISTANCE</u> : 4,879.978 sm <u>TOTAL SHUTTLE</u> <u>DISTANCE</u> : 524,493,743 sm	significant of provided gr procedures	contributior eat effort when the	ns to Shuttle in developm e laser senso	Ops. Ops. Op ent of al package	D] Spotlight" for n STS-132 he ternate survey e camera was previous page.	Continued EVENTS: Continued Transfers: 28,792 Lbs H/W transferred to ISS (inside & out) includes MRM1 "Rassvet" - loaded (17,670 Lbs) 7,573 Lbs ICC with supplies to ISS 6,466 LbsICC with supplies from ISS 42 Lbs Oxygen to ISS 30 Lbs Oxygen to ISS 10.5 Lbs Nitrogen to ISS 10.5 Lbs Nitrogen to ISS 2,192 Lbs middeck items to ISS aboard Atlantis 1,763 Lbs middeck items returned from ISS aboard Atlantis 2,192 Lbs middeck items returned from ISS aboard Atlantis 2,1763 Lbs of ISS now in space Undocked at 143:15:22:04Z During entry comm outage time due to blackout was 146/12:32:00Z - 12:34:30Z (- MET 011/18:12 - 18:14:30). S/W handover to TS 46 was not available as TS 46 was on a Lower Antenna resulting in plasma blackout. This was well advertised. At 12:34:30Z due to Roll Reversal, TS 46 satellite works over to upper antenna and regains comm. Comm through Mila was available at 12:36:00Z with hand down to Mila at 12:37:00Z.
Oil Spil	023-E-032398 S sippi Delta showin rt of the river del	Soichi Noguchi (JAXA) ISS ED g the BP oil slick in the Gu ta and nearby Louisiana co out of frame to the left. USC	If of Mexico on May 4 ast appear dark in the	S132-E-00810 frame), cont	inues construc	tion and r	EVA with Reism maintenance or tion of a 2nd	the ISS,		Continued O Good (foreground) & Reisman, are surrounded are during the flight's final EVA.

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ABOVE RIGHT: KSC-2010-4450 (http://mediaarchive.ksc.nasa.gov/index.cfm). This Tribute Display features *Atlantis* soaring above the earth. *Atlantis* flew seven missions to space station Mir. In addition to its many assembly, construction, and resupply missions to the International Space Station, *Atlantis* also flew the last Hubble Space Telescope servicing mission on STS-125. The planet Venus represents the Magellan probe deployed during STS-30, and the planet Jupiter represents the Galileo probe deployed during STS-34. Threaded through the design are the mission patches for each of *Atlantis* 'flights. The inset photos illustrate various aspects of space shuttle processing as well as significant achievements such as the 'glass cockpit'' and the first shuttle docking with Mir during STS-71. The inset photo in the upper left corner shows a rainbow over *Atlantis* on Pad A and *Endeavour* was the assigned vehicle had *Atlantis* 'STS-125 mission needed rescue, and this was the last time both launch pads were occupied simultaneously. The stars in the background represent the many people who have worked with *Atlantis* and their contributions to the vehicle's success.







CONGRESS ALLOWS ATLANTIS TO FLY AGAIN - SEE STS-135



----- ATLANTIS NOW HEADS TO STS-335 RESCUE MISSION PREP THEN TO THE BARN/MUSEUM! -------

"Space Shuttle Atlantis comes home to the Kennedy Space Center for the final time, 25 years, 32 flights, and more than 120 million miles traveled; the legacy of Atlantis, now in the history books," Commentator Josh Byerly remarked from his console in Houston. NASA Photos courtesy: Susan Phipps Multimedia Librarian/AP3 JSC

FLT ORBITER NO.	SOME OF THE OPERATIONS SUPPORT TEAM	
STS- 132/ULF4 Continued OV-104 Atlantis	Image: Sector of the	
	Director Mike Sarafin (center) on front row. Director Chris Edelen (second left) on front row. First "Centur	e Schmitt - y Club" Controller
STS132-S-012 (14 May 2010	CDR Ken Ham joiner members of MCC The 2010] to recognize Le Flight Controller to re- mission. "This is true	.com - Robert Pearlman) - d in with past and present ursday morning [May 20, ponce Schmitt as the first each his 100th shuttle y a momentous occasion," phoard Atlantic, "We were

STS132-S-012 (14 May 2010) --- Secretary o Defense Dr. Robert M. Gates, right, NASA Associate Administrator for Space Operations William H. Gerstenmaier, center, and other NASA mission managers monitor the last scheduled launch of Space Shuttle Atlantis from Firing Room 4 at KSC.



Ginger Kerrick (right) holds mission logo.



JSC2010-E-087358 -- Entry FCT Flight Director Tony Ceccacci holds mission logo.





JSC2010-E-080436 ---Kyle J. Herring (left) & Joshua Byerly, both PAO commentators, on JSC MCC consoles during launch countdown.



JSC2010-E-063832-- ISS FD's: Left (front row) Emily Nelson & Scott Stover. Back row: Royce Renfrew & Holly Ridings.



JSC2010-E-045162 --- STS FD's: From left: Chris Edelen, Richard Jones, Mike Sarafin, Ginger Kerrick & Tony Ceccacci.



JSC2010-E-090665-- Ascent FCT: FD Richard Jones (right) & STS-132 CDR Ken Ham hold the mission logo.

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		CREW		LANDING SITE/	SSME-TL								
FLT	ORBITER	(6)	LAUNCH SITE, LIFTOFF TIME,	RUNWAY, CROSSRANGE	NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,		
NO.	ONDITER	TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP	101	PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)		
STS- 133/ULF5 SEQ FLT # 133 KSC-133 PAD 39A (56) MLP-3 35th SHUTTLE FLIGHT TO ISS	OV-103 (Flight 39) Discovery's LAST FLIGHT OMS PODS LPO1 -42 RPO3-40 FRC3-39	CDR: Steven W. Lindsey (Fit 5 - STS-87, STS-95, STS-104, STS-121) P836/R229/V131/M200 PLT Eric A. Boe (Fit 2 - STS-126) P837/R331/V 221/M286 MS 1 Alvin Drew (Fit 2 STS-118) P838/R314/V221/M270 MS 2 Sleve Bowen (Fit 3 - STS-126, STS-131) P839/R332/V220M287 MS 3 Michael Barratt (TMA-14 ISS EXP 19 & 20) P840/R355/M306 MS 4 Nicole Stott (Fit 2 - Up STS-128 stay ISS	KSC 39A 055:21:53:24Z 4:50:27 PM EST (P) 4:53:24 PM EST (A) Thursday (35) 02/24/11 (11) LAUNCH WINDOW: 6M 02S (Total) 3M02S (Preferred) EOM PLS: KSC TAL: ZZA TAL WX: MRN , FMI SELECTED: RTLS: KSC15 CI/N TAL: ZZA30 CI/N AOA: KSC15 CI/N 1 ST DAY PLS EDW22 CI/N (Briefed to crew) KSC15 CI/N (Go WX)	KSC15 KSC (76) 068:16:57:15Z 10:57:15 AM CST Wednesday (17) 03/09/11 (11) <u>DEORBIT BURN</u> : 068:15:52:04Z <u>XRANGE</u> : 24.8 NM <u>ORBIT DIR</u> : A/R (15) <u>AIM PT</u> : Close-In <u>MLGTD</u> : 2446 FT 068:16:57:15Z VEL: 180 KGS 197 KEAS HDOT: -1.4 FPS <u>TD NORM 195</u> : 2645 FT Continued	104/104/ 109% <u>PREDICTED</u> : 100/104.5/104.5/ 72/104.5 <u>ACTUAL</u> : 100/104.5/72/ 104.5 1 = 2044 (13) 2 = 2048 (9) 3 = 2058 (5) <u>M 3 EOM</u> : WEIGHT: 205011 LBS X CG: 1082.4 IN LANDING: WEIGHT: 205022 LBS X CG: 1084.3 IN	BI-144 RSRM 112 ET-137 SLWT 41 w/Stringer Mod ET <u>IMPACT</u> 1:14:20 MET <u>LAT:</u> 35.535S <u>LONG</u> : 158.000W	51.6 (35)	DIRECT INSERTION POST OMS-2 125.5x84.9 NM DEORBIT HA 192.9 NM HP 23.2 NM ENTRY VELOCITY: 25868 FPS ENTRY RANGE: 4387 NM	Ol-34 (6)	CARGO: 40108 LBS PAYLOAD CHARGEABLE: 31802 LBS DEPLOYED: 30576 LBS NON-DEPLOYED: 818 LBS MIDDECK: 408 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 1729240 LBS NON-DEPLOYED: 1629277 6LBS	Brief Mission Summary: The STS-133 (35th mission to ISS) delivered two key components to ISS – the Italian-built Permanent Multipurpose Module (PMM) and Express Logistics Carrier 4 (ELC4) – for spare parts and storage capacity. Also delivered was Robonaut 2, the first dexterous humanoid robot in space. This was the final flight of the most flown Orbiter, Discovery (39 flights) - The Beginning of the END! KSC W/D OPF: 138 days + 3 holidays VAB HB3 (part 1):10 days + 2 contingency days PAD A (part 1): 82 days + 8 contingency days PAD A (part 2): 35 days + 5 holidays VAB (part 2): 19 days + 5 contingency Total Work Days = 284 (OPF processing occurred over a total time period of 141 days POSTPONEMENTS: - Baselined STS-133 to FDRD - launch date of 07/29/10 on 06/30/09. - Ppd. to 09/16/10 on 09/30/09. Adjustments needed for flight product planning.		
Controlle		Dn STS-129) P841/R347/V223/F47 SPECIAL PASSENGER Robonaul 2 First dexterious humanoid robot in space - stay ISS Continued ROBONAUT 2	TDEL: 0.000 (P) 0.092 (A) MAX Q NAV: 7114.8 (P) 710.4 (A) SRB STG: 2:05.9 (P) 2:06.9 (A) PERF: NOMINAL 2 2 ENG TAL (MRN): 2:44 (A NEG MRN (2@ 104): 3:56(A 3:54(P) 3:56(A PTA (U/S 160 FPS): 5:15(A) Continued	Giant C ABOVE: STS- attempt - scrut transporters (tr Shuttle vehicle Launch Compt	bbed on 10/29 wo) carried al es on the grav	AD on 09 9/10. The I Apollo S	/20/1 e KSC Saturr	0 for first lau C crawler- n V's and all	Inch	CARGO TOTAL: 4326516 LBS PERFORMANCE MARGINS (LBS): FPR: 2821 FUEL BIAS: 954 FINAL TDDP: 1481 RECON: 394 PAYLOADS: PLB: ISS-ULF 5 (ELC 4,PMM), LWAPA MIDDECK: ISS-ULF 5, MAUI, SEITE, SIMPLEX, RAMBO-2 4 CRYO TANK SETS, ODS, SRMS (89), OBSS, SSPTS	 Ppd to 11/01/10 on 07/01/10. Slip was required to complete preparations of critical spares that will be launched in the Permanent Multi-Purpose Module (PMM). LAUNCH SCRUBS: - Launch scrubbed on 10/29/10 due to helium & nitrogen leaks discovered in the right OMS pod. Launch rescheduled for 11/02/10. On 10/30/10 launch rescheduled to 11/03/10 to allow additional time for reloading the helium tank after repair in the right OMS pod. Technical scrub. - Launch scrubbed on 11/02/10 at L-1 MMT meeting due to problem with center SSME controller. Launch rescheduled for 11/04/10. Technical scrub. - Launch scrubbed on 11/04/10 at tanking MMT meeting due to predictions of bad weather. Launch rescheduled for 11/05/10. Weather scrub. - Launch scrubbed on Friday, 11/05/10 when a liquid hydrogen leak was detected about 6:30 a.m. CDT in the Ground Umbilical Carrier Plate (GUCP). Mike Moses, MMT Chair stated: "This is not a stranger to us – we saw this on STS-119 and STS-127." In addition to the leak, a crack was detected on the flange of the ET intertank near the oxygen tank. To allow time for engineering analyses of these issues, for compatibility with on orbit sun angles and for avoidance of other space traffic to/from ISS, the launch was reset for NET 11/30/10. Continued 		

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		CREW		LANDING SITE/	SSME-TL						
		(7)	LAUNCH SITE,	RUNWAY,	NOM-ABORT	SRB		ORBIT	5014	PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	()	LIFTOFF TIME,	CROSSRANGE	EMERG	RSRM			FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION,	THROTTLE PROFILE	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABURT HIVES	WINDS	ENG. S.N.	EI				EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-	OV-103	Continued		WINDS	LING. J.IN.						Continued
133/ULF5	0 103	Continueu	Continued	Continued	פוס	COVE	סייס	S FINAL L	IET_(Continued
133/ULF5		SS EVA 157	CE TAL (77A 10A)				NI C				LAUNCH SCRUBS: (Continued)
		DOCKED QUEST EVA 75	<u>SE TAL (ZZA 104)</u> : 6:03(P) 6:01(A)	DRAG CHUTE							On 11/18/10 launch rescheduled for NET 12/03/10 due to
Continued,,,		EMU/TETHERED EVA 150	0.03(F) 0.01(A)	DEPLOY: 191 KEAS							identified analysis and ET repairs required for safe launch. On
		SCHEDULED EVA 148	PTM (U/S 180 FPS):	068:16:57:18Z							11/24/10 launch rescheduled to NET 12/17/10 to allow analysts
		DURATION 6:34		<u>NLGTD</u> : 5439 FT					All		additional time to determine likelihood of additional ET stringer
		00 51/4 450		68:16:57:26Z							cracks during ascent. "This is turning out to be a little more complicated from an analysis standpoint," NASA's associate
		SS EVA 158 DOCKED QUEST EVA 76	SE PRESS 104	VEL: 129 KGS							administrator Bill Gerstenmaier. On 12/03/10 launch rescheduled
		EMU/TETHERED EVA 151	6:58(P) 7:00 (A)	141 KEAS							to NET 02/03/11 to validate repairs and to support engineering
		SCHEDULED EVA 149		HDOT: -6.2 FPS				a ta			analysis with instrumented ET Tanking Test. On 01/08/11 launch
		DURATION 6:14	MECO CMD:		and the second			- Competit			rescheduled to NET 02/24/11 to allow engineers additional time to
			8:22.6 (P) 8:23.8 (A) VI:	DKK INIT: 20 KGS	1000	4	,				assess new cracks resulting from tanking test. And, on 01/20/11
CAPCOMS:		MCC WHITE FLIGHT FCR	25819(P) 25818(A)		launch date was established as 02/24/11. This date allowed for						
SHUTTLE		(63)		completion of all stringer work. Technical scrub.							
Asc - Charlie	- Hobaudh	FLIGHT DIRECTORS:	<u>OMS-2</u> :	58 KGS 68:16:57:47Z		100	-	A REAL		10 M	
	Wilmore (Wx)	SHUTTLE:	37:46 (P) 38:30(A) 98.8(P) 96.4(A) FPS		El Contractor	LAUNCH WINDOW: Window open at 055:21:47:25Z and close					
	ve Robinson	Ascent- Richard Jones LD/O1 - Bryan Lunney		at 055:21:53:27Z. Preferred Launch Time was 055:21:53:27Z (In-							
O2 - Megan	McArthur	O2- Ginger Kerrick		BRK DECEL FPS ² :							Plane Time) for a launch window of 3M02S.
Planning - M	like	O3 - Rick LaBrode		AVE 4.4 PK 6.3		STS133-	S-039) (24 Feb. 2	011)		
Massimino		Entry - Tony Ceccacci		WHEELS STOP:							LAUNCH DELAYS: 2M 57S due to Range Safety Central Command Computer anomaly. "We had about two seconds of
Ent - Charlie		MOD – John Mccullough		68:16:58:11Z							hold time remaining, which is about one second more than Mike
- Terry V Team 4 - N/	′irts (Wx) ^	Team 4 & Prelaunch:		9641 FT	Cox Imm					575-133	[Launch Director Leinbach] needed to get the job done, so we had
ISS	A	- Paul Dye ISS		ROLLOUT:		STS-1		37 Intertank String Observation	er Crack	G. Wadge, LM-ET	plenty of margin," guipped Launch Integration Mgr Mike Moses.
01 - Hal Ge	talmon	133 01 - David Korth		7195 FT	 During post drain LO₂-Intertank Fla 	inspections a	crack was	noted on	1		0 0 0
LD/02 - Sta		LD/O2 - Royce Renfrew		0:56 M:S	 Dissection of 1 sides of string 	foam revealed a er at \$7-2 (~9.0" it stringer (\$6-2,	crack on bo	oth	109		TAL WEATHER: Spaceflight Meteorology Group (SMG) reported
03 - Ricky A		O3 - Chris Edelen		WINDS:	at the adjacen	it stringer (\$6-2,	~3.0°L)		56 5		high pressure across Spain and France for generally acceptable
Team 4 - N/	A	Team 4 - Kwatsi Alibaruho		18 H KTS 2 L KTS	 1st observation in — Design uncha 	nged since SLW	ram T (ET-96)			A REPORT	weather at the TAL sites. ZZA was selected as prime TAL site at
				OFFICIAL:				Ultraction and			crew briefing [however, earliest TAL call was based on MRN]. Winds were gusting to 30 kts prior to crew brief, but headwinds
Extern	al Tank Fo	am Loss 3 min, 51 se	c into Ascent	15018P25KT		A Titud Para	in fre		102/0		dropped within limits at time of briefing. Isolated showers in
LAGIN		No Severe Damage	o into Agueill	(X2P2H18P25)	Panel #2		-16	(ATE)	Clos	wout Crack	Eastern France were never a threat and strong winds at Istres
		to devere Damaye		· · · · · · · · · · · · · · · · · · ·	Location of Cracks	110.3	Han a little		54-2 Crack	87-2 (3468	weakened enough for forecast to be amended GO.
		Deins	effaced	<u>DENS ALT</u> : 1266 FT	The second secon	H	Firent	Vanters	100/-	A	
	Imp	(chadow)	Contraction of the second		· · · · · · · · · · · · · · · · · · ·	pin (ISL)	Inte	rtank Stringer	1	1. 1/	PERFORMANCE ENHANCEMENTS:
			pnet 1	FLT DURATION:	1	J Beam	1		18		Include the standard set plus: 1) PE Operational High Q -WIN/
	. 4			12:19:03:53	No. 6	1 No. 7	A		100		FEB, 2) OMS Assist, 3) a 52 nautical mile MECO, & 4) Del Psi
	A			S/T:	- Z View Lookin	g Pwa			12		
	1	Impart 2		<u>-3/1</u> . 1290:04:07:04	11-16-2010			SR4001	and some states	674	FLIGHT DURATION CHANGES: Plus 1 day added for PMM outfitting was approved by MMT on FD 5. The IMMT/MMT
						fing Cha		T-137 Inter	tank S	tringer Crack	added a 2nd extra day on FD 8 to allow the six member shuttle
	and set			<u>OV-103:</u>						05/10 when a	crew to further help unload the new PMM storage unit.
	Contraction of			359: 22: 24:02	liquid hydro					05/10 when a	, °
		addit co		Continued	ilquid hydro	geniear	was	detected.			Continued
				Continucu							

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FLT NO.	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	Landing Site/ Runway, Crossrange	SSME-TL NOM-ABORT EMERG	SRB RSRM	ORBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
STS- 133/ULF5		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
blue and	white part o	6 Feb. 2011) Backor f Earth, Discovery app	tropped by a proaches ISS	Continued <u>DISTANCE</u> : 5,304,140 sm <u>TOTAL OV-103</u> <u>DISTANCE</u> 148,221,675 sm <u>TOTAL SHUTTLE</u> <u>DISTANCE</u> : 529,797,883 sm	built Perma	nent Mult ery's pay	SS's Canadarm2 ipurpose Module load bay to be p	(PMN	 for transfer 	Continued FIRSTS/LASTS: - Last flight of Discovery - 1st vehicle to be retired. - Robonaut 2 is first dexterous humanoid robot in space - First flight of SRB Thrust Vector Control (TVC) Auxiliary Pow Unit (APU) Phase II fuel pump - All six existing major spacecraft from Japan, Europe, Russia the US that service ISS were simultaneously docked for first and last time. (Proposed Soyuz fly around of ISS for historic photo of the 6 vehicles - ruled out by Russia's FSA as safety - Last NASA module (Italian-built), the Permanent Multipurpo Module (PMM), a storage room, was attached to ISS. - Steve Bowen is first NASA astronaut to fly on back-to-back Shuttle missions (see below). - FD13: First "Live" Wakeup Call! Performed by Big Head Too the Monsters playing "Blue Sky" from MCC, Tuesday, March & 3:23 a.m. CST. <u>11th SHUTTLE CREWMEMBER REPLACEMENT</u> - Tim Kopra (injury) was replaced by Bowen in Jan. 2011. (1 Shuttle crewmember replacement occurred on STS-132.)
	007375 B	owen (top) and Drew,			S133-E-008 joint STS-13 in red shirts Lindsey, Bal from left, are Dmitry Kond	627 In 33/Exp 26 (from left rratt & Bo Paolo N dratyev/R	U.S. Lab Destin group portrait. T b) are Stott, Drew owen. In dark blu lespoli/ESA, Oleg SA (below), Aleg Kelly and Cady 0	he ST , PLT le Exp g Skrip kandel	S-133 crew Boe, CDR 26 crew, pochka/RSA, r Y. Kaleri/	 NIGHT LAUNCH: N/A RENDEZVOUS: #80 Rendezvous and dock with ISS. EVE NTS: FD1: OMS2 ignition at 55:22:31:54Z resulted in a 125.5 by 84.9 M orbit. FD2: No Focus Inspection required for TPS/RCC T1 maneuver at 57:16:33:24Z resulted in a 192.4 by184.9 N orbit. FD3: Performed R-Bar Pitch Maneuver. Docking Contact occurred at 057:19:14:18Z Hard Dock, hooks closed, occurred at 057:20:04:09Z ISS Hatch opened at 3:16 PM CST Feb. 26, 2011. Reboost (26 mins) at 62:14:29:36Z resulted in a 194.6 by 18 NM orbit. FD5: EVA 1: Bowen & Drew completed all planned tasks: Jd extension cable install, Pump module retrieval from POA, Pum module install on ESP-2, CP3 camera wedge install, and Mess in a Bottle Experiment. During pump installation task the cupor obotic workstation had a "loss of comm." resulting in Bowen holding the 800 lb (but now weightless) pump for 25 min. He reported "I'm fine as long as it's not too much longer." Then a "How much longer?" Operations were transferred to the Lab robotics and task completed. EVA1 duration 6:34 Continued

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FLT	ORBITER	CREW (7)	LAUNCH SITE, LIFTOFF TIME,	LANDING SITE/ RUNWAY, CROSSRANGE	SSME-TL NOM-ABORT EMERG	SRB RSRM		ORBIT	FSW	Payload Weights,	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES & EVA'S	LANDING SITES, ABORT TIMES	LANDING TIMES FLT DURATION, WINDS	THROTTLE PROFILE ENG. S.N.	AND ET	INC	HA/HP		PAYLOADS/ EXPERIMENTS	TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)



S133-E-007866 --- CDRs Scott Kelly (left) Exp 26 & Steve Lindsey STS-133 are shown in the hatch leading to the newly-installed PMM.

STS-133/ULF5 **Discovery departs ISS for last time!**



EVE NTS: (Continued)

Continued...

- FD5 MMT Decision: Based on FD2 inspection and RPM data,

the TPS was cleared for entry per Flight Rule A2-142 - FD6: PMM, an extra storage room/closet, was installed and hatch opened.

- FD7: EVA2: Bowen & Drew successfully completed all tasks: Vent Ops/QD bag cleanup, Light Weight Adapter Plate Assembly (LWAPA) Retrieval & Install, P3 CETA Light Install, SPDM

Camera Light Pan/Tilt Assy 1 Install and EP1 MLI Removal, and P1 Grapple Beam re-torque bolts down, plus several get-aheads.

EVA2 duration 6:14.

Transfers:

- 31,459 Pounds of H/W to ISS (inside & out) 110 Pounds of Oxygen to ISS (Ouest tanks) 72 Pounds of Oxygen to ISS (stack repress) 26 Pounds of Nitrogen to ISS 931 Pounds of water to ISS

- 2,031 Pounds of middeck items to ISS

2,599 Pounds of H/W (middeck only) returned to Discovery

ISS Mass in space 919,964 Pounds 100 Percent ISS complete (pressurized volume)

FD12: Undock from ISS complete at 066:12:00:10Z

FD14:During entry comm outage times due to blackout were: - 1st outage 068:16:39:25Z. INCO cmds H/O from TDRS 174 to

TDRS 46 prior to roll cmd - at 068:16:30:25Z 1st outage ends.

- 2nd outage at 068:16:37:53Z. INCO cmds H/O back to TDRS 174 prior to 1st roll reversal - at 068:16:37:58Z 2nd outage ends. MILA AOS at 68:16:45:00Z good return link and UHF.

SIGNIFICANT ANOMALIES:

Orbiter

TPS Anomalies

ATVC Ch 1 Power Supply Failed to Restart

Ammonia Spray Boiler Sys B Unexpected Switchover

KSC, RSRM, SSME, MOD, SRB - None.

VIDEO FROM RH ET OBSERVATION CAMERA NOT

RECORDED BY DAS DURING FLIGHT

ET: (See Integration issues below)

Integration:

ET Intertank Stringer Cracks

Hydrogen Leak at ET Ground Umbilical Carrier Plate (GUCP) Unexpected Debris/Expected Debris Exceeding Mass Allowable Prior to Pad Clearance (Liftoff Debris) Debris Released From LH2 Flange Area Near the Bipod



DISCOVERY'S FLAWLESS FINALE MLGTD @ KSC March 09, 2011, 10:57:15 CST 201103090001HQ. - Courtesy: Rob Navias/JSC-PAO

11-12200500 bit Barni 9:52 am CT/16:52 am ET Idown: 10:57 am CT/11:57 am ET

------ SOME OF THE OPERATIONS SUPPORT TEAM ------

FLT NO. ORBITER STS-133/ULF5 OV-103



JSC2011-E-021930 - STS-133 Lead FD Bryan Lunney monitors rendezvous data. His last flight.



JSC2011-E-023001 --- STS-133 Orbit 1 FCT - Flight Director Bryan Lunney (center left) on 2nd row.



Jsc2011e023002 --- ISS Orbit 3 FCT - Orbit 3 - FD Chris Edelen (It) & CAPCOM Richard Arnold with STS-133 logo.







JSC2011-E- 021648 -- Rt to Lt: FDs Tony Ceccacci & Richard Jones, & CAPCOMs Charlie Hobaugh & Barry Wilmore.



JSC2011-E-024279 --- STS-133 Ascent and Entry FCT in shuttle FCR in JSC. Flight Directors Tony Ceccacci (left) and Richard Jones hold the STS-133 mission logo.



IN KSC LCC: ABOVE: NASA Ctr Directors: (It to rt) are Patrick Scheuermann/Stennis, Bob Cabana/KSC, Mike Coats/JSC, & Robert Lightfoot/MSFC. BELOW: We have lift-off! (It to rt) Stephanie Stilson/Discovery Flow Director, Charlie Blackell-Thompson/Lead Test Director, & Mike Leinbach/ Launch Director.



----- SALUTE ------

STS-133/ULF5 "A MIXTURE OF SADNESS AND PRIDE"

JSC Center Director: "I am proud to have been the Pilot on the first flight of Discovery in 1984. I also flew Discovery on my two missions as Commander." - Mike Coats

Shuttle Program Manager/JSC: "Discovery's landing yesterday was an outstanding end to an amazing mission. I was really struck by the 'business as usual" attitude of the dedicated team that takes care of our Orbiters. ... To those team members that have flown their last flight with us – You should walk away with your head held very high. You have built and kept safe a unique capability in the most extreme of environments. I can only hope that others that come after us will look back at the Space Shuttle team and emulate the dedication, perseverance, and excellence that this team represents. If they do, we will have an outstanding human spaceflight program. For those team members remaining - Let's go finish this program strong." - John Shannon

STS-133 Crew: Nearing the end of the shuttle's final mission, the crew sentiments were a mixture of sadness and pride. "When you look out the Cupola window, times like that, I really reflect on what a great vehicle it's been – 39 missions, nearly one year on orbit, thinking about all the things the vehicle has done, it's kind of bittersweet." And later, "Houston for the last time, Wheels Stop!" - CDR Steve Lindsey. "She retires with all of the honors and dignity due any of those ships that made great discoveries. So I think we salute Discovery in that way, with all the accolades she deserves. But it also lays out a challenge. What will be the next ship named Discovery? The next ship to bear this name hopefully will go farther than this one and make every bit as much of a contribution to history and to discovery as this ship." - Michael Barratt/MS

Launch Director/KSC: "I'm going to take away the attitude of the team on the ground that safed the vehicle. They did that today just like they've done every mission. They didn't skip a beat today and that's a true testament to their work ethic. It was heartwarming. ... Proud of the people that put the vehicle together and the flight controllers in Houston that executed the mission." - Mike Leinbach

Lead Flight Director/JSC: "Discovery represents the ingenuity, creativity and diligence of the teams who originally designed and built Discovery and also the teams who operated and evolved the capabilities of Discovery across three decades. Discovery evolved from a short duration LEO delivery vehicle to a much more capable delivery and service spacecraft staying on orbit more than twice as long as originally intended. The engineering teams and operations teams expanded Discovery's capabilities well beyond the original designers intentions enabling scientists to learn more and more about the world and universe around us." - Bryan Lunney/Onyx Flight

NASA Assoc Admin. for Space Ops: "I don't really know what to say other than to thank the Discovery team. I think of all the processing work, the folks throughout the history of this vehicle back to Downey and Palmdale who gave us a phenomenal vehicle. It's legacy is the future with station in great shape and that's only possible because Discovery performed so well. That extra work sets up so well for the research period aboard station." - Gerst

DISCOVERY NOW HEADS TO THE SMITHSONIAN NATIONAL AIR AND SPACE MUSEUM'S UDVAR-HAZY CENTER IN CHANTILLY, VA.

Shuttle Legacy Mural - Hanging in LCC Firing Room at KSC



DISCOVERY TRIBUTE: From Mike Leinbach/Launch Director/KSC

(http://mediaarchive.ksc.nasa.gov/index.cfm). This KSC-2010-4453 Tribute Display features Discovery demonstrating the renowned Rendezvous Pitch Maneuver on approach to the International Space Station (ISS) during STS-114. Having accumulated the most space shuttle flights, Discovery's 39 mission patches are shown encircling the vehicle. The background image was taken from the Hubble Space Telescope, which was launched aboard Discovery on STS-31 and serviced by Discovery on STS-82 and STS-103. The prominent American flag and eagle represent Discovery's two "Return to Flight" missions, STS-26 and STS-114, and symbolize Discovery's heroic role in returning American astronauts to spaceflight. Discovery's significant accomplishments include the first female Shuttle pilot (Eileen Collins on STS-63), John Glenn's legendary STS-95 mission, and the celebration of the 100th space shuttle mission with STS-92. In addition, Discovery supported numerous DOD programs, satellite deploy/repair missions, and 13 flights for construction and operation of the ISS.









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FLT NO.	ORBITER	CREW (6) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE ENG. S.N.	SRB RSRM AND ET	INC	orbit Ha/HP	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS- 134/ULF6 SEQ FLT # 134 KSC-134 PAD 39A (57) MLP-2 36th SHUTTLE FLIGHT TO ISS	OMS PODS LPO3 -35 RPO4 -31 FRC5 -24	CDR: Mark E. Kelly (FII 4 - STS-124,STS-108, STS-121) P842/R271/V181/M237 PLT Gregory H. Johnson (Fit 2 - STS-123) P843/R322/V224/M278 MS 1 Michael Finke (ISS EXP 9 & 19) P844/R356//M307 MS 2 Greg Chamitoff (Fit 2 UP ON STS-124, stay ISS, DN ON STS-126) P845/R330/V225/M285 MS 3 Andrew Feustel (ESA) (Fit 2 - STS-125) P845/R340/V226/M294 MS 4 Roberto Vittori (ESA) (ISS "Marco Polo" & "Eneide") P846/R357/M308 SS EVA 159 DOCKED QUEST EVA 77 EMU/TETHERED EVA 152 SCHEDULED EVA 150 DURATION 6:19 SS EVA 161 DOCKED QUEST EVA 79 EMU/TETHERED EVA 153 SCHEDULED EVA 154 SCHEDULED EVA 151 DURATION 8:07	8:55:42 AM EDT (A) Monday (18) 05/16/11 (10) <u>LAUNCH WINDOW</u> : 5M 46S (Total) 5M01S (Preferred) <u>EOM PLS</u> : KSC <u>TAL</u> : ZZA <u>TAL WX</u> : MRN , FMI <u>SELECTED</u> : <u>RTLS</u> : KSC15 N/N	KSC15 KSC (77) 152:06:34:50Z 01:34:50 AM CDT Wednesday (18) 06/01/11 (9) <u>DEORBIT BURN</u> : 152:05:29:03Z <u>XRANGE</u> :141.1 NM <u>ORBIT DIR</u> : A/L (46) <u>AIM PT</u> : Nominal <u>MLGTD</u> : 3138 FT 152:06:34:50Z VEL: 196 KGS 191 KEAS HDOT: -1.0 FPS <u>TD NORM 195</u> : 2931 FT Continued STS-134 - (10	1 = 2059 (5) 2 = 2061 (2) 3 = 2057 (6) <u>M 3 EOM</u> : WEIGHT: 204532 LBS X CG: 1080.4 IN <u>LANDING</u> : WEIGHT: 204463 LBS X CG: 1082.3 IN	BI-145 RSRM- 113 ET-122 SLWT 42 w/Stringer Mod ET <u>IMPACT</u> 1:14:11 MET LAT: 36.436S LONG: 158.531W	51.6 (36)	DIRECT INSERTION <u>POST OMS-2</u> 175.9x124.7 NM <u>DEORBIT</u> HA 188.7 NM HP 23.1 NM <u>ENTRY</u> <u>VELOCITY</u> : 25860 FPS <u>ENTRY</u> <u>RANGE:</u> 4419 NM	OI-34 (6)	CARGO: 39210 LBS PAYLOAD CHARGEABLE: 31693 LBS DEPLOYED: 30721 LBS NON-DEPLOYED: 811 LBS MIDDECK: 161 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 1759961 LBS NON-DEPLOYED: 1759961 LBS NON-DEPLOYED: 1630249LBS CARGO TOTAL: 4365726 LBS PERFORMANCE MARGINS (LBS): FPR: 2821 FUEL BIAS: 954 FINAL TDDP: 1968 RECON: 3211 PAYLOADS: PLB: ISS-UL F6 (AMS-02 ELC 3) MISSE 7 Return MISSE 8, STORRM DTO-703 MIDDECK: ISS-UL65, MAUI, SEITE, SIMPLEX, RAMBO-2	 Brief Mission Summary: The STS-134 (36th mission to ISS) delivered the \$2 billion Alpha Magnetic Spectrometer-2 (AMS-02) to the ISS. AMS-02 is a particle physics detector designed to search for dark matter and for antimatter (first discovered by British physicist Paul Dirac in 1920's) in the universe. MIT Prof. Sam Ting is the AMS Principal Investigator. ISS spare parts and a suite of DoD Experiments were also delivered to orbit. Four EVA's were conducted for ISS maintenance and the Orbiter OBSS was transferred to ISS as a permanent fixture. This was the final flight of Endeavour (25 flights). KSC W/D OPF: 263 days+ 89 Non-work days + 17 holidays + 2 safety days VAB: 9 +1C (Contingency) day + 1Wx PAD A: 53+14C Total Work Days = 325 (OPF processing occurred over a total time period of 371 days) POSTPONEMENTS: Baselined STS-134 to FDRD - launch date of 07/29/10 on 06/30/09. Ppd. to 11/26/10 on 07/01/10. Delayed to late November after a decision to replace the magnet at the heart of the Alpha Magnetic Spectrometer payload. Ppd. to 02/26/11 on 07/01/10. A late-November/early December launch was ruled out because of conflicts with other planned station launches. Temperature constraints related to the station's orbit prevented a launch in January and range conflicts with other unmanned missions pushed the approved launch date to Feb. 26. Ppd. to 04/19/11 on 01/26/11. This date was driven by the launch pad turnaround time required after STS-133 launch. Ppd. to 04/29/11 on 01/26/11. This date was driven by the launch bad turnaround time required after STS-133 launch. Ppd. to 04/29/11 on 01/26/11. This date was driven by the launch ad turnaround time required after STS-133 launch. Ppd. to 04/29/11 on 04/04/11 due to conflicts with Russian Progress vehicle flight to ISS. LAUNCH SCRUBS: - Launch scrubbed on 04/29/11 due to failed APU fuel line
		Continued		ENDE	AVOUR'S	FINAL	LIF	T-OFF		Continued	Continued

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FLT ORBITER (7) LAUNCH SITE, LANDING SITE/ SSME-TL RUNWAY, NOM-ABORT SRB ORBIT FSW WEIGHTS, CROSSRANGE EMERG RSRM FSW WEIGHTS,	MISSION HIGHLIGHTS
	(LAUNCH SCRUBS/DELAYS,
NO. TILLE NAMES LANDING SITES, LANDING TIMES THROTTLE AND INC HA/HP PAYLOADS/ TAI	L WEATHER, ASCENT I-LOADS, S, SIGNIFICANT ANOMALIES, ETC.)
STS- 134/ULF6 OV-105 Continued Cont	136:12:55:43Z and close at 136:13:01:29Z Time was 136:12:56:28 (In-Plane Time) for a 5M01S (preferred).
Ascent - Barry Wilmore - Lee Archambault/Wx LD/O1 - Megan McArthur O2 - Steve Robinson Planning: - Shannon Lucid Entry - Barry Wilmore - Terry Virts/Wx Team 4 - N/A SHUTTLE: Ascent- Richard Jones LD/O1 - Gary Horlacher O2 - Paul Dye O3 & Prelaunch - Kwatsi Alibaruho O4 - Rick LaBrode Entry - Tony Ceccacci MOD - John Mccullough Team 4 - N/A MECO CMD: 8:21.8 (P) 8:21.5 (A) VI: 25819(P) 25818(A) HDOT: - 4.5 FPS 8:21.8 (P) 8:21.5 (A) VI: 25819(P) 25818(A) HDOT: - 4.5 FPS 8:21.8 (P) 8:21.5 (A) VI: 25819(P) 25818(A) BRK INIT: 119 KGS ABOVE: Jsc2011e036650STS-134 was first flight controlled from JSC Mission Control Center after it was renamed in honor of Christopher C. Kraft, Jr. on April 152:06:35:19Z 47 KGS BRK DECEL FPS2: AVE 8.3 PK 11.7 ABOVE: Jsc2011e036646 Chris speaks at the ceremony. He was NASA's 1st Flight Director for manned spaceflight. He served on all Mercury & Psi PERFORMANCE Include the standa Psi	skies at ZZA & FMI, but head winds near on reported concerns for thunderstorms. ZZA prime TAL site for launch. The slight chance of MRN was removed one hour before launch introl Team two acceptable TAL sites with FMI
O1 - Rob hayhurst LD/O2 - Lucia McCullough O3 - Dan Tani O1 - Dana Weigel LD/O2 - Derek Hassmann O3 - Dina Contella Team 4 - Dave Korth WHEELS STOP: 152:06:35:32Z 9712 FT Several Germini nights, was one of the designers & implementers of the MCC, and was JSC Center Director from 1972 to 1982. Call Name - Red Flight. FLIGHT DURATION FIRSTS/LASTS/M - Last flight of End - First Flight contro C. Kraft, Jr. on A - First Paper (Jr. or A - First	Jeavour. Jlled from JSC MCC renamed for Dr. Christopher April 14, 2011. o space. On Saturday, May 21, 2011 Pope mended crews for their courage and blessed
Image: Second	ce by an American: Mike Fincke surpassed record of 377cumulative days finishing with 382
Ting the Principal Investigator for the \$2 Billion AMS-02 in search of cosmic dark matter & antimatter. ST: 1305:21:45:26 <u>OV-105:</u> 296:03:17:45	: N/A <u>5 KSC #18:</u> (#24 in Shuttle history) #80 Rendezvous and dock with ISS.
grasp of the Orbiter's robotic Canadarm for transfer to ISS. (AMS-01 was flown & tested on STS-91.) Continued	

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FLT ORBITER	CREW (7) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION, WINDS	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE ENG. S.N.	SRB RSRM AND ET	ORBIT INC HA/HP	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
S- 4/ULF6 ntinued	Crew "Star Trek"	Connection	Continued <u>DISTANCE</u> : 6,510,221 sm	S134-E-009	9265 E	EVA-1 Feustel	(rt) & C	Chamitoff (It)	Continued <u>VIP</u> CDR Mark Kelly's wife & U.S. Representative Gabrielle Giffords severely wounded in a shooting at a public event in Tucson, Arizona on Jan. 8. 2011, was able to attend the launch.
	STSAL		<u>TOTAL OV-105</u> <u>DISTANCE</u> 122,883,151 sm <u>TOTAL SHUTTLE</u> <u>DISTANCE</u> : 536,308,104 sm						EVE NTS: - FD1: OMS2 ignition at 136:13:33:25Z resulted in a 175.9 by 124.7 NM orbit. - FD2: RCC surveys showed some areas of concern. Focus Inspection required on FD6 - T1 maneuver at 138:07:38:13Z resulted in a 186.1 by182.8 NM orbit. - FD3: Performed R-Bar Pitch Maneuver. - Docking Contact occurred at 138:10:13:52Z
	631 EVA 4 Fincke (F								 Hard Dock, hooks closed, occurred at 138:10:25:15Z ISS Hatch opened at 6:38 AM CDT May 18, 2011. FD4: AMS handed off from Shuttle arm to ISS arm and installed on ISS. Scientists immediately began detecting "thousands and thousands" of subatomic particles from deep space. FD5: - DAT team cleared ascent RCC damage, but recommende a Focused Inspection of area between MLGD & ET door. MMT approved for FD6. FD5: EVA 1: Feustel & Chamitoff completed Installation & retrieval of MISSE experiments, & installations of: S3 CETA light SARJ cover 7, P3/P4 ammonia jumper on ISS. Chamitoff's ppCO2 sensor dropped out during EWC antenna task. Flight rule required termination of the EVA. EVA1 duration 6:19 FD6: Focused Inspection was completed. DATteam analysis using these images cleared TPS for safe entry. FD7: EVA 2: Feustel & Fincke completed all tasks, however, duration was 1:30 longer than planned due to H/W issues. During
			Blue) pose in CDR Dmitry row), Cady C	n ISS Kibo: It Kondratyev/F Coleman, Anc v/RSA, Ron (to rt (fro RSA, CD Irey Bori	134 (in Black) nt row) are Pac R Kelly & Vitto senko/RSA, Al Fincke, Feustel	olo Ne ori/ESA exand	spolí/ESA, .; and (back er	port SARJ lube task some loose bolts prevented removal of 2 covers & reinstallation of another. Also, after filling P6 truss PVTCS one ammonia flake was seen near Fincke's suit. Inspections revealed no visible contamination. Other tasks included SPDM LEE lube & S1 Radiator Stowage Beam installation. EVA2 duration 8:07. - FD8: GMT 143/21:35 Soyuz TMA-20 undocking from ISS & imagery operations of Shuttle docked to ISS. - FD10: EVA3: Feustel & Fincke completed all tasks for servicing of ISS, installing cables for the power system & completion of wo on a wireless communications system. EVA3 duration 6:54. - FD10 the OBSS will be left behind to serve as an extension for station use if needed in the future.





FD 7: JSC2011-E-046603 (21 May 2011) --- This overall view of the space shuttle FCR in the Christopher C. Kraft, Jr. Mission Control Center was taken during a special call from Pope Benedict XVI (upper left) in the Vatican to the STS-134 and Expedition 27 crews (center screen) on the ISS.



JSC2011-E-050144 --- CAPCOMs Terry Virts (left) and Barry Wilmore on console in CCK-MCC.



FD 11: May 25, 2011 the 50th Anniversary of President John F. Kennedy's historic space message to a joint session of Congress, on May 25, 1961.

"...I believe this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the Moon and returning him safelv to the Earth."

And ending with... "We have a long way to go in this space race. But this is the new ocean, and I believe that the United States must sail on it and be in a position second to none."

America has sailed this ocean for the past 50 years, and grabbed the lead on July 20, 1969. The question now is: will she still be the lead ship on this ocean for the next 50 years?

MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)

Continued...

EVENTS: Continued

- FD12: EVA 4: Fincke & Chamitoff completed all major objectives including: OBSS Stow on ISS, P6 PGDF Retrieve, & OBSS EFGF/PDGR Swap. Only items not completed: relocation of APFR from P6 and stowing EFGF on Tool Stowage Assembly (TSA) in Shuttle P/L Bay. EVA4 duration 7:24:15. This was last EVA of the Shuttle era.

FD14: ISS reboost with 14-min Orbiter RCS Verniers completed for 1.8 fps burn.

Transfers:

29,370 pounds of H/W to ISS 17 Pounds of Oxygen to ISS (Quest tanks) 278 Pounds of Oxygen to ISS (stack repress) 18 Pounds of Nitrogen to ISS 2,266 Pounds of middeck items to ISS 2,225 Pounds of middeck returned to Endeavour

ISS Mass in space 904,991 Pounds

- FD15: Undock from ISS complete at 150:03:55:12Z - FD15: Completed DTO for new docking system - Sensor Test for Orion Relative Navigation Risk Mitigation (STORRM) - "Went exceptionally well." Anthony Ceccacci/FD.

FD16: No significant comm outage during blackout timeframe.
 Start of RF Blackout : MET 15/17:09, good comm on TDRS-174
 & Orbiter upper antennas. 1st Roll Maneuver: MET 15/17:11, still on upper antenna & good comm. 1st Roll Reversal: MET 15/17:20, INCO handoff to TDRS-46, still on uppers & good comm. Hand down to MILA: MET 15/17:25.

SIGNIFICANT ANOMALIES:

Orbiter: RH NLG P2 Pressure Measurement(V51P0373A) Erratic/Off - RH NLG P2 Pressure Measurement(V5 IP03/3A) Erratic/off Scale High During Ascent - DURING PRE-LAUNCH OPERATIONS ON APRIL 29, AUXILIARY POWER UNIT (APU) 1 FUEL TEST LINE AND FUEL SERVICE LINE B HEATERS FAILED TO ACTIVATE (TEMPERATURE TRENDED BELOW THE LCC LIMIT OF 45 DEG F IN LCC APU-14) WITH BOTH GROUND COMMAND AND DAMEL SWITCH ACTIVATION PANEL SWITCH ACTIVATION.

SRB: - RH SRB MAIN CHUTE FAILURE ? GORE 26 FAILED FROM THE SKIRT BAND THROUGH THE VENT BAND. KSC, RSRM, SSME, MOD,& ET - None.

Integration: - Unexpected Debris/Expected Debris Exceeding Mass Allowable Prior to Pad Clearance (Liftoff Debris)
 - Cylindrical Debris Observed Near +Y Thrust Panel During SRB Separation

----- SALUTE TO ENDEAVOUR AND ITS FLIGHT CREW ------



FD 8: iss027e036679 (May 23, 2011) ---- One of first legacy photos taken from Soyuz TMA-20 of a Shuttle (Endeavour, left of center) docked to ISS.



ABOVE: STS134-070 (1 June 2011) --- After 19 years of service, xenon lights illuminate Endeavour's drag chute during it's last landing & Shuttle's last night landing.

BELOW: 201106010004hq (1 June 2011) --- Crew poses in front of Endeavour post- landing: (Lt to Rt) Vittori, Johnson, CDR Kelly, Fincke, Chamitoff, & Feustel.



STS-134/ULF7 ----- SALUTE TO ENDEAVOUR AND SOME OF ITS OPERATIONS SUPPORT TEAM -----



TOP: JSC2011-E-048881 --- STS-134 Orbit 3 FCT. FD Kwatsi Alibaruho (left) on the front row.

BOTTOM: JSC2011-E-048941 --- Entry FCT. FD Tony Ceccacci (third from left) on the front row with CAPCOM Barry Wilmore holding STS-134 mission logo.



Shuttle Legacy Mural - Hanging in LCC Firing Room at KSC



ENDEAVOUR: From Mike Leinbach/Launch Director/KSC

KSC-2010-4454 (http://mediaarchive.ksc.nasa.gov/index.cfm). This Tribute Display features Endeavour soaring into orbit above the sailing vessel HMS Endeavour for which the orbiter was named. The Cupola, delivered to the International Space Station by Endeavour on STS-130, is shown framing various images of Endeavour. The images represent the phases of mission processing and execution for the Space Shuttle Program. The first ever use of a drag chute during orbiter landing (STS-49) is depicted in the top window and moving clockwise the images symbolize the following: Rollout to the Pad, Ferry Flight return to Kennedy Space Center, Orbiter Processing Facility Roll-in, Docking at the International Space Station, and Lifting Operations for Orbiter Mate in the Vehicle Assembly Building. The background image was captured by the Hubble Space Telescope and signifies the first servicing mission which was performed by the Endeavour crew on STS-61. Crew-designed patches from Endeavour's maiden voyage through her final mission are shown ascending toward the stars.



FD LD/O1 Gary Horlacher (left) & Chief FD John McCullough

FD O4 Rick LaBrode





Kelly Humphries/PAO



ATLANTIS COMING HOME TO KSC



An unprecedented view, as seen by the ISS Exp 28 crew, of Space Shuttle Atlantis on its way home with its plasma trail generated during the heat of entry. Airglow over Earth and stars can be seen in the background. (ISS028-E-018214)

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FLT ORBITER NO.	CREW (4) TITLE, NAMES & EVA'S	LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES	LANDING SITE/ RUNWAY, CROSSRANGE LANDING TIMES FLT DURATION,	SSME-TL NOM-ABORT EMERG THROTTLE PROFILE	SRB RSRM AND ET	INC	orbit Ha/HP	FSW	PAYLOAD WEIGHTS, PAYLOADS/ EXPERIMENTS	MISSION HIGHLIGHTS (LAUNCH SCRUBS/DELAYS, TAL WEATHER, ASCENT I-LOADS, FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS- 135/ULF7 SEQ FLT # 135 PAD 39A (58) MLP-3 SHUTTLE FLIGHT SHUTTLE FLIGHT FLIGHT TO ISS	CDR: Chris Ferguson (Flt 3 - STS-115, STS-126) P847/R300/V197/M179 PLT Doug Hurley (Flt 2 - STS-127) P848/R358/V227/M295 MS 1 Sandy Magnus Flt3- STS-112, (UP ON STS-126, stay ISS, DN on STS-119) P849/R284/V200/F36 MS 2 Rex Walheim (Flt3 - STS-110, STS-122) P850/R277/V193/M243	KSC 39A 189:15:29:04Z 11:26:46 EDT (P) 11:29:04 EDT (A) Friday (29) 07/08/11 (16) <u>LAUNCH WINDOW</u> : 9M6S (Total) 4M33S (Preferred) <u>EOM PLS</u> : KSC <u>TAL</u> : ZZA30L <u>TAL WX</u> : MRN , FMI <u>SELECTED</u> : <u>RTLS</u> : KSC15 N/N <u>TAL</u> : ZZA30L N/N <u>AOA</u> : NOR17 N/N 1 ST DAY PLS:	WINDS KSC15 KSC (78) 202: 09:56:58Z 4:56:58 AM CDT Thursday (12) 07/21/11 (13) DEORBIT BURN: 202:08:49:04Z XRANGE:385.1 NM ORBIT DIR: A/L (47) AIM PT: Nominal Continued	ENG. S.N. 104/104/ 109% <u>PREDICTED</u> : 100/104.5/104.5/ 72/104.5 <u>ACTUAL</u> : 100/104.5/72/ 104.5 1 = 2047 (15) 2 = 2060 (3) 3 = 2045 (12)	BI-146 RSRM 114 ET-138 SLWT 43 w/Stringer Mod ET <u>IMPACT</u> 1:13:58 MET LAT: 36.871S LONG: 159.695W	(37)	DIRECT INSERTION <u>POST OMS-2</u> 124.3x84.9 NM <u>DEORBIT</u> HA 209.8 NM HP 25.3 NM <u>ENTRY</u> <u>VELOCITY:</u> 25902 FPS <u>ENTRY</u> <u>RANGE:</u> 4407 NM		CARGO: 37534 LBS PAYLOAD CHARGEABLE: 30425 LBS DEPLOYED: 27997 LBS NON-DEPLOYED: 2137 LBS MIDDECK: 291 LBS SHUTTLE ACCUMULATED WEIGHTS: DEPLOYED: 1787958 LBS	Brief Mission Summary: With U.S. Congress approval NASA flies one more flight. STS-135 "The Final Mission" (37th mission to ISS) delivered supplies and logistics to ISS via the Raffaello Multi-Purpose Logistics Module and the middeck cargo area. Purpose of these supplies and spare parts was to provide "sustenance of the [ISS] and its crew in the post- shuttle era" [excerpt from PAO press Kit]. The mission also flew the Robotic Refueling Mission (RFM) an experiment to demonstrate robotically refueling of satellites. This final flight of Atlantis and of the 30-year Space Shuttle Flight Program was witnessed by an estimated crowd of one million people. KSC W/D OPF: 242 days +96 Non-work days +17 H (holiday) VAB-1: 9 + 4C (Contingency) days +11 PAD A: 35+2C+1H Total Work Days = 286 (OPF processing occurred over a total time period of 355 days) POSTPONEMENTS: - Baselined STS-135 to FDRD - Revised STS-335 rescue mission
Hurricane Katrina	SS EVA's No SS EVAs were scheduled for this flight. (There was an ISS Crew EVA by Michael Fossum & Ronald Garan during this mission for a duration of 6:31 hr:min)	EDW22 N/N TDEL: 0.000 (P) 0.082 (A) <u>MAX Q NAV</u> : 745 (P) 734 (A) <u>SRB STG</u> : 2:02.8 (P) 2:03.0 (A) <u>PERF</u> : NOMINAL <u>2 ENG TAL (MRN)</u> : 2:32 (P) 2:37 (A <u>NEG RET (2@ 104)</u> : 3:54(P) 3:55(A <u>PTA (U/S 157 FPS)</u> : 5:02(P) 5:07(A) <u>SE TAL (ZZA 104)</u> : 6:02 (P) 5:59(A) Continued	FINA	LIFT-OFF ally 8, 2011	tt 11:29 at (STS-13)				NON-DEPLOYED: 1632677 LBS CARGO TOTAL: 4403260 LBS PERFORMANCE MARGINS (LBS): FPR: 2821 FUEL BIAS: 954 FINAL TDDP: 1987 RECON: N/A PAYLOADS: PLB: ISS-UL F7 (MPLM, LMC), TRIDAR AR&D SENSOR, DTO- 701A, PSSC MIDDECK: MAUI, SEITE, SIMPLEX, RAMBO-2 5 CRYO TANK SETS, ODS, SRMS (91) OBSS, SSPTS,	to STS-135 on 01/31/11 with launch date of 06/28/11. - Ppd. to 07/08/11 on 05/24/11 due to STS-134 slip. LAUNCH SCRUBS: None. LAUNCH WINDOW: Window open at 189:15:22:13Z and close at 189:15:31:19Z Preferred Launch Time was 189:15:26:46Z (In-Plane Time) for a launch window of 4M33S (preferred). LAUNCH DELAYS: Held at T-31 seconds for 2M 18S to confirm GOX vent arm retracted. Note: Holding @T-31 sec was "inside of drain back" which further limited the available window to 3M16S. Launch occurred with 58 Sec remaining in that launch window. TAL WEATHER: Spaceflight Meteorology Group (SMG) reported weather at TAL sites was "Solid GO" with clear skies & light winds at Moron, Spain and only a few low clouds & winds within flight rules at Zaragoza, Spain & Istres France. RTLS weather was NO GO through out the countdown due to showers within 20nm of SLF. Mark McDonald, Flight Dynamics Officer (FDO), was asked & concluded there would be enough energy to fly through a rain shower upon re-entry. The FD, Richard Jones, waived the RTLS weather flight rule and proceeded with launch countdown. PERFORMANCE ENHANCEMENTS Include the standard set plus: 1) PE Operational High Q - SUM/JUL, 2) OMS Assist, 3) a 52 NM MECO, & 4) Del Psi.

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				ACE SH						
		CREW (7)	LAUNCH SITE,	LANDING SITE/ RUNWAY,	SSME-TL NOM-ABORT	SRB	ORBIT		PAYLOAD	MISSION HIGHLIGHTS
FLT	ORBITER	(7)	LIFTOFF TIME,	CROSSRANGE		RSRM		FSW	WEIGHTS,	(LAUNCH SCRUBS/DELAYS,
NO.		TITLE, NAMES	LANDING SITES,	LANDING TIMES	THROTTLE	AND	INC HA/HP		PAYLOADS/	TAL WEATHER, ASCENT I-LOADS,
		& EVA'S	ABORT TIMES	FLT DURATION, WINDS	PROFILE ENG. S.N.	ET			EXPERIMENTS	FIRSTS, SIGNIFICANT ANOMALIES, ETC.)
STS-	OV-104	Continued		WINDS	Continued					
135/ULF7	01104	Continueu	Continued	Continued	Continued		W: S135-E-0080	61	In what has	Continued
Continued		MCC WHITE FLIGHT FCR	PTM (U/S 180 FPS):		M 3 EOM:		ne a tradition for			FUCUE DUDATION CUANCES: On ED4 MMT agreed to add 1
Continued		(64)	6:14(P) 6:23(A)	<u>MLGTD</u> : 1649 FT	WEIGHT:					FLIGHT DURATION CHANGES: On FD4, MMT agreed to add 1 day to mission, stating: "Additional mission content would benefit
CAPCOMS:		FLIGHT DIRECTORS:	0.14(1) 0.23(A)	202:09:56:58Z	226333 LBS		, STS-135 & ISS d a microgravity			ISS transfer and utilization".
SHUTTLE	-	<u>SHUTTLE:</u>	SE PRESS 104	VEL: 221 KGS 216 KEAS	Xcg: 1090.7 IN	ohoor	d JAXA Kibo Lal			
Ascent - Bar	rry Wilmore	Ascent - Richard Jones	6:52(P) 6:55 (A)	HDOT: -2.1 FPS	<u>LANDING</u> : WEIGHT:	aboar	consists of NASA	ootroi	ly. 515-135	FIRSTS/LASTS/MOSTS:
	nambault/Wx	LD/O1 - Kwastsi Alibaruho O2- Rick LaBrode			226270 LBS					 Last flight of Atlantis & Space Shuttle Program. Sandra Magnus is "Last Woman to Blast Off" in Space Shuttle.
	ve Robinson	Planning - Paul Dye	MECO CMD:	TD NORM 205:	Xcg:1092.4 IN	Fergu	son, Doug Hurley	y, Sano	ay Magnus	- First iPhone launched into space to run an experimental app
O2 - Megan	McArthur	Entry - Tony Ceccacci	8:23.5 (P) 8:23.8 (A)	2809 FT	-		ex Walheim; Exp			designed by Odyssey Space Research.
Planning:		MOD – John Mccullough	<u>V</u> I: 25819(P) 25817(A)	DRAG CHUTE			Satoshi Furukaw			assigned by Ourssey opace research.
	on Lucid	Team 4 - N/A	20019(P) 20017(A)	DEPLOY:192 KEAS			Fossum, and R			NIGHT LAUNCH: N/A
Entry - Barry		<u>ISS</u>	<u>OMS-2</u> :	202:09:57:03Z			lexander Samok			
- Charlie Hobaugh/W		01 - Jerry Jason	37:46 (P) 37:45(A)	<u>NLGTD</u> : 6713 FT			S CDRs Ferguso			NIGHT LANDING KSC #19: (#25 in Shuttle history)
Team 4 - N/		LD/O2 - Chris Edelen	37:46 (P) 37:45(A) 98.7(P) 96.8(A) FPS	202:09:57:11Z			ix o'clock positior			RENDEZVOUS: #81 Rendezvous and dock with ISS.
<u>ISS</u>	~	O3 - Courtenay		VEL: 156 KGS			lag pictured was			<u>REINDEZVOUS.</u> #61 REINEZVOUS and dock with 155.
01 - Dan Ta	ni	Team 4 - N/A		146 KEAS			on, STS-1, and fl			EVE NTS:
LD/O2 - Rot				HDOT: - 6.6 FPS			<u>ne ISS crew</u> . It wi			- FD1: OMS2 ignition at 189:16:06:49Z resulted in a 124.3 by
O3 - Kathy E							unched [comme			84.9 NM orbit.
Team 4 - N/				<u>BRK INIT</u> : 118 KGS			urn to Earth. It wil			- FD2 Wakeup: "Viva la Vida" by Coldplay for Doug Hurley
				DRAG CHUTE			that launches fro		U.S. on a	(w/greeting from MSFC employees)
				JETTISON:	journey of ex	ploratio	n beyond Earth o	orbit.		- RCC survey data collected for DAT. Go to MMT on FD4.
-	Frank J	55. 8		52 KGS						 T1 maneuver at 191:12:29:04Z resulted in a 210.5 by 207.3 nm orbit.
4	E			202:09:57:35Z	10.0		A DECEMBER OF		10 _ 10	- FD3: Performed R-Bar Pitch Maneuver.
							-	100	A SAN	- Docking Contact occurred at 191:15:07:15Z
		the state of the s		BRK DECEL FPS ² : AVE 6.8 PK 8.0						- Hard Dock, hooks closed, occurred at 191:15:19:32Z
				AVE 0.8 PK 8.0	and the	6	100	0000		- ISS Hatch opened at11:47 AM CDT July 10, 2011.
				WHEELS STOP:	1 Startes	20				- FD4: MMT agreed to add 1 day to mission. "Additional mission
	<u> </u>			202:09:57:49Z	111		AL AL	1	145	content would benefit ISS transfer and utilization."
110°				11,361					120	- MPLM installed on ISS
No. 2	Re	- Contraction - Contraction	-	ROLLOUT:		-		3.00		- FD5: MMT concurred with DAT assessment that Orbiter TPS was cleared for deorbit, entry, & landing.
, my	HA		2. 3	9712 FT 0:51 M:S		600	A COLOR	100		- ISS crewmembers Mike Fossum & Ron Garan conduced EVA
- 12 FS	anti					1	State of States	24	11	completing the following activities: Readied Pump Module in P/L
	E° /	State of the	-	WINDS:		1	Vac Alle		1	Bay for return, RRM installed on SPDM EOTP, MISSE 8 ORMATE
-			St. 4	-1 H KTS 0 KTS OFFICIAL:		- an		-	8	installed, FGB PDGF exposed grounding wire corrected, & PMA3
			Michtleman Alexand	33001P02KT (X0P0	and a second		ton I	Ser.	5.6	cover installed. PET duration 6 hrs 31 minutes
ISS028-	-E-015565	Atlantis as seen fro	m ISS brings	T1P2)	E ALKA			any	No.	- FD7: GPC 4 (SMGPC) failed - most likely cause was a transient
		parts to ISS packed i			2	5				single event upset (radiation hit). Same event occurred on STS-
		ast flight of the "Ban		<u>DENS ALT</u> : 1239 FT	N.		131- 0	TT	1	71 (same vehicle & same GPC).
		bily called the "Banar					A DAMAS	131	All	 FD 8: GPC 2 was reconfigured as SM GPC. FD 10: GPC 4 reconfigured to SM and treated as fully functional
		onaut Strehalov, see		Continued			lan a	4	Q	for Entry.
515-71	by Cosine	nau Strenalov, see	page 2-04.]		all to		8 1:47		and the second second	or Endy.
										Continued

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"God Bless America" sung by the unmistakable Kate Smith signaled the start of landing prep. FD Paul Dye, CapCom Shannon Lucid (in rear center) and the rest of the team in the CCK MCC MOCR stood during the song, which was played for the crew and all those who have worked for the Space Shuttle Program. (From PAO)

----- SALUTE ------



Entry Flight Control Team in Shuttle FCR in CCK MCC. FD Tony Ceccacci (center front) holds STS-135 mission logo.

(JSC2011-E-067253)



ROSES FOR CCK MCC

Seated on INCO console with Atlantis model is a bouquet of roses sent once again by the Shelton & Murphy families of North Texas. See history of "MCC Roses" given on flight STS-119/14A (page 2-203).

(JSC2011-E-063867)



Space Shuttle's Last Landing Path (From PAO)





CDR Ferguson has a big smile for the thermal tiles (JSC2011-E-067990)

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----- SALUTE ------



JSC2011-E-067473-- In MOCR in CCK MCC Michael Lopez-Algeria (left) Director/Flight Crew Ops for ISS shakes hands with Ascent FD Richard Jones. In middle (I to r) are Paul Hill/ Director/MOD, John Mccullough/Chief FD Office & Norm Knight/Dep Ch FD Office.



JSC2011-E-070840 --- STS-135 Ascent flight control team and flight crew (black shirts) in shuttle flight control room in the CCK MCC. Flight Director Richard Jones (left) and CDR Chris Ferguson, STS-135 Commander, hold the mission logo.



JSC2011-E-064806 --- STS-135 Shuttle & ISS FD's in the shuttle FCR in CCK MCC at JSC. From left (front row) are Tony Ceccacci, Courtenay McMillan, Chris Edelen, Kwatsi Alibaruho, Gary Horlacher, and Rick LaBrode. Back row are Paul Dye, Royce Renfrew, Richard Jones and Jerry Jason.



JSC2011-E-062692 --- STS-135 Orbit 1 FCT group portrait. Flight Director Kwatsi Alibaruho (center) stands on the front row.



JSC2011-E-063635 --- STS-135 Orbit 2 FCT group portrait. Flight Director Rick LaBrode holds the STS-135 mission logo.



JSC2011-E-064789 --- STS-135 Orbit 3 FCT group portrait. FD Paul Dye is in front near Shuttle model & MCC Roses.

JSC2011-E-063846 --- Shannon Lucid, STS-135 Planning Shift CAPCOM. She was one of NASA's first six women astronauts.

----- SALUTE ------

On behalf of the Astronaut Office...

Now that Atlantis and the final Shuttle crew have safely returned to planet Earth, we are all feeling the finality of 30 years of Space Shuttle flights. ... While the Shuttle is an incredible, one-of-a-kind flying machine, the most important thing that this program has given us is wrapped up in all the people and expertise that turned a concept into something real. ... We are exceptionally honored to have flown with all of you as part of the Shuttle Program, and look forward to the continuation of our journey on board the International Space Station and beyond.

Peggy A. Whitson STS-111/Exp 5/STS-113, ISS Exp 16 CDR Chief, Astronaut Office

> Ghis plaque flew on the final Space Shuttle Mission in July, 2011. From the fortunate few who have served in space to the thousands who make spaceflight a reality, thank you for keeping the dream alive. Your passion for these amazing space ships will always stand as proof of what this country can do when it dares to be bold!

STS-135 crew left this plaque in the cockpit of Atlantis as a tribute to all of the people who have worked on the Space Shuttle Program.



30 YEARS OF FLIGHT

SPACE SHUTTLE PROGRAM MANAGERS

Robert Thompson February 1970 - June 1981 **Glynn Lunney** June 1981 - June 1985 **Richard Kohrs (Interim Mgr)** June 1985 - August 1985 Arnold Aldrich August 1985 - November 1986 **Richard Kohrs** November 1986 - June 1989 Leonard Nicholson June 1989 - March 1993 **Brewster Shaw** March 1993 - November 1995 **Tommy Holloway** November 1995 - April 1999 **Ronald Dittemore** April - 1999 - July 2003 William Parsons July 2003 - September 2005 Wayne Hale September 2005 - February 2008 John Shannon February 2008 - To End of Shuttle Program 2011



Above:(jsc2011e071116): Lead INCO Heidi Brewer hangs final Shuttle plaque for STS-135 in White FCR in CCK MCC at JSC.

Below: Atlantis Shuttle Legacy Mural [UPDATED for STS-135] -Hanging in LCC Firing Room at KSC - From Mike Leinbach/Launch Director



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----- SALUTE ------



A LARGE WELOME HOME & A SUPER WELL DONE!

ABOVE: (JSC2011-E-068785) --- A large crowd welcomes home the crew of STS-135 on July 22, 2011 at Ellington Field near JSC. AT RIGHT: (JSC2011-E-070276) ---JSC Director Michael L. Coats (left), Houston Mayor Annise Parker, U.S. Senator Kay Bailey Hutchison (R.-Texas) and STS-135 Commander Chris Ferguson enjoy the crew return ceremony. Poster reads: "HOUSTON! Always the first word in Space. Thank You!" The Mayor was also presented a flown flag by the STS-135 crew.

NOTES: From STS-135 (ULF7) Post Landing News Conference - July 21, 2011 (From PAO)

Gerst – I really want to thank the Space Shuttle team and Program for today and the entire history of the Program. I can't say enough about meeting the challenges and finishing strong. Today they met all the objectives. I'd also like to thank the nation for supporting this vehicle. It is a true marvel and allowed us to do amazing things. It's going to allow us to move forward and utilize the station and commercial cargo providers come online later this year. We need to go forward and explore.

I recognize that change is very hard, but huge improvement comes from change, so this team can accomplish great things in the future. I wish them the best. They will be successful in the future.

Moses – It's been a heck of a day and heck of a Program. I'm representing a team across the country today and the vehicle performed perfectly. The team here and in Houston are world class. The Marshall team put together a propulsion system that also finished strong. It's been a nice ride.

Cabana – It is great to have Atlantis home to stay after this mission. I can't say enough about the teams here at KSC and how they performed the last few flights. The folks that knew they were going to be out of work performed flawlessly and were dedicated to what they were doing. That is what they do. I am proud to be part of this program. We've achieved the goal of flying out the shuttle safely and we'll celebrate what we've accomplished over the last 30 years. But when that's done, we'll move on to the future.

Leinbach – Thanks to the KSC workforce. I've worked here all my career – 27 years. They did their job just like always. The workers here and across the country that dedicated their lives to this are my friends and I wish them well. I want to thank the press as well. You guys have been good friends of the space program as well. It was a good day. Mission complete and we're looking forward to new challenges.

----- SALUTE ------



STS135-S-214 (21 July 2011) -- Space Shuttle's "Final Four" stand proudly in front of Atlantis after landing at KSC. From right, are CDR Chris Ferguson, PLT Doug Hurley; Sandy Magnus/MS and Rex Walheim/MS. U.S. SENATE RESOLUTION 233 -HONORING THE MEN AND WOMEN OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION SPACE SHUTTLE PROGRAM ON REACHING THE HISTORIC MILESTONE OF THE 135TH AND FINAL FLIGHT OF THE SPACE TRANSPORTATION SYSTEM Passed U.S. Senate on July 13. 2011

At Left:

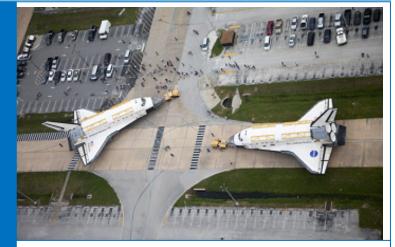
Safely Home... ...Mission Accomplished!

"What a privilege to be on the scene for the last Apollo splashdown AND the last Space Shuttle landing ... and, what a privilege for each of us to have been associated with such talented and dedicated people ..."

Milt Heflin

Apollo Recovery Engineer- Primary Recovery Ship for Apollo 8, 10, 16, 17, Skylab 2,3,4, & ASTP Space Shuttle EPS, Thermal, EGIL, EECOM & Flight Director JSC Associate Director (Technical)

[That's Milt with "hands on hips". Yes, he was there & there. Well Done!]



No, they are not rolling out for launch! Discovery & Endeavour are rolling to storage locations at KSC where they will remain until ready for transport to museums, see below. (Photo from Herirng/PAO)

Where will they go?

Announced April 12, 2011:

OV-101 Enterprise Test Vehicle

- To New York City's Intrepid Museum

OV-103 Discovery

- To Smithsonian National Air & Space Museum in Chantilly, Virginia

OV-104 Atlantis

- To Kennedy Space Center, Florida

OV-105 Endeavour

- To California Science Center in Los Angeles

NASA officially closed the books on the Space Shuttle Program on August 31, 2011.



A summary table of weight data for each shuttle element and payloads for each mission is provided in herein. The data for flights STS-1 through STS-57 was extracted from the SODB, Volume II. Effective with STS-51, the SODB data was no longer updated as flown. Therefore, the data has been obtained from the Day-of-Launch (DOL) Trajectory Design Data Package (TDDP), with Mach 3 EOM (End of Mission) and Landing Weights/CG's from the Postflight Prop 30 Reports. The Performance Margin data was extracted from the RI/Boeing Postflight Trajectory Reconstruction Reports.

Starting with STS-75, the Shuttle Program agreed to a 900-lb Ascent Performance Margin (APM) gain for all missions. STS-75 and STS-76 have 900 lbs of inert weight adjustment (-450 lbs inert weight discrepancy adjustment and -450 lbs

performance discrepancy adjustment, which were subtracted from the STS Operator Chargeable Cargo). Effective with STS-77, the -450 lbs was subtracted from the STS Operator Chargeable Cargo and the -450 lbs performance discrepancy is included in the MPS Prop Inventory. Effective with STS-79, the performance adjustment was changed to -200 lbs which is subtracted from the STS Operations Chargeable Cargo. Finally, beginning with STS-97 the TDDP included an item for "RECONSTRUCTED ASCENT PERFORMANCE COLLECTOR" in the "Shuttle Total Weight at SRB Igniton".

The P/L Deployed Weights for MIR flights reflect the weights of hardware transferred to the MIR (does not include consumables transferred to MIR). DOD mission weight data was not available for this document.

(SOURCES: SODB, VOL II Thru STS-57 & DOL TDDP for STS-51 and Beyond)

PERF ORBITER ORBITER ORBITER CARGO ORBITER TOTALS AT NON FLIGHT PAYLOAD WEIGHTS FLIGHT ACCUMULATED ET SRB SHUTTLE MARG AT TAIL W/O PROP OMS RCS PROP ORB WT WT ACCUM TOTAL TOTAL TOTAL FINAL MACH 3 FOM LANDING DPLY RETR CHARGE-CARGO NO. PRI ANCIL PYLD CARGO FLIGHT CONS TOTAL @ @ WT@ @ LEFT @ TDDP ORBIT OV-CONS. PROP DPLY/ AND OR ABLE DPLY/ SRB ORBIT SRB & SRB @ @ & AFT TOTAL RECON SRB FWD SRB NON-RETR ONLY MID-PYLD/ NON-TOTAL **INSERT** INSERT IGN RIGHT WT X CG WT X CG IGN IGN DPLY DPLY IGN IGN DECK STS NOT AVAILABLE STS-1 172425 5197 18408 2461 5371 208437 1664455 1295940 4459280 195943 195473 102 0 10823 10823 219260 208415 208415 1096.7 1098.1 0 0 0 (1)10823 10823 1298160 STS-2 102 175211 5922 18011 2469 5383 212161 0 0 0 18778 0 29601 230939 219844 428259 1647514 1296747 4471984 2049 204356 1096.6 204263 1098.1 (2)18778 29601 1296784 275 STS-3 175374 6560 17919 2446 5384 212846 22710 222985 1643507 1296696 4470555 1095.4 207073 102 0 0 0 0 52311 235556 651244 5343 207349 1096.9 22710 52311 1296915 2278 (3)STS-4 102 175581 6588 22155 2446 5344 217280 1844 11644 24492 241772 228442 879696 1644745 1298213 4483983 4038 209141 1092.9 208947 0 0 0 0 76803 1094.4 (4)9800 12848 63955 1299253 1195 STS-5 102 176729 5507 19804 2448 5379 215033 14585 0 0 1078 20830 32080 14585 108883 247113 231213 1110869 1644995 1298256 4489078 822 202643 2094.8 202480 1096.3 (5)5167 12596 70200 1298714 -1017 46971 1352224 STS-6 099 172837 5364 19242 1964 5384 209957 37546 0 0 2263 46662 52131 155854 256928 241325 1644495 1295364 4488967 4755 190627 1099.7 190330 1101.2 6853 79316 1296180 (1)1794 2463 STS-7 099 172822 5415 21015 2449 5372 212239 14949 3192 0 3942 31893 37124 67080 192978 249363 233619 1585843 1644631 1295695 4484035 2940 204340 1089.8 204043 1091.2 (2)13002 5448 96260 1294346 2021 STS-8 099 172879 5363 22011 2456 4962 212837 7445 0 5166 25790 30076 74525 223054 242913 227365 1813208 1656386 1297016 4493822 204141 1090.4 203945 1091.9 0 14863 1297508 (3)13179 4440 114605 15735 MIDDECK 2049001 STS-9 179369 6184 16000 2446 5384 214549 33131 33264 74525 247813 235793 1662238 1298367 4505505 220288 1085.8 220027 102 0 0 0 256318 841 1087.1 CRYO T 870 32261 1708 147736 1297983 -411 (6)STS 41-B 099 173041 6210 24704 2446 4970 216537 15073 0 0 2981 28252 33868 89598 290186 250405 234108 2283109 1662570 1295569 4500237 12062 201529 1087.9 201239 1089.3 (STS-11) (4)10198 5598 160915 1296187 6961 245167 STS 41-C 173207 5285 25096 2449 5012 216215 21396 0 38266 254481 2528276 1661790 1295828 4508234 197170 1100.0 196976 1101.6 099 0 41 33831 110994 328452 995 12394 173350 1296378 -3322 (5)4446 STS-41-DR 103 173911 5748 23864 2446 4970 216105 30086 0 0 1174 41382 47516 141080 375968 263621 246903 2775179 1662823 1296101 4518538 -1611 202317 1090.7 201675 1091.7 1298244 (1)10122 6521 184646 -1564 STS 41-G 099 175411 6236 25088 2465 4970 219326 4949 0 0 657 17592 23465 146029 399433 242791 226344 3001523 1662451 1296571 4495592 2194 202829 1083.7 202266 1084.8 11986 (6)5772 197289 1296300 3375 STS 51-A 103 174036 6311 25107 2446 4970 218016 22764 0 2381 187 45306 444739 263352 247014 3248537 1662369 1299428 4522111 281 207983 1081.4 207506 1082.6 38003 168793 (2)15052 7717 212528 1299700 1003 STS 51-C 103 1091.8 197700 1096.8 ---- DOD WEIGHT DATA NOT AVAILABLE -------------1457 (3)174756 6272 21464 2446 4970 214855 22576 1079 28747 35794 250679 239298 3487835 1661830 1297460 4504439 1092.7 STS 51-D 103 0 0 191369 480513 1243 198167 198014 1094.3 5092 218699 1296665 (4)7265 1957 STS 51-B 099 174968 5397 22900 2446 4970 215847 105 30748 31377 191474 511910 247254 230944 3718779 1661509 1296246 4501978 2536 213795 1084.1 213499 1085.4 0 0 302 (7)30341 1727 249342 1296969 3609 STS 51-G 103 174862 6272 18600 2446 4970 212316 22832 2217 0 560 38258 44477 214306 556387 256823 243779 3962558 1661726 1297968 4518845 160 204321 1082.1 204169 1083.7 (5)14866 6299 264768 1298704 -1664 NOT AVAILABLE STS-51-F 175260 5397 25064 2446 4970 218303 34400 237931 4200489 1661338 216894 1081.3 099 0 0 0 1755 33012 214306 590787 252733 1300211 4514313 1079.8 216735 (8) 31257 1492 297780 1300031

(SOURCES: SODB, VOL II Thru STS-57 & DOL TDDP for STS-51 and Beyond)

			С	RBITE	R						(CARGO				ORE	BITER TO	TALS				PERF	ORBI	TER	ORBI	TER
			NON-						FLIGHT F	PAYLOAD	NEIGHTS	i	FLIGHT	ACCUM	ULATED				ET	SRB	SHUTTLE	MARG	A	Г	A	ſ
	TAIL	W/O	PROP	OMS	RCS	PROP	ORB									WT	WT	ACCUM	TOTAL	TOTAL	TOTAL	FINAL	MACH	3 EOM	LAND	<mark>/ING</mark>
FLIGHT	NO.		CONS				TOTAL	PRI	DPLY	RETR	MID-	CHARGE-	CARGO	PYLD	CARGO	@	@	WT @	@	LEFT	@	TDDP				
	OV-	CONS.	@	PROP			@	DPLY/	AND			ABLE		DPLY/		SRB	ORBIT	ORBIT	SRB	&	SRB	&				
			SRB		FWD	AFT	SRB	NON-	RETR	ONLY	DECK	PYLD/	TOTAL	NON-	TOTAL	IGN	INSERT	INSERT	IGN	RIGHT	IGN	RECON	WT	X CG	WT	X CG
			IGN				IGN	DPLY				STS		DPLY												
STS 51-I	103	174785	6272	24646	2446	4970	218285	30289	0	0	374	38884	43988	244595	634775	262303	249479	4449968	1661662	1297697	4520198	176	196856	1092.4	196674	1094.2
	(6)							8221				5223		306375						1298536		-1145				
STS 51-J	104											- DOD V	VEIGHT	DATA NO	OT AVAIL	ABLE									190765	1101.2
STS 61-A	(1)	175531	5207	10200	2446	4070	211810	150	0	0	2164	30519	31911	244745		243751		4677765	1665455	1298021	4505113	6222	214325	1002.0	214171	1095.2
51561-A	(9)	175531	5397	16300	2440	4970	211010	27330	0	0	2104	1587	31911	335869	000000	243751	221191	40///00	1000400	1296021	4505113	6222 6219	214325	1063.6	214171	1065.2
STS 61-B		175615	6272	20000	1882	4970	213905	27465	0	0	1337	42788	47509		714195	261444	250836	4928601	1661470	1296606	4515538	874	205880	1084.4	205732	1085.9
0.00.2	(2)		0					13986	Ŭ	Ū		5236		351192						1296018		2332				
STS 61-C	102	185529	5692	22700	2096	4970	223153	12351	0	0	437	28625	32733	284561	746928	255916	238764	5167365	1665325	1295611	4512534	10754	210325	1083.6	210161	1085.1
	(7)							15837				5547		367466						1295702		11127				
STS 51-L		175760	5397	21500	2446	4970	215239	37636	0	0	830	48633	52655			267929			1665170		4528770	NOT AVAILABLE	199585 projected	1089.7 PROJECTED	199438 PROJECTED	1091.3
	(10)							10167 PROJECTED				4171								1297848			PROJECTED	PROJECTED	PROJECTED	PROJECTED
STS-26	103	176680	5409	14000	1914	4970	208139	37514	0	0	1159		46448	322075	793376	254617	243158	5410523	1664857	1301509	4522407	1546	194347	1096.6	194184	1098.3
	(7)							5928				3073		374553						1301424		624				
STS-27	104											- DOD V	VEIGHT	DATA NO	OT AVAIL	ABLE						2905 -286			190956	1095.1
STS-29	(3) 103	177365	5400	1209/	1014	4072	208811	37640	0	0	949	45316	47394	359715	840770	256235	244040	5655472	1664872	1300254	4500077	-286 3772	194940	1002.7	194790	1005.2
515-29	(8)	177305	5409	13904	1914	4973	200011	6727	0	0	949	3303	47394	382229	040770	200200	244949	505547Z	1004072	1300234	4522211	2995	194940	1093.7	194790	1095.5
STS-30	104	177163	5415	18916	1906	4977	213543	40118	0	0	165	45823	17783	399833	888553	261356	245051	5900523	1664743		4527426	4709	192558	1097.4	192460	1099.1
	(4)							5540	-	•		3140		387934						1300880		2650				
STS-28	102				,										, OT AVAIL							409			200214	1089.4
	(8)																					158				
STS-34	104	177407	5479	14007	1926	4987	208972	38323	0	0	886	45905	48613		937166	257615	246268	6146791	1664981		4523573	2103	196112	1093.1	195954	1094.7
STS-33	(5) 103	Г						6696				3871		395516						1300165		-132 1157			194282	1004.0
515-33	(9)											- DOD V	VEIGHT	DATA NO	OT AVAIL	ABLE						653			194282	1094.8
STS-32	102	184982	7165	25187	2224	4951	229575	15316	0	21398	1039	18317	26458	453472	963624	256063	244557	6391348	1664843	1299175	4510498	1956	228523	1078.2	228335	1079.6
010 02	(9)	101002	1100	20107	1	1001	220070	1962	Ŭ	21000	1000	8141	20100	398517	000021	200000	211007	0001010	1001010	1299406	1010100	992	220020	1070.2	220000	107 0.0
STS-36	104		I															•			:	881			187200	1096.4
	(6)														OT AVAIL							930				
STS-31	103	177516	5556	25045	2219	4966	220468	23095	0	0	652	25517	28643		992267	249141	231665	6623013	1665069	1300241	4514665	2861	189309	1087.9	189118	1089.7
	(10)	477500	5400	4 4 5 0 0	4001	4001	000500	960			007	3126	40000	400129	4040000	050501	0.40.400	0074444	4004077	1300214	4507460	1352	100000	1000 1	400000	1001.0
STS-41	103	177599	5406	14509	1861	4961	209502	38604	0	0	837	46173	49969	515171	1042236	259501	248128	6871141	1664877	1301372	4527138	1270	196982	1089.4	196869	1091.2
STS-38	(11) 104							6732				3796		407698						1301388		-152 863			191091	1008.6
313-36	(7)											- DOD V	VEIGHT	DATA N	OT AVAIL	ABLE						003 474			191091	1090.0
	(')																	6								

(SOURCES: SODB, VOL II Thru STS-57 & DOL TDDP for STS-51 and Beyond)

			(ORBITE	R							CARGO)			ORE	BITER TO	DTALS				PERF	ORBI	TER	ORBI	TER
			NON-						FLIGHT P	PAYLOAD	WEIGHT	S	FLIGHT	ACCUN	IULATED				ET	SRB	SHUTTLE	MARG	A	Т	A	r i
	TAIL	W/O	PROP	OMS	RCS	PROP	ORB						1			WT	WT	ACCUM	TOTAL	TOTAL	TOTAL	FINAL	MACH	3 EOM	LAND	JING
FLIGHT	NO.		CONS				TOTAL	PRI	DPLY	RETR	MID-	CHARGE-	CARGO	PYLD	CARGO	@	@	WT @	@	LEFT	@	TDDP				
	OV-	CONS.	@	PROP			@	DPLY/	AND			ABLE		DPLY/		SRB	ORBIT	ORBIT	SRB	&	SRB	&				
			SRB		FWD	AFT	SRB	NON-	RETR	ONLY	DECK	PYLD/	TOTAL	NON-	TOTAL	IGN	INSERT	INSERT	IGN	RIGHT	IGN	RECON	WT	X CG	WT	X CG
			IGN				IGN	DPLY				STS		DPLY												
STS-35	102	184580	7156	19339	2232	4971	223444	0	0	0	1792		33037	515171	1075273	256511	243474	7114615	1664775	1300088	4521514	4131	225531	1079.1	225329	1080.5
OTO 07	(10)	477700	5070	20052	4005	4074	045407	25968	0	0	740	5277	40504	435458	4445004	055750	040000	7055404	4004000	1300140	4540045	3812	400000	4007.4	100000	1000.0
STS-37	104 (8)	177763	5379	20053	1835	4971	215167	34442 1615	0	0	743	36800 3761	40561	549613 437816	1115834	255758	240809	7355424	1664803	1300130 1299254	4519945	1116 525	190266	1087.4	190098	1089.2
STS-39	103	179611	6257	22553	2451	4974	221012	827	4046	0	494	21413	26294	550440	1142128	247336	236623	7592047	1664494	1299733	4513048	1054	211673	1080.3	211512	1082.0
	(12)							16046	3955	-		4881		454356						1301485		2768				
STS-40	102	185755	7111	13265	1919	4968	218184	0	0	0	1877	28114	33707	550440	1175835	251921	241175	7833222	1664845	1301303	4519792	3137	226737	1079.6	226535	1080.9
070.40	(11)	177000	00.15		4000	1070		26237			004	5593	10005	482470	1005100	0500.47	0.1700.1		4004000	1301723	4500440	4212	100050	1007.1	100000	1000 -
STS-43	104	177623	6245	14126	1860	4972	209992	37575 8146	0	0	991	46712 2613	49325	588015 491607	1225160	259347	247964	8081186	1664898	1299653 1299220	4523118	2656 2593	196353	1087.4	196088	1089.7
STS-48	103	178149	5466	22643	2061	4970	218455	14388	0	0	690	17144	21569	602403	1246729	240054	224141	8305327	1665078	1299220	4502671	2593 510	192925	1096.0	192780	1097.8
010 10	(13)	170110	0100	22010	2001	107.0	210100	2066	Ŭ	Ŭ	000	4425	21000	494363	1210120	210001	221111	0000027	1000070	1298580	1002071	-562	102020	1000.0	102100	1007.0
STS-44	104	177916	6245	16390	1893	4976	212586	37588	0	0	1240	44637	47235	639991	1293964	259851	247087	8552414	1664283	1298356	4522576	565	195047	1090.8	194818	1092.5
	(10)							5809				2598		501415						1300086		1025				
STS-42	103	178203	6341	14469	1908	4974	211062	0	0	0	2210	28663	32364	639991	1326328	243456	231497	8783911	1664527	1300167	4507474	2511	218159	1080.6	218089	1082.2
STS-45	(14) 104	177732	6227	16904	2190	4070	213279	26453 0	0	0	2145	3701 17683	20341	530075 639991	1346669	222650	222086	9005997	1664861	1299324 1298457	4496035	2716 11017	205672	1095 /	205588	1087.2
313-45	(11)	111132	0337	10094	2100	4970	213219	15538	0	0	2145	2658	20341	547758	1340009	233030	222000	9000997	1004001	1298957	4490035	10427	203072	1005.4	200000	1007.2
STS-49	105	180161	6197	19916	2448	4971	218859	23346	0	0	697	32809	37444	663337	1384113	256333	246008	9252005	1664838	1299195	4519154	3351	201400	1084.4	201235	1086.2
	(1)							8766				4635		557221						1298788		3206				
STS-50	102	186622	9760	16830	1903	4967	225218	0	0	0	2179	24305	32447	663337	1416560	257695	245902	9497907	1664945	1298413	4520103	2940	225865	1077.7	225615	1079.1
070.40	(12)	470000	0000	04007	0454	4000	004044	22126	4 4 0 0	0	4404	8142	0.4000	581526	4.450000	050004	044707	0700704	4004700	1299050	4540700	3276	000054	4070.0	000500	4070.0
STS-46	104 (12)	178089	6380	24887	2451	4968	221941	9901 16094	1486 1396	0	1104	28585 5475	34060	673238 598724	1450620	256031	241797	9739704	1664720	1297746 1298292	4516789	2825 1942	209851	1078.2	209532	1079.6
STS-47	105	179161	6286	14559	1917	4979	212058	0	0	0	1845	28092	32480	673238	1483100	244568	232661	9972365	1664720	1298225	4506804	1348	220325	1083.7	220195	1085.3
	(2)		0200					26247	Ŭ	Ŭ		4388	02.00	626816				00.2000		1299291		2887				
STS-52	102	186650	7127	17398	2163	4974	223478	5577	0	0	2080	20132	26862	678815	1509962	250370	239178	10211543	1664613	1299187	4514565	10788	216043	1082.6	215935	1084.3
070 -0	(13)							12475				6730		641371						1300395		9801				
STS-53	103	179035	5874	18600	1912	4964	215551	20789	0	0	1030	26118	28316	699604	1538278	243897	230731	10442274	1664985	1299174	4506587	1368	194028	1089.5	193851	1091.3
STS-54	(15) 105	178558	5805	14278	1025	1080	210802	4299 37497	0	0	1052	2198 46540	49039	646700 737101	1587317	259871	2/8338	10690612	1664458	1298531 1299819	4523299	2844 2659	107/81	1001.6	197353	1003.4
010-04	(3)	170000	2092	14270	1925	4900	210002	7991	0	0	1052	2499	49039	655743	1307317	200071	240330	10030012	1004430	1299019	4525255	3421	197401	1091.0	197333	1093.4
STS-56	103	179811	6287	17526	2456	4967	216223	0	2840	0	1031	16439	21003	737101	1608317	237253	225597	10916209	1664388	1299765	4501920	9521	208052	1084.6	207946	1086.3
	(16)							12568	2798			4561		669342						1300514		10714				
STS-55	102	186929	7345	15687	1928	4967	222022	0	0	0	2282	26881	33416	737101	1641733	255468	244156	11160365	1664456	1298515	4519000	6248	227484	1078.4	227209	1079.7
	(14)	170440	6440	25147	2450	4060	222554	24599	0	0424	1054	6535	20110	696223	1670950	050700	000040	11200604	1664000	1300561	4649660	7559	004750	1001 4	224462	1092 5
STS-57	105 (4)	179410	0412	25147	2450	4969	223554	132 18244	0	9424	1254	19630 9489	29119	737233 715721	1670852	252703	239319	11399684	1664332	1300548 1300983	4518566	2030 2162	224752	1081.1	224468	1082.5
	(4)						I	10244				94 09		113721	1	I	1			1200903		2102				

(SOURCES: SODB, VOL II Thru STS-57 & DOL TDDP for STS-51 and Beyond)

PERF ORBITER ORBITER ORBITER CARGO ORBITER TOTALS NON-FLIGHT PAYLOAD WEIGHTS FLIGHT ACCUMULATED ET SRB SHUTTLE MARG AT AT TAIL W/O PROP OMS RCS PROP ORB WT WT ACCUM TOTAL TOTAL TOTAL FINAL MACH 3 FOM LANDING RETR CARGO NO. PRI DPLY MID-CHARGE-PYLD CARGO FLIGHT CONS TOTAL @ @ WT@ @ LEFT @ TDDP OV-CONS. PROP DPLY/ AND ABLE DPLY/ SRB ORBIT ORBIT SRB & SRB @ @ & AFT TOTAL RECON SRB FWD SRB NON-RETR ONLY DECK PYLD/ NON-TOTAL **INSERT** INSERT IGN RIGHT WT X CG WT X CG IGN IGN DPLY DPLY IGN IGN STS **STS-51** 179422 6003 16743 2451 4978 214763 26889 7321 1122 42637 46685 1717537 261487 250023 11649708 1664649 1298328 4523125 206932 1086.5 103 764122 1358 207043 1084.8 0 (17)7305 4048 724148 1298670 1273 1373 **STS-58** 102 187669 9789 14520 1945 4975 224062 0 0 0 23127 32011 764122 1749548 256103 244860 11894568 1664337 1298196 4517138 767 229481 1078.8 229369 1080.4 (15) 21754 8884 747275 1298502 1114 **STS-61** 181308 7000 24989 2451 4971 225885 665 24363 250279 236670 12131238 1664521 1298559 4511794 1078.9 212836 105 2308 0 2148 17401 766430 1773911 927 212947 1080.6 14428 6962 762368 1298436 (5)554 STS-60 103 179635 6510 18045 2450 4972 216778 171 1110 22296 28957 766601 1802868 245765 233290 12364528 1664515 1298776 4508839 216663 1079.6 216595 *0 0 110 1081.3 (18) 21015 6661 784493 1298783 306 STS-62 102 187779 9733 16797 2091 4968 226533 0 0 0 1280 19792 30016 766601 1832884 256579 245457 12609985 1664370 1299668 4519801 871 228360 1082.6 228250 1084.1 18512 (16) 10224 804285 1299184 1795 33758 **STS-59** 180488 7220 13287 1924 4976 213061 0 0 1445 27447 766601 1866642 246849 237048 12847033 1664202 1300061 4511411 2856 221981 1079.6 221865 1081.2 105 0 26002 831732 1300299 (6) 6311 1731 STS-65 102 188398 9567 16385 1898 4975 226389 0 0 1761 24282 32880 766601 1899522 259296 247778 13094811 1664460 1299585 4523441 229368 1078.6 229261 1080.1 0 2169 (17)22521 8598 856014 1300097 3531 STS-64 103 180122 6286 16789 2451 4969 215783 0 2842 0 1363 20417 25621 1925143 241439 230743 13325554 1664420 1298946 4503921 6409 212294 1082.3 212180 1083.9 766601 1299121 (19) 16212 2800 5204 873589 9639 34252 180520 7225 13321 1913 4976 213121 27640 766601 1959395 247404 237742 13563296 1664393 1299294 4510613 221784 1078.7 221673 **STS-68** 105 0 0 0 1643 1721 1080.4 25997 6612 901229 1299523 2071 (7)STS-66 104 180096 7163 20801 2448 4974 220648 0 7154 0 1080 18135 23560 766601 1982955 244238 232278 13795574 1664386 1299860 4508715 3284 211562 1084.4 211411 1086.1 (13)9901 7011 5426 912210 1300231 3158 4980 222692 STS-63 103 179828 6285 23979 2454 23 2651 0 1128 19051 24903 766624 2007858 247630 235671 14031245 1664161 1299714 4511630 1830 212775 1079.5 212693 1081.2 (20)15249 2617 5852 928587 1300130 3476 **STS-67** 180588 10610 24154 2447 4972 227937 0 0 1764 20067 28528 766624 2036386 256495 243809 14275054 1664446 1299857 4520187 217646 1083.5 217437 105 0 4099 1085.0 (8)18303 8461 948654 1299389 6754 **STS-71** 104 180545 7390 21956 2452 4972 222481 0 0 476 690 17941 26577 766624 2062963 249089 238682 14513736 1664561 1299083 4511586 1040 216527 1079.7 216352 1081.3 1298854 (14)17251 8636 966595 1398 STS-70 103 179039 5537 15110 1921 4982 211755 37774 1086 44445 46799 804398 2109762 258584 247141 14760877 1664631 1299218 4521772 3789 194267 1097.2 194190 0 0 1099.1 5585 2354 973266 1299339 5299 (21) STS-69 105 180072 7149 24993 2452 4973 224805 25346 31549 804398 2141311 256385 243328 15004205 1664169 1299385 4519114 1080.7 219298 1082.3 0 7306 0 1301 5409 219395 (9) 16739 7258 6203 991306 1299176 7966 STS-73 102 188174 10734 12653 1883 4972 223592 0 0 0 2008 25310 33705 804398 2175016 257321 246718 15250923 1664190 1299554 4521581 1906 230603 1080.7 230479 1082.3 23302 1016616 1300510 (18)8395 4902 STS-74 104 179624 7175 25155 2453 4976 224549 10015 0 690 914 14064 23687 814413 2198703 248266 237141 15488064 1664354 1299872 4512395 1823 202767 1078.7 202718 1080.6 3135 9623 1020665 1299903 3689 (15) STS-72 181188 7149 25038 2452 4970 225963 0 2643 10459 898 21018 814413 2219721 247011 238498 15726562 1664138 1302278 4514647 218496 1081.7 218345 1083.3 105 14087 11447 1032109 1301220 13346 (10) 10546 6931 STS-75 102 188372 9386 19109 2452 4970 229455 1494 *0 0 1369 23353 32006 815907 2251727 261491 250226 15976788 1663825 1300542 4526493 1594 226443 1079.4 226287 1080.9 (19)20490 8653 1053968 1300635 638

* NOTE: DEPLOYED, NON-DEPLOYED, AND DEPLOYED/RETRIEVED REFLECT ACTUALS, E.G., WSF WAS NOT DEPLOYED AND RETRIEVED ON STS-60; TSS WAS LEFT IN SPACE ON STS-75.

(SOURCES: SODB, VOL II Thru STS-57 & DOL TDDP for STS-51 and Beyond)

ACCUMULATED

ORBITER TOTALS

WT

ACCUM

WT

FT

TOTAL

SRB

TOTAL

CARGO

FLIGHT

FLIGHT PAYLOAD WEIGHTS

ORBITER

OMS

RCS PROP

ORB

NON-

PROP

TAIL

W/O

CARGO NO. TOTAL PRI RETR MID-CHARGE PYLD CARGO FLIGHT CONS DPLY @ @ WT@ @ LEFT @ TDDP DPLY/ OV-CONS. PROP ABLE DPLY/ SRB ORBIT ORBIT SRB & SRB @ @ AND & AFT RECON SRB FWD SRB NON-RETR ONLY DECK PYLD/ TOTAL TOTAL INSERT **INSERT** IGN RIGHT WT X CG WT X CG NON-IGN IGN DPLY DPLY IGN IGN STS **STS-76** 180112 7216 21664 2451 4976 221585 818721 2276332 246222 238531 1664159 1299899 4509631 211913 1082.8 104 2814 0 736 760 14152 24605 16215319 3140 211805 1084.5 (16)10578 10453 1065306 1299353 3563 STS-77 105 180204 7235 19483 2453 4976 219518 1104 1837 0 866 27393 35205 819825 2311537 254753 243818 16459137 1664470 1300764 4519162 5381 222399 1080.5 222276 1082.0 (11)23586 1820 7812 1089758 1299175 8528 **STS-78** 188422 10876 13227 1940 4979 224611 2343391 256495 1664859 228986 102 0 0 2066 23666 31854 819825 245723 16704860 1297868 4517477 3683 229134 1081.9 1083.4 0 (20) 21598 1113422 1298255 4245 8188 **STS-79** 104 180241 7286 21473 2450 4971 221598 3170 2126 718 19039 27812 822995 2371203 249440 241776 16946636 1664353 1297828 4510469 215990 1081.3 215904 1083.0 0 462 (17)15151 8773 1129291 1298848 716 **STS-80** 102 187805 9760 20528 2451 4975 230676 0 12524 0 1109 21208 31111 822995 2402314 261817 248721 17195357 1663927 1299137 4524735 487 227815 1079.1 227670 1080.6 (21) 7575 12427 9903 1137975 1299854 1103 1663879 **STS-81** 104 180533 7284 21574 2452 4978 221988 4019 2842 810 19321 28149 827014 2430463 250167 242178 17437535 1298753 4511011 1286 215403 1081.4 215337 1083.1 0 (18)1153277 1298212 2118 14492 8828 STS-82 103 182897 6572 25010 2448 4971 227065 6941 6638 512 17374 24891 833955 2455354 251986 239583 17677118 1663879 1299604 4513855 3503 213949 1077.8 213869 1079.6 0 (22)9921 7517 1163710 1298386 4235 STS-83 102 187924 10876 15000 1912 4970 225849 0 2020 25556 34373 833955 2489727 259963 248526 17925644 1663889 1299392 4522925 4820 235510 1078.5 235421 1080.0 0 0 23536 1189266 1299392 3741 (22)8817 179665 7163 21674 2455 4973 221097 3902 2576 1136 19643 28497 2518224 249624 1663879 1298206 4509832 **STS-84** 104 0 837857 241827 18167471 938 216169 1081.0 216021 1082.6 14605 8854 1205007 1298123 868 (19) **STS-94** 102 187901 10876 15058 1918 4968 225890 0 0 2032 25568 34359 837857 2552583 260279 248956 18416427 1664630 1297078 4519333 2845 230818 1078.4 230773 1080.1 0 (23) 23536 8791 1230575 1297346 4193 STS-85 103 181354 7072 17089 2450 4978 218082 7726 0 1590 24982 31959 837857 2584542 250101 238142 18654569 1664460 1298435 4512125 1446 221335 1082.0 221264 1083.6 0 (23) 15666 7587 6977 1247831 1299129 3065 **STS-86** 180477 7283 21682 2451 4975 222037 6058 602 21039 29728 843915 2614270 251795 241773 18896342 1664491 1297660 4512024 1756 215387 1081.3 215303 1083.0 104 0 2859 (20)14379 8689 1262812 1298078 81 **STS-87** 102 188297 10459 16179 2188 4978 227270 0 2998 0 1452 21946 34394 843915 2648665 261664 250693 19147035 1664353 1297733 4521900 4384 232930 1081.0 232849 1082.6 1298120 (24)17496 2998 12448 1281760 6115 STS-89 182187 7059 20679 2450 4972 222513 4596 3508 868 22163 28040 848511 2676705 250583 239584 19386619 1664543 1298227 4511879 2309 217475 1086.5 217422 1088.2 105 0 16699 5877 1298526 3544 (12) 1299327 **SYS-90** 102 187562 10884 15763 1841 4972 226191 26205 36049 848511 2712754 262270 247955 19634574 1663992 1298901 4523683 233031 1080.3 232979 1081.9 0 0 0 2340 3162 (25)23865 9844 1325532 1298520 1999 **STS-91** 103 182624 7273 21882 2450 4976 224374 2419 0 2964 891 25625 35549 850933 2748303 259973 249580 19884154 1658766 1298618 4514649 631 226968 1079.5 226872 1081.1 22315 9944 1348738 (24)1297292 403 STS-95 103 182647 7085 25032 2294 4980 227207 125 2973 1314 28520 38618 851055 2786921 265855 247947 20132101 1658996 1297332 4520191 1587 228455 1076.8 228388 1079.5 0 (25)24108 2945 10098 1374160 1298008 2740 **STS-88** 182065 6997 24612 2451 4971 226265 335 1122 37731 2824652 264026 251336 20383437 1658691 1297827 4518489 2365 201538 1084.3 201492 1086.2 105 26791 0 30986 877846 3073 1378355 1297945 (13) 6745 1043 **STS-96** 103 183197 7174 25007 2450 4977 227974 4228 0 213 1034 22707 33808 882074 2858460 261812 245256 20628693 1658803 1297048 4514231 4435 222366 1080.2 222299 1081.8 17994 (26)11101 1397383 1296568 4306 * NOTE: STS-91 WAS FIRST FLIGHT OF SLWT, 59212 LBS. STS-95 WAS SECOND FLIGHT OF SLWT, 59942 LBS. STS-88 WAS THIRD FLIGHT OF SLWT, 59137 LBS. STS-89 ET WEIGHED 66353 LBS.

Page A-6

ORBITER

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LANDING

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MACH 3 FOM

(SOURCES: SODB, VOL II Thru STS-57 & DOL TDDP for STS-51 and Beyond)

			С	RBITE	R							CARGO				ORE	BITER TO	DTALS				PERF	ORBI	TER	ORBI	TER
			NON-						FLIGHT P	AYLOAD	NEIGHTS	;	FLIGHT	ACCUM	ULATED				ET	SRB	SHUTTLE	MARG	A	Г	A	т
	TAIL	W/O	PROP	OMS	RCS	PROP	ORB									WT	WT	ACCUM	TOTAL	TOTAL	TOTAL	FINAL	MACH	B EOM	LAND	DING
FLIGHT	NO.		CONS				TOTAL	PRI	DPLY	RETR	MID-	CHARGE-	CARGO	PYLD	CARGO	@	@	WT@	@	LEFT	@	TDDP				
	OV-	CONS.	@	PROP			@	DPLY/	AND			ABLE		DPLY/		SRB	ORBIT	ORBIT	SRB	&	SRB	&				
			SRB		FWD	AFT	SRB	NON-	RETR	ONLY	DECK	PYLD/	TOTAL	NON-	TOTAL	IGN	INSERT	INSERT	IGN	RIGHT	IGN	RECON	WT	X CG	WT	X CG
			IGN				IGN	DPLY				STS		DPLY												
STS-93	102	185743	4820	14814	2473	4976	217975	43080	0	0	1538	49789	52382	925154	2910842	270387	258911	20887604	1658826	1297760	4524972	2081	202872	1097.5	202796	1099.4
	(26)							5171				2593		1404092						1297999		-3981				
STS-103	103	183199	7065	24990	2451	4979	227853	5423	0	5351	1334	13208	20276	930577	2931118	248159	236285	21123889	1658784	1299709	4506419	13576	212288	1080.6	212217	1082.4
070.00	(27)	100000		10005		1000	004000	6451			1000	7068	05440	1411877		0=0=00	0.40000		4004004	1299767	4500450	13388		1070 -		4000.0
STS-99		182260	6989	19605	2308	4968	221299	260	0	0	1822	29069	35410	930837	2966528	256739	242322	21366211	1664331	1299767	4520450	1085	225092	1078.5	225030	1080.2
STS-101	(14) 104	183166	7025	23891	2452	4090	226894	26987 3371	0	1391	1262	6341 24733	35604	1440686 934208	2002122	262529	252056	21618267	1658873	1299817 1299223	4519455	395 1480	226277	1091 2	226212	1092.0
515-101	(21)	103100	1200	23091	2400	4900	220034	20159	0	1391	1202	10871	33004	1462107	3002132	202320	232030	21010207	1000070	1298831	4019400	988	220211	1001.2	220212	1002.5
STS-106	· /	183426	7235	23786	2449	4978	227032	5399	0	948	1172	23967	34991	939607	3037123	262053	253389	21871656	1658741	1299561	4519178	1940	222835	1080.1	222774	1081.7
	(22)				_			17935	-			11024		1481214						1298823		317				
STS-92	103	183363	7235	24629	2447	4968	227808	21998	0	293	1333	28009	35250	961605	3072373	263088	253459	22125115	1658781	1299531	4520549	1532	205188	1080.0	205129	1081.8
	(28)							4678				7241		1487225						1299149		2330				
STS-97*		181992	6989	22156	2452	4971	223736	36376	0	227	1021	37496	42804	997981	3115177	266570	253646	22378761	1658695	1299246	4524795	1920	197829	1085.9	197781	1087.7
070.00	(15)	400005	7055	00004	0007	4070	004005	719	0	070	007	5308	00400	1488965	0454000	004407	054000	00000704	4050047	1300085	*	2032	407000	4000.4	407054	4000.0
STS-98	(23)	182605	7055	22904	2221	4978	224935	32270 583	0	872	987	33286 5876	39162	1030251 1490535	3154339	264127	251033	22629794	1658647	1298270 1298137	4519380	2138 1538	197909	1083.1	197854	1082.0
STS-102	103	182881	7055	24940	2452	4975	227469	9649	0	1086	472	28739	37328		3191667	264797	253436	22883230	1658484	1299774	4521809	2847	218094	1083.2	218031	1084.9
010 102	(29)	102001	1000	2-10-10	2702	4070	221 400	3517	0	1000	772	8559	07020	1494524	0101007	204151	200400	22000200	1000-0-	1298555	4021000	3031	210004	1000.2	210001	1004.5
STS-100	1 - 1	182943	7301	24075	2451	4972	226908	6346	0	1608	781	29472	38330	1046246	3229997	265268	253063	23136293	1658593	1298945	4522246	2670	220623	1083.8	220556	1085.5
	(16)							4282				8858		1499587						1299241		2296				
STS-104	104	182862	7301	25033	2452	4975	227787	19782	0	626	582	26424	35135	1066028	3265132	262952	254358	23390651	1658552	1298897	4520159	2884	209142	1083.8	209097	1085.6
	(24)							6060				8711		1506229						1299559		2990				
STS-105		182831	7055	23428	1886	4974	225340	9657	0	3802	475	29305	37107	1075685	3298239	262477	253897	23644548	1658085	1298852	4518170	705	222682	1081.0	222620	1085.6
STS-108	(30)	182106	7059	25057	2452	4072	226711	4654 6454	0	4156	690	7802 31393	38177	1511358 1082139	3336416	264918	252854	23897402	1657921	1298417 1298263	4519872	631 2381	220623	1092.9	220556	1085.5
313-100	(17)	102100	7050	25057	2452	4912	220711	8635	0	4150	090	6784	30177	1520683	3330410	204910	202004	23097402	1057651	1298203	4019072	1182	220023	1005.0	220550	1005.5
STS-109	· /	188444	6969	25066	2451	4975	233071	8256	0	6409	1216	20144	27564	1090395	3363980	260665	250970	24148372	1658065	1298219	4515646	3309	222447	1082.9	222366	1084.6
	(27)							10672	Ũ	0.00		7420		1532571						1298358		4170				
STS-110	104	184160	7060	25072	2451	4975	228854	30600	0	2607	757	28379	35849	1120995	3399829	264763	253486	24401858	1658030	1298947	4520964	1256	201513	1085.3	201463	1087.2
	(25)							0				7470		1533328						1298885		2670				
STS-111	105	183220	7060	25059	2454	4976	227935	9512	0	6342	288	29712	36082	1130507	3435911	264047	253522	24655380	1657969	1297561	4518077	2484	220234	1083.6	220279	1085.3
	(18)							906				6370		1534522						1298161		1870				
STS-112	-	183924	7060	25043	2179	4869	228341	29543	0	1839	381	29502	37441	1160050	3473352	265812	254269	2490949	1658013	1298072	4521314	2744	202688	1087.1	202621	1088.9
STS-113	(26)	183037	7060	25064	<u></u> 22⊑≬	4070	227551	0 29672	0	2250	200	7939	38393	1534904 1189722	3511745	265974	250282	25159931	1658011	1299078 1298806	1521210	3860 1736	200993	1097 6	200939	1089.5
313-113	(19)	103037	1000	∠ວ∪64	2204	4970	221001	29672 46	0	2250	288	30217 8176	20393	1189722	3011/45	2009/4	200282	20109931	TUPCOL	1298806	4521249	2486	200993	0.1001	200939	1089.5
STS-107	1 - 1	189487	10160	17619	2180	4976	229588	40	0	0	801	24316	35463	1189722	3547208	265081	250270	25410201	1663352	1298648	4526034	1335	234495	1078.5	234167	1077.9
010107	(28)	100-07	10100	11013	2100	-510	220000	23515	0	5	001	11147	50-100	1559554	5071200	200001	200210	20710201	1000002	1298614	1020004	1348	**	**	**	**

* Beginning with STS-97 the TDDP included an item for "RECONSTRUCTED ASCENT PERFORMANCE COLLECTOR" in the "Shuttle Total Weight at SRB Igniton".

** WT & CG ARE AT EI AND EI+15 MINUTES.

(SOURCES: SODB, VOL II Thru STS-57 & DOL TDDP for STS-51 and Beyond)

	ORBITER							CARGO							ORBITER TOTALS						PERF	ORBI	TER	ORBI	TER	
			NON-						FLIGHT	PAYLOAD V	NEIGHTS	;	FLIGHT	ACCUM	ULATED				ET	SRB	SHUTTLE	MARG	A	Г	TA	r 👘
	TAIL	W/O	PROP	OMS	RCS	PROP	ORB									WT	WT	ACCUM	TOTAL	TOTAL	TOTAL	FINAL	MACH	B EOM	LAND	JING
FLIGHT	NO.		CONS				TOTAL	PRI	DPLY	RETR	MID-	CHARGE-	CARGO	PYLD	CARGO	@	@	WT @	@	LEFT	@	TDDP				
	OV-	CONS.	@	PROP			@	DPLY/	AND			ABLE		DPLY/		SRB	ORBIT	ORBIT	SRB	&	SRB	&				
			SRB		FWD	AFT	SRB	NON-	RETR	ONLY	DECK	PYLD/	TOTAL	NON-	TOTAL	IGN	INSERT	INSERT	IGN	RIGHT	IGN	RECON	WT	X CG	WT	X CG
			IGN				IGN	DPLY				STS		DPLY												
STS-114	103	184906	7076	24931	2174	4972	229219	26413	0	6600	163	29807	38652	1216135	3585860	267901	253950	25664151	1657242	1298074	4523083	2111	225792	1086.6	225727	1088.2
	(31)							3231	-			8845		1562948						1298565		3792				
STS-121	103	184902	7076	24922	2174	4968	229235	23696	0	8456	158	29280	37736	1239831	3623596	267001	253267	25917418	1657055	1299220	4523889	2290	226063	1084.6	225972	1086.3
	(32)							5426				8456		1568532						1299312		N/A				
																						(Sensor Fail)				
STS-115	104	184260	6986	24926	2449	4970	228734	35552	0	993	206	35758	41848	1275383	3665444	270612	252240	26169658	1657088	1298957	4526580	1749	199711	1086.0	199642	1087.0
	(27)	101200	0000	2.020	2110	107.0	220101	0	Ŭ	000	200	6090	11010	1568738	0000111	210012	2022.0	20100000	1001000	1298678	1020000	349	100711	1000.0	100012	1001.0
STS-116	103	185153	7189	24959	2134	4977	229555	5748	0	806	182	22502	35690	1281131	3701134	265275	250980	26420638	1657123	1298200	4520334	3768	224053	1077.5	223986	1079.2
	(33)							1652				13188		1585492						1298501		4559				
STS-117	104	184487	7018	24298	1926	4974	227846	36393	0	857	200	36593	42641	1317524	3743775	270517	255388	26676026	1657157	1298138	4525519	1306	199418	1084.6	199305	1086.8
	(28)	405400	7400	0.4000	0000	4075	000000	0		040	000	6048	07000	1585692	0704405	000700	050005	0000004	4057400	1298472	4504040	1431	004740	1070.1	004000	4070.0
STS-118	105 (20)	185133	7189	24899	2030	4975	229369	11830 11740	0	316	329	23899 13491	37390	1329354 1597761	3781165	266789	250805	2692831	1657180	1298333 1297781	4521318	1913 2435	221740	1078.1	221660	1079.8
STS-120	103	185405	7108	22763	1885	4971	227275	33474	0	1577	59	33813	40872	1362828	3822037	268177	251790	2944621	1657012	1297781	4524107	2435	203069	1078 3	202989	1083.0
010 120	(34)	100-100	1100	22100	1000	457 1	221210	280	Ŭ	10/1		7059	40072	1598100	0022007	200177	201700	2044021	1007012	1298777	-02-107	1880	200000	1070.0	202000	1000.0
STS-122	104	184885	7042	20823	1914	4979	226743	30657	0	2162	122	32941	40296	1393485	3862333	267069	252667	3197288	1657253	1298675	4523236	2402	207013	1078.2	207215	1080.4
	(29)							2162				7355		1600384						1299004		3435				
STS-123	105	185393	7108	22763	1928	4981	227316	29442	0	4891	188	30762	38915	1422927	3901248	266261	253348	3450636	1657249	1298163	4521388	2109	208916	1079.7	208762	1081.8
	(21)							1132				8153		1601704						1298480		5128				
STS-124	103	185476	6868	22771	1923	4971	227152	33890	0	1608	79	33969	41997	1456817	3943245	269179	251247	3701883	1656958	1299147	4525140	1308	203605	1088.0	203755	1089.3
STS-126	(35) 105	105212	7100	22761	2107	4071	227513	0 30432	0	19436	211	8028 32403	39471	1601783 1487249	3982716	267014	254431	3956314	1657112	1298621 1298611	4523242	2513 1682	221787	1007.0	221712	1090.0
313-120	(22)	100343	/100	22701	2107	4971	227515	30432 1760	0	19430	211	7068	39471	1603754	3902/10	20/014	204431	3930314	1037112	1298011	4020242	2329	221707	1007.2	221712	1069.0
STS-119	103	185710	6808	22762	2162	4973	227558	32489	0	1279	57	32546	39088	1519738	4021804	266676	254546	4210860	1656990	1298197	4521897	1746	201795	1082.8	201713	1084.7
	(36)							0	Ŭ		0.	6542		1603811						1298799		2016				
STS-125	104	186902	7087	24984	2450	4982	231548	4694	0	3893	0	22254	32418	1524432	4054222	231548	254376	4465236	1657233	1297936	4519550	1689	225509	1078.3	225469	1080.1
	(30)							17560				10164		1621371						1298774		2499				
STS-127	105	185510	7108	22762	2204	4973	227700	24266	0	9756	126	24682	36253	1548698	4090475	263983	252658	4717894	1657094	1298273	4518787	2553	215900	1089.8	215817	1091.7
	(23)							290				11571		1621787						1298296		2734				
STS-128	103	185683	6586	22762	1934	4970	227078	30572	0	19130	153	33056	40605	1579270	4131080	267713	254672	4972566	1657188	1298511	4522876	1707	222200	1088.4	222148	1090.2
STS-129	(37) 104	185268	7042	22762	2205	4067	227387	2331 27615	0	1176	353	7549 29372	38893	1624271 1606885	4160070	266310	254734	5227300	1657082	1298323 1298893	4522269	2077 2228	206917	1002.0	207200	10946
515-129	(31)	100200	1042	22102	2203	4907	221301	27615	U	0/11	555	29372 9521	20093	1626028	4169973	200310	204734	5227300	1057062	1298893	4022209	2228	200917	1003.0	201200	1084.6
STS-130	105	185488	6397	22763	1918	4974	226683	34648	0	1262	283	34931	40956	1641533	4210929	267669	252838	5480138	1657227	1298385	4522160	1188	201138	1082.8	201084	1084.8
510 100	(24)	100100	0007	22100	1010	107 4	220000	0	Ŭ	1202	200	6025	10000	1626311	1210020	20,000	202000			1297738	1022100	2828		.002.0	201004	
STS-131	103	186007	6392	22762	1931	4976	227212	30512	0	21764	231	32131	39516	1672045	4250445	266758	251459	5731597	1657053	1298230	4521643	1133	224257	1089.0	224206	1090.7
	(38)							1388				7385		1627930						1298461		1491				

APPENDIX A - SPACE SHUTTLE FLIGHT WEIGHT SUMMARY (SOURCES: SODB, VOL II Thru STS-57 & DOL TDDP for STS-51 and Beyond)

PERF ORBITER ORBITER ORBITER CARGO **ORBITER TOTALS** FLIGHT PAYLOAD WEIGHTS FLIGHT ACCUMULATED SRB SHUTTLE MARG AT AT NON-ET TAIL W/O OMS **RCS PROP** ORB WT WT ACCUM TOTAL TOTAL TOTAL FINAL MACH 3 EOM LANDING PROP NO. MID-FLIGHT DPLY RETR CHARGE-CARGO PYLD CARGO @ @ CONS TOTAL PRI WT @ @ LEFT @ TDDP OV-CONS. PROP @ DPLY/ AND ABLE DPLY/ SRB ORBIT ORBIT SRB & SRB @ & SRB FWD AFT SRB NON-RETR ONLY DECK PYLD/ TOTAL TOTAL IGN INSERT IGN RIGHT RECON WT X CG WT X CG NON-**INSERT** IGN IGN IGN DPLY STS DPLY STS-132 104 185064 7042 22762 2166 4974 227151 263144 5982767 1299411 4519813 26619 0 7564 121 26740 35963 1698664 4286408 251170 1657088 5074 210434 1081.0 210370 1082.9 (32) 9223 1628051 1299029 4326 0 STS-133 103 185336 6084 24861 1927 4971 228323 30576 0 1949 408 31802 40108 1729240 4326516 268461 254067 6236834 1657403 1299112 4525061 1431 205075 1082.4 205022 1084.2 (39)818 8306 1629277 1299345 394 39210 1759961 4365726 268769 256331 STS-134 105 185638 7007 24860 1907 4973 229529 30721 0 1609 161 31693 6493165 1657445 1298824 4525091 1968 204532 1080.4 204463 1082.3 (25) 1630249 1299313 3211 811 7517 STS-135 104 184276 7072 24861 2171 4962 228486 27997 0 24175 291 30425 37534 1787958 4403260 266050 254325 6747490 1657525 1298160 4521103 1987 226333 1090.7 226270 1092.4 (33)7109 1632677 1298628 4521103 N/A* 2137

*Reconstruction analysis was not available (N/A) for STS-135 due to lack of funding.

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ACKNOWLEDGEMENTS - LEGLER INFORMAL BOOK

To: Brewster H. Shaw, while COO of United Space Alliance, for his sponsorship of Legler's informal book.

To: Mary C. Thomas/DA8 for her dedicated services as Book Manager for Revisions and Change Notices to Bob Legler's informal book through flight STS-115.

To: Karen J. Chisholm/DA8 for her dedicated services as editor and typist for Revisions and Change Notices to Bob Legler's informal book through flight STS-115.

To: All those who helped Bob Legler gather data through flight STS-115.

DATA SOURCES - LEGLER INFORMAL BOOK

This document provides "as flown" operational mission data and has been compiled from many sources including the following:

- Flight Logs
- Flight Rules
- Flight Anomaly Logs
- MOD Post-Flight Reports (Ascent, On-Orbit and Descent)
- Post Flight Analysis of MPS propellants
- FDRD Flight Definiton Requirements Document
- FRD Flight Requirements Document
- SODB Shuttle Operational Data Book
- MER (Mission Evaluation Room) Shuttle Flight Data.
- Orbit Distance traveled is taken from the PAO Mission Statistics.

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DATA SOURCES - FOR BENNETT

And finally, thanks to all the Data Source Contributors who helped Floyd Bennett find his way to the correct mission data for flights STS-116 through STS-135. See the listing to follow: This listing provides the data sources and Point(s) of Contact (POC's) used in preparing the portion of the Space Shuttle Mission Summary Book for missions STS-116 through STS-135. My thanks to all these contributors and many others who helped this author find his way to the correct mission data.

Floyd V. Bennett

ITEM DATA SOURCES

COLUMN 1: FLT NUMBER

FLT NO.	FDRD: https://sspweb.jsc.nasa.gov/webdata/pdcweb/07700.htm
SEQ FLT #	Calculated from previous missions
KSC- #	Calculated from previous missions at KSC
PAD # PAD # (#)	FDRD: <u>https://sspweb.jsc.nasa.gov/webdata/pdcweb/07700.htm</u> Calculated from previous missions same pad
MLP-3	FDRD: https://sspweb.jsc.nasa.gov/webdata/pdcweb/07700.htm
# SHUTTLE FLIGHT TO ISS	Calculated from previous missions to ISS
COLUMN 2: ORBITER	
ORBITER Vehicle Designation (Number of Flights) Vehicle Name	FDRD: https://sspweb.jsc.nasa.gov/webdata/pdcweb/07700.htm
OMS PODS Left POD #, Right POD #, & FWD RCS POD # # of Flights of each POD	MV/Orbiter Project Office, POC's: Dwyer, Kenneth J. (JSC-MV6) and Storm, Michael D. (KSC-USA) # of flights calculated from previous flight of the POD's

ITEM

DATA SOURCES

COLUMN 3: CREW SIZE: TITLE, NAMES, AND EVA'S

FLIGHT CREW SIZE	FDRD: https://sspweb.jsc.nasa.gov/webdata/pdcweb/07700.htm
FLIGHT CREW, FLIGHT DIRECTORS, & CAPCOMS TITLES & NAMES	DA8/Lead Flight Directors Memos & JSC PAO Mission Press Kit: http://www.shuttlepresskit.com
EVA's	
Type and Duration	JSC PAO Shuttle Status Reports: <u>http://www.nasa.gov/centers/johnson/news/shuttle/index.html</u> MMT Briefings: John A. Mccullough, Annette P. Hasbrook, Norm Knight DA8
# of EVA's	Calculated from previous mission EVAs

COLUMN 4: LAUNCH SITE, LIFTOFF TIME, LANDING SITES, ABORT TIMES

LAUNCH SITE Launch Pad Launch Date & Time Day of Week (#) Date (#)	FDRD: <u>https://sspweb.jsc.nasa.gov/webdata/pdcweb/07700.htm</u> Ascent FDO Post Flight Report/DM, POC's: Gonzalez,Edward P. Sparks, Carson W. (USA), & McDonald, Mark A. (USA) Refers to # of launches that day of week calculated from previous missions same day of week Refers to # of launches that month calculated from previous missions same month
LAUNCH WINDOW	Real-time data, POC: Sparks, Carson W. and Mark McDonald (JSC-DM) [USA]
EOM PLS	Planned landing site: FDRD: https://sspweb.jsc.nasa.gov/webdata/pdcweb/07700.htm
TAL	Ascent FDO Post Flight Report/DM, POC's: Gonzalez, Edward P. Sparks, Carson W. (USA), McDonald, Mark A. (USA), & Kalil, Jose G. (JSC-DM)[USA]
TAX WX	Spacecraft Meteorology Group Post Mission Summary, POC: Oram, Timothy D. (JSC-WS8) [NOAA]
SELECTED: RTLS, TAL, AOA, PLS	LSO Post-Flight Summary, POC: Linde, Martin G. (JSC-DM) [USA] & Hensley, Doyle W. (JSC-DM461)
MAX Q NAV	STS-XXX GNC First Stage Reconstruction: <u>https://sspweb.jsc.nasa.gov/w ebdata/sei/t_Post%20Flight%20Reports/</u> POC's: Cooper, Carling C. (Boeing), and Biskup, Bruce A., (Boeing)
SRB STG: [MET]	STS-XXX Ascent Performance Trajectory Reconstruction letter, POC: Stephen P. Brod/The Boeing Company (HM5-20)
ALL REMAINING DATA THIS COLUMN	Ascent FDO Post Flight Report/DM, POC's: Gonzalez, Edward P. Sparks, Carson W. (USA), & McDonald, Mark A. (USA)

DATA SOURCES

ITEM

COLUMN 5: LANDING SITE/RUNWAY, CROSSRANGE, LANDING TIMES, FLIGHT DURATION, WINDS

ALL ITEMS EXCEPT ENTRIES LISTED BELOW:	Descent Postflight Summary & Quicklook Reports: <u>http://usa1.unitedspacealliance.com/usahou/orgs/48-20/dsct/pf/</u> POC: Barbara Schill (USA) & Chris Re (USA), Chris Lessman (USA), Rosalyn Mark
LANDING EVENTS Time of Landing Site (#) Surface (#) Landing Day of Week (#) Landing Date (#)	Image Science & Analysis group: <u>http://isal-web1.jsc.nasa.gov/Shuttle/ShowPage.pl?template=default.htm</u> Ascent/Descent Flight Design, POC: Lessmann, Christopher F. (USA) Site (#) refers to # of landings at a site, calculated from previous landing at that site Surface (#) refers to # of landings on surface from previous landings on same surface (#) refers to # of landings on that particular weekday, calculated from landings on same weekday (#) refers to # of landings in a particular calendar month, calculated from landings in the same calendar month
DEORBIT BURN	GMT (e.g., 051:12:59:52.0Z)-DM Trajectory Server - Legler Report, POC's:Propst, Carolyn A. (USA) & Deboeck, Toni F (USA)
ORBIT DIR	(#) refers to # of landings from the same direction, calculated from # of last mission at same direction
TIME OF EVENTS DURING LANDING	LLIMS Events: <u>http://isal-web1.jsc.nasa.gov/llims/ObservationPublic.aspx?Mode=screening&mission=STS-XXX</u>
ROLLOUT Distance (ft) Time (sec)	Calculated: wheels stop position - MLGTD position Calculated: wheels stop GMT - MLGTD GMT
WINDS: OFFICIAL and DENS ALT (ft)	Spaceflight Meteorology Post Flight Mission Summary, POC: Oram, Timothy D. (JSC-WS8) [NOAA]
FLT DURATION S/T OV-XXX:	Shuttle total flight time, calculated: mission duration + sum of previous missions Total flight time for specific orbiter vehicle, calculated: mission duration + sum of previous missions
DISTANCE	Statute miles traveled this mission: PAO Missions Stats Report, POC: Herring, Kyle J. (JSC-AP311)
TOTAL SHUTTLE DISTANCE	Calculated: distance traveled this mission + sum of previous missions PAO Missions Stats Report, POC: Herring, Kyle J. (JSC-AP311)

ITEM DATA SOURCES

COLUMN 6: SSME-TL, NOM-ABORT, EMERG THROTTLE PROFILE

SSME THROTTLE LEVELS PREDICTED ACTUAL	FDRD: <u>https://sspweb.jsc.nasa.gov/webdata/pdcweb/07700.htm</u> Ascent FDO Post Flight Report/DM, POC's: Gonzalez,Edward P. Sparks, Carson W. (USA), & McDonald, Mark A. (USA)
ENG. S.N. (#)	FDRD: https://sspweb.jsc.nasa.gov/webdata/pdcweb/07700.htm Refers to # of flights by engine serial number - calculated from previous flight by that SSME
M 3 EOM and LANDING WEIGHT and X CG	IDP Cycle/Prop30 Aerosciences Report/Version 01, POC: Schill, Barbara C. (USA)
COLUMN 7: SRB, RSRM, AND ET	<u> </u>
SRB, RSRM, and ET	FDRD: https://sspweb.jsc.nasa.gov/webdata/pdcweb/07700.htm
ET IMPACT: MET, LAT, LONG	STS-XXX Nominal ET Disposal Chart and ET Summary Table, POC: Dulski, Matthew B. (USA) & Strach, Daniel P (USA)
COLUMN 8: ORBIT INCLINATION	<u>l</u>
INC	FDRD: https://sspweb.jsc.nasa.gov/webdata/pdcweb/07700.htm
COLUMN 9: ORBIT HA/HP	
INSERTION (type)	FDRD: https://sspweb.jsc.nasa.gov/webdata/pdcweb/07700.htm
POST OMS-2 (nm) and DEORBIT HA/HP	DM Trajectory Server - Legler Report Request, POC's: Propst, Carolyn A. (USA), Deboeck, Toni F (USA), and Leleux, Darrin P. (JSC-DM411)
ENTRY VELOCITY (fps) and ENTRY RANGE (nm)	Descent Post Flight Summary: <u>http://usa1.unitedspacealliance.com/usahou/orgs/48-20/dsct/pf/</u> , POC: Hill, Trudy D. (Debbie) (USA)

ITEM DATA SOURCES

COLUMN 10: FLIGHT SOFTWARE (FSW)

OI-XX	Orbit Insertion Flight Software version # - FDRD: https://sspweb.jsc.nasa.gov/webdata/pdcweb/07700.htm
(#)	(#) refers to # of flights flown - calculated from last flight of that FSW version

COLUMN 11: PAYLOAD WEIGHTS; PAYLOADS, EXPERIMENTS

PAYLOAD WEIGHTS Day of Launch (DOL) Trajectory Design Data Package (TDDP), POC: Bhula, Jayantilal (Jay) (USA) TOTAL, MIDDECK, DEPLOYED, and NON-DEPLOYED

SHUTTLEACCUMULATED

WEIGHTS	Calculated (summed) from previous missions
DEPLOYED,	
NON-DEPLOYED,	
and CARGO TOTAL	

PERFORMANCE MARGIN (LBS)

FPR and FUEL BIAS,
FINAL TDDPDay of Launch (DOL) Trajectory Design Data Package (TDDP), POC's: Bhula, Jayantilal (Jay) (USA)
Provided by Mike . L. Scott/USA/FDD POC
STS-XXX Ascent Performance Trajectory Reconstruction, POC:Steven P. Brod/Boeing

ASSIGNMENTS FDRD: <u>https://sspweb.jsc.nasa.gov/webdata/pdcweb/07700.htm</u> PAYLOADS: PLB and MIDDECK # CRYO TANK SETS STS OPERATOR SELECTIONS

RMS (#) -# of flights RMS flown - calculated from previous missions with RMS

APPENDIX B - ACKNOWLEDGEMENTS AND DATA SOURCES (Continued)

<u>ITEM</u>

DATA SOURCES

COLUMN 12: MISSION HIGHLIGHTS

BRIEF MISSION SUMMARY	JSC PAO Mission Press Kit: <u>http://www.shuttlepresskit.com/</u> MMT Minutes: <u>https://sspweb.jsc.nasa.gov/mmt/</u>
KSC W/D (Work Days)	KSC Milestone Interface Chart, POC: Overton, Thomas L. (KSC) [ASRC AEROSPACE] & Clark D. Ford (KSC PHO00)
LAUNCH POSTPONEMENTS	SSPO PRCB Directives: https://sspweb.jsc.nasa.gov/meeting/mtgdata.cfm
LAUNCH SCRUBS	MMT Minutes: https://sspweb.jsc.nasa.gov/mmt/
LAUNCH WINDOW	Real-time Data, POC: Sparks, Carson W. (JSC-DM) [USA]
LAUNCH DELAYS	MMT Minutes: https://sspweb.jsc.nasa.gov/mmt/
TAL WEATHER	Spaceflight Meteorology Group Post Mission Summary, <u>http://www.srh.noaa.gov/smg/XXX_Postmission_Summary.pdf</u> (XXX is STS Flight #) POC: Oram, Timothy D. (JSC-WS8) [NOAA]
PERFORMANCE ENHANCEMENTS	Day of Launch (DOL) Trajectory Design Data Package (TDDP), POC: Bhula, Jayantilal (Jay) (USA)
FLIGHT DURATION CHANGES/LANDING	MMT Minutes: <u>https://sspweb.jsc.nasa.gov/mmt/</u> Spaceflight Meteorology Group Post Mission Summary, POC: Oram, Timothy D. (JSC-WS8) [NOAA]
FIRSTS/LASTS	JSC PAO Mission Press Kit: <u>http://www.shuttlepresskit.com/</u> Flight Readiness Reviews: <u>https://sspweb.jsc.nasa.gov/webdata/launch/</u>
NIGHT LAUNCH (#)	Number of night launches, calculated from previous night launch mission
NIGHT LANDING (Site, #)	Number of night landings at specified site, calculated from previous night landing mission at that site
RENDEZVOUS	Number of rendezvous missions, calculated from previous rendezvous mission

Continued...

APPENDIX B - ACKNOWLEDGEMENTS AND DATA SOURCES (Continued)

ITEM	DATA SOURCES
COLUMN 12 MISSION HIGHLIGH	TS (Continued)
EVENTS Time of on-orbit maneuver events (OMS 2, IT, etc.)	DM Trajectory Server - Legler Report, POC's: Propst, Carolyn A. (USA) and Deboeck, Toni F (USA)
Time of docking/undocking events	APDS sensor Data from the ODRC, POC: Dake, Janna J., Murphy, Rachel & Haskovec, Doug (JSC-DS421)
Time of ISS hatch opening and crew welcome	JSC PAO Shuttle Status Reports: http://www.nasa.gov/centers/johnson/news/shuttle/index.html
EVA descriptions and durations	Post flight EVA notes (provided by DX POC) JSC PAO Shuttle Status Reports: <u>http://www.nasa.gov/centers/johnson/news/shuttle/index.html</u>
Transfers (hardware and consumables weights)	STS-XXX Final Customer Support Room (CSR) Report and STS-XXX Mission by the Numbers (provided by MO POC's)
SIGNIFICANT ANOMALIES	PCASS In-flight Anomalies: https://usa93.usa-spaceops.com:4443/adamvweb/ifa.ifa_search2.wp_execfind
ENTRY BLACKOUT	INCO Electronic Flight Log (Provided by DS POC Steve Sides & Mark Williamson)
WEIGHT SUMMARY All entries except entries below:	Day of Launch (DOL) Trajectory Design Data Package (TDDP): POC: Bhula, Jayantilal (Jay)/USA
Orbiter Tail No. Shuttle /PL Accumulated WTs Weight at Orbit Insertion Performance Margin	FDRD: https://sspweb.jsc.nasa.gov/webdata/pdcweb/07700.htm Calculated from previous missions Ascent Post Flight Data (provided by Gonzalez, Edward P./JSC-DM)
Final TDDP Reconstructed Orbiter weight at Mach 3 EOM	Provided by Mike . L. Scott/USA/FDD POC STS-XXX Ascent Performance Trajectory Reconstruction (Kristin Smaltz & Stephen Brod/Boeing)
and at Landing	IDP Cycle/Prop30 Aerosciences Report (provided by Barbara Shill & Rosalyn Mark/USA/FDD/SDM)
PHOTOS (All Missions)	Identified by NASA Number, unless otherwise noted. POC: Jody Russell/JSC-AP (Tessada)

APPENDIX C - FLIGHT DIRECTOR LOG

This appendix provides the JSC Flight Director Log initially compiled and kept updated by Bob Legler, "History Flight". Since his death the log has been maintained by the Flight Director Office staff. This is a listing of Flight Directors beginning with Christopher C. Kraft, Jr. "Red Flight" in 1960 with Project Mercury flights, and ending with the completion of the Space Shuttle Program in 2011.

Note: Names listed in blue denote photo available from electronic copy by "control-hold-click".

FLIGHT DIRECTOR LOG (August 2010) Compiled by HISTORY FLIGHT and updated by DA8 Staff						
#	COLOR	NAME	CLASS	STATUS	First Shift on Console	Retired as a Flight Director
1	Red Flight	Christopher C. Kraft	1960	Retired		1967
2	Blue Flight	John Hodge	1963	Retired		
3	White Flight	Eugene F. Kranz	1963	Retired		1974
4*	Black Flight	Glynn S. Lunney	1963	Retired		
5	Green Flight	Clifford E. Charlesworth	1966	Deceased - 2001		1970
6	Gold Flight	Gerald D. Griffin	1968	Retired		1973
7	Maroon Flight	Milton L. Windler	1968	Retired		
8	Orange Flight	M. P. (Pete) Frank	1968	Deceased - 2005		1983
9	Purple Flight	Phillip C. Shaffer	1971	Deceased - 2007		1974
10	Crimson Flight	Donald R. Puddy (STS-1)	1971	Deceased - 2007		1981
11	Silver Flight	Neil B. Hutchinson (STS-1)	1971	Retired		1984
12	Bronze Flight	Charles R. Lewis (STS-1)	1971	Retired		1984
13	Ivory Flight	Tommy W. Holloway	1979	Retired		1984
14	Crystal Flight	Harold M. Draughon	1979	Retired		1984
15	Gray Flight	Gary E. Coen	May-81	Retired		1995
16	Granite Flight	John T. Cox	May-81	Retired		1988
17	Emerald Flight	Jay H. Greene	May-81	Retired		1987
18	Amber Flight	Brock (Randy) Stone	Nov-81	Retired		1993
19	Indigo Flight	Lawrence S. Bourgeois	Nov-81	Retired		1991
20	Aquila Flight	A. (Lee) Briscoe	Mar-83	Retired		1991
21	Orion Flight	T. Cleon Lacefield	Mar-83	Retired		1986
22	<u>Polaris Flight</u>	Granvil A. Pennington	Mar-83	Retired		2007
23	Alpha Flight	William D. Reeves	Mar-83	Retired		2001
24	Altair Flight	Charles W. Shaw	Mar-83	Retired		2003
25	Sirius Flight	J. Milton Heflin, Jr.	Mar-83	Retired		2005
26	Rigel Flight	Charles R. Knarr	Mar-83	Retired		1991
27	Phoenix Flight	Ronald D. Dittemore	Nov-85	Retired		1992
28	Turquoise Flight	N. Wayne Hale, Jr.	Feb-88	Retired		2004
29	Antares Flight	Robert E. Castle, Jr.	Feb-88	Retired		2003 2000
30	Falcon Flight	Robert M. Kelso	Feb-88	Retired Retired		2000
31 32	Regulus Flight Aurora Flight	Philip L. Engelauf Jeffrey W. Bantle	Dec-89 Dec-89	Retired		2008
<u> </u>	Corona Flight	Linda J. (Hautzinger) Ham	Jan-91	Retired		2001
33 34	Burgundy Flight	Richard D. Jackson, Jr.	Jan-91 Jan-91	Retired		1997
34	Kitty Hawk Flight	John F. Muratore	Jan-91 Jan-92	Retired		1997
35	Iron Flight	Paul F. Dye	Nov-93	Relifu		1774
30	Perseus Flight	Bryan P. Austin	Nov-93	Retired		2003
37	Midnight Flight	John P. Shannon	Nov-93	Retired		2003
39	Argon Flight	Andrew F. Algate	Oct-94	Retired		2004
Continu		rindion 1. ringuto	000 74	Retireu	1	2000

		FLIGHT DIRE				
Compiled by HISTORY FLIGHT and updated by DA8 Staff						
(Continued)						
#	COLOR	NAME	CLASS	STATUS	First Shift on Console	Retired as a Flight Director
40	Atlas Flight	Paul S. Hill	Jun-96	Retired		2005
41	Ares Flight	Jeffrey M. Hanley	Jun-96	Retired		2005
42	Cardinal Flight	Mark A. Kirasich	Jun-96	Retired		2006
43	Cassini Flight	<u>Sally P. Davis</u>	Jun-96	Retired		2008
44	Azure Flight	Mark J. Ferring	Jun-96	Retired		2007
45	<u>Arcturus Flight</u>	John M. Curry	Jun-98	Retired		2007
46	Pegasus Flight	Richard E. La Brode, Jr.	Jun-98			
47	Chromium Flight	Leroy E. Cain	Jun-98	Retired		2005
48	<u>Sapphire Flight</u>	Kelly B. Beck	Jun-98	Retired		2008
49	Flash Flight	Joel R. Montalbano	Oct-00	Retired		2008
50	<u>Eagle Flight</u>	John A. McCullough	Oct-00			
51	<u>Amethyst Flight</u>	<u>Norman D. Knight</u>	Oct-00			
52	Fuchsia Flight	Annette P. Hasbrook	Oct-00	Retired		2009
53	Titanium Flight	J. Derek Hassmann	Oct-00			
54*	Onyx Flight	Bryan C. Lunney	Oct-00	[Retired]		[2011]
55	<u>Aquarius Flight</u>	Matthew R. Abbott	Oct-00			
56	<u>Topaz Flight</u>	Catherine A. Koerner	Oct-00	Retired		2007
57	<u>Intrepid Flight</u>	Anthony J. Ceccacci	Oct-00			
58	<u>Garnet Flight</u>	Steven J. Stich	Oct-00	Retired		2007
59	<u>Defiant Flight</u>	<u>Kwatsi Alibaruho</u>	Feb-05			
60	<u>Vega Flight</u>	Ginger Kerrick	Feb-05			
61	<u>Galileo Flight</u>	Robert Dempsey	Feb-05			
62	<u>Viking Flight</u>	Holly Ridings	Feb-05			
63	<u>Mercury Flight</u>	Dana Weigel	Feb-05		01/16/06	
64	<u>Liberty Flight</u>	Brian Smith	Feb-05		02/13/06	
65	<u>Sigma Flight</u>	Richard Jones	Feb-05		06/30/06	
66	<u>Kodiak Flight</u>	Michael Sarafin	Feb-05		07/13/06	
67	<u>Apex Flight</u>	Michael Moses	Feb-05	Retired	09/05/06	2008
68	<u>Sequoia Flight</u>	Heather Rarick	June-06		02/26/07	
69	<u>Gemini Flight</u>	Ron Spencer	June-06		04/23/07	
70	<u>Peridot Flight</u>	Emily J. Nelson	2007		12/03/07	
71	<u>Tranquility</u>	Courtenay McMillan	2007		12/07/07	
72	<u>Odyssey Flight</u>	David Korth	2007		3/31/08	
73	<u>Venture Flight</u>	J. Chris Edelen	2007		4/11/08	
74	<u>Tungsten Flight</u>	Royce J. Renfrew	2008		10/31/08	
75	Raptor Flight	Jerry P. Jason	2008		4/14/09	
76	<u>Viper Flight</u>	Gary C. Horlacher	2008		7/16/09	
77	Saturn Flight	Michael L. Lammers	2008		7/11/09	
78	Carbon Flight	Edward A. Van Cise	2009		1/20/10	
79	Keystone Flight	Scott Stover	2009		3/29/10	
80	<u>Steel Flight</u>	Dina Contella * Second generation	2009		5/10/10	

* Second generation FDs, #4 Glynn Lunney and #54 Bryan Lunney NOTE: There were two additional individuals that were selected as flight directors but elected to not continue: Rick Fitts and Michele Brekke. Continued...

HONORARY FLIGHT DIRECTORS					
	COLOR	NAME	STATUS		
1	Grey Flight	Howard W. Tindall, Jr.	Deceased - 1995		
2	Pink Flight	Lois Ransdell	Deceased - 1996		
3	Diamond Flight	Alene Ganzer			
4	Scarlet Flight	John W. O'Neill			
5	History Flight	Robert D. Legler	Deceased - 2007		

THE FLIGHT DIRECTOR OFFICE: "Provides leadership and direction for conducting human space flight operation. Our mission is to ensure excellence in mission operations for Human Space Flight." (DA8 Home Page)

IN MEMORIAM



Bob Legler April 4, 1927 - March 16, 2007 Bob Legler, the originator of the informal Space Shuttle Missions Summary Book, was born a natural Corn Husker and lived a full life. His true love was serving his country in the US Coast Guard, Merchant Marines, United Nations, US Army, and the NASA Space Programs as an aerospace engineer. As one of a handful of people to ever support the Mercury, Gemini, Apollo, Skylab, Space Shuttle, and International Space Station missions, Bob was an icon to his peers. He spent 44 years in this noble endeavor called manned space flight. In the memorial service for Bob, Milt Heflin, JSC Associate Director and former JSC Chief Flight Director, provided the following insight:

> "Bob was about making things happen, no matter what his position or rank, in whatever the enterprise was at that time...it might have been dodging bullets and bombs while establishing communication systems for United Nations outposts in crazy places...it might have been while riding the Coastal Sentry Quebec Tracking ship in the Indian Ocean...watching over the Lunar Module electrical power system or the operation of the Apollo Telescope Mount...serving as a SPAN Manager in the MCC (where a lot of really good stories were told during crew sleep)...or even while serving as the Chairman of the Annual FOD Chili Cook-off or his beloved Chairmanship of the Apollo Flight Operations Association [for reunions]...`in each case he gave of himself so that the "mission," no matter what it was, could be successful...Bob might not have been the most efficient chairman...story telling could get in the way from time to time...but he made up for it by being a catalyst, causing the team to rise to the occasion...

(Continued)

IN MEMORIAM

(Continued)

And, we all know quite well his love of capturing the history of manned space flight...Apollo reunions and producing the Space Shuttle Missions Summary Book are two of his legacies...events and things with Bob's hands that were done for the enjoyment of all...he took great pride in keeping the "official" Flight Director Log, a listing of those that have served as a Flight Director in Mission Control...the Log today lists 69 Flight Directors beginning with Red Flight, Chris Kraft...even I had a hard time in convincing Bob that I would not abuse my electronic copy of this list, if he would just send it to me...this list also contains the names of only five individuals designated as an Honorary Flight Director...Bob is number 5, known as 'History Flight,' given that honor upon his retirement..."

From Randy Stone, former JSC Chief Flight Director and former JSC Deputy Director: "Bob mentored all of the new Flight Controller's with his wisdom, knowledge, but more importantly his passion for human space flight."

Others commented: "Bob was a walking encyclopedia of space knowledge and also had a great sense of humor." "Bob was a rarity in the annuals of human space flight – a joyful cheerleader [with] unabashed love of the space program." "I could always rely on Bob for hard to find info. His enthusiasm for his work was obvious." "Bob was good natured and enjoyed a good joke, even if it was on him. I love Bob and will miss him."

And, shortly before Bob died, he received the following note from Bob Cabana, KSC Center Director and former Astronaut: "Bob, I look forward to your Summary Shuttle Book after the last [final] Shuttle mission. I think it's the only way I'm ever going to remember what missions I CAPCOM'ed on and who was on console with me."

The detail, the accuracy, the completeness of this Space Shuttle Missions Summary Book are a testament to Bob Legler's "passion and knowledge" for human space flight. We will finish this book for him with the same dedication.

> Floyd Bennett Friend & Colleague



After Bob Legler's death in 2007, Floyd Bennett asked for and was given the task of completing Bob Legler's Space Shuttle Missions Summary Book, beginning with flight STS-116 and ending with the final Space Shuttle Mission. He was a friend and colleague of Bob's during the Apollo and Space Shuttle Programs. He also worked with Bob as a member of the Apollo Flight Operations Association for reunion events and was a co-author of Bob's 35th [and last] Apollo Anniversary Reunion Book.

Floyd has 57 years of technical and managerial experience in the field of Aerospace Engineering. After graduation from Virginia Tech University in 1954, he joined the National Advisory Committee for Aeronautics (which became NASA in 1958) at Langley Research Center in Hampton, VA. As a research engineer he published several NACA/NASA Technical Reports on aircraft aeroelasticity. In 1962 he transferred with the Space Task Group to the Manned Spacecraft Center (now Johnson Space Center) in Houston, TX. Here he performed and managed analyses for manned spaceflight in engineering development, mission planning, flight operations, systems integration, and finally as a Space Shuttle Missions historian.

He performed key roles during the Apollo Program in establishing the Lunar Module Spacecraft landing and ascent operational trajectory strategies, lunar landing site selection, mission planning and real-time mission support for all Apollo manned lunar landing missions. During the Space Shuttle Program he performed a key role in systems integration for establishing program control of vehicle weight and performance for initial Space Shuttle manned development flights.

After NASA retirement in 1982 he continued making contributions in Space Shuttle Systems Integration for resolution of Payload, SSME, and Orbiter technical issues while working for three different NASA contractors, retiring from United Space Alliance in 2006.

Floyd is an Associate Fellow & Emeritus Lifetime Member American Institute of Aeronautics & Astronautics. He has received numerous NASA and USA awards for exceptional service during the Apollo and Space Shuttle Programs including an Apollo 15 Astronaut's Lunar Landmark named "Bennett Hill".