INDEPENDENT ORBITER ASSESSMENT

ANALYSIS
OF THE
REMOTE MANIPULATOR
SYSTEM

12 JANUARY 1987

MCDONNELL DOUGLAS ASTRONAUTICS COMPANY
HOUSTON DIVISION

SPACE TRANSPORTATION SYSTEM ENGINEERING AND OPERATIONS SUPPORT

WORKING PAPER NO. 1.0-WP-VA86001-23

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12 January 1987

This Working Paper is Submitted to NASA under
Task Order No. VA86001, Contract NAS 9-17650

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1.0 EXECUTIVE SUMMARY

The McDonnell Douglas Astronautics Company (MDAC) was selected in June 1986 to perform an Independent Orbiter Assessment (IOA) of the Failure Modes and Effects Analysis (FMEA) and Critical Items List (CIL). Direction was given by the STS Orbiter and GFE Projects Office to perform the hardware analysis using the instructions and ground rules defined in NSTS 22206, Instructions for Preparation of FMEA and CIL, 10 October 1986. The IOA approach features a top-down analysis of the hardware to determine failure modes, criticality, and potential critical items. To preserve independence, this analysis was accomplished without reliance upon the results contained within the NASA FMEA/CIL documentation. This report documents (Appendix C) the independent analysis results for the Orbiter Remote Manipulator System (RMS).

The RMS hardware and software are primarily required for deploying and/or retrieving up to five payloads during a single mission, capture and retrieve free-flying payloads, and for performing Manipulator Foot Restraint operations. Specifically, the RMS hardware consists of the following components:

- o End Effector
- o Displays and Controls
- o Manipulator Controller Interface Unit
- o ARM Based Electronics
- o ARM

The IOA analysis process utilized available RMS hardware drawings, schematics and documents for defining hardware assemblies, components, and hardware items. Each level of hardware was evaluated and analyzed for possible failure modes and effects. Criticality was assigned based upon the severity of the effect for each failure mode.

Figure 1 presents a summary of the failure criticalities for each of the five major divisions of the RMS. A summary of the number of failure modes, by criticality, is also presented below with Hardware (HW) criticality first and Functional (F) criticality second.

Summary of IOA Failure Modes By Criticality (HW/F)

Criticality:	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
Number :	240	112	25	24	12	161	574

For each failure mode identified, the criticality and redundancy screens were examined to identify critical items. A summary of Potential Critical Items (PCIs) is presented as follows:

Summary of IOA Potential Critical Items (HW/F)						
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	TOTAL
Number :	240	112	25	24	12	413

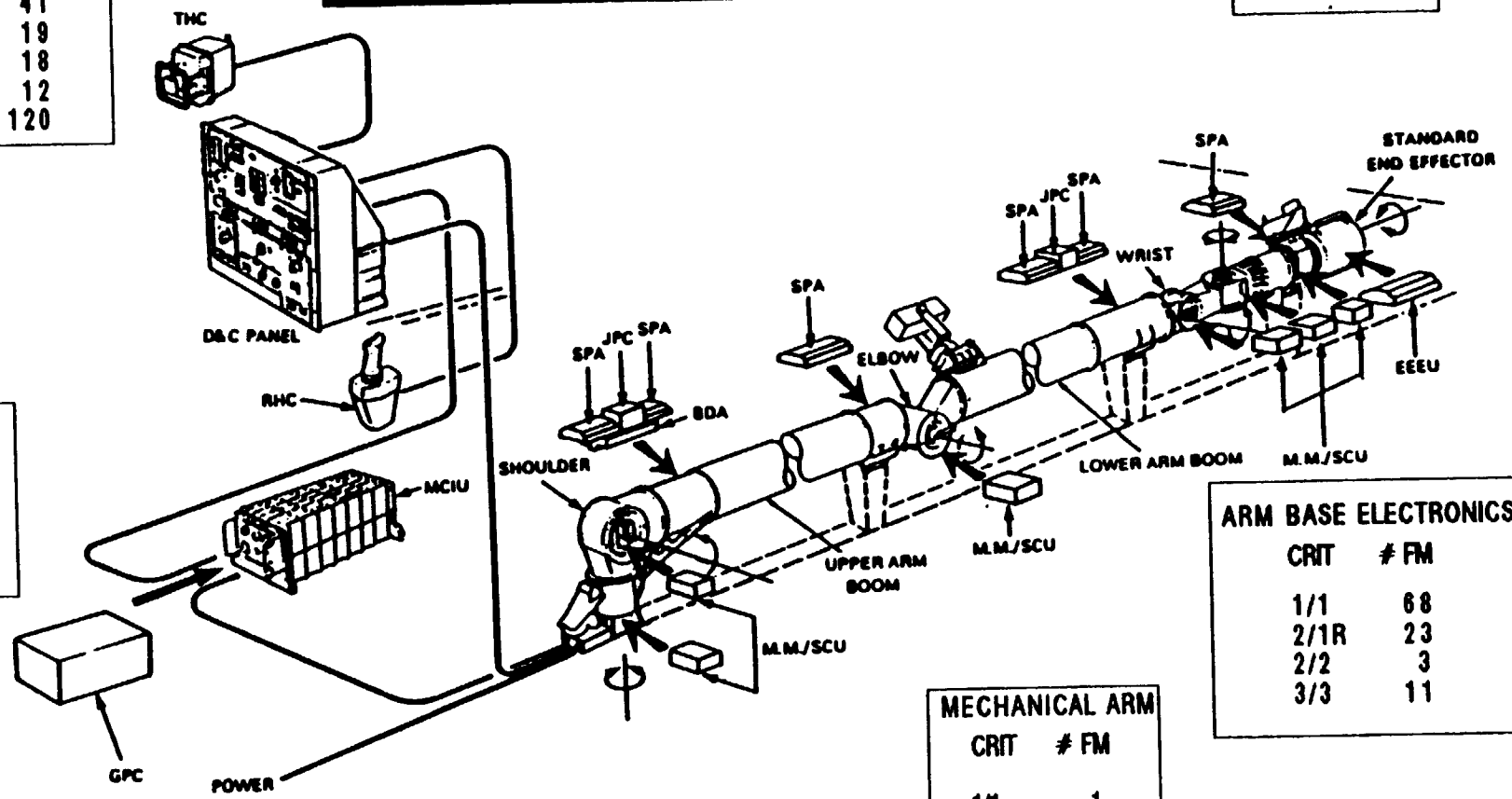
Of the 574 failure modes analyzed, 413 were determined to be PCIs.

RMS OVERVIEW ANALYSIS SUMMARY

RMS SUMMARY							
CRIT	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
#FM	240	112	25	24	12	161	574
#PCI	240	112	25	24	12	-	413

DISPLAY & CONTROLS	
CRIT	# FM
1/1	59
2/1R	41
2/2	19
3/1R	18
3/2R	12
3/3	120

END EFFECTOR	
CRIT	# FM
1/1	66
2/1R	3
3/1R	3
3/3	20



MCIU	
CRIT	# FM
1/1	46
2/1R	45
3/3	6

ARM BASE ELECTRONICS	
CRIT	# FM
1/1	68
2/1R	23
2/2	3
3/3	11

MECHANICAL ARM	
CRIT	# FM
1/1	1
2/2	3
3/1R	3
3/3	4

Figure 1 - RMS OVERVIEW ANALYSIS SUMMARY

RMS001GG 1/16/87

2.0 INTRODUCTION

2.1 Purpose

The 51-L Challenger accident prompted the NASA to readdress safety policies, concepts, and rationale being used in the National Space Transportation System (NSTS). The NSTS Office has undertaken the task of reevaluating the FMEA/CIL for the Space Shuttle design. The MDAC is providing an independent assessment of the Orbiter FMEA/CIL for completeness and technical accuracy.

2.2 Scope

The scope of the independent FMEA/CIL assessment activity encompasses those Shuttle Orbiter subsystems and GFE hardware identified in the Space Shuttle Independent FMEA/CIL Assessment Contractor Statement of Work. Each subsystem analysis addresses hardware, functions, internal and external interfaces, and operational requirements for all mission phases.

2.3 Analysis Approach

The independent analysis approach is a top-down analysis utilizing available drawings, schematics and documents to breakdown the respective subsystem into components and low-level hardware items. Each hardware item is evaluated for failure mode, effects, and criticality. These data are documented in the respective subsystem analysis report, and are used to assess the NASA and Prime Contractor FMEA/CIL reevaluation results. The IOA analysis approach is summarized in the following Steps 1.0 through 3.0. Step 4.0 summarizes the assessment of the NASA and Prime Contractor FMEAs/CILs that is to be performed and documented at a later date.

Step 1.0 Subsystem familiarization
- 1.1 Define subsystem functions
- 1.2 Define subsystem components
- 1.3 Define subsystem specific ground rules and assumptions

Step 2.0 Define subsystem analysis diagram
- 2.1 Define subsystem
- 2.2 Define major assemblies
- 2.3 Develop detailed subsystem representations

Step 3.0 Failure events definition
- 3.1 Construct matrix of failure modes
- 3.2 Document IOA analysis results

Step 4.0 Compare IOA analysis data to NASA FMEA/CIL
- 4.1 Resolve differences
- 4.2 Review in-house
- 4.3 Document assessment issues
- 4.4 Forward findings to Project Manager

2.4 Ground Rules and Assumptions

The RMS ground rules and assumptions used in the IOA are defined in Appendix B. The subsystem specific ground rules were defined to provide necessary additions and clarifications to the ground rules and assumptions contained in NSTS 22206.

3.0 SYSTEM DESCRIPTION

3.1 Design and Function

The RMS is a major component of the Payload Deployment and Recovery System (PDRS) of the Space Shuttle Orbiter. It is used primarily for the deployment of payloads in orbit or the retrieval of payloads from orbit for return to earth or redeployment in orbit. The RMS is also used in conjunction with the Manipulator Foot Restraint (MFR) for various Extra Vehicular Activity (EVA) tasks.

The RMS is an Anthropomorphic Man-machine System that consists of six servocontrolled rotary joints and an end effector all connected together by structural boom members. The RMS is attached to the orbiter longeron (port, starboard, or both) through a roll-out mechanism. The arm is operated by a crew member using direct viewing and closed circuit television (CCTV), from the Display and Control (D&C) station located on the aft flight deck.

The primary components of the RMS are:

- Backup Drive Amplifier (BDA)
- Display and Control Panel (D&C)
- End Effector (EE)
- End Effector Electronics Unit (EEU)
- Joint Power Conditioner (JPC)
- Manipulator Controller Interface Unit (MCIU)
- Motor Module/Signal Conditioning Unit (MM/SCU)
- Rotational Hand Controller (RHC)
- Servo Power Amplifier (SPA)
- Translation Hand Controller (THC)
- Thermal Protection Kit (TPK)

3.1.1 Backup Drive Amplifier - There is only one BDA for each RMS and it is located in the shoulder joint's electronics housing. The BDA is a backup unit to any of the SPAs, in the event of a SPA failure or its associated power source (JPC). The main functions of the BDA are to provide drive to any one joint motor as selected from the D&C panel and to provide for power conditioning from the backup +28 V bus.

3.1.2 Display and Control - The D&C panel provides primary/backup control on display functions, and contains D&C electronics and Orbiter/THC/RHC wiring interfaces. All of the displays and the majority of the controls are used to control and monitor the RMS in its prime modes of operation. Three control functions, located on a separate section of the D&C panel, form the backup channel of the D&C panel and use separate wiring and connectors.

3.1.3 End Effector - The standard EE is designed to effect the capture or release of a previously captured payload by means of capture/release and rigidize/derigidize operations. The capture/release sequences are achieved by rotating internal rings located at the open end of the EE body to open or close three wire snares around the payload grapple fixture. The rigidize/derigidize sequences withdraw the snare assembly towards the rear of the EE body thereby tensioning the snare wires and pulling the snared payload into full and keyed orientation and contact with the end effector, or extend the snare assembly to release tension on the payload. The EE consists essentially of the EE body, prime channel drive chain, EEEU, EE wiring harness, Backup release system, and seven microswitches for status of the EE.

3.1.4 End Effector Electronics Unit - The EEEU is located within the EE body and controls and monitors the operation of the EE as commanded by the operator from the D&C panel. This includes power conditioning, command decoding, detects failures in decoding and commutator logic, outputs signal flags, and conditions the EE status signals which are sent to the MCIU via the data bus.

3.1.5 Joint Power Conditioner - There are two JPCs per manipulator arm. One of which is located in the shoulder joint electronics compartment serving the shoulder and elbow joints, and the second is located in the wrist electronics compartment serving the three wrist joints. The JPCs convert the +28 V dc bus to provide secondary regulated supply voltages of +15 V and +10.1 V dc to the SPA's motor commutators and position encoders. Overvoltage and undervoltage protection circuits are provided to shut off the JPC if preset threshold values are exceeded or not achieved.

3.1.6 Manipulator Controller Interface Unit - The MCIU handles the exchange of information between the Orbiter GPC and the RMS and other entities of the system. The MCIU performs manipulation of data but does not have any significant data processing function. In addition to GPC/MCIU communication the MCIU has data communication with the Arm Based Electronics (ABE) and the D&C, does data gathering from the THC, RHC, and temperature sensors, does hard wired fault detection and annunciation, performs auto safing, brake drive control, auto braking, EE drive commands in EE auto mode, and power conditioning for MCIU and D&C.

3.1.7 Motor Module/Signal Conditioning Unit - The Motor Module (MM) functions as a servo motor providing the mechanical

drive for joint movement in response to commands from the MCIU via the SPA, and in response to the feedback signal from the tachometer. This tachometer feedback signal is low level and is amplified by the SCU for use by the MM.

3.1.8 Rotational Hand Controller - The RHC is a three axis manual controller which provides electrical control signals for the RMS point of resolution (POR) in the pitch, yaw, and roll degrees of freedom. These control signals are proportional to the manual input displacement of the RHC handgrip in each of the three mutually perpendicular axis. The RHC handgrip also has three secondary switch inputs for rate hold, vernier/coarse, and capture/release. The gimbal assembly is the main mechanism that obtains the manual commands input into the handgrip. Transducers provide the appropriate signals to the MCIU.

3.1.9 Servo Power Amplifier - Each RMS has six SPAs, one for each joint. Each SPA provides a drive signal to it's joint motor in response to MCIU control signals or direct drive commands from the D&C panel. The SPA also provides an excitation signal to the tachometer, transmits data back to the MCIU, releases the joint brake in response to a MCIU command, performs self-testing, switches the motor drive from MDA to BDA on command, and transmits external flags to the MCIU.

3.1.10 Translation Hand Controller - The THC allows the operator to control the three-dimensional linear motion of the end effector by means of manual inputs through the controller handgrip. The POR velocity commands are proportional to the deflection of the handle. Three independent electrical signals are provided, by the THCs gimbal assembly transducers, to the MCIU, one for each control axis. This gimbal mechanism, located within the THC assembly, is the main mechanism for obtaining the X, Y, and Z axis commands.

3.1.11 Thermal Protection Kit - The RMS uses active and passive thermal control systems both to keep the RMS within proper operating temperatures and to isolate the manipulator arm from the space environment. This TPK essentially consists of thermal blankets, white paint, heaters and thermostats, and thermistors. The thermal blankets primarily provide the space environment isolation function. The white paint minimizes external heat input while maximizing heat radiation due to internal dissipation of electronics. The heaters and thermostats control the temperature within limits while the thermistors provide the temperature monitoring function.

3.2 Interfaces and Locations

The components of the RMS are located on the aft flight deck of the crew compartment and within the payload bay of the Orbiter. The items in the crew compartment are the RHC, THC, D&C Panel, MCIU and the GPC. The manipulator arm, SPAs, JPCs, BDA, MM/SCU, EE, and EEEU are located in the payload bay along the port longeron (or starboard longeron or both).

3.3 Hierarchy

Figures 2 through 7 illustrate the hierarchy of the RMS components and their corresponding subcomponents.

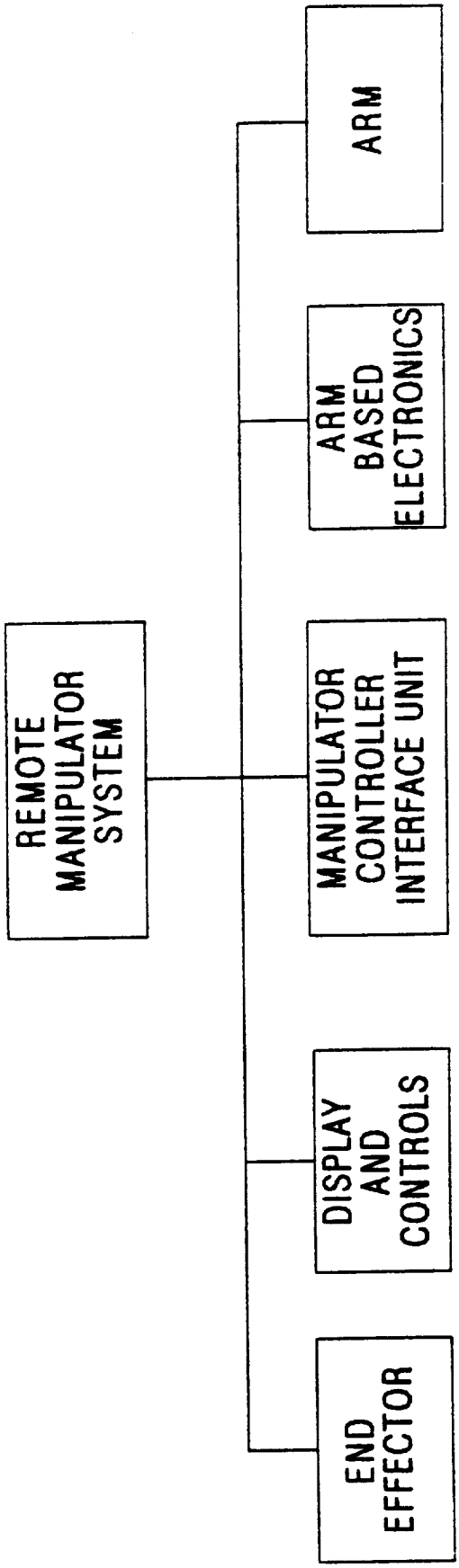


Figure 2 - RMS SUBSYSTEM OVERVIEW

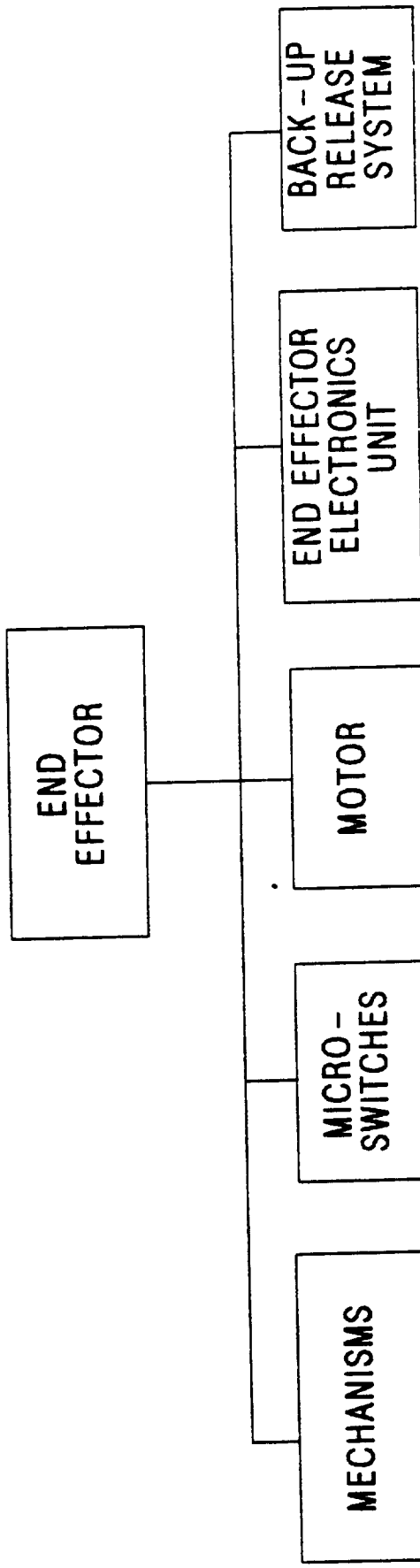


Figure 3 - END EFFECTOR SUBCOMPONENTS

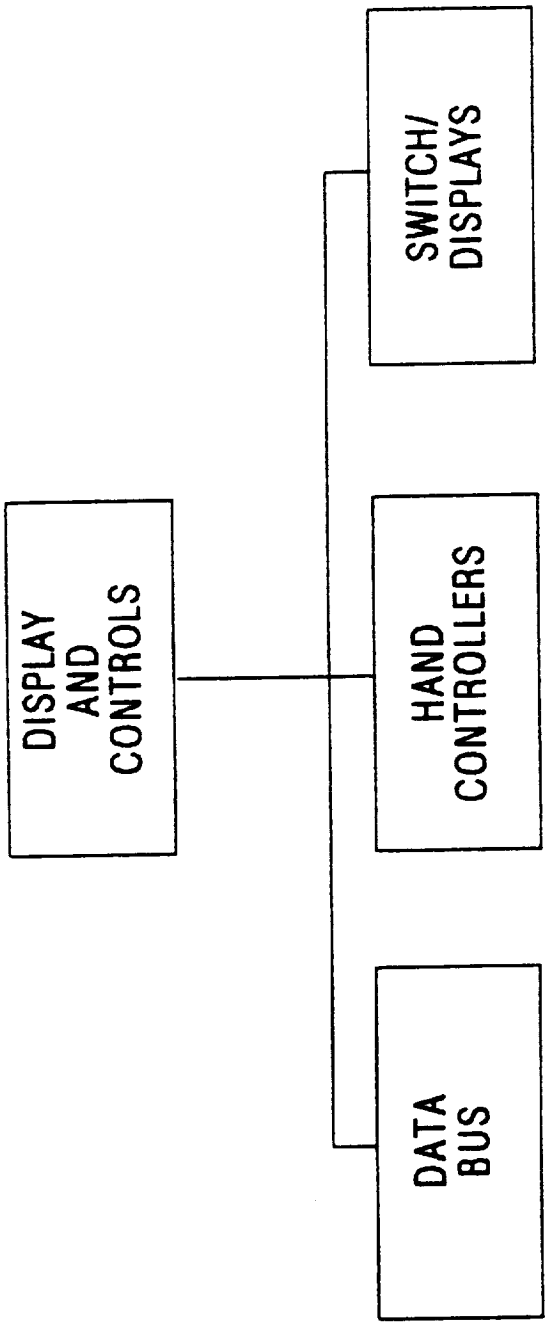


Figure 4 - DISPLAY & CONTROLS PANEL SUBCOMPONENTS

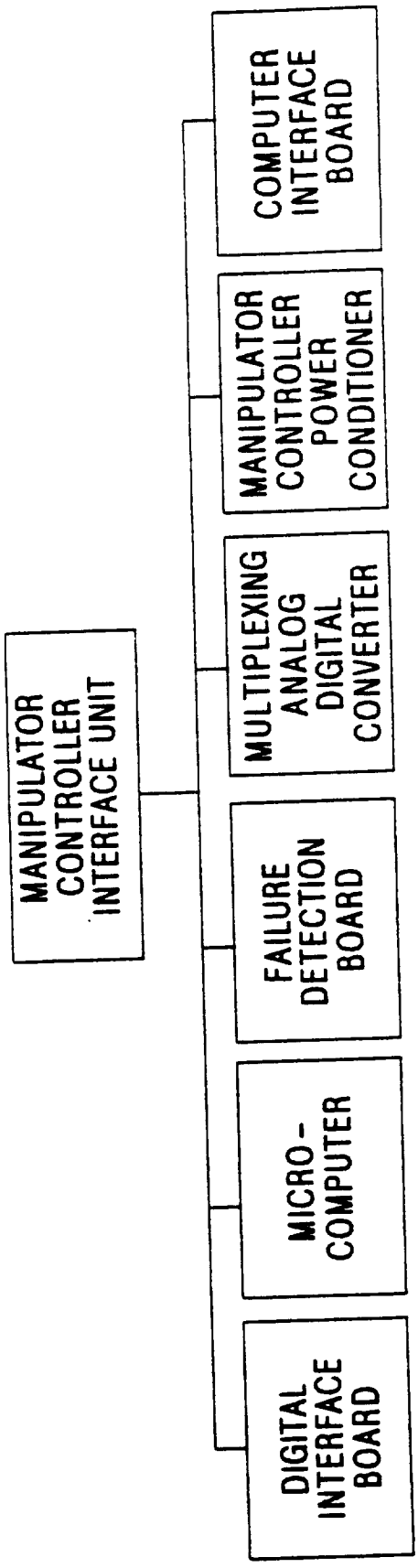


Figure 5 - MANIPULATOR CONTROLLER INTERFACE UNIT SUBCOMPONENTS

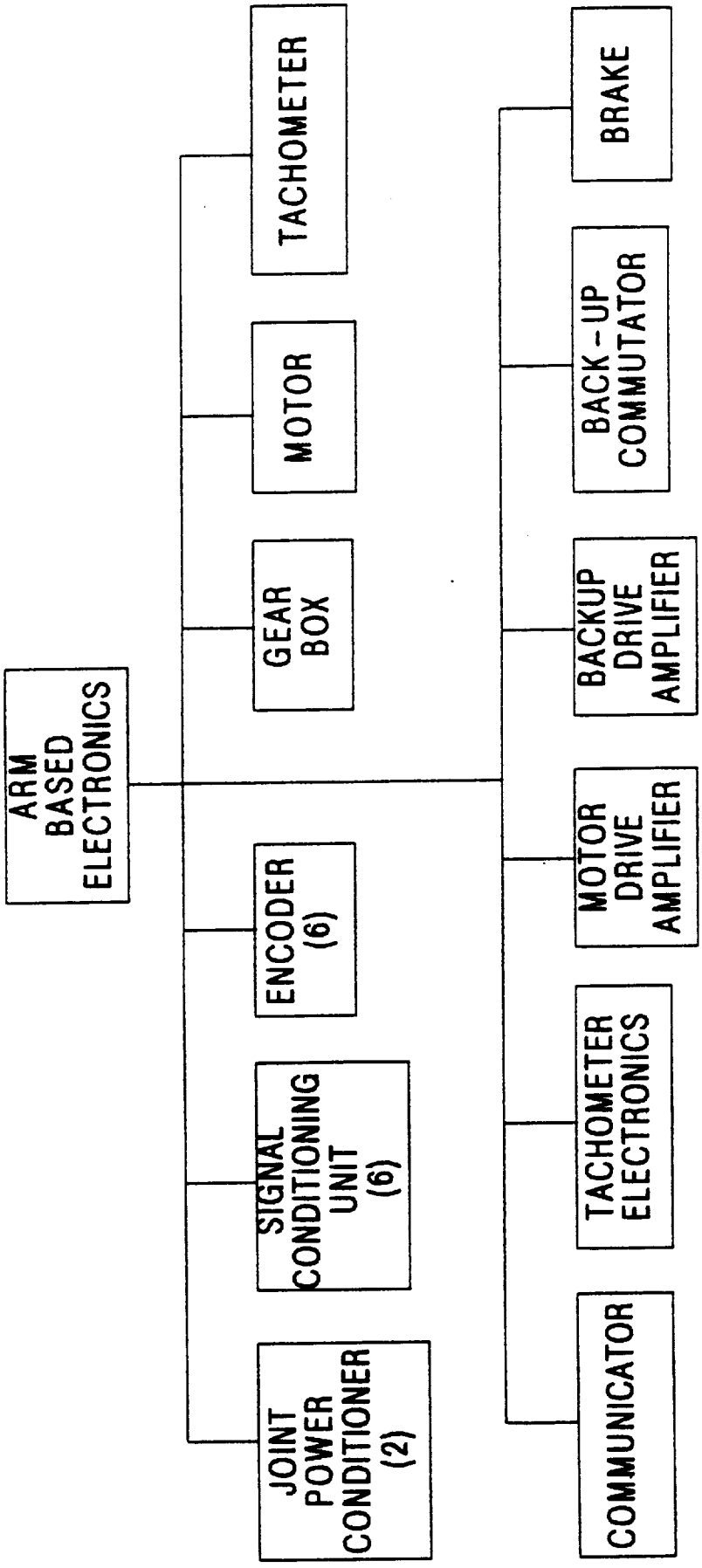


Figure 6 - ARM BASED ELECTRONICS SUBCOMPONENTS

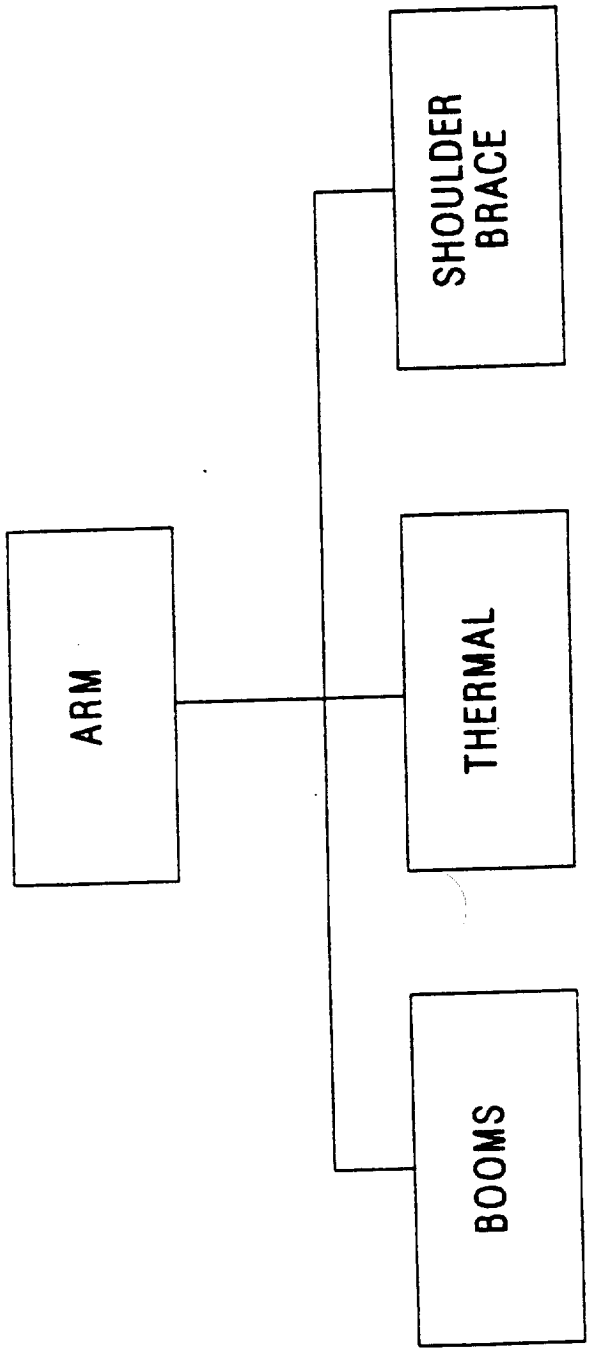


Figure 7 - ARM SUBCOMPONENTS

4.0 ANALYSIS RESULTS

Detailed analysis results for each of the identified failure modes are presented in Appendix C. Table I presents a summary of the failure criticalities for each of the five major subdivisions of the RMS. Further discussion of each of these subdivisions and the applicable failure modes is provided in subsequent paragraphs. The RMS analysis hierarchy is illustrated in Figure 1.

TABLE I Summary of IOA Failure Modes and Criticalities

Criticality:	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
D&C	59	41	19	18	12	120	269
ABE	68	23	3	-	-	11	105
MCIU	46	45	-	-	-	6	97
EE	66	3	-	3	-	20	92
MECH ARM	1	-	3	3	-	4	11
TOTAL	240	112	25	24	12	161	574

Of these 574 failure modes analyzed, 413 were determined to be PCIs. A summary of the PCIs is presented in Table II. Appendix D contains a cross reference between each PCI and analysis worksheet in Appendix C.

TABLE II Summary of IOA Potential Critical Items

Criticality:	1/1	2/1R	2/2	3/1R	3/2R	TOTAL
D&C	59	41	19	18	12	149
ABE	68	23	3	-	-	94
MCIU	46	45	-	-	-	91
EE	61	3	-	3	-	72
MECH ARM	1	-	3	3	-	7
TOTAL	240	112	25	24	12	413

4.1 Analysis Results - End Effector

The End Effector analysis considered five subcomponents as shown in Figure 3. Most criticalities were 1/1 and 2/1R. There are seventy-two PCIs.

4.2 Analysis Results - Displays and Controls

The Displays and Controls were divided into three subcomponents as shown in Figure 4. There are one hundred forty-nine PCIs.

4.3 Analysis Results - Manipulator Controller Interface Unit

The Manipulator Controller Interface Unit was divided into six subcomponents as shown on Figure 5. Most criticalities were found to be 2/1R. There are ninety-one PCIs.

4.4 Analysis Results - ARM Based Electronics

The Arm Based Electronics were divided into twelve subcomponents as shown on Figure 6. Most criticalities were 1/1 due to uncommanded motion. There are ninety-four PCIs.

4.5 Analysis Results - ARM

The ARM was divided into three subcomponents as shown on Figure 7. Only seven significant criticalities were found.

5.0 REFERENCES

Reference documentation available from NASA and Rockwell was used in the analysis. The documentation used included the following:

1. Space Shuttle Programs Orbiter Avionics Software OPS Detailed Design Specification, Vol. III - Applications Part 2 - System Management, 12/20/83

2. SPAR/RMS/PA.1067 Issue A

3. PDRS Console Handbook,, Vol. II, 3/21/84

4. JSC-11174, Space Shuttle Systems Handbook Rec. C

5. SPAR Wirelists and Schematics (33)

APPENDIX A
ACRONYMS

ABE - Arm Based Electronics
AC - Alternating Current
AOA - Abort Once Around
APU - Auxiliary Power Unit
ASSY - Assembly
ATO - Abort to Orbit
BFS - Backup Flight System
BOA - Backup Drive Amplifier
CIL - Critical Items List
CIRC - Circulation
CNTL - Control
CRIT - Criticality
CRT - Cathode Ray Tube
C&W - Caution and Warning System
DC - direct current
DISTR - Distribution
DPS - Data Processing System
DU - Display Unit
D&C - Display & Control
EE - End Effector
EEEU - End Effector Electronics Unit
EPD&C - Electrical Power Distribution and Control
F - Functional
FA - Flight Aft
FF - Flight Forward
FM - Failure Mode
FMEA - Failure Mode and Effects Analysis
GFE - Government Furnished Equipment
GN2 - Gaseous Nitrogen
GPC - General Purpose Computer
GPM - Gallons Per Minute
GSE - Ground Support Equipment
HW - Hardware
HYD - Hydraulics
H2O - Water
IOA - Independent Orbiter Assessment
JPC - Joint Power Conditioner
JSC - Johnson Space Center
LCA - Load Control Assembly
LH2 - Liquid Hydrogen
LO2 - Liquid Oxygen
MCIU - Manipulator Controller Interface Unit
MDAC - McDonnell Douglas Astronautics Company
MDM - Multiplexer/Demultiplexer
MEC - Main Engine Controller
MN - Main
MN/SCU - Motor Module/Signal Conditioning Unit

MONIT - Monitoring
MPS - Main Propulsion System
NA - Not Applicable
NASA - National Aeronautics and Space Administration
NSTS - National Space Transportation System
OMRSD - Operational Maintenance Requirements and Specifications Document
PBI - Push Button Indicator
PCA - Power Control Assembly
PCI - Potential Critical Item
PDRS - Payload Deployment and Recovery System
POR - Point of Resolution
PSI - Pounds Per Square Inch
RHC - Rotation Hand Controller
RI - Rockwell International
RM - Redundancy Management
RMS - Remote Manipulator System
RPC - Remote Power Controller
RTLS - Return to Launch Site
SM - Systems Management
SPA - Servopower Amplifier
SRB - Solid Rocket Booster
SSME - Space Shuttle Main Engine
STS - Space Transportation System
SW - Software
TAL - Transatlantic Abort Landing
TD - Touch Down
THC - Translation Hand Controller
TPK - Thermal Protection Kit
TVC - Thrust Vector Control
WSB - Water Spray Boiler

APPENDIX B

DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

APPENDIX B
DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

B.1 Definitions

Definitions contained in NSTS 22206, Instructions For Preparation of FMEA/CIL, 10 October 1986, were used with the following amplifications and additions.

INTACT ABORT DEFINITIONS:

RTLS - begins at transition to OPS 6 and ends at transition to OPS 9, post-flight

TAL - begins at declaration of the abort and ends at transition to OPS 9, post-flight

AOA - begins at declaration of the abort and ends at transition to OPS 9, post-flight

ATO - begins at declaration of the abort and ends at transition to OPS 9, post-flight

CREDIBLE (CAUSE) - an event that can be predicted or expected in anticipated operational environmental conditions. Excludes an event where multiple failures must first occur to result in environmental extremes

CONTINGENCY CREW PROCEDURES - procedures that are utilized beyond the standard malfunction procedures, pocket checklists, and cue cards

EARLY MISSION TERMINATION - termination of onorbit phase prior to planned end of mission

EFFECTS/RATIONALE - description of the case which generated the highest criticality

HIGHEST CRITICALITY - the highest functional criticality determined in the phase-by-phase analysis

MAJOR MODE (MM) - major sub-mode of software operational sequence (OPS)

MC - Memory Configuration of Primary Avionics Software System (PASS)

MISSION - assigned performance of a specific Orbiter flight with payload/objective accomplishments including orbit phasing and altitude (excludes secondary payloads such as GAS cans, middeck P/L, etc.)

MULTIPLE ORDER FAILURE - describes the failure due to a single cause or event of all units which perform a necessary (critical) function

OFF-NOMINAL CREW PROCEDURES - procedures that are utilized beyond the standard malfunction procedures, pocket checklists, and cue cards

OPS - software operational sequence

PRIMARY MISSION OBJECTIVES - worst case primary mission objectives are equal to mission objectives

PHASE DEFINITIONS:

PRELAUNCH PHASE - begins at launch count-down Orbiter power-up and ends at moding to OPS Major Mode 102 (liftoff)

LIFTOFF MISSION PHASE - begins at SRB ignition (MM 102) and ends at transition out of OPS 1 (Synonymous with ASCENT)

ONORBIT PHASE - begins at transition to OPS 2 or OPS 8 and ends at transition out of OPS 2 or OPS 8

DEORBIT PHASE - begins at transition to OPS Major Mode 301 and ends at first main landing gear touchdown

LANDING/SAFING PHASE - begins at first main gear touchdown and ends with the completion of post-landing safing operations

B.2 IOA Project Level Ground Rules and Assumptions

The philosophy embodied in NSTS 22206, Instructions for Preparation of FMEA/CIL, 10 October 1986, was employed with the following amplifications and additions.

1. The operational flight software is an accurate implementation of the Flight System Software Requirements (FSSRs).

   RATIONALE: Software verification is out-of-scope of this task.

2. After liftoff, any parameter which is monitored by system management (SM) or which drives any part of the Caution and Warning System (C&W) will support passage of Redundancy Screen B for its corresponding hardware item.

   RATIONALE: Analysis of on-board parameter availability and/or the actual monitoring by the crew is beyond the scope of this task.

3. Any data employed with flight software is assumed to be functional for the specific vehicle and specific mission being flown.

   RATIONALE: Mission data verification is out-of-scope of this task.

4. All hardware (including firmware) is manufactured and assembled to the design specifications/drawings.

   RATIONALE: Acceptance and verification testing is designed to detect and identify problems before the item is approved for use.

5. All Flight Data File crew procedures will be assumed performed as written, and will not include human error in their performance.

   RATIONALE: Failures caused by human operational error are out-of-scope of this task.

6. All hardware analyses will, as a minimum, be performed at the level of analysis existent within NASA/Prime Contractor Orbiter FMEA/CILs, and will be permitted to go to greater hardware detail levels but not lesser.

RATIONALE: Comparison of IOA analysis results with other analyses requires that both analyses be performed to a comparable level of detail.

7. Verification that a telemetry parameter is actually monitored during AOS by ground-based personnel is not required.

RATIONALE: Analysis of mission-dependent telemetry availability and/or the actual monitoring of applicable data by ground-based personnel is beyond the scope of this task.

8. The determination of criticalities per phase is based on the worst case effect of a failure for the phase being analyzed. The failure can occur in the phase being analyzed or in any previous phase, whichever produces the worst case effects for the phase of interest.

RATIONALE: Assigning phase criticalities ensures a thorough and complete analysis.

9. Analysis of wire harnesses, cables, and electrical connectors to determine if FMEAs are warranted will not be performed nor FMEAs assessed.

RATIONALE: Analysis was substantially complete prior to NSTS 22206 ground rule redirection.

10. Analysis of welds or brazed joints that cannot be inspected will not be performed nor FMEAs assessed.

RATIONALE: Analysis was substantially complete prior to NSTS 22206 ground rule redirection.

11. Emergency system or hardware will include burst discs and will exclude the EMU Secondary Oxygen Pack (SOP), pressure relief valves and the landing gear pyrotechnics.

RATIONALE: Clarify definition of emergency systems to ensure consistency throughout IOA project.

B.3 RMS-Specific Ground Rules and Assumptions

The IOA analysis was performed to the component or assembly level. The analysis considered the worst case effects of the hardware or functional failure on the subsystem, mission, and crew and vehicle safety.

1. A RMS mission is considered to be uncradling, grappling a berthed payload, unberthing it, deploying it and then retrieving a rotating payload, berthing it and performing MFR operations. Any failure that prevents the completion of any of these tasks is loss of mission (i.e. loss of manual augmented modes).

   RATIONALE: This is the most demanding nominal RMS mission possible. This causes the worst case criticalities for certain failures because they will prevent the completion of this mission. If the mission was simpler, many failures would be a lower criticality.

2. Consistency checking and safing is not considered redundancy for failures that cause uncommanded motion.

   RATIONALE: The consistency check and safing are not redundant for the hardware that when fails causes uncommanded motion. They are also only designed to stop the RMS in 2 feet, which may not prevent collision.

3. A Criticality 1 failure is considered to be any failure that causes uncommanded motion, uncommanded release, uncommanded derigidization, or loss of capability to move a joint or any number of joints. It also includes the loss of the ability to release a payload, and the payload hanging up in the snares.

   RATIONALE: Uncommanded motion in its worst case can cause the loss of vehicle if the arm or payload struck a window or damaged the payload bay doors so they could not close. Uncommanded release could cause the payload to hit the Orbiter, uncommanded derigidization or a payload hanging up in the snares can cause the unrestrained payload on the end effector to swing into the Orbiter. The loss of the ability to move a joint or release a payload would mean the RMS could not be cradled which would prevent the doors from closing.

4. The loss of primary modes will cause loss of mission (Criticality 2) but backup is considered redundancy for release of the payload and cradling the RMS for some failures. Therefore, loss of primary modes is a criticality 2 as long as backup is available.

   RATIONALE: Without primary modes the RMS mission cannot be accomplished. Backup mode does not provide enough redundancy to accomplish the task mentioned in rule 1. Backup does provide some redundancy for failures that cause loss of payload release or loss of joint drive. Therefore, the failures that backup provides redundancy for will be classified as loss of mission.

5. For ascent, entry and aborts, the RMS is assumed to be cradled, latched, and unpowered. Only failures that can occur while the RMS is in this mode are considered for those flight phases.

   RATIONALE: The RMS is designed for use while onorbit. During ascent and entry the RMS is latched and unpowered. No consideration will be given to failures unless they have an effect during ascent and entry.

6. Failure modes are assumed to occur during two arm operations. If a failure can effect two arms, then the worst case result of that effect will determine the criticality.

   RATIONALE: The Orbiter is capable of supporting dual arm operation. If this configuration proves to be the worst case for a particular failure, then that will drive the criticality.

7. Failures of wire harnesses and bundles (structural failures, wire to wire shorts, incorrect attachment) are not considered. Failures of a single wire are covered by considering loss of input or output from a component.

   RATIONALE: The failure of wire harnesses and bundles are not being considered because of the magnitude of possible failures.

APPENDIX C
DETAILED ANALYSIS

This section contains the IOA analysis worksheets generated during the analysis of this subsystem. The information on these worksheets is intentionally similar to the NASA FMEAs. Each of these sheets identifies the hardware item being analyzed, and parent assembly, as well as the function. For each failure mode, the possible causes are outlined, and the assessed hardware and functional criticality for each mission phase is listed, as described in the NSTS 22206, Instructions for Preparation of FMEA and CIL, 10 October 1986. Finally, effects are entered at the bottom of each sheet, and the worst case criticality is entered at the top.

LEGEND FOR IOA ANALYSIS WORKSHEETS

Hardware Criticalities:

- 1 = Loss of life or vehicle
- 2 = Loss of mission or next failure of any redundant item (like or unlike) could cause loss of life/vehicle
- 3 = All others

Functional Criticalities:

- 1R = Redundant hardware items (like or unlike) all of which, if failed, could cause loss of life or vehicle.
- 2R = Redundant hardware items (like or unlike) all of which, if failed, could cause loss of mission.

Redundancy Screen A:

- 1 = Is Checked Out PreFlight
- 2 = Is Capable of Check Out PreFlight
- 3 = Not Capable of Check Out PreFlight
- NA = Not Applicable

Redundancy Screens B and C:

- P = Passed Screen
- F = Failed Screen
- NA = Not Applicable

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/2
MDAC ID: 101 ABORT: /

ITEM: ENTER PUSH BUTTON INDICATOR
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.ENT.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ONCE MODE SWITCH IS MOVED SOFTWARE REMAINS IN IDLE MODE. LOSS OF COMPUTER AUGMENTED MODE WHICH IS LOSS OF MISSION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/86
SUBSYSTEM: RMS
MDAC ID: 102

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/2
ABORT: /

ITEM: ENTER PUSH BUTTON INDICATOR
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.ENT.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT ENTER COMPUTER AUGMENTED MODES WHICH IS LOSS OF MISSION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 103 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) CAPTURE/RELEASE TRIGGER
4) CAPTURE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.CR.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
WILL CAUSE ARM TO LIMP WHEN END EFFECTOR MODE SWITCH MOVED FROM OFF. EE WILL CAPTURE AS SOON AS EE MODE SWITCH IS PLACED IN AUTO. UNCOMMANDED LIMPING CAN CAUSE UNCOMMANDED MOTION. UNCOMMANDED CAPTURE CAN CAUSE SNARE HANGUP.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/86
SUBSYSTEM: RMS
MDAC ID: 104

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) CAPTURE/RELEASE TRIGGER
4) CAPTURE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.CR.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT CAPTURE IN AUTO EE MODE. LOSS OF REDUNDENT CAPABILITY TO CAPTURE. MANUAL MODE IS REDUNANT CAPABILITY TO CAPTURE. ARM WILL NOT LIMP DURING MANUAL CAPTURE EE DAMAGE MAY RESULT IN CRIT 1/1.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 105 ABORT: /

ITEM: 6.2V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) CAPTURE/RELEASE TRIGGER
4) RELEASE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.CR.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
EE WILL RELEASE WHEN EE MODE SWITCH IS PLACED IN MANUAL.
UNCOMMANDED RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/86
SUBSYSTEM: RMS
MDAC ID: 106

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: /

ITEM: 6.2V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) CAPTURE/RELEASE TRIGGER
4) RELEASE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.CR.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT RELEASE PAYLOAD IN MANUAL MODE. LOSS OF REDUNDANT PATH TO RELEASE PAYLOAD. EE AUTO MODE AND BACKUP MODE ARE REDUNDANT TO MANUAL FOR RELEASING PAYLOADS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/1R
MDAC ID: 107 ABORT: /

ITEM: 6.2V CONTACT
FAILURE MODE: OPEN DIODE

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) CAPTURE/RELEASE TRIGGER
4) RELEASE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.CR.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
EE WILL CLOSE WHEN MANUAL OPEN IS COMMANDED. LOSS OF REDUNANT PATH TO RELEASE PAYLOAD. EE AUTO MODE AND B/U MODE ARE REDUNDANT TO MANUAL FOR RELEASING PAYLOAD.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/05/86
SUBSYSTEM: RMS
MDAC ID: 108

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: CAUTION AND WARNING TONE
FAILURE MODE: FAILS ON

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SW.2

CAUSES: BISTABLE OUTPUT FAILS HIGH. TRANSISTER DRIVER COLLECTOR SHORTS TO GROUND.

EFFECTS/RATIONALE:
CONSTANT AUDIO TONE. BISTABLE FAILURE ALSO FAILS MASTER ALARM LIGHT ON.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/05/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 109 ABORT: /

ITEM: CAUTION AND WARNING TONE
FAILURE MODE: FAILS OFF

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SW.2

CAUSES: BISTABLE OUTPUT FAILS LOW. TRANSISTOR DRIVER FAILS OPEN CIRCUIT. LOSS OF 12V POWER SUPPLY.

EFFECTS/RATIONALE:
AUDIO ALARM WILL NOT COME ON. BISTABLE FAILURE ALSO FAILS MASTER ALARM LIGHT OFF.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86
SUBSYSTEM: RMS
MDAC ID: 110

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: MODE LIGHT
FAILURE MODE: FAILS ON

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.MD.3

CAUSES: ELECTRICAL DRIVER FAILS ON.

EFFECTS/RATIONALE:
FAILED LIGHT REMAINS ON WHEN PANEL IS POWERED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 111 ABORT: /

ITEM: MODE LIGHT
FAILURE MODE: FAILS OFF

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.MD.3

CAUSES: ELECTRICAL DRIVER FAILS OFF. BULBS BURN OUT (2).

EFFECTS/RATIONALE:
FAIL LIGHT WILL NOT COME ON.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86
SUBSYSTEM: RMS
MDAC ID: 112

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: BRAKE TALKBACK
FAILURE MODE: FAILS TO "ON"

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.BRK.5

CAUSES: MECHANICAL JAM. ELECTRICAL DRIVER FAILS HIGH.

EFFECTS/RATIONALE:
WRONG INDICATION OF BRAKE STATUS. NO EFFECT ON OPERATIONS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 113 ABORT: /

ITEM: BRAKE TALKBACK
FAILURE MODE: FAILS TO "OFF"

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] . C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.BRK.5

CAUSES: MECHANICAL JAM. ELECTRICAL DRIVER FAILS LOW.

EFFECTS/RATIONALE:
WRONG INDICATION OF BRAKE STATUS. NO EFFECT ON OPERATIONS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/05/86
SUBSYSTEM: RMS
MDAC ID: 114

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: SOFTWARE STOP TALKBACK
FAILURE MODE: FAILS TO BARBERPOLE

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SS.1

CAUSES: MECHANICAL JAM. DRIVER CIRCUIT FAILS HIGH.

EFFECTS/RATIONALE:
TALKBACK REMAINS BARBERPOLE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/05/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 115 ABORT: /

ITEM: SOFTWARE STOP TALKBACK
FAILURE MODE: FAILS TO GRAY

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SS.1

CAUSES: MECHANICAL JAM. DRIVER CIRCUIT FAILS LOW.

EFFECTS/RATIONALE:
TALKBACK REMAINS GRAY.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/05/86
SUBSYSTEM: RMS
MDAC ID: 116

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: CAUTION AND WARNING LIGHTS
FAILURE MODE: FAILS ON

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.CW.1

CAUSES: ELECTRICAL DRIVER FAILS ON.

EFFECTS/RATIONALE:
LIGHT REMAINS ON.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/05/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 117 ABORT: /

ITEM: CAUTION AND WARNING LIGHTS
FAILURE MODE: FAILS OFF

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.CW.1

CAUSES: ELECTRICAL DRIVER FAILS OFF.

EFFECTS/RATIONALE:
LIGHT WILL NOT COME ON.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/05/86
SUBSYSTEM: RMS
MDAC ID: 118

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: SAFING TALKBACK
FAILURE MODE: FAILS TO BARBERPOLE

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SF.7

CAUSES: MECHANICAL JAM. DRIVER CIRCUIT FAILS LOW.

EFFECTS/RATIONALE:
TALKBACK REMAINS BARBERPOLE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/05/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 119 ABORT: /

ITEM: SAFING TALKBACK
FAILURE MODE: FAILS TO GRAY

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SF.7

CAUSES: MECHANICAL JAM. DRIVER CIRCUIT FAILS HIGH.

EFFECTS/RATIONALE:
TALKBACK REMAINS GRAY.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/86
SUBSYSTEM: RMS
MDAC ID: 120

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: EXTENDED
FAILURE MODE: FAILS TO BARBERPOLE

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR TALKBACK
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EET.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
TALKBACK REMAINS BARBERPOLE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 121 ABORT: /

ITEM: EXTENDED
FAILURE MODE: FAILS TO GRAY

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR TALKBACK
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EET.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
TALKBACK REMAINS GRAY.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/86
SUBSYSTEM: RMS
MDAC ID: 122

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: OPEN
FAILURE MODE: FAILS TO BARBERPOLE

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR TALKBACK
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EET.5

CAUSES: MECHANICAL JAM. DRIVER CIRCUIT FAILS LOW.

EFFECTS/RATIONALE:
TALKBACK REMAINS BARBERPOLE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 123 ABORT: /

ITEM: OPEN
FAILURE MODE: FAILS TO GRAY

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR TALKBACK
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EET.5

CAUSES: MECHANICAL JAM. DRIVER CIRCUIT FAILS LOW.

EFFECTS/RATIONALE:
TALKBACK REMAINS GRAY.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/86
SUBSYSTEM: RMS
MDAC ID: 124

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: CLOSED
FAILURE MODE: FAILS TO BARBERPOLE

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR TALKBACK
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EET.4

CAUSES: MECHANICAL JAM. DRIVER CIRCUIT FAILS LOW.

EFFECTS/RATIONALE:
TALKBACK REMAINS BARBERPOLE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 125 ABORT: /

ITEM: CLOSED
FAILURE MODE: FAILS TO GRAY

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR TALKBACK
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EET.4

CAUSES: MECHANICAL JAM. DRIVER CIRCUIT FAILS HIGH.

EFFECTS/RATIONALE:
TALKBACK REMAINS GRAY.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/86
SUBSYSTEM: RMS
MDAC ID: 126

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: CAPTURE
FAILURE MODE: FAILS TO BARBERPOLE

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR TALKBACK
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EET.3

CAUSES: MECHANICAL JAM. DRIVER CIRCUIT FAILS LOW.

EFFECTS/RATIONALE:
TALKBACK REMAINS BARBERPOLE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 127 ABORT: /

ITEM: CAPTURE
FAILURE MODE: FAILS TO GRAY

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR TALKBACK
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EET.3

CAUSES: MECHANICAL JAM. DRIVER CIRCUIT FAILS HIGH.

EFFECTS/RATIONALE:
TALKBACK REMAINS GRAY.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/86
SUBSYSTEM: RMS
MDAC ID: 128

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: DERIGID
FAILURE MODE: FAILS TO BARBERPOLE

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR TALKBACK
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EET.2

CAUSES: MECHANICAL JAM. DRIVER CIRCUIT FAILS LOW.

EFFECTS/RATIONALE:
TALKBACK REMAINS BARBERPOLE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 129 ABORT: /

ITEM: DERIGID
FAILURE MODE: FAILS TO GRAY

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR TALKBACK
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EET.2

CAUSES: MECHANICAL JAM. DRIVER CIRCUIT FAILS HIGH.

EFFECTS/RATIONALE:
TALKBACK REMAINS GRAY.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 130 ABORT: /

ITEM: RIGID
FAILURE MODE: FAILS TO BARBERPOLE

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR TALKBACK
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EET.1

CAUSES: MECHANICAL JAM. DRIVER CIRCUIT FAILS LOW.

EFFECTS/RATIONALE:
TALKBACK REMAINS BARBERPOLE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 131 ABORT: /

ITEM: RIGID
FAILURE MODE: FAILS TO GRAY

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR TALKBACK
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EET.1

CAUSES: MECHANICAL JAM. DRIVER CIRCUIT FAILS HIGH.

EFFECTS/RATIONALE:
TALKBACK REMAINS GRAY.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86
SUBSYSTEM: RMS
MDAC ID: 132

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/2
ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) MODE SWITCH
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.MD.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
WHEN ENTER PBI IS PUSHED, MODE WILL BE ENTERED ACCORDING TO HIEARCHY ASSUMING MODE ENTRY CONDITIONS ARE MET. COULD LOSE EE MODE WHICH IS REQUIRED FOR ROTATING TRACK AND CAPTURE OF DEFINED MISSION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/2
MDAC ID: 133 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) MODE SWITCH
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.MD.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT ENTER FAILED MODE(S). DIRECT MODE LIGHT WILL NOT WORK. COULD USE EE MODE WHICH IS REQUIRED FOR ROTATING TRACK AND CAPTURE OF DEFINED MISSION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 134 ABORT: /

ITEM: 6.2V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MANUAL CONTROL
4) DERIGID POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EMC.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
EE WILL DERIGIDIZE WHEN EE MODE SWITCH IS PLACED IN MANUAL MODE.
UNCOMMANDED DERIGIDIZATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 135 ABORT: /

ITEM: 6.2V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MANUAL CONTROL
4) DERIGID POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EMC.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT DERIGIDIZE EE IN MANUAL MODE. LOSS OF REDUNDANT PATH TO DERIGIDIZATION. EE AUTO MODE IS REDUNDANT PATH TO MANUAL MODE. LOSS OF DERIGIDIZATION IS LOSS OF MISSION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/86
SUBSYSTEM: RMS
MDAC ID: 136

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: /

ITEM: 6.2V CONTACT
FAILURE MODE: OPEN DIODE

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MANUAL CONTROL
4) DERIGID POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EMC.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
EE WILL RIGIDIZE WHEN MANUAL DERIGIDIZATION IS COMMANDED. LOSS OF REDUNDANT PATH TO RIGIDIZATION. EE AUTO MODE IS REDUNDANT PATH TO MANUAL MODE. LOSS DERIGIZATION IS LOSS OF MISSION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 137 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MANUAL CONTROL
4) DERIGID POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EMC.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO EFFECT ON OPERATIONS. DERIGIDIZATION CHECK IS INHIBITED.
RIGIDIZE COMMAND WILL OVERRIDE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/86
SUBSYSTEM: RMS
MDAC ID: 138

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MANUAL CONTROL
4) DERIGID POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EMC.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
UNCOMMANDED DERIGIDIZATION MESSAGE ON MANUAL DERIGIDIZATION. NO EFFECT ON OPERATIONS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 139 ABORT: /

ITEM: 12.4V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MANUAL CONTROL
4) RIGID POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EMC.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
EE WILL RIGIDIZE AS SOON AS EE MODE SWITCH IS PLACED IN MANUAL. LOSS OF REDUNDANT PATH TO OPERATE EE. EE AUTO MOSE IS REDUNDANT PATH TO MANUAL MODE. LOSS OF EE IS LOSS OF MISSION SINCE PAYLOAD CANNOT BE CAPTURED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/86
SUBSYSTEM: RMS
MDAC ID: 140

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: 12.4V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MANUAL CONTROL
4) RIGID POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EMC.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT RIGIDIZE IN MANUAL EE MODE. LOSS OF REDUNDANT PATH TO RIGIDIZATION. EE AUTO MODE IS REDUNDANT PATH TO MANUAL MODE. LOSS OF RIGIDIZATION IS LOSS OF MISSION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 141 ABORT: /

ITEM: 12.4V CONTACT
FAILURE MODE: SHORTED DIODE

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MANUAL CONTROL
4) RIGID POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EMC.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO EFFECT. EE WILL RIGIDIZE FROM 28V AS WELL AS 12 V.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 142 ABORT: /

ITEM: 12.4V CONTACT
FAILURE MODE: OPEN DIODE

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MANUAL CONTROL
4) RIGID POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EMC.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
END EFFECTOR WILL DERIGIDIZE WHEN RIGIDIZATION IS COMMANDED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 143 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MANUAL CONTROL
4) RIGID POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EMC.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
WILL CAUSE ARM TO LIMP IF END EFFECTOR MODE NOT IN OFF.
UNCOMMANDED LIMPING CAN CAUSE UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 144 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MANUAL CONTROL
4) RIGID POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EMC.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ARM WILL NOT LIMP DURING MANUAL RIGIDIZATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/05/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/2
MDAC ID: 145 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SAFING SWITCH
4) SAFE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SF.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
MCIU COMMANDED SAFING ALWAYS PRESENT. DIRECT AND BACKUP MODES ONLY AVAILABLE. DEFINE MISSION CANNOT BE DONE WITH DIRECT AND BACKUP MODES ONLY.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/05/86
SUBSYSTEM: RMS
MDAC ID: 146

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SAFING SWITCH
4) SAFE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SF.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT COMMAND MCIU COMMANDED SAFING. LOSS OF REDUNDANT ABILITY TO STOP ARM WITH SAFING SWITCH IS UNCOMMANDED MOTION. HARDWIRE SAFING STILL WORKS. MCIU COMMANDED AND HARDWIRED SAFING ARE REDUNDANT PATHS OF OPERATOR COMMANDED SAFING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/05/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/1R
MDAC ID: 147 ABORT: /

ITEM: 28V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SAFING SWITCH
4) AUTO POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SF.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO HARDWIRED SAFING FROM SWITCH. LOSS OF REDUNDANT ABILITY TO STOP ARM WITH SAFING SWITCH IS UNCOMMANDED MOTION. MCIU COMMANDED SAFING STILL WORKS. MCIU COMMANDED AND HARDWIRED SAFING ARE REDUNDANT PATHS OF OPERATOR COMMANDED SAFING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/05/86
SUBSYSTEM: RMS
MDAC ID: 148

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/2
ABORT: /

ITEM: 28V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SAFING SWITCH
4) AUTO POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SF.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
HARDWIRE SAFING OCCURS WHEN SAFING SWITCH IN AUTO POSITION. DIRECT AN BACKUP MODES ONLY AVAILABLE. DEFINED MISSION CANNOT BE DONE WITH DIRECT AND BACKUP MODES ONLY.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/05/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 149 ABORT: /

ITEM: 28V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SAFING SWITCH
4) CANCEL POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SF.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO HARDWIRED SAFING FROM SWITCH. MCIU COMMANDED SAFING STILL WORKS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/05/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 150 ABORT: /

ITEM: 28V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SAFING SWITCH
4) CANCEL POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SF.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO EFFECT ON OPERATIONS. ARM WILL HARDWIRE SAFE WHEN SAFING SWITCH IS TAKEN TO CANCEL (TB WILL GO/REMAIN BP). MCIU SAFING WILL STILL BE CANCELLED AND HARDWIRED SAFING WILL BE REMOVED WHEN SWITCH IS RETURNED TO AUTO.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/05/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 151 ABORT: /

ITEM: SAFING SWITCH
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SAFING SWITCH
4) CANCEL POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SF.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
MCIU COMMANDED SAFING IS CANCELLED WITH SAFING SWITCH IN AUTO POSITION. NO EFFECT ON OTHER OPERATIONS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/05/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/2
MDAC ID: 152 ABORT: /

ITEM: SAFING SWITCH
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SAFING SWITCH
4) CANCEL POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SF.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
MCIU COMMANDED SAFING CANNOT BE CANCELLED. MCIU COMMAND SAFING OCCURS EACH TIME MCIU IS TURNED ON. DIRECT AND BACKUP MODES REMAIN. CANNOT COMPLETE DEFINED MISSION WITH DIRECT AND BACKUP ONLY.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/1R
MDAC ID: 153 ABORT: /

ITEM: 28V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) MODE SWITCH
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.MD.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
IN DIRECT MODE ANYTIME BRAKES ARE ON WITH PRIMARY POWER AND ARM SELECTED. LOSS OF REDUNDANT PATH IN ABILITY TO INHIBIT UNCOMMANDED JOINT DRIVE. LIGHT WILL ONLY INDICATE DIRECT MODE WHEN 10V CONTACT IS MADE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86
SUBSYSTEM: RMS
MDAC ID: 154

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: 28V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) MODE SWITCH
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.MD.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT COMMAND IN DIRECT MODE. MODE LIGHT WILL STILL COME ON.
DIRECT MODE IS NOT REQUIRED FOR DEFINED MISSION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 155 ABORT: /

ITEM: RIGIDIZE/DERIGIDIZE CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MODE SWITCH
4) MANUAL POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EEM.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO IMMEDIATE EFFECT. LOSS OF REDUNDANT PATH IN ABILITY TO INHIBIT UNCOMMANDED DERIGID. FAILURE OF MANUAL CONTROL SWITCH BECOMES CRIT 1 FOR UNCOMMANDED DERIGIDIZATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 156 ABORT: /

ITEM: RIGIDIZE/DERIGIDIZE CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MODE SWITCH
4) MANUAL POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EEM.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT RIGIDIZE OR DERIGIDIZE IN MANUAL EE MODE. LOSS OF RIGIDIZATION IS LOSS OF MISSION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 157 ABORT: /

ITEM: RIGIDIZE/DERIGIDIZE CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MODE SWITCH
4) AUTO POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EEM.9

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO IMMEDIATE EFFECT. LOSE ONE REDUNDANT PATH IN ABILITY TO INHIBIT UNCOMMANDED DERIGIDIZATION. FAILURE OF MCIU EE AUTO LOGIC BECOMES CRIT 1 FOR UNCOMMANDED DERIGIZATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 158 ABORT: /

ITEM: RIGIDIZE/DERIGIDIZE CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MODE SWITCH
4) AUTO POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EEM.9

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT RIGIDIZE OR DERIGIDIZE IN AUTO EE MODE. LOSS OF RIGIDIZATION IS LOSS OF MISSION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 159 ABORT: /

ITEM: CAPTURE/RELEASE CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MODE SWITCH
4) AUTO POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EEM.8

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO IMMEDIATE EFFECT. LOSE ONE REDUNDANT PATH IN ABILITY TO INHIBIT UNCOMMANDED CAPTURE OR RELEASE. FAILURE OF MCIU EE AUTO LOGIC BECOMES CRIT 1 FOR UNCOMMANDED RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/1R
MDAC ID: 160 ABORT: /

ITEM: CAPTURE/RELEASE CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MODE SWITCH
4) AUTO POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EEM.8

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT CAPTURE OR RELEASE IN AUTO EE MODE. LOSS OF RELEASE IS CRIT 1.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 161 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MODE SWITCH
4) AUTO POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EEM.7

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO IMMEDIATE EFFECT. LOSE ONE REDUNDANT PATH IN ABILITY TO INHIBIT LIMPING. FAILURE OF CAPTURE TRIGGER BECOMES CRIT 1 FOR UNCOMMANDED LIMPING WHICH IS UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 162 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MODE SWITCH
4) AUTO POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EEM.7

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF EE AUTO MODE. LOSE ONE REDUNDANT PATH OF PAYLOAD RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 163 ABORT: /

ITEM: CAPTURE/RELEASE CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MODE SWITCH
4) MANUAL POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EEM.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO IMMEDIATE EFFECT. LOSE ONE REDUNDANT PATH IN ABLILITY TO INHIBIT UNCOMMANDED CAPTURE/RELEASE. FAILURE OF CAPTURE/RELEASE TRIGGER BECOMES CRIT 1 FOR UNCOMMANDED RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 164 ABORT: /

ITEM: CAPTURE/RELEASE CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MODE SWITCH
4) MANUAL POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EEM.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT CAPTURE OR RELEASE IN MANUAL EE MODE. LOSS OF RELEASE IS CRIT 1.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 165 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MODE SWITCH
4) MANUAL POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EEM.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO IMMEDIATE EFFECT. FAILURE OF THE CAPTURE TRIGGER OR MANUAL CONTROL. SWITCH NOW BECOMES CRIT 1 FOR UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 166 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MODE SWITCH
4) MANUAL POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EEM.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ARM WILL NOT LIMP DURING NORMAL MANUAL EE OPERATIONS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/2R
MDAC ID: 167 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) BRAKE SWITCH
4) ON POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.BRK.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
SOFTWARE ALWAYS SEES BRAKE COMMAND. BRAKES STILL WORKS.
CONSISTENCY CHECK PARAMETERS WILL NOT RESET WHICH MAY CAUSE FALSE
CONSISTENCY CHECK ALARM WHEN BRAKES ARE REMOVED. FALSE
CONSISTENCY CHECKS WOULD CAUSE LOSS OF MISSION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86
SUBSYSTEM: RMS
MDAC ID: 168

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) BRAKE SWITCH
4) ON POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.BRK.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
SOFTWARE NEVER SEES BRAKE COMMAND. BRAKES STILL WORK.
CONSISTENCY CHECK PARAMETERS WILL NOT RESET WHICH MAY CAUSE FALSE
CONSISTENCY CHECK ALARM WHEN BRAKES ARE REMOVED. FALSE
CONSISTENCY CHECKS WOULD CAUSE LOSS OF MISSION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 169 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) BRAKE SWITCH
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.BRK.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
DIRECT LIGHT WILL NOT ILLUMINATE WHEN DIRECT MODE IS SELECTED AND BRAKES ARE ON. DIRECT DRIVE STILL WORKS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 170 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) BRAKE SWITCH
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.BRK.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/2R
MDAC ID: 171 ABORT: /

ITEM: STOP CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) AUTO SEQUENCE SWITCH
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.AS.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
AUTO MODES CANNOT BE ENTERED. IF SEQUENCE IN PROGRESS IT WILL STOP.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 172 ABORT: /

ITEM: STOP CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) AUTO SEQUENCE SWITCH
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.AS.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT STOP ARM WITH AUTO SEQUENCE SWITCH WHICH IS UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 173 ABORT: /

ITEM: PROCEED CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) AUTO SEQUENCE SWITCH
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.AS.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
AUTO MODES CANNOT BE ENTERED. IF IN AUTO MODE WILL PROCEED WITHOUT SWITCH THROW AND WILL NOT STOP AT PAUSE POINTS WHICH IS UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 174 ABORT: /

ITEM: PROCEED CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) AUTO SEQUENCE SWITCH
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.AS.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT PROCEED AUTO MODES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 175 ABORT: /

ITEM: MASTER ALARM PUSH BUTTON INDICATOR
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.MA.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
WOULD NOT RECEIVE MASTER ALARM TONE OR LIGHT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 176 ABORT: /

ITEM: MASTER ALARM PUSH BUTTON INDICATOR
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] . C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.MA.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT CANCEL MASTER ALARM AND TONE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 177 ABORT: /

ITEM: BACKUP CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS SELECT SWITCH
4) STARBOARD POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SEL.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
STARBOARD ARM WILL MOVE WHEN PORT ARM IS COMMANDED IN BACKUP.
PORT EE WILL OPEN WHEN B/U PAYLOAD RELEASE IS COMMANDED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 178 ABORT: /

ITEM: BACKUP CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS SELECT SWITCH
4) STARBOARD POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SEL.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT OPERATE STARBOARD ARM IN BACKUP POWER. LOSS OF REDUNDANT METHOD TO DRIVE JOINT AND RELEASE PAYLOAD. PRIMARY DRIVE FAILURES AND EE FAILURES BECOME CRIT 1.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 179 ABORT: /

ITEM: BACKUP CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS SELECT SWITCH
4) PORT POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SEL.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
PORT ARM WILL MOVE WHEN STARBOARD ARM IS COMMANDED IN BACKUP.
PORT EE WILL OPEN WHEN B/U PAYLOAD RELEASE IS COMMANDED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/86
SUBSYSTEM: RMS
MDAC ID: 180

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /

ITEM: BACKUP CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS SELECT SWITCH
4) PORT POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SEL.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT OPERATE PORT ARM IN BACKUP POWER. LOSS OF REDUNDANT METHOD TO DRIVE JOINT AND RELEASE PAYLOAD. PRIMARY DRIVE FAILURES AND EE FAILURES NOW BECOME CRIT 1.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 181 ABORT: /

ITEM: PRIMARY CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS SELECT SWITCH
4) STARBOARD POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SEL.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
STARBOARD ARM REMAINS POWERED REGARDLESS OF SWITCH POSITION. STARBOARD ARM COULD MOVE WHEN PORT IS COMMANDED. STARBOARD EE WILL ALSO RECEIVE PORT EE COMMANDS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 182 ABORT: /

ITEM: PRIMARY CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS SELECT SWITCH
4) STARBOARD POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SEL.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT OPERATE STARBOARD ARM IN PRIMARY POWER. LOSS OF REDUNDANT METHOD TO DRIVE JOINT AND RELEASE PAYLOAD. DEFINED MISSION CANNOT BE COMPLETED IN BACKUP.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 183 ABORT: /

ITEM: PRIMARY CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS SELECT SWITCH
4) PORT POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SEL.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
PORT ARM REMAINS POWERED REGARDLESS OF SWITCH POSITION. PORT ARM COULD MOVE WHEN STARBOARD IS COMMANDED. PORT EE WILL ALSO RECEIVE STARBOARD EE COMMANDS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/86
SUBSYSTEM: RMS
MDAC ID: 184

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /

ITEM: PRIMARY CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS SELECT SWITCH
4) PORT POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SEL.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT OPERATE PORT ARM IN PRIMARY POWER. LOSS OF REDUNDANT METHOD TO DIRVE JOINT AND RELEASE PAYLOAD. DEFINED MISSION CANNOT BE COMPLETED IN BACKUP.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 185 ABORT: /

ITEM: 12.4V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) CAPTURE/RELEASE TRIGGER
4) CAPTURE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.CR.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
EE WILL CAPTURE AS SOON AS EE MODE SWITCH IS PLACED IN MANUAL.
UNCOMMANDED MOTION CAN CAUSE SNARE HANGUP.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/2R
MDAC ID: 186 ABORT: /

ITEM: 12.4V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) CAPTURE/RELEASE TRIGGER
4) CAPTURE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.CR.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT CAPTURE IN MANUAL EE MODE. LOSS OF REDUNDANT PATH TO CAPTURE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 187 ABORT: /

ITEM: 12.4V CONTACT
FAILURE MODE: OPEN DIODE

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) CAPTURE/RELEASE TRIGGER
4) CAPTURE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.CR.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/86
SUBSYSTEM: RMS
MDAC ID: 188

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: 12.4V CONTACT
FAILURE MODE: SHORTED DIODE

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) CAPTURE/RELEASE TRIGGER
4) CAPTURE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.CR.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT CAPTURE IN MANUAL EE MODE. LOSS OF REDUNDANT PATH TO CAPTURE. END EFFECTOR WILL RELEASE WHEN CAPTURE IS COMMANDED FOR MANUAL EE MODE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/86
SUBSYSTEM: RMS
MDAC ID: 189

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) CAPTURE/RELEASE TRIGGER
4) RELEASE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.CR.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
SNARE WILL OPEN AS SOON AS EE MODE SWITCH IS PLACED IN AUTO.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/12/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/1R
MDAC ID: 190 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) CAPTURE/RELEASE TRIGGER
4) RELEASE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.CR.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT RELEASE EE IN AUTO EE MODE. LOSS OF REDUNDANT CAPABILITY TO RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 191 ABORT: /

ITEM: DC CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS POWER SWITCH
4) BACKUP POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.PWR.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
BDA REMAINS POWERED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 192 ABORT: /

ITEM: DC CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS POWER SWITCH
4) BACKUP POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.PWR.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT DRIVE JOINT(S) IN BACKUP. LOSS OF REDUNDANT CAPABILITY TO DRIVE JOINT. PRIMARY MODE FAILURES BECOME CRIT 1.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 193 ABORT: /

ITEM: AC CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS POWER SWITCH
4) BACKUP POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.PWR.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
BACKUP EDGE LIGHTING REMAINS ON.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 194 ABORT: /

ITEM: AC CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS POWER SWITCH
4) BACKUP POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.PWR.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
BACKUP EDGE LIGHTING WILL NOT WORK.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 195 ABORT: /

ITEM: AC CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS POWER SWITCH
4) PRIMARY CONTACT
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] . B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.PWR.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
PANEL LIGHTING IS ALWAYS POWERED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/2
MDAC ID: 196 ABORT: /

ITEM: AC CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS POWER SWITCH
4) PRIMARY CONTACT
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.PWR.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT RELEASE SHOULDER BRACE WHICH IS LOSS OF MISSION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 197 ABORT: /

ITEM: ENABLE CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) BACKUP DRIVE SWITCH
4) NEGATIVE POSITIVE
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.BD.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF REDUNDANT CAPABILITY TO PREVENT UNCOMMANDED JOINT MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86
SUBSYSTEM: RMS
MDAC ID: 198

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /

ITEM: ENABLE CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) BACKUP DRIVE SWITCH
4) NEGATIVE POSITIVE
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.BD.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT DRIVE ANY JOINT IN NEGATIVE DIRECTION IN BACKUP.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86
SUBSYSTEM: RMS
MDAC ID: 199

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: DC CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS POWER SWITCH
4) PRIMARY POWER
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.PWR.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT REMOVE POWER FROM MCIU OR DC POWER TO PANEL.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86
SUBSYSTEM: RMS
MDAC ID: 200

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /

ITEM: DC CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS POWER SWITCH
4) PRIMARY POWER
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.PWR.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT OPERATE RMS IN PRIMARY POWER. LOSS OF REDUNDANT ABILITY TO DRIVE JOINTS. BACKUP FAILURES BECOME CRIT 1.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86
SUBSYSTEM: RMS
MDAC ID: 201

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: ENABLE CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) BACKUP DRIVE SWITCH
4) POSITIVE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.BD.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF REDUNDANT CAPABILITY TO PREVENT UNCOMMANDED JOINT MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 202 ABORT: /

ITEM: ENABLE CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) BACKUP DRIVE SWITCH
4) POSITIVE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.BD.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT DRIVE ANY JOINT IN POSITIVE DIRECTION IN BACKUP.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 203 ABORT: /

ITEM: 28V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) BACKUP PAYLOAD RELEASE SWITCH
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.BPR.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
SNARES COMMANDED OPEN WHEN BACKUP POWER SELECTED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 204 ABORT: /

ITEM: 28V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) BACKUP PAYLOAD RELEASE SWITCH
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.BPR.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT OPEN SNARES IN BACKUP. LOSS OF REDUNDANT CAPABILITY TO RELEASE PAYLOAD.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 205 ABORT: /

ITEM: COMMAND CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) BACKUP DRIVE SWITCH
4) NEGATIVE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.BD.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF REDUNDANT CAPABILITY TO PREVENT UNCOMMANDED JOINT MOTION. CANNOT DRIVE POSITIVE DIRECTION IN BACKUP MODE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86
SUBSYSTEM: RMS
MDAC ID: 206

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /

ITEM: COMMAND CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) BACKUP DRIVE SWITCH
4) NEGATIVE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.BD.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT DRIVE ANY JOINT IN POSITIVE DIRECTION IN BACKUP.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86
SUBSYSTEM: RMS
MDAC ID: 207

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /

ITEM: COMMAND CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) BACKUP DRIVE SWITCH
4) POSITIVE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.BD.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF REDUNDANT CAPABILITY TO PREVENT UNCOMMANDED JOINT MOTION.
CANNOT DRIVE NEGATIVE DIRECTION IN BACKUP MODE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 208 ABORT: /

ITEM: COMMAND CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) BACKUP DRIVE SWITCH
4) POSITIVE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.BD.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT DRIVE ANY JOINT IN POSITIVE DIRECTION IN BACKUP.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 209 ABORT: /

ITEM: 28V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) BACKUP JOINT SELECT SWITCH
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.BJS.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ONLY JOINT RELATED TO FAILED CONTACT WILL DRIVE IN BACKUP. LOSE REDUNDANT PATH TO DRIVE JOINT. PRIMARY DRIVE FAILURE BECOMES CRIT 1.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 210 ABORT: /

ITEM: 28V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) BACKUP JOINT SELECT SWITCH
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.BJS.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
JOINT RELATED TO FAILED CONTACT WILL NOT DRIVE. LOSE REDUNDANT PATH TO DRIVE JOINT. PRIMARY DRIVE FAILURES BECOME CRIT 1.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 211 ABORT: /

ITEM: DIGITAL DISPLAYS
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.DD.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ELEMENT(S) ALWAYS REMAINS ON WHEN PANEL POWERED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 212 ABORT: /

ITEM: DIGITAL DISPLAYS
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.DD.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ELEMENT(S) DOES NOT DISPLAY.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/1R
MDAC ID: 213 ABORT: /

ITEM: 28V ENABLE CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SINGLE/DIRECT DRIVE SWITCH
4) NEGATIVE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SD.9

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF REDUNDANT CAPABILITY TO PREVENT UNCOMMANDED JOINT MOTION.
NO IMMEDIATE EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/1R
MDAC ID: 214 ABORT: /

ITEM: 28V ENABLE CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SINGLE/DIRECT DRIVE SWITCH
4) NEGATIVE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SD.9

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT DRIVE ANY JOINT IN NEGATIVE DIRECTION IN DIRECT MODE.
LOSS OF REDUNDANT CAPABILITY TO DRIVE JOINT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/1R
MDAC ID: 215 ABORT: /

ITEM: 28V ENABLE CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SINGLE/DIRECT DRIVE SWITCH
4) POSITIVE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SD.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF REDUNDANT CAPABILITY TO PREVENT UNCOMMANDED JOINT MOTION.
NO IMMEDIATE EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/1R
MDAC ID: 216 ABORT: /

ITEM: 28V ENABLE CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SINGLE/DIRECT DRIVE SWITCH
4) POSITIVE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SD.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT DRIVE ANY JOINT IN POSITIVE DIRECTION IN DIRECT MODE.
LOSS OF REDUNDANT CAPABILITY TO DRIVE JOINT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/1R
MDAC ID: 217 ABORT: /

ITEM: 12V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SINGLE/DIRECT DRIVE SWITCH
4) POSITIVE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SD.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF REDUNDANT CAPABILITY TO PREVENT UNCOMMANDED JOINT MOTION.
NO IMMEDIATE EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/1R
MDAC ID: 218 ABORT: /

ITEM: 12V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SINGLE/DIRECT DRIVE SWITCH
4) POSITIVE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SD.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT DRIVE ANY JOINT IN POSITIVE DIRECTION IN DIRECT MODE.
LOSS OF REDUNDANT CAPABILITY TO DRIVE JOINT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 219 ABORT: /

ITEM: 12V CONTACT
FAILURE MODE: OPEN DIODE

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SINGLE/DIRECT DRIVE SWITCH
4) POSITIVE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SD.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/08/86
SUBSYSTEM: RMS
MDAC ID: 220

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: 12V CONTACT
FAILURE MODE: SHORTED DIODE

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SINGLE/DIRECT DRIVE SWITCH
4) POSITIVE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SD.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
JOINT WILL DRIVE IN NEGATIVE DIRECTION WHEN POSITIVE SELECTED, RESULTING IN UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86
SUBSYSTEM: RMS
MDAC ID: 221

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: 6V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SINGLE/DIRECT DRIVE SWITCH
4) NEGATIVE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SD.8

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF REDUNDANT CAPABILITY TO PREVENT UNCOMMANDED JOINT MOTION.
NO IMMEDIATE EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86
SUBSYSTEM: RMS
MDAC ID: 222

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: /

ITEM: 6V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SINGLE/DIRECT DRIVE SWITCH
4) NEGATIVE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SD.8

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT DRIVE ANY JOINT IN NEGATIVE DIRECTION IN DIRECT MODE.
LOSS OF REDUNDANT CAPABILITY TO DRIVE JOINT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 223 ABORT: /

ITEM: 6V CONTACT
FAILURE MODE: OPEN DIODE

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SINGLE/DIRECT DRIVE SWITCH
4) NEGATIVE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SD.8

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
JOINT WILL DRIVE IN POSITIVE DIRECTION WHEN NEGATIVE SELECTED, RESULTING IN UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 224 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SINGLE/DIRECT DRIVE SWITCH
4) NEGATIVE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SD.7

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
SELECTED JOINT WILL DRIVE WITHOUT DEFLECTING SWITCH WHEN IN SINGLE MODE. CANNOT ENTER SINGLE MODE IF NOT IN IT WHEN FAILURE OCCURS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/11/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/1R
MDAC ID: 225 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SINGLE/DIRECT DRIVE SWITCH
4) NEGATIVE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SD.7

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT COMMAND ANY JOINT IN NEGATIVE DIRECTION WHILE IN SINGLE MODE. LOSS OF REDUNDANT CAPABILITY TO DRIVE JOINT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 226 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SINGLE/DIRECT DRIVE SWITCH
4) POSITIVE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SD.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
SELECTED JOINT WILL DRIVE WITHOUT DEFLECTING SWITCH WHEN IN SINGLE MODE. CANNOT ENTER SINGLE MODE IF NOT IN IT WHEN FAILURE OCCURS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/1R
MDAC ID: 227 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SINGLE/DIRECT DRIVE SWITCH
4) POSITIVE POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SD.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT COMMAND ANY JOINT IN POSITIVE DIRECTION WHILE IN SINGLE MODE. LOSS OF REDUNDANT CAPABILITY TO DRIVE JOINT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 228 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) JOINT SELECT SWITCH
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.JS.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
IN SINGLE MODE JOINT WILL DRIVE (AND DATA DISPLAYED ACCORDING TO HIEARCHY). COULD RESULT IN WRONG JOINT BEING DRIVEN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/1R
MDAC ID: 229 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) JOINT SELECT SWITCH
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.JS.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT DRIVE (OR DISPLAY DATA FOR) FAILED JOINT CONTACT. LOSS OF REDUNDANT PATH TO DRIVE JOINT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 230 ABORT: /

ITEM: 12V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) JOINT SELECT SWITCH
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.JS.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
JOINT RELATED TO FAILED CONTACT WILL DRIVE WHEN ANY JOINT IS COMMANDED IN DIRECT MODE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/1R
MDAC ID: 231 ABORT: /

ITEM: 12V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) JOINT SELECT SWITCH
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.JS.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
JOINT RELATED TO FAILED CONTACT WILL NOT DRIVE IN DIRECT MODE.
LOSS OF REDUNDANT CAPABILITY TO DRIVE JOINT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 232 ABORT: /

ITEM: 12V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) PARAMETER SELECT SWITCH
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.PS.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LAMP ON CONTINOUSLY IF ACTIVATED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 233 ABORT: /

ITEM: 12V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) PARAMETER SELECT SWITCH
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.PS.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT DO A LAMP TEST.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 234 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) PARAMETER SELECT SWITCH
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.PS.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
DATA WILL BE DISPLAYED ACCORDING TO HIEARCHY OF CONTACT MADE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 235 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) PARAMETER SELECT SWITCH
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.PS.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT DISPLAY DATA RELATED TO FAILED CONTACT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/86
SUBSYSTEM: RMS
MDAC ID: 236

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: D & C ADDRESS DECODER INPUT LINES
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.AD.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ERRATIC DATA FROM PANEL. ERRATIC DISPLAYS, UNCOMMANDED MOTION OR UNCOMMANDED PAYLOAD RELEASE. SOFTWARE WILL RECEIVE WORDS FROM D & C IN WRONG SLOTS AND TRY TO INTERPRET THEM AS IF THEY WERE IN THE PROPER SLOTS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 237 ABORT: /

ITEM: D & C ADDRESS DECODER INPUT LINES
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.AD.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ERRATIC DATA FROM PANEL. ERRATIC DISPLAYS, UNCOMMANDED MOTION OR UNCOMMANDED PAYLOAD RELEASE. SOFTWARE WILL RECEIVE WORDS FROM D & C IN WRONG SLOTS AND TRY TO INTERPRET THEM AS IF THEY WERE IN THE PROPER SLOTS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 238 ABORT: /

ITEM: D & C ADDRESS DECODER OUTPUT LINES
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.AD.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ERRATIC DATA FROM PANEL. ERRATIC DISPLAYS, UNCOMMANDED MOTION OR UNCOMMANDED PAYLOAD RELEASE. SELECTED D & C RECEIVE WORD WILL BE ORED WITH WORD OF FAILED ADDRESS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/1R
MDAC ID: 239 ABORT: /

ITEM: D & C ADDRESS DECODER OUTPUT LINES
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.AD.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF REDUNDANCY TO SAFE ARM, RELEASE PAYLOAD OR DRIVE JOINT.
FAILED WORD WILL NOT BE RECEIVED FROM PANEL.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 240 ABORT: /

ITEM: D & C ADDRESS DECODER OUTPUT LINES
FAILURE MODE: LOSS OF WORD 0

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.AD.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF EE MODE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 241 ABORT: /

ITEM: D & C INVERTOR NETWORK
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ERRATIC DATA FROM PANEL. UNCOMMANDED MOTION OR UNCOMMANDED PAYLOAD RELEASE. BIT RELATED TO FAILED INVERTOR IS OPPOSITE OF NORMAL STATUS FOR ALL WORDS FROM PANEL.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/18/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 242 ABORT: /

ITEM: D & C INVERTOR NETWORK
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF REDUNDANCY TO SAFE ARM, RELEASE PAYLOAD OR DRIVE JOINT. LOSS OF EE MODE POSSIBLE. BIT RELATED TO FAILED INVERTOR WILL ALWAYS BE A 0 STATE FOR ALL WORDS FROM PANEL.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 243 ABORT: /

ITEM: D & C TEST WORD SELECTOR
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ALL DATA FROM PANEL IS SHIPPED TO SOFTWARE AS FALSE STATE. LOSS OF REDUNDANCY TO SAFE ARM, RELEASE PAYLOAD AND DRIVE JOINT. LOSS OF EE MODE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 244 ABORT: /

ITEM: D & C TEST WORD SELECTOR
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ALL DATA FROM PANEL IS SHIPPED TO SOFTWARE AS FALSE STATE. LOSS OF REDUNDANCY TO SAFE ARM, RELEASE PAYLOAD AND DRIVE JOINT. LOSS OF EE MODE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 245 ABORT: /

ITEM: D & C TEST WORD SELECTOR
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ERRATIC DATA FROM PANEL. UNCOMMANDED MOTION. ASSUMES SIGNAL TO INVERTER STILL GOOD. INPUT WORD TO D & C GETS ORED WITH OUTPUT WORD FROM PANEL RESULTING IN ERRATIC DATA TO SOFTWARE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 246 ABORT: /

ITEM: D & C TEST WORD SELECTOR
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
D & C DATA ALARM. ASSUMES SIGNAL TO INVERTER STILL GOOD.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 247 ABORT: /

ITEM: CLOCK PULSE
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [P] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO DATA IS TRANSFERED TO OR FROM D & C PANEL. LOSS OF REDUNDANCY TO DRIVE JOINT, SAFE ARM AND RELEASE PAYLOAD. D & C TEST WORD CHECK WILL ANNUNCIATE IMMEDIATELY IN TEMP MONITOR MODE OR HIGHER.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 248 ABORT: /

ITEM: STROBE PULSE
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [P] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO DATA IS TRANSFERED TO OR FROM D & C PANEL. LOSS OF REDUNDANCY TO DRIVE JOINT, SAFE ARM AND RELEASE PAYLOAD. LOSS OF EE MODE POSSIBLE. D & C TEST WORD CHECK WILL ANNUNCIATE IMMEDIATELY IN TEMP MONITOR MODE OR HIGHER.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 249 ABORT: /

ITEM: SERIAL TO PARALLEL CONVERTER
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ERRATIC DATA FROM PANEL. ERRATIC DISPLAYS. UNCOMMANDED MOTION OR UNCOMMANDED PAYLOAD RELEASE. SOFTWARE WILL RECEIVE WORDS FROM D & C IN WRONG SLOTS AND TRY TO INTERPRET THEM AS IF THEY WERE IN PROPER SLOTS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 250 ABORT: /

ITEM: SERIAL TO PARALLEL CONVERTER
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ERRATIC DATA FROM PANEL. ERRATIC DISPLAYS. UNCOMMANDED MOTION OR UNCOMMANDED PAYLOAD RELEASE. SOFTWARE WILL RECEIVE WORDS FROM D & C IN WRONG SLOTS AND TRY TO INTERPRET THEM AS IF THEY WERE IN PROPER SLOTS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 251 ABORT: /

ITEM: SERIAL TO PARALLEL CONVERTER
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
DATA RELATED TO FAILED BIT IS ALWAYS DISPLAYED AT TRUE STATE. D & C DATA ALARM.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 252 ABORT: /

ITEM: SERIAL TO PARALLEL CONVERTER
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
DATA RELATED TO FAILED BIT IS ALWAYS DISPLAYED AT FALSE STATE. D & C DATA ALARM.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 253 ABORT: /

ITEM: PARITY GENERATOR
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO EFFECT ON OPERATIONS. D & C DATA ALARM. SOFTWARE WILL CONTINUE TO USE DATA EVEN THOUGH IT FAILS PARITY CHECK.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 254 ABORT: /

ITEM: PARITY GENERATOR
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO EFFECT ON OPERATIONS. D & C DATA ALARM. SOFTWARE WILL CONTINUE TO USE DATA EVEN THOUGH IT FAILS PARITY CHECK.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 255 ABORT: /

ITEM: PARITY GENERATOR
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO EFFECT ON OPERATIONS. D & C DATA ALARM. SOFTWARE WILL CONTINUE TO USE DATA EVEN THOUGH IT FAILS PARITY CHECK.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 256 ABORT: /

ITEM: PARALLEL TO SERIAL CONVERTER
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.7

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
DATA RELATED TO FAILED BIT WILL BE SHIPPED TO SOFTWARE AS TRUE STATE. D & C DATA ALARM. UNCOMMANDED MOTION OR UNCOMMANDED PAYLOAD RELEASE. WILL FAIL TEST WORD CHECK BUT SOFTWARE WILL CONTINUE TO USE DATA FROM PANEL.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 257 ABORT: /

ITEM: PARALLEL TO SERIAL CONVERTER
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [P] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.7

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
DATA RELATED TO FAILED BIT WILL BE SHIPPED TO SOFTWARE AS FALSE STATE. D & C DATA ALARM. LOSS OF REDUNDANCY TO DRIVE JOINT, SAFE ARM OR RELEASE PAYLOAD. LOSS OF EE MODE POSSIBLE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 258 ABORT: /

ITEM: PARALLEL TO SERIAL CONVERTER
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.7

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ALL DATA FROM PANEL IS SHIPPED TO SOFTWARE AS TRUE STATE. UNCOMMANDED CAPTURE IF IN EE AUTO FOR POSSIBLE SNARE HANGUP. D & C ALARM. WILL FAIL TEST WORD CHECK BUT SOFTWARE WILL CONTINUE TO USE DATA FROM PANEL.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/19/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 259 ABORT: /

ITEM: PARALLEL TO SERIAL CONVERTER
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [P] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.7

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ALL DATA FROM PANEL IS SHIPPED TO SOFTWARE AS FASLE STATE. LOSS OF REDUNDANCY TO SAFE ARM, RELEASE PAYLOAD AND DRIVE JOINT. LOSS OF EE MODE. D & C DATA ALARM. WILL FAIL TEST WORD CHECK BUT SOFTWARE WILL CONTINUE TO USE DATA FROM PANEL.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/86
SUBSYSTEM: RMS
MDAC ID: 260

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: INPUT TRANSISTOR DRIVER CIRCUIT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.8

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
DATA RELATED TO FAILED BIT WILL DISPLAY TRUE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/86
SUBSYSTEM: RMS
MDAC ID: 261

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: INPUT TRANSISTOR DRIVER CIRCUIT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.8

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
DATA RELATED TO FAILED BIT WILL DISPLAY FALSE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 262 ABORT: /

ITEM: INPUT TRANSISTOR DRIVER CIRCUIT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.8

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ERRATIC DATA DISPLAYED. DISPLAYS RELATED TO FAILED ADDRESS WILL BE DRIVEN BY ALL DATA WORDS TO PANEL.

REFERENCES:

C 5

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 263 ABORT: /

ITEM: INPUT TRANSISTOR DRIVER CIRCUIT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.8

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
INCORRECT DATA DISPLAYED. DISPLAYS RELATED TO FAILED ADDRESS WILL DISPLAY FALSE STATE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/86
SUBSYSTEM: RMS
MDAC ID: 264

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /

ITEM: OUTPUT TRANSISTOR DRIVER CIRCUIT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.9

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
DATA RELATED TO FAILED BIT IN TWO WORDS (0-1,2-3,ETC.) ALWAYS IS SEEN BY SOFTWARE AS FALSE. LOSS OF REDUNDANCY TO SAFE ARM, RELEASE PAYLOAD, OR DRIVE JOINT. LOSS OF EE MODE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/86
SUBSYSTEM: RMS
MDAC ID: 265

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: OUTPUT TRANSISTOR DRIVER CIRCUIT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.9

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
DATA RELATED TO FAILED BIT IN ALL OUTPUT WORDS ALWAYS SEEN AS TRUE. UNCOMMANDED MOTION OR UNCOMMANDED PAYLOAD RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 266 ABORT: /

ITEM: OUTPUT TRANSISTOR DRIVER CIRCUIT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.9

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ERRATIC DATA FROM PANEL. UNCOMMANDED PAYLOAD RELEASE OR MOTION. WORD RELATED TO FAILED ADDRESS GET ORED WITH OTHER WORDS FROM PANEL.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 267 ABORT: /

ITEM: OUTPUT TRANSISTOR DRIVER CIRCUIT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.9

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF REDUNDANCY TO SAFE ARM, RELEASE PAYLOAD, OR DIRVE JOINT. WORD FROM D & C PANEL RELATED TO FAILED ADDRESS IS SEEN BY SOFTWARE AS ALL 0 - FALSE STATE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/20/86
SUBSYSTEM: RMS
MDAC ID: 268

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: OUTPUT TRANSISTOR DRIVER CIRCUIT
FAILURE MODE: LOSS OF WORD 0

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) DATA BUS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.DB.9

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF EE MODE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/29/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/2
MDAC ID: 269 ABORT: /

ITEM: VERNIER CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) COARSE/VERNIER
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.CV.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT SELECT COARSE RATE MODE. IN A TIME CRITICAL TIMELINE THE SLOWER RATE COULD CAUSE LOSS OF MISSION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/29/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/2
MDAC ID: 270 ABORT: /

ITEM: COARSE CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) COARSE/VERNIER
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.CV.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT SELECT VERNIER RATE MODE. SLOWER RATE CANNOT BE USED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/29/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 271 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RATE HOLD SWITCH
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: ROTATIONAL HAND CONTROLLER
PART NUMBER: DC.SD.RH.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
THE SHORT WOULD CONTINOUSLY ENABLE RATE HOLD. THIS COULD LEAD TO UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/24/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/2R
MDAC ID: 272 ABORT: /

ITEM: LINKAGE
FAILURE MODE: PHYSICAL BINDING, LINKAGE DISCONNECTS

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) HAND CONTROLLERS
3) TRANSLATIONAL HAND CONTROLLER
4) MECHANICAL
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: TRANSLATIONAL HAND CONTROLLER
PART NUMBER: DC.HC.THC.1

CAUSES: PIECE-PART STRUCTURAL FAILURE, LINKAGE BREAKS/SLIPS FOR X-AXIS (FORWARD/BACK) OR Z-AXIS (UP/DOWN) MOTION.

EFFECTS/RATIONALE:
TRANSLATIONAL HAND CONTROLLER LOSES THE ABILITY TO TRANSMIT FORWARD/BACK OR UP/DOWN MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/30/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 273 ABORT: /

ITEM: COMMANDED
FAILURE MODE: FAILS TO OPERATE

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RATE METER
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.RM.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
UPON FAILURE COMMANDED RATES CANNOT BE OBSERVED ON THE METER.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/30/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 274 ABORT: /

ITEM: ACTUAL
FAILURE MODE: FAILS TO OPERATE

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RATE METER
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.RM.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
UPON FAILURE ACTUAL RATES CANNOT BE OBSERVED ON THE METER.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/30/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 275 ABORT: /

ITEM: X10 TALKBACK
FAILURE MODE: FAILS TO OPERATE

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RATE METER
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.RM.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
UPON FAILURE OF THE TALKBACK THE COARSE/VERNIER INDICATION CANNOT BE OBSERVED ON THE CONSOLE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/30/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 276 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SHOULDER BRACE RELEASE
4) SWITCH
5) PORT POSITION
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SB.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
MCIU WILL ALWAYS RECEIVE SHOULDER BRACE RELEASE COMMAND.
SHOULDER BRACE WILL STILL RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/30/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 277 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SHOULDER BRACE RELEASE
4) SWITCH
5) PORT POSITION
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SB.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
MCIU WILL NEVER RECEIVE SHOULDER BRACE RELEASE COMMAND. SHOULDER BRACE WILL STILL RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/30/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/2
MDAC ID: 278 ABORT: /

ITEM: 115V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SHOULDER BRACE RELEASE
4) SWITCH
5) PORT POSITION
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SB.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
SHOULDER BRACE WILL RELEASE AS SOON AS THE PRIMARY POWER IS APPLIED TO THE ARM. SHOULDER BRACE SOLINOID COULD OVERHEAT AND OPEN THE CIRCUIT BREAKER DUE TO CONTINOUS POWER ON IT. LOSS PANEL LIGHTING IS ALSO POSSIBLE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/30/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/2
MDAC ID: 279 ABORT: /

ITEM: 115V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SHOULDER BRACE RELEASE
4) SWITCH
5) PORT POSITION
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SB.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
WILL NOT BE ABLE TO RELEASE SHOULDER BRACE. EVA IS THE ONLY REDUNDANCY FOR RELEASE OF SHOULDER BRACE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/30/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 280 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SHOULDER BRACE RELEASE
4) SWITCH
5) STARBOARD POSITION
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SB.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
MCIU WILL ALWAYS RECEIVE SHOULDER BRACE COMMAND. SHOULDER BRACE WILL STILL RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/30/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 281 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SHOULDER BRACE RELEASE
4) SWITCH
5) STARBOARD POSITION
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SB.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
MCIU WILL NEVER RECEIVE SHOULDER BRACE COMMAND. SHOULDER BRACE WILL STILL RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/30/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/2
MDAC ID: 282 ABORT: /

ITEM: 115V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SHOULDER BRACE RELEASE
4) SWITCH
5) STARBOARD POSITION
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SB.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
SHOULDER BRACE WILL RELEASE AS SOON AS THE PRIMARY IS APPLIED TO THE ARM. SHOULDER BRACE SOLINOID COULD OVERHEAT AND OPEN THE CIRCUIT BREAKER DUE TO CONTINOUS POWER ON IT. LOSS OF PANEL LIGHTING IS ALSO POSSIBLE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/30/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/2
MDAC ID: 283 ABORT: /

ITEM: 115V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SHOULDER BRACE RELEASE
4) SWITCH
5) STARBOARD POSITION
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SB.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
WILL NOT BE ABLE TO RELEASE SHOULDER BRACE. EVA IS ONLY REDUNDANCY FOR RELEASE OF SHOULDER BRACE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/30/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 284 ABORT: /

ITEM: TALKBACK
FAILURE MODE: FAILS TO OPERATE

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SHOULDER BRACE RELEASE
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SB.7

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
TALKBACK FAILURE WILL NOT ALLOW SHOULDER BRACE STATUS TO BE OBSERVED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/01/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 285 ABORT: /

ITEM: K1
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RELAYS
4) PORT
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.RL.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
WILL NOT BE ABLE TO INITIATE AUTO SAFING. WILL NOT BE ABLE TO RIGIDIZE OR DERIGIDIZE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/01/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 286 ABORT: /

ITEM: K1
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RELAYS
4) PORT
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.RL.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/01/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 287 ABORT: /

ITEM: K2
FAILURE MODE: OPEN, DIRECT DRIVE CIRCUIT

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RELAYS
4) PORT
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.RL.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF DIRECT DRIVE CAPABILITY. RETAINS BACKUP DRIVE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/01/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 288 ABORT: /

ITEM: K2
FAILURE MODE: OPEN, CAPTURE CIRCUIT

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RELAYS
4) PORT
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.RL.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL CAPTURE CAPABILITY. LOSE AUTO AND MANUAL RELEASE CAPABILITY. RETAINS BACKUP RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/01/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 289 ABORT: /

ITEM: K2
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RELAYS
4) PORT
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.RL.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/01/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 290 ABORT: /

ITEM: K3
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RELAYS
4) STARBOARD
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.RL.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
WILL NOT BE ABLE TO INITIATE AUTO SAFING. WILL NOT BE ABLE TO RIGIDIZE OR DERIGIZE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/01/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 291 ABORT: /

ITEM: K3
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RELAYS
4) STARBOARD
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.RL.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/01/86
SUBSYSTEM: RMS
MDAC ID: 292

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/2
ABORT: /

ITEM: K4
FAILURE MODE: OPEN, DIRECT DRIVE CIRCUIT

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RELAYS
4) STARBOARD
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.RL.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF DIRECT DRIVE CAPABILITY. RETAINS BACKUP DRIVE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/01/86
SUBSYSTEM: RMS
MDAC ID: 293

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /

ITEM: K4
FAILURE MODE: OPEN, CAPTURE CIRCUIT

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RELAYS
4) STARBOARD
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.RL.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL CAPTURE CAPABILITY. LOSE AUTO AND MANUAL RELEASE CAPABILITY. RETAINS BACKUP RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/01/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 294 ABORT: /

ITEM: K4
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RELAYS
4) STARBOARD
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.RL.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/01/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 295 ABORT: /

ITEM: K6
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RELAYS
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.RL.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
WILL NOT BE ABLE TO INITIATE AUTO SAFING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/01/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/2
MDAC ID: 296 ABORT: /

ITEM: K6
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RELAYS
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.RL.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
PERMANENT SAFING WILL OCCUR.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/2
MDAC ID: 297 ABORT: /

ITEM: 28V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) BRAKE
4) SWITCH
5) ON POSITION
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.BRK.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. RETAIN DIRECT DRIVE AND BACKUP DRIVE CAPABILITY.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/2
MDAC ID: 298 ABORT: /

ITEM: 28V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) BRAKE
4) SWITCH
5) ON POSITION
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.BRK.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF DIRECT DRIVE CAPABILITY. COMPUTER AUGMENTED MODES AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/2
MDAC ID: 299 ABORT: /

ITEM: 28V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) BRAKE
4) SWITCH
5) OFF POSITION
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.BRK.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF DIRECT DRIVE CAPABILITY.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86
SUBSYSTEM: RMS
MDAC ID: 300

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: 28V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) BRAKE
4) SWITCH
5) OFF POSITION
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.BRK.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/24/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 301 ABORT: /

ITEM: LINKAGE
FAILURE MODE: PHYSICAL BINDING, LINKAGE DISCONNECTS

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) HAND CONTROLLERS
3) ROTATIONAL HAND CONTROLLER
4) MECHANICAL
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: ROTATIONAL HAND CONTROLLER
PART NUMBER: DC.HC.RHC.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ROTATIONAL HAND CONTROLLER LOSES THE ABILITY TO TRANSMIT PITCH SIGNALS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 302 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SAFING
4) SWITCH
5) AUTO POSITION
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SF.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 303 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SAFING
4) SWITCH
5) AUTO POSITION
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SF.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86
SUBSYSTEM: RMS
MDAC ID: 304

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: 28V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SAFING
4) SWITCH
5) SAFE POSITION
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SF.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 305 ABORT: /

ITEM: 28V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SAFING
4) SWITCH
5) SAFE POSITION
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SF.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 306 ABORT: /

ITEM: PRIMARY CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS SELECT
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SEL.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 307 ABORT: /

ITEM: PRIMARY CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS SELECT
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SEL.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 308 ABORT: /

ITEM: BACKUP CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS SELECT
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SEL.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 309 ABORT: /

ITEM: BACKUP CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS SELECT
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SEL.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 310 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) CAPTURE/RELEASE
4) DETENT POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.CR.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 311 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) CAPTURE/RELEASE
4) DETENT POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.CR.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 312 ABORT: /

ITEM: 6.2V/12.4V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) CAPTURE/RELEASE
4) DETENT POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.CR.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 313 ABORT: /

ITEM: 6.2V/12.4V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) CAPTURE/RELEASE
4) DETENT POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.CR.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 314 ABORT: /

ITEM: DC CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS POWER
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.PWR.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 315 ABORT: /

ITEM: DC CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS POWER
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.PWR.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 316 ABORT: /

ITEM: AC CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS POWER
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.PWR.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 317 ABORT: /

ITEM: AC CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) RMS POWER
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.PWR.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 318 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SHOULDER BRACE RELEASE
4) SWITCH
5) OFF POSITION
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SB.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 319 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SHOULDER BRACE RELEASE
4) SWITCH
5) OFF POSITION
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SB.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86
SUBSYSTEM: RMS
MDAC ID: 320

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: 28V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SHOULDER BRACE RELEASE
4) SWITCH
5) OFF POSITION
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SB.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 321 ABORT: /

ITEM: 28V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SHOULDER BRACE RELEASE
4) SWITCH
5) OFF POSITION
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SB.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86
SUBSYSTEM: RMS
MDAC ID: 322

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: OFF CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) AUTO SEQUENCE
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.AS.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 323 ABORT: /

ITEM: OFF CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) AUTO SEQUENCE
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.AS.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86
SUBSYSTEM: RMS
MDAC ID: 324

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MODE
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EEM.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 325 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MODE
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EEM.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 326 ABORT: /

ITEM: CAPTURE/RELEASE CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MODE
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EEM.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 327 ABORT: /

ITEM: CAPTURE/RELEASE CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MODE
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EEM.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 328 ABORT: /

ITEM: RIGIDIZE/DERIGIDIZE CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MODE
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EEM.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 329 ABORT: /

ITEM: RIGIDIZE/DERIGIDIZE CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MODE
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EEM.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86
SUBSYSTEM: RMS
MDAC ID: 330

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MANUAL MODE
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EEC.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 331 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MANUAL MODE
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EEC.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86
SUBSYSTEM: RMS
MDAC ID: 332

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: 12/6V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MANUAL MODE
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EMC.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86
SUBSYSTEM: RMS
MDAC ID: 333

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: 12/6V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) END EFFECTOR MANUAL MODE
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.EMC.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 334 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SINGLE/DIRECT DRIVE
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SD.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 335 ABORT: /

ITEM: 10V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SINGLE/DIRECT DRIVE
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SD.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86
SUBSYSTEM: RMS
MDAC ID: 336

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: 6/12V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SINGLE/DIRECT DRIVE
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SD.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86
SUBSYSTEM: RMS
MDAC ID: 337

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: 6/12V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SINGLE/DIRECT DRIVE
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SD.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 338 ABORT: /

ITEM: 28V CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SINGLE/DIRECT DRIVE
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SD.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/02/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 339 ABORT: /

ITEM: 28V CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) SINGLE/DIRECT DRIVE
4) OFF POSITION
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.SD.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO ELECTRICAL CONNECTION. NO EFFECT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/24/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 340 ABORT: /

ITEM: TRANSDUCER
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) HAND CONTROLLERS
3) TRANSLATIONAL HAND CONTROLLER
4) ELECTRICAL
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/.		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: TRANSLATIONAL HAND CONTROLLER
PART NUMBER: DC.HC.THC.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
FAILURE OF TRANSDUCER WILL RESULT IN LOSS OF 1.5 KHZ OUTPUT SIGNAL. THEREFORE LOSS OF TRANSLATIONAL HAND CONTROLLER OPERATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/24/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 341 ABORT: /

ITEM: TRANSDUCER
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) TRANSLATIONAL HAND CONTROLLER
4) ELECTRICAL
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: TRANSLATIONAL HAND CONTROLLER
PART NUMBER: DC.HC.THC.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
FAILURE OF TRANSDUCER WILL RESULT IN LOSS OF 1.5 KHZ OUTPUT SIGNAL. THEREFORE LOSS OF TRANSLATIONAL HAND CONTROLLER OPERATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/24/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 342 ABORT: /

ITEM: TRANSDUCER
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) HAND CONTROLLERS
3) ROTATIONAL HAND CONTROLLER
4) ELECTRICAL
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: ROTATIONAL HAND CONTROLLER
PART NUMBER: DC.HC.RHC.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
FAILURE OF TRANSDUCER WILL RESULT IN LOSS OF 1.5 KHZ OUTPUT SIGNAL. THEREFORE LOSS OF ROTATIONAL HAND CONTROLLER OPERATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/24/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 343 ABORT: /

ITEM: TRANSDUCER
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) HAND CONTROLLERS
3) ROTATIONAL HAND CONTROLLER
4) ELECTRICAL
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: ROTATIONAL HAND CONTROLLER
PART NUMBER: DC.HC.RHC.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
FAILURE OF TRANSDUCER WILL RESULT IN LOSS OF 1.5 KHZ OUTPUT SIGNAL. THEREFORE LOSS OF ROTATIONAL HAND CONTROLLER OPERATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 344 ABORT: /

ITEM: SIGNAL CONDITIONING DEMODULATOR
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) HAND CONTROLLERS
3) ROTATIONAL HAND CONTROLLER
4) ELECTRICAL
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: ROTATIONAL HAND CONTROLLER
PART NUMBER: DC.HC.RHC.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
FAILURE OF SIGNAL CONDITIONING DEMODULATOR WILL RESULT IN LOSS OF DC CONTROL OUTPUT SIGNALS. THEREFORE LOSS OF ROTATIONAL HAND CONTROLLER OPERATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 345 ABORT: /

ITEM: SIGNAL CONDITIONING DEMODULATOR
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) HAND CONTROLLERS
3) ROTATIONAL HAND CONTROLLER
4) ELECTRICAL
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: ROTATIONAL HAND CONTROLLER
PART NUMBER: DC.HC.RHC.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
FAILURE OF SIGNAL CONDITIONING DEMODULATOR WILL RESULT IN LOSS OF DC CONTROL OUTPUT SIGNALS. THEREFORE LOSS OF ROTATIONAL HAND CONTROLLER OPERATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 346 ABORT: /

ITEM: SIGNAL CONDITIONING DEMODULATOR
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) HAND CONTROLLERS
3) ROTATIONAL HAND CONTROLLER
4) ELECTRICAL
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: ROTATIONAL HAND CONTROLLER
PART NUMBER: DC.HC.RHC.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
FAILURE OF SIGNAL CONDITIONING DEMODULATOR WILL RESULT IN LOSS OF DC CONTROL OUTPUT SIGNALS. THEREFORE LOSS OF ROTATIONAL HAND CONTROLLER OPERATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 347 ABORT: /

ITEM: SIGNAL CONDITIONING DEMODULATOR
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) HAND CONTROLLERS
3) TRANSLATIONAL HAND CONTROLLER
4) ELECTRICAL
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: TRANSLATIONAL HAND CONTROLLER
PART NUMBER: DC.HC.THC.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
FAILURE OF SIGNAL CONDITIONING DEMODULATOR WILL RESULT IN LOSS OF DC CONTROL SIGNALS OUTPUT. THEREFORE LOSS OF TRANSLATIONAL HAND CONTROLLER OPERATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 348 ABORT: /

ITEM: SIGNAL CONDITIONING DEMODULATOR
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) HAND CONTROLLERS
3) TRANSLATIONAL HAND CONTROLLER
4) ELECTRICAL
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: TRANSLATIONAL HAND CONTROLLER
PART NUMBER: DC.HC.THC.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
FAILURE OF SIGNAL CONDITIONING DEMODULATOR WILL RESULT IN LOSS OF DC CONTROL SIGNALS OUTPUT. THEREFORE LOSS OF TRANSLATIONAL HAND CONTROLLER OPERATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 349 ABORT: /

ITEM: SIGNAL CONDITIONING DEMODULATOR
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) HAND CONTROLLERS
3) TRANSLATIONAL HAND CONTROLLER
4) ELECTRICAL
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: TRANSLATIONAL HAND CONTROLLER
PART NUMBER: DC.HC.THC.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
FAILURE OF SIGNAL CONDITIONING DEMODULATOR WILL RESULT IN LOSS OF DC CONTROL SIGNALS OUTPUT. THEREFORE LOSS OF TRANSLATIONAL HAND CONTROLLER OPERATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 350 ABORT: /

ITEM: OSCILLATOR
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) HAND CONTROLLERS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.HC.XX.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
FAILURE OF OSCILLATOR WILL RESULT IN LOSS OF 1.5 KHZ SIGNAL TO BOTH HAND CONTROLLERS. THIS RESULTS IN A LOSS OF DC CONTROL SIGNALS FROM BOTH HAND CONTROLLERS. THEREFORE LOSS OF BOTH HAND CONTROLLER OPERATIONS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 351 ABORT: /

ITEM: OSCILLATOR
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) HAND CONTROLLERS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.HC.XX.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
FAILURE OF OSCILLATOR WILL RESULT IN LOSS OF 1.5 KHZ SIGNAL TO BOTH HAND CONTROLLERS. THIS RESULTS IN A LOSS OF DC CONTROL SIGNALS FROM BOTH HAND CONTROLLERS. THEREFORE LOSS OF BOTH HAND CONTROLLER OPERATIONS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 352 ABORT: /

ITEM: OSCILLATOR
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) HAND CONTROLLERS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.HC.XX.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
FAILURE OF OSCILLATOR WILL RESULT IN LOSS OF 1.5 KHZ SIGNAL TO BOTH HAND CONTROLLERS. THIS RESULTS IN A LOSS OF DC CONTROL SIGNALS FROM BOTH HAND CONTROLLERS. THEREFORE LOSS OF BOTH HAND CONTROLLER OPERATIONS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/26/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 353 ABORT: /

ITEM: RHEOSTAT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) LIGHTING
4) PANEL/INSTRUMENT
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.LTG.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
MOVEMENT OF THE RHEOSTAT DOES NOT VARY LIGHTING BRIGHTNESS.
LIGHTING WILL STAY BRIGHT OR OUT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/26/86
SUBSYSTEM: RMS
MDAC ID: 354

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: RHEOSTAT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) LIGHTING
4) PANEL/INSTRUMENT
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.LTG.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
MOVEMENT OF THE RHEOSTAT DOES NOT VARY LIGHTING BRIGHTNESS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/26/86
SUBSYSTEM: RMS
MDAC ID: 355

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: BRIGHT CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) LIGHTING
4) ANNUNCIATOR/NUMERIC SWITCH
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.LTG.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
DISPLAY PANEL IS WASHED OUT DUE TO BRIGHT LIGHTING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/26/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 356 ABORT: /

ITEM: BRIGHT CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) LIGHTING
4) ANNUNCIATOR/NUMERIC SWITCH
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.LTG.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
DISPLAY PANEL IS DARK DUE TO THE INABILITY TO DIM LIGHTING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/26/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 357 ABORT: /

ITEM: VARIABLE CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) LIGHTING
4) ANNUNCIATOR/NUMERIC SWITCH
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.LTG.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
MOVEMENT OF SWITCH FROM VARIABLE SELECTION DOES NOT GIVE BRIGHT SELECTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/26/86
SUBSYSTEM: RMS
MDAC ID: 358

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: VARIABLE CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) LIGHTING
4) ANNUNCIATOR/NUMERIC SWITCH
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.LTG.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
MOVEMENT OF SWITCH TO VARIABLE SELECTION DOES NOT GIVE VARIABLE CONTROL.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/26/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 359 ABORT: /

ITEM: RHEOSTAT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) LIGHTING
4) ANNUNCIATOR/NUMERIC SWITCH
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.LTG.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
MOVEMENT OF THE RHEOSTAT DOES NOT VARY LIGHTING BRIGHTNESS.
LIGHTING WILL STAY BRIGHT OR OUT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/26/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 360 ABORT: /

ITEM: RHEOSTAT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) LIGHTING
4) ANNUNCIATOR/NUMERIC SWITCH
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.LTG.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
MOVEMENT OF THE RHEOSTAT DOES NOT VARY LIGHTING BRIGHTNESS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/29/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 361 ABORT: /

ITEM: RETURN SPRING
FAILURE MODE: STRUCTURAL FAILURE (RUPTURE) SPRING ROTATIONAL HAND CONTROLLER DOES NOT RETURN TO CENTER

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) HAND CONTROLLERS
3) ROTATIONAL HAND CONTROLLER
4) MECHANICAL
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ROTATIONAL HAND CONTROLLER
PART NUMBER: DC.HC.RHC.2

CAUSES: PIECE-PART STRUCTURAL FAILURE, SPRING BREAKS/LOSS OF ELASTICITY

EFFECTS/RATIONALE:
ROTATIONAL HAND CONTROLLER LOSES THE ABILITY TO RETURN BACK TO CENTER, MUST BE MOVED BACK TO CENTER.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/29/86
SUBSYSTEM: RMS
MDAC ID: 362

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: /

ITEM: AUTO CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) HEATERS
4) B SWITCH
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.HTR.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
SHORTED CONTACT WILL RESULT IN THE INABILITY TO TURN B HEATERS OFF. A AND B HEATERS ARE BOTH TURNED ON DURING OPERATIONS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/29/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/2R
MDAC ID: 363 ABORT: /

ITEM: AUTO CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) HEATERS
4) B SWITCH
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.HTR.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
OPEN CONTACT WILL RESULT IN THE INABILITY TO TURN B HEATERS ON. A AND B HEATERS ARE BOTH TURNED ON DURING OPERATIONS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/29/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/2R
MDAC ID: 364 ABORT: /

ITEM: AUTO CONTACT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) HEATERS
4) A SWITCH
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.HTR.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
SHORTED CONTACT WILL RESULT IN THE INABILITY TO TURN A HEATERS OFF. A AND B HEATERS ARE BOTH TURNED ON DURING OPERATIONS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/29/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/2R
MDAC ID: 365 ABORT: /

ITEM: AUTO CONTACT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) HEATERS
4) A SWITCH
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/2R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.HTR.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
OPEN CONTACT WILL RESULT IN THE INABILITY TO TURN A HEATERS ON. A AND B HEATERS ARE BOTH TURNED ON DURING OPERATIONS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/29/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 366 ABORT: /

ITEM: OFF CONTACT
FAILURE MODE: SHORTED, OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) HEATERS
4) A SWITCH
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.HTR.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO EFFECT. NO ELECTRICAL CONNECTION TO OFF CONTACTS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/29/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 367 ABORT: /

ITEM: OFF CONTACT
FAILURE MODE: SHORTED, OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) SWITCHES/DISPLAYS
3) HEATERS
4) B SWITCH
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: DISPLAY AND CONTROL PANEL
PART NUMBER: DC.SD.HTR.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO EFFECT. NO ELECTRICAL CONNECTION TO OFF CONTACTS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 9/25/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 368 ABORT: /

ITEM: RETURN SPRING
FAILURE MODE: STRUCTURAL FAILURE

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) DISPLAYS AND CONTROLS
2) HAND CONTROLLERS
3) TRANSLATIONAL HAND CONTROLLER
4) MECHANICAL
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: TRANSLATIONAL HAND CONTROLLER
PART NUMBER: DC.HC.THC.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
TRANSLATIONAL HAND CONTROLLER MUST ME MOVED BACK TO CENTER.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 401 ABORT: /

ITEM: ENCODER PHOTO DETECTORS
FAILURE MODE: ERRATIC OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) ENCODER
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [N/A] C [N/A]

LOCATION: MCIU
PART NUMBER: ABE.EN.1

CAUSES: CIRCUITRY FAILURE

EFFECTS/RATIONALE:
UNCOMMANDED MOTION DUE TO ERRONEOUS JOINT ANGLE DATA INPUT TO S/W. ONE (OR MORE) OF THE 15 PHOTO SENSORS COULD FAIL, RESULTING IN ERRATIC OUTPUT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 402 ABORT: /

ITEM: ENCODER PHOTO DETECTORS
FAILURE MODE: FAIL OFF

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) ENCODER
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [N/A] C [N/A]

LOCATION: MCIU
PART NUMBER: ABE.EN.2

CAUSES: LOSS OF +5.1V INPUT, CIRCUITRY FAILURE

EFFECTS/RATIONALE:
UNCOMMANDED MOTION DUE TO ERRONEOUS JOINT ANGLE DATA INPUT TO S/W

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 403 ABORT: /

ITEM: ENCODER ROTATING DISK
FAILURE MODE: ERRATIC OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) ENCODER
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [N/A] C [N/A]

LOCATION: MCIU
PART NUMBER: ABE.EN.4

CAUSES: CONTAMINATION OF DISK

EFFECTS/RATIONALE:
UNCOMMANDED MOTION DUE TO ERRONEOUS JOINT ANGLE DATA INPUT TO S/W

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/13/86
SUBSYSTEM: RMS
MDAC ID: 404

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: MOTOR-STATOR
FAILURE MODE: MOTOR FAILS OFF

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MOTOR
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [N/A] C [N/A]

LOCATION: MCIU
PART NUMBER: ABE.MTR.1

CAUSES: SHORT CIRCUIT TO STATOR WINDINGS OR VOLTAGE TOO LOW

EFFECTS/RATIONALE:
UNCOMMANDED PDR MOTION. JOINT MAY BE BACKDRIVEN

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/15/86
SUBSYSTEM: RMS
MDAC ID: 405

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: MOTOR BEARINGS
FAILURE MODE: MOTOR FAILS DUE TO SEIZED BEARINGS

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MOTOR
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [N/A] C [N/A]

LOCATION: MCIU
PART NUMBER: ABE.MTR.2

CAUSES: HIGH FRICTION DUE TO CONTAMINATION, GALLING, LACK OF LUBRICATION

EFFECTS/RATIONALE:
UNCOMMANDED PDR MOTION. JOINT IS FROZEN (i.e., MECHANICAL JAM), JOINT CANNOT BE BACKDRIVEN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/15/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 406 ABORT: /

ITEM: MOTOR SHAFT
FAILURE MODE: MOTOR FAILS DUE TO BROKEN MOTOR SHAFT OR QUILL COUPLER

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MOTOR
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [N/A] C [N/A]

LOCATION: MCIU
PART NUMBER: ABE.MTR.3

CAUSES: FATIGUE

EFFECTS/RATIONALE:
UNCOMMANDED PDR MOTION. JOINT MAY BE BACKDRIVEN. BRAKE IS STILL OPERABLE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/15/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 407 ABORT: /

ITEM: MOTOR SHAFT AND PININON GEAR
FAILURE MODE: MOTOR FAILS DUE TO BROKEN DRIVE SHAFT OR PINION GEAR

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MOTOR
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [N/A] C [N/A]

LOCATION: MCIU
PART NUMBER: ABE.MTR.4

CAUSES: FATIGUE

EFFECTS/RATIONALE:
UNCOMMANDED PDR MOTION. BRAKE WILL NOT HOLD JOINT THEREBY MAKING BACKDRIVE TECHNIQUES QUESTIONABLE. THE ONLY THING HOLDING THE JOINT IS THE FRICTION IN THE GEAR TRAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 408 ABORT: /

ITEM: COMMUTATOR ROTATING DISK
FAILURE MODE: ERRATIC OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) COMMUTATOR
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [N/A] C [N/A]

LOCATION: MCIU
PART NUMBER: ABE.COM.1

CAUSES: CONTAMINATION OF DISK

EFFECTS/RATIONALE:
UNCOMMANDED MOTION AS MOTOR IS NOT ABLE TO RUN PROPERLY. NO B/U COMMUTATOR DISK. LOSS OF JOINT DRIVE BOTH IN PRIMARY AND B/U MODES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 409 ABORT: /

ITEM: COMMUTATOR BUFFER AMPLIFIER ELECTRONICSELECT
FAILURE MODE: NO OUTPUT. ALL THREE CHANNELS FAIL OFF

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) COMMUTATOR
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [N/A] C [N/A]

LOCATION: MCIU
PART NUMBER: ABE.COM.2

CAUSES: LOSS OF 10.0V INPUT RAIL OR CIRCUITRY FAILURE OR LOSS OF GROUND

EFFECTS/RATIONALE:
UNCOMMANDED PDR MOTION. MOTOR IS UNABLE TO RUN OR PROVIDE TORQUE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 410 ABORT: /

ITEM: COMMUTATOR BUFFER AMPLIFIER ELECTRONICSELECT
FAILURE MODE: LOSS OF ONE CHANNEL

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) COMMUTATOR
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: MCIU
PART NUMBER: ABE.COM.2

CAUSES: OP AMP FAILURE

EFFECTS/RATIONALE:
MOTOR WILL OPERATE IN A DEGRADED FASHION DUE TO A REDUCTION IN MOTOR TORQUE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 411 ABORT: /

ITEM: COMMUTATOR LED
FAILURE MODE: NO OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) COMMUTATOR
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [N/A] C [N/A]

LOCATION: MCIU
PART NUMBER: ABE.COM.3

CAUSES: LOSS OF +5.1V INPUT RAIL. BURNED OUT LED. OPEN LEAD. SHORTED LEAD.

EFFECTS/RATIONALE:
UNCOMMANDED MOTION. MOTOR IS UNABLE OT RUN OR PROVIDE TORQUE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 412 ABORT: /

ITEM: COMMUTATOR PHOTO SENSOR
FAILURE MODE: LOSS OF ONE CHANNEL

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) COMMUTATOR
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: MCIU
PART NUMBER: ABE.COM.4

CAUSES: CIRCUITRY FAILURE, OPEN OR SHORTED PHOTO SENSOR

EFFECTS/RATIONALE:
MOTOR WILL OPERATE IN A DEGRADED FASHION DUE TO A REDUCTION IN MOTOR TORQUE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 413 ABORT: /

ITEM: COMMUTATOR PHOTO SENSOR
FAILURE MODE: LOSS OF 2 OR MORE CHANNELS

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) COMMUTATOR
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [N/A] C [N/A]

LOCATION: MCIU
PART NUMBER: ABE.COM.4

CAUSES: CIRCUITRY FAILURE

EFFECTS/RATIONALE:
UNCOMMANDED PDR MOTION. MOTOR IS UNABLE TO RUN OR PROVIDE SUFFICIENT TORQUE FOR OPERATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 414 ABORT: /

ITEM: COMMUTATOR OUTPUT DRIVER
FAILURE MODE: NO OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) COMMUTATOR
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [N/A] C [N/A]

LOCATION: MCIU
PART NUMBER: ABE.COM.5

CAUSES: LOSS OF +10VINPUT RAIL

EFFECTS/RATIONALE:
UNCOMMANDED MOTION. MOTOR IS UNABLE TO RUN OR PROVIDE SUFFICIENT TORQUE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 415 ABORT: /

ITEM: COMMUTATOR OUTPUT DRIVER
FAILURE MODE: LOSS OF ONE CHANNEL

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) COMMUTATOR
3)
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7)
8)
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [N/A] C [N/A]

LOCATION: MCIU
PART NUMBER: ABE.COM.5

CAUSES: CIRCUITRY FAILURE

EFFECTS/RATIONALE:
MOTOR WILL OPERATE IN A DEGRADED FASHION DUE TO REDUCED TORQUE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 416 ABORT: /

ITEM: GEARBOX (G1)
FAILURE MODE: SHAFT FRACTURES

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) GEARBOX
3)
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [N/A] C [N/A]

LOCATION: MCIU
PART NUMBER: ABE.GB.1

CAUSES: FATIGUE

EFFECTS/RATIONALE:
UNCOMMAND PDR MOTION. JOINT IS ESSENTIALLY FAILED UNRESTRAINED (i.e.,) THERE IS SOME FRICTION IN G2 GEAR TRAIN). WON'T ATTEMPT BACKDRIVE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 417 ABORT: /

ITEM: GEARBOX (G1)
FAILURE MODE: GEARBOX JAM

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) GEARBOX
3)
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [N/A] C [N/A]

LOCATION: MCIU
PART NUMBER: ABE.GB.1

CAUSES: BEARING SEIZURE, GEAR FRACTURES, FATIGUE

EFFECTS/RATIONALE:
UNCOMMANDED PDR MOTION. JOINT IS FAILED FROZEN. BACKDRIVE TECHNIQUES WILL NOT WORK.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 418 ABORT: /

ITEM: GEARBOX (G2)
FAILURE MODE: SHAFT FRACTURES

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) GEARBOX
3)
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7)
8)
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [N/A] C [N/A]

LOCATION: MCIU
PART NUMBER: ABE.GB.2

CAUSES: FATIGUE

EFFECTS/RATIONALE:
UNCOMMANDED PDR MOTION. JOINT IS FAILED UNRESTRAINED. WON'T ATTEMPT TO BACKDRIVE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/14/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 419 ABORT: /

ITEM: GEARBOX (G2)
FAILURE MODE: GEARBOX JAMS

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) GEARBOX
3)
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6)
7)
8)
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [N/A] C [N/A]

LOCATION: MCIU
PART NUMBER: ABE.GB.2

CAUSES: BEARING SEIZURE, GEAR FRACTURES, FATIGUE

EFFECTS/RATIONALE:
UNCOMMANDED PDR MOTION. JOINT IS FAILED FROZEN. BACKDRIVE TECHNIQUES WILL NOT WORK.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 420 ABORT: /

ITEM: TACHOMETER ROTOR
FAILURE MODE: NO OUTOUT OR ERRATIC OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) GEARBOX
3)
4)
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7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [N/A] C [N/A]

LOCATION: MCIU
PART NUMBER: ABE.TCH.1

CAUSES: SHORTED ROTOR OR OPEN ROTOR

EFFECTS/RATIONALE:
RUNAWAY. WORST CASE FAILURE. RUNAWAY COULD CAUSE DAMAGE TO ORBITER OR INJURY TO CREW. NOTE: DIRECT DRIVE AND B/U MODE ARE STILL AVAILABLE TO DRIVE THE ARM.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 421 ABORT: /

ITEM: TACHOMETER ROTOR
FAILURE MODE: ERRONEOUS OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) GEARBOX
3)
4)
5)
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7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [N/A] C [N/A]

LOCATION: MCIU
PART NUMBER: ABE.TCH.2

CAUSES: OPEN CIRCUIT OF COIL, LOSS OF EXCITATION TO COIL.

EFFECTS/RATIONALE:
RUNAWAY. WORST CASE FAILURE. RUNAWAY COULD CAUSE DAMAGE TO ORBITER OR INJURY TO CREW. NOTE: DIRECT DRIVE AND B/U MODE ARE STILL AVAILABLE TO DRIVE THE ARM.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 422 ABORT: /

ITEM: COMMUTATOR BITE LOGIC
FAILURE MODE: FAIL ON

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACHOMETER ELECTRONICS
3)
4)
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6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: MCIU
PART NUMBER: ABE.TE.8

CAUSES: BITE CIRCUIT FAILURE

EFFECTS/RATIONALE:
BITE LOGIC INCORRECTLY ANNUNCIATES COMMUTATOR FAILURE. NO B/U BITE LOGIC. BITE DOESN'T INHIBIT JOINT DRIVE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 8/06/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 423 ABORT: /

ITEM: COMMUTATOR BITE LOGIC
FAILURE MODE: FAIL OFF

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACHOMETER ELECTRONICS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: MCIU
PART NUMBER: ABE.TE.8

CAUSES: FAILED BITE CIRCUIT OUTPUT. FAILED 25 KHZ CLOCK SIGNAL.

EFFECTS/RATIONALE:
BITE LOGIC WILL NOT ANNUNCIATE COMMUTATOR FAILURE. NO B/U BITE LOGIC.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/21/86
SUBSYSTEM: RMS
MDAC ID: 424

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: POWER-ON RESET CONTROL
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
3)
4)
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7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.TE.14

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
THE POR RESETS (ZERO'S) THE DATA LATCHES, SHIFT REGISTERS, ETC. (ESSENTIALLY SAFING ON ONE JOINT). THIS COULD CAUSE UNCOMMANDED MOTION OF THE POINT OF RESOLUTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 425 ABORT: /

ITEM: POWER-ON RESET CONTROL
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
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7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.TE.14

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
THE LATCHES, SHIFT REGISTERS, ETC., WOULD NOT BE RESET WHEN THE ARM IS SELECTED. THEREFORE, OLD DATA WOULD STILL BE PRESENT; HOWEVER SINCE MCIU-ABE COMMUNICATIONS OCCURS ONCE EVERY 42 MSEC., THE "OLD" DATA WOULD BE PRESENT FOR ONLY 42 MSEC.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/21/86
SUBSYSTEM: RMS
MDAC ID: 426

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: CONTROLLER, POWER CONDITIONER
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) JPC
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.JPC.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
FAILURES OF THE CONTROLLER WILL HAVE THE SAME RESULT AS CONVERTER FAILURES. FOR EXAMPLE, FAILURE OF THE 30 KHZ TRIANGULAR WAVE GENERATOR CIRCUIT WOULD INHIBIT THE PWM OUTPUT OF THE CONTROLLER WHICH IS REQUIRED FOR CONVERTER OUTPUT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/21/86
SUBSYSTEM: RMS
MDAC ID: 427

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: CONTROLLER, POWER CONDITIONER
FAILURE MODE: ERRONEOUS OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) JPC
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8)
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.JPC.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
SIMILARLY, FAILURE OF THE CURRENT BALANCE COMPARATOR STAGE OR VOLTAGE FEEDBACK COMPARATOR STAGE COULD RESULT IN ERRATIC OUTPUT OF THE CONVERTER OR AN OVERVOLTAGE/UNDERVOLTAGE/OVERCURRENT CONDITION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/21/86
SUBSYSTEM: RMS
MDAC ID: 428

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: CONVERTER, POWER CONDITIONER
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) JPC
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.JPC.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
THE LOSS OF +10V OR +5.1V WILL "SHUTDOWN" THE ENCODER AND THE COMMUNTATOR. LIKEWISE, THE LOSS OF +10V OR +-15V WILL SHUTDOWN THE MDA. THESE FAILURES WILL AFFECT THREE JOINTS CAUSING UNCOMMANDED POR MOTION DUE TO 3 JOINTS STOPPING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/21/86
SUBSYSTEM: RMS
MDAC ID: 429

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: CONVERTER, POWER CONDITIONER
FAILURE MODE: ERRONEOUS OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) JPC
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.JPC.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
FAILURE OF A FULL WAVE RECTIFIER TO A HALF WAVE RECTIFIER COULD CAUSE ERRATIC OUTPUT FROM THE ENCODER, COMMUTATOR, MDA, AND ABE DATA BUS. WORST CASE-UNCOMMANDED POR MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 430 ABORT: /

ITEM: CONVERTER, POWER CONDITIONER
FAILURE MODE: ERRONEOUS OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) JPC
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.JPC.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
AN OVERVOLTAGE/UNDERVOLTAGE OR OVERCURRENT CONDITION WILL BE SENSED IN THE PROTECTOR MODULE AND SHUT DOWN THE JPC. THIS ACTION COULD CAUSE UNCOMMANDED POR MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 431 ABORT: /

ITEM: 28V BITE LOGIC
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
3)
4)
5)
6)
7)
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9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.TE.9

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
THE BITE DOESN'T "DRIVE" ANYTHING WHICH COULD STOP THE ARM.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 432 ABORT: /

ITEM: 28V BITE LOGIC
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.TE.9

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
THE BITE DOESN'T PROVIDE ANY SAFETY FEATURES, THEREFORE ONLY THE ANNUNCIATION (OF A SPA +28V SOURCE BELOW TOLERANCE LEVEL) WILL BE LOST.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/2
MDAC ID: 433 ABORT: /

ITEM: TACH BITE
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.TE.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
THE TACH BITE IS WHAT "DRIVES" AUTO BRAKES. THEREFORE, THE TACH BITE FAILING "ON" WOULD CAUSE THE BRAKES TO BE APPLIED TO ALL SIX JOINTS. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/21/86
SUBSYSTEM: RMS
MDAC ID: 434

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: TACH BITE
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.TE.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
BASED ON OUR GROUND RULES, FAILURE OF ANY BITE "OFF" IS 3/3.
THAT IS, AN ACTUAL TACH FAILURE IS ALREADY A 1/1.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 435 ABORT: /

ITEM: PROTECTOR, POWER CONDITIONER
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) JPC
3)
4)
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7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.JPC.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
A FAILURE WITHIN ANY ONE OF THE THREE PROTECTION CIRCUITS WILL CAUSE THE JPC TO SHUTDOWN. THIS COULD RESULT IN UNCOMMANDED MOTION OF THE POR.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 436 ABORT: /

ITEM: PROTECTOR, POWER CONDITIONER
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) JPC
3)
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8)
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.JPC.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
FAILURE OF THE PROTECTION CIRCUIT TO DETECT A PROBLEM IS IN ITSELF A 3/3. AN ACTUAL FAILURE OF THE JPC, IN CONJUCTION WITH THIS FAILURE, IS REALLY NO WORSE THAN JUST THE ACTUAL JPC FAILURE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 437 ABORT: /

ITEM: PROTECTOR, POWER CONDITIONER
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) JPC
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.JPC.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
THE JPC BITE FLAG DOES NOT "DRIVE" ANYTHING WHICH COULD STOP THE ARM.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 438 ABORT: /

ITEM: PROTECTOR, POWER CONDITIONER
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) JPC
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.JPC.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
THE JPC BITE FLAG DOES NOT "DRIVE" ANYTHING WHICH COULD STOP THE ARM.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 439 ABORT: /

ITEM: SCU
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2)
3)
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6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.SCU.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF FEEDBACK TO THE PLL COULD CAUSE A RUNAWAY/UNCOMMANDED MOTION OF THE POR.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/21/86
SUBSYSTEM: RMS
MDAC ID: 440

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: SCU
FAILURE MODE: ERRONEOUS OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2)
3)
4)
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6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.SCU.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
BIASED FEEDBACK TO PLL COULD CAUSE A RUNAWAY/UNCOMMANDED MOTION OF THE POR IN THE BIASED LOW CASE AND SLUGGISHNESS OF JOINT MOTION (AND POR) IN THE BIASED HIGH CASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 441 ABORT: /

ITEM: POSITION ENCODER DATA PROCESSING
FAILURE MODE: ERRONEOUS OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) ENCODER
3)
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7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.EN.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
UNCOMMANDED MOTION DUE TO ERRONEOUS JOINT ANGLE DATA INPUT TO GPC SOFTWARE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 442 ABORT: /

ITEM: POSITION ENCODER DATA PROCESSING
FAILURE MODE: ERRATIC OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) ENCODER
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.EN.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
UNCOMMANDED MOTION DUE TO ERRONEOUS JOINT ANGLE DATA INPUT TO GPC SOFTWARE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/21/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 443 ABORT: /

ITEM: POSITION ENCODER DATA PROCESSING
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) ENCODER
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.EN.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
UNCOMMANDED MOTION DUE TO ERRONEOUS JOINT ANGLE DATA INPUT TO GPC SOFTWARE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/21/86
SUBSYSTEM: RMS
MDAC ID: 444

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /

ITEM: + 10V
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: ARM
PART NUMBER: ABE.TE.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/21/86
SUBSYSTEM: RMS
MDAC ID: 445

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /

ITEM: + 10V
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: ARM
PART NUMBER: ABE.TE.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 446 ABORT: /

ITEM: + 28V
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F] .

LOCATION: ARM
PART NUMBER: ABE.TE.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
SETS POWER FAIL BIT. LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 447 ABORT: /

ITEM: + 28V
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: ARM
PART NUMBER: ABE.TE.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
SETS POWER FAIL BIT. LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 448 ABORT: /

ITEM: D/A CONVERTER
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.TE.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
JOINT WILL MOVE AT AN ERRATIC SPEED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86
SUBSYSTEM: RMS
MDAC ID: 449

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /

ITEM: D/A CONVERTER
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
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4)
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6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.TE.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86
SUBSYSTEM: RMS
MDAC ID: 450

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: ENCODER FEEDBACK
FAILURE MODE: ERRONEOUS OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.TE.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
POSSIBLE UNCOMMANDED MOTION. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86
SUBSYSTEM: RMS
MDAC ID: 451

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /

ITEM: ENCODER FEEDBACK
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
3)
4)
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6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.TE.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86
SUBSYSTEM: RMS
MDAC ID: 452

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: I/P CLOCK OR SYNCH SIGNAL
FAILURE MODE: ERRONEOUS OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.TE.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
POSSIBLE UNCOMMANDED MOTION. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 453 ABORT: /

ITEM: I/P CLOCK OR SYNCH SIGNAL
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.TE.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86
SUBSYSTEM: RMS
MDAC ID: 454

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: O/P CLOCK OR SYNCH SIGNAL
FAILURE MODE: ERRONEOUS OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.TE.7

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
POSSIBLE UNCOMMANDED MOTION. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 455 ABORT: /

ITEM: O/P CLOCK OR SYNCH SIGNAL
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
3)
4)
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7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.TE.7

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 456 ABORT: /

ITEM: 3.2 MHZ OSC
FAILURE MODE: ERRONEOUS OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.TE.10

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
POSSIBLE UNCOMMANDED MOTION. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 457 ABORT: /

ITEM: 3.2 MHZ OSC
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.TE.10

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86
SUBSYSTEM: RMS
MDAC ID: 458

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: SHIFT REGISTERS
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
3)
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7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] . C [NA]

LOCATION: ARM
PART NUMBER: ABE.TE.11

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
POSSIBLE UNCOMMANDED MOTION. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 459 ABORT: /

ITEM: SHIFT REGISTERS
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
3)
4)
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6)
7)
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.TE.11

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 460 ABORT: /

ITEM: DIGITAL F/B (ENCODER)
FAILURE MODE: ERRONEOUS OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
3)
4)
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6)
7)
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.TE.12

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
POSSIBLE UNCOMMANDED MOTION. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 461 ABORT: /

ITEM: DIGITAL F/B (ENCODER)
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.TE.12

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 462 ABORT: /

ITEM: ANALOG F/B (COMMUTATOR)
FAILURE MODE: ERRONEOUS OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
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7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.TE.13

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
POSSIBLE UNCOMMANDED MOTION. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 463 ABORT: /

ITEM: ANALOG F/B (COMMUTATOR)
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) TACH ELECTRONICS
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4)
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6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.TE.13

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86
SUBSYSTEM: RMS
MDAC ID: 464

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /

ITEM: + 10V
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
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4)
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7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.MDA.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 465 ABORT: /

ITEM: + 28V
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.MDA.13

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
WILL NOT ALLOW BRAKES TO BE RELEASED. LOSS OF ALL COMPUTER AUGMENTED MODES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86
SUBSYSTEM: RMS
MDAC ID: 466

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /

ITEM: + 5.1V
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
3)
4)
5)
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9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.MDA.16

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 467 ABORT: /

ITEM: - 15V
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.MDA.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86
SUBSYSTEM: RMS
MDAC ID: 468

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /

ITEM: + 15V
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
3)
4)
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7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.MDA.8

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/23/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 469 ABORT: /

ITEM: MDA INHIB
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.MDA.15

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
WILL NOT BE ABLE TO DRIVE JOINT. LOSS OF ALL COMPUTER AUGMENTED MODES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/23/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 470 ABORT: /

ITEM: MDA INHIB
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.MDA.15

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CONSTANT "BRAKES OFF" SIGNAL TO SCU.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/23/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 471 ABORT: /

ITEM: MTR TRANSFER RELAY
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.MDA.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. BACKUP IS ONLY REMAINING MODE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/23/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/2
MDAC ID: 472 ABORT: /

ITEM: MTR TRANSFER RELAY
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.MDA.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF BACKUP MODE. ALL OTHERS REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/24/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 473 ABORT: /

ITEM: PWM GENERATOR
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.MDA.11

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/24/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 474 ABORT: /

ITEM: PWM SWITCH DRIVERS
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
3)
4)
5)
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7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.MDA.9

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/24/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 475 ABORT: /

ITEM: COMMUTATOR I/P SIGNAL
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.MDA.9

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/24/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 476 ABORT: /

ITEM: DIR/ B/U /BRAKE SWITCHING LOGIC
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.MDA.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF BRAKES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/24/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 477 ABORT: /

ITEM: DIR/ B/U /BRAKE SWITCHING LOGIC
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.MDA.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF DIRECT MODE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/24/86
SUBSYSTEM: RMS
MDAC ID: 478

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/2
ABORT: /

ITEM: MDA BITE LOGIC
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.MDA.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
POSSIBLE ERRONEOUS CONSISTANCY CHECK MESSAGES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/24/86
SUBSYSTEM: RMS
MDAC ID: 479

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: MDA BITE LOGIC
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA] .

LOCATION: ARM
PART NUMBER: ABE.MDA.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
FAILS TO ANNUNCIATE OVERCURRENT CONDITION IN CURRENT LIMIT CIRCUIT. POSSIBLE UNEXPECTED JOINT SPEED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86
SUBSYSTEM: RMS
MDAC ID: 480

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: MTR CURRENT SENSE RESISTOR
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.MDA.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
POSSIBLE UNCOMMANDED MOTION. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 481 ABORT: /

ITEM: MTR CURRENT SENSE RESISTOR
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
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5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.MDA.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
POSSIBLE UNCOMMANDED MOTION. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86
SUBSYSTEM: RMS
MDAC ID: 482

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: POWER "ON" RESET
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.MDA.10

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
POSSIBLE UNCOMMANDED MOTION. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 483 ABORT: /

ITEM: POWER "ON" RESET
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
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7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.MDA.10

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
POSSIBLE UNCOMMANDED MOTION. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86
SUBSYSTEM: RMS
MDAC ID: 484

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: CURRENT LIMITER
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
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7)
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9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.MDA.12

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
POSSIBLE UNCOMMANDED MOTION. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 485 ABORT: /

ITEM: CURRENT LIMITER
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
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7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.MDA.12

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
POSSIBLE UNCOMMANDED MOTION. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86
SUBSYSTEM: RMS
MDAC ID: 486

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: MTR TRANSFER RELAY
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) BDA
3)
4)
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7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.BDA.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF DIRECT MODE. ARM WILL HAVE UNCOMMANDED MOTION. ARM WILL MOVE AS SOON AS JOINT IS SELECTED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 487 ABORT: /

ITEM: MTR TRANSFER RELAY
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) BDA
3)
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6)
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8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.BDA.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL MODES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 488 ABORT: /

ITEM: PWM
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) BDA
3)
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7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.BDA.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
POSSIBLE UNCOMMANDED MOTION.

REFERENCES:

C-5

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 489 ABORT: /

ITEM: PWM
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) BDA
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.BDA.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF JOINT. ALL OTHER MODES REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 490 ABORT: /

ITEM: PWM SWITCH ELECTRONICS
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) BDA
3)
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7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.BDA.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
POSSIBLE UNCOMMANDED MOTION. ALL OTHER MODES REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 491 ABORT: /

ITEM: PWM SWITCH ELECTRONICS
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) BDA
3)
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5)
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7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.BDA.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF JOINT. ALL OTHER MODES REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 492 ABORT: /

ITEM: + 28V
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) BDA
3)
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5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.BDA.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF JOINT. ALL OTHER MODES REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 493 ABORT: /

ITEM: BDA PWR CONDITIONER
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) BDA
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7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.BDA.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
POSSIBLE UNCOMMANDED MOTION. ALL OTHER MODES REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 494 ABORT: /

ITEM: BDA PWR CONDITIONER
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) BDA
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.BDA.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF JOINT. ALL OTHER MODES REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 495 ABORT: /

ITEM: ANALOG PROCESSOR
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) BDA
3)
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5)
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7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.BDA.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
POSSIBLE UNCOMMANDED MOTION. ALL OTHER MODES REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86
SUBSYSTEM: RMS
MDAC ID: 496

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: ANALOG PROCESSOR
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) BDA
3)
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7)
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9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.BDA.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF JOINT. ALL OTHER MODES REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 497 ABORT: /

ITEM: POWER SIGNAL CONDITIONER
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) BDA
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.BDA.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
POSSIBLE UNCOMMMANDED MOTION. ALL OTHER MODES REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 498 ABORT: /

ITEM: POWER SIGNAL CONDITIONER
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) BDA
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.BDA.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF JOINT. ALL OTHER MODES REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 499 ABORT: /

ITEM: B/U COMMUTATOR
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.BCM

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF JOINT. ALL OTHER MODES REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86
SUBSYSTEM: RMS
MDAC ID: 500

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: ELECTRICAL
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) BRAKE
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.BRK.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT PUT BRAKES ON.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 501 ABORT: /

ITEM: ELECTRICAL
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) BRAKE
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.BRK.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT TAKE BRAKES OFF. LOSS OF ALL COMPUTER AUGMENTED MODES.
DIRECT DRIVE REMAINS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86
SUBSYSTEM: RMS
MDAC ID: 502

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: MECHANICAL
FAILURE MODE: FAILS TO CLOSE

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) BRAKE
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.BRK.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF BRAKES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 503 ABORT: /

ITEM: MECHANICAL
FAILURE MODE: FAILS TO OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) BRAKE
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.BRK.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
BRAKES CANNOT OPEN. LOSS OF ALL COMPUTER AUGMENTED MODE. DIRECT DRIVE REMAINS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86
SUBSYSTEM: RMS
MDAC ID: 504

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: FWD/BACKDRIVE FLAG
FAILURE MODE: SHORTED

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.MDA.14

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CONSISTANCY CHECK IS DISABLED. WILL HAVE NO EFFECT AS LONG AS EVERYTHING ELSE WORKS CORRECTLY.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 505 ABORT: /

ITEM: FWD/BACKDRIVE FLAG
FAILURE MODE: OPEN

LEAD ANALYST: R. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) ARM BASED ELECTRONICS
2) MDA
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: ABE.MDA.14

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CONSISTANCY CHECK IS ENABLED. WILL GET FALSE CONSISTANCY CHECKS IF JOINT IS BACKDRIVEN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 601 ABORT: /

ITEM: 16 CHANNEL ANALOG MULTIPLEXOR (3)
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MADC
3)
4)
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6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.AD.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
MULTIPLEXOR WILL OUTPUT ERRONEOUS RHC AND THC COMMANDS. LOSS OF RHC AND THC CAPABILITIES OR POSSIBLE UNCOMMANDED MOTION. ERRONEOUS TEMPERATURE DATA COULD BE DISPLAYED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 602 ABORT: /

ITEM: 16 CHANNEL ANALOG MULTIPLEXOR (3)
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MADC
3)
4)
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6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.AD.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
MULTIPLEXOR WILL NOT OUTPUT RHC AND THC COMMANDS. LOSS OF RHC AND THC CAPABILITIES. ALSO NO TEMPERATURE DATA WILL BE DISPLAYED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86
SUBSYSTEM: RMS
MDAC ID: 603

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: BINARY COUNTERS (2)
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MADC
3)
4)
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6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.AD.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
COUNTER WILL OUTPUT ERRONEOUS DATA. LOSS OF RHC AND THC CAPABILITIES OR POSSIBLE UNCOMMANDED MOTION. ERRONEOUS TEMPERATURE DATA COULD BE DISPLAYED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 604 ABORT: /

ITEM: BINARY COUNTERS (2)
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MADC
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.AD.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
COUNTER WILL NOT OUTPUT DATA. LOSS OF RHC AND THC CAPABILITIES. ALSO NO TEMPERATURE DATA WILL BE DISPLAYED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86
SUBSYSTEM: RMS
MDAC ID: 605

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: SAMPLE AND HOLD GATED OP AMP
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MADC
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7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.AD.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
AMP WILL OUTPUT ERRONEOUS RHC AND THC COMMANDS. LOSS OF RHC AND THC CAPABILITIES OR POSSIBLE UNCOMMANDED MOTION. ERRONEOUS TEMPERATURE DATA COULD BE DISPLAYED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 606 ABORT: /

ITEM: SAMPLE AND HOLD GATED OP AMP
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MADC
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.AD.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
AMP WILL NOT OUTPUT RHC AND THC COMMANDS. LOSS OF RHC AND THC CAPABILITIES. ALSO NO TEMPERATURE DATA WILL BE DISPLAYED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86
SUBSYSTEM: RMS
MDAC ID: 607

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: VOLTAGE COMPARATOR
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MADC
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.AD.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
COMPARATOR OUTPUTS ERRONEOUS CURRENT. LOSS OF RHC AND THC CAPABILITIES OR POSSIBLE UNCOMMANDED MOTION. ERRONEOUS TEMPERATURE DATA COULD BE DISPLAYED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 608 ABORT: /

ITEM: VOLTAGE COMPARATOR
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MADC
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.AD.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
COMPARATOR WILL NOT OUTPUT ANY CURRENT. LOSS OF RHC AND THC CAPABILITIES. ALSO NO TEMPERATURE DATA WILL BE DISPLAYED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 609 ABORT: /

ITEM: ANALOG TO DIGITAL CONVERTER
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MADC
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.AD.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
AD CONVERTER WILL OUTPUT ERRONEOUS RHC AND THC COMMANDS. LOSS OF RHC AND THC CAPABILITIES OR UNCOMMANDED MOTION. ERRONEOUS TEMPERATURE DATA COULD BE DISPLAYED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 610 ABORT: /

ITEM: ANALOG TO DIGITAL CONVERTER
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MADC
3)
4)
5)
6)
7)
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9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.AD.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
AD CONVERTER WILL NOT OUTPUT RHC AND THC COMMANDS. LOSS OF RHC AND THC CAPABILITIES. ALSO NO TEMPERATURE DATA WILL BE DISPLAYED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 611 ABORT: /

ITEM: QUAD 3-STATE R/S LATCHES (2)
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MADC
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.AD.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LATCH WILL OUTPUT ERRONEOUS RHC AND THC COMMANDS. LOSS OF RHC AND THC CAPABILITIES OR UNCOMMANDED MOTION. ERRONEOUS TEMPERATURE DATA COULD BE DISPLAYED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 612 ABORT: /

ITEM: QUAD 3-STATE R/S LATCHES (2)
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MADC
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5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.AD.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LATCH WILL NOT OUTPUT RHC AND THC COMMANDS. LOSS OF RHC AND THC CAPABILITIES. ALSO NO TEMPERATURE DATA WILL BE DISPLAYED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 613 ABORT: /

ITEM: MULTIWINDING OUTPUT TRANSFORMER
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MCPC
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.PC.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITY. LOSS OF MANUAL SAFING. POSSIBLE UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 614 ABORT: /

ITEM: MULTIWINDING OUTPUT TRANSFORMER
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MCPC
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.PC.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITY. LOSS OF MANUAL SAFING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 615 ABORT: /

ITEM: 2-PHASE PWM
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MCPC
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.PC.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITY. LOSS OF MANUAL SAFING AND POSSIBLE UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 616 ABORT: /

ITEM: 2-PHASE PWM
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MCPC
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.PC.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITY. LOSS OF MANUAL SAFING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 617 ABORT: /

ITEM: POWER SWITCHING TRANSISTORS
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MCPC
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.PC.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITY. LOSS OF MANUAL SAFING. POSSIBLE UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 618 ABORT: /

ITEM: POWER SWITCHING TRANSISTORS
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MCPC
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.PC.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF EE CAPABILITY.
LOSS OF MANUAL SAFING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 619 ABORT: /

ITEM: 30-KHZ TRIANGULAR WAVE GENERATOR
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MCPC
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.PC.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITY. LOSS OF MANUAL SAFING. POSSIBLE UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 620 ABORT: /

ITEM: 30-KHZ TRIANGULAR WAVE GENERATOR
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MCPC
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.PC.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE .
CAPABILITY. LOSS OF MANUAL SAFING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 621 ABORT: /

ITEM: DIFFERENTIAL AMPLIFIER PWM ADJUSTER
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MCPC
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.PC.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITY. LOSS OF MANUAL SAFING. POSSIBLE UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 622 ABORT: /

ITEM: DIFFERENTIAL AMPLIFIER PWM ADJUSTER
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MCPC
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.PC.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITY. LOSS OF MANUAL SAFING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86
SUBSYSTEM: RMS
MDAC ID: 623

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: OP AMP, 30 KHZ TRIANGULAR WAVE WIDTH ADJUSTER
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MCPC
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.PC.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITY. LOSS OF MANUAL SAFING. POSSIBLE UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86
SUBSYSTEM: RMS
MDAC ID: 624

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /

ITEM: OP AMP, 30 KHZ TRIANGULAR WAVE WIDTH ADJUSTER
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MCPC
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.PC.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITY. LOSS OF MANUAL SAFING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 625 ABORT: /

ITEM: RECTIFIER MODULES
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MCPC
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.PC.7

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITY. LOSS OF MANUAL SAFING. POSSIBLE UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/07/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 626 ABORT: /

ITEM: RECTIFIER MODULES
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MCPC
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.PC.7

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITY. LOSS OF MANUAL SAFING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 627 ABORT: /

ITEM: MIA
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) COMPUTER INTERFACE BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.CI.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. POSSIBLE UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 628 ABORT: /

ITEM: MIA
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) COMPUTER INTERFACE BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.CI.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 629 ABORT: /

ITEM: CLOCK DIVIDER CIRCUIT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) COMPUTER INTERFACE BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [.F]

LOCATION: MCIU
PART NUMBER: MCU.CI.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. POSSIBLE UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 630 ABORT: /

ITEM: CLOCK DIVIDER CIRCUIT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) COMPUTER INTERFACE BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.CI.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 631 ABORT: /

ITEM: 16 MHZ CRYSTAL OSCILLATOR
FAILURE MODE: ERRONEOUS OUTPUT

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) COMPUTER INTERFACE BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.CI.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. POSSIBLE UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 632 ABORT: /

ITEM: 16 MHZ CRYSTAL OSCILLATOR
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) COMPUTER INTERFACE BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.CI.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 633 ABORT: /

ITEM: O/P PARALLEL TO SERIAL SHIFT REGISTER (3)
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) COMPUTER INTERFACE BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.CI.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF DISPLAY AND CONTROL AND HAND CONTROLLER DATA INTO THE MIA. LOSS OF ALL COMPUTER AUGMENTED MODES. POSSIBLE UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 634 ABORT: /

ITEM: O/P PARALLEL TO SERIAL SHIFT REGISTER (3)
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) COMPUTER INTERFACE BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.CI.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF DISPLAY AND CONTROL AND HAND CONTROLLER DATA INTO THE MIA. LOSS OF ALL COMPUTER AUGMENTED MODES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 635 ABORT: /

ITEM: I/P SERIAL TO PARALLEL SHIFT REGISTER
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) COMPUTER INTERFACE BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.CI.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF DISPLAY AND CONTROL AND HAND CONTROLLER DATA OUT OF THE MIA. LOSS OF ALL COMPUTER AUGMENTED MODES. POSSIBLE UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 636 ABORT: /

ITEM: I/P SERIAL TO PARALLEL SHIFT REGISTER
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) COMPUTER INTERFACE BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.CI.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS DISPLAY AND CONTROL AND HAND CONTROLLER DATA OUT OF THE MIA.
LOSS OF ALL COMPUTER AUGMENTED MODES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 637 ABORT: /

ITEM: TRANSMIT TIMING CONTROL
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) COMPUTER INTERFACE BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.CI.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ERRONEOUS TDA SIGNAL WILL REACH THE MIA WHICH PREVENTS DATA FROM BEING SENT TO THE GPC. LOSS OF ALL COMPUTER AUGMENTED MODES. POSSIBLE UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/08/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 638 ABORT: /

ITEM: TRANSMIT TIMING CONTROL
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) COMPUTER INTERFACE BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.CI.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
TDA SIGNAL WILL NOT REACH THE MIA WHICH PREVENTS DATA FROM BEING SENT TO THE GPC. LOSS OF ALL COMPUTER AUGMENTED MODES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/09/96 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 639 ABORT: /

ITEM: RECEIVE TIMING CONTROL
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) COMPUTER INTERFACE BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.CI.7

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
PREVENTS GPC/MCIU COMMUNICATION. LOSS OF ALL COMPUTER AUGMENTED MODES. POSSIBLE UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/09/96 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 640 ABORT: /

ITEM: RECEIVE TIMING CONTROL
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) COMPUTER INTERFACE BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.CI.7

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
PREVENTS GPC/MCIU COMMUNICATION. LOSS OF ALL COMPUTER AUGMENTED MODES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/09/96 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 641 ABORT: /

ITEM: BRAKE STATUS OPTO ISOLATOR
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) FAILURE DETECTION BOARD
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7)
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.FD.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL SAFING CAPABILITY. LOSS OF AUTO BRAKING. LOSS OF CAPTURE/RELEASE CAPABILITY. POSSIBLE UNCOMMANDED MOTION. LOSS OF ALL COMPUTER AUGMENTED MODES. DIRECT AND BACKUP CAPABILITY REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/09/96 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 642 ABORT: /

ITEM: BRAKE STATUS OPTO ISOLATOR
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) FAILURE DETECTION BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.FD.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. DIRECT AND BACKUP CAPABILITY REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/09/96 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 643 ABORT: /

ITEM: BRAKE DRIVE SWITCHES
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) FAILURE DETECTION BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.FD.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF BRAKES. LOSS OF DIRECT DRIVE. LOSS OF AUTO BRAKING CAPABILITY.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/09/96 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 644 ABORT: /

ITEM: BRAKE DRIVE SWITCHES
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) FAILURE DETECTION BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.FD.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CANNOT RELEASE BRAKES. LOSS OF ALL COMPUTER AUGMENTED MODES.
ARM WILL NOT LIMP DURING CAPTURE/RIGIDIZATION PROCESS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/10/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 645 ABORT: /

ITEM: AUTO BRAKE CIRCUIT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) FAILURE DETECTION BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.FD.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
AUTO BRAKING FAILED ON. LOSS OF ALL COMPUTER AUGMENTED MODES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/10/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 646 ABORT: /

ITEM: AUTO BRAKE CIRCUIT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) FAILURE DETECTION BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.FD.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO AUTO BRAKING CAPABILITY. POSSIBLE UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/10/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 647 ABORT: /

ITEM: EE AUTO LOGIC
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) FAILURE DETECTION BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.FD.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO EE MODES. POSSIBLE UNCOMMANDED RELEASE/DERIGIDIZATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/10/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 648 ABORT: /

ITEM: EE AUTO LOGIC
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) FAILURE DETECTION BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.FD.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL AUTO EE CAPABILITIES. MANUAL EE MODE REMAINS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/10/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 649 ABORT: /

ITEM: DUAL 4-BIT LATCH
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) FAILURE DETECTION BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.FD.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ERRONEOUS DATA IS OUTPUT. POSSIBLE LOSS OF COMPUTER AUGMENTED MODES THROUGH PERMANENT AUTO SAFING OR AUTO BRAKING. LOSS OF AUTO EE CAPABILITIES. POSSIBLE UNCOMMANDED RELEASE OR DERIGIDIZATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/10/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 650 ABORT: /

ITEM: DUAL 4-BIT LATCH
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) FAILURE DETECTION BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.FD.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO SAFING, AUTO BRAKING, AND AUTO EE CAPABILITIES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/10/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 651 ABORT: /

ITEM: 4-BIT MAGNITUDE COMPARATOR (2)
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) FAILURE DETECTION BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.FD.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ERRONEOUS DATA OUTPUT COULD CAUSE LOSS OF AUTO SAFING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/10/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 652 ABORT: /

ITEM: 4-BIT MAGNITUDE COMPARATOR (2)
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) FAILURE DETECTION BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.FD.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
PERMANENT AUTO SAFING. LOSS OF ALL COMPUTER AUGMENTED MODES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/10/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 653 ABORT: /

ITEM: FRAME SYNC FAILURE DETECTOR TIMING CIRCUIT
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) FAILURE DETECTION BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.FD.7

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
PERMANENT AUTO SAFING. LOSS OF ALL COMPUTER AUGMENTED MODES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/10/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 654 ABORT: /

ITEM: FRAME SYNC FAILURE DETECTOR TIMING CIRCUIT
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) FAILURE DETECTION BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.FD.7

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO SAFING CAPABILITIES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/10/86
SUBSYSTEM: RMS
MDAC ID: 655

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: 7-BIT BINARY COUNTER
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) FAILURE DETECTION BOARD
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.FD.8

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO SAFING. POSSIBLE UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/10/86
SUBSYSTEM: RMS
MDAC ID: 656

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /

ITEM: 7-BIT BINARY COUNTER
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) FAILURE DETECTION BOARD
3)
4)
5)
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7)
8)
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.FD.8

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
PERMANENT AUTO SAFING. LOSS OF ALL COMPUTER AUGMENTED MODES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/10/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 657 ABORT: /

ITEM: READ IN/WRITE OUT MAGNITUDE COMPARATOR
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) FAILURE DETECTION BOARD
3)
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8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.FD.9

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO SAFING. POSSIBLE UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/10/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 658 ABORT: /

ITEM: READ IN/WRITE OUT MAGNITUDE COMPARATOR
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) FAILURE DETECTION BOARD
3)
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.FD.9

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
PERMANENT AUTO SAFING. LOSS OF ALL COMPUTER AUGMENTED MODES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/14/86
SUBSYSTEM: RMS
MDAC ID: 659

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: LOWER SERIAL SHIFT REGISTER, ABE O/P
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) DIGITAL INTERFACE BOARD
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7)
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9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.DI.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ERRONEOUS DATA TO THE ABE AND DISPLAY AND CONTROL PANEL.
POSSIBLE UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/14/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 660 ABORT: /

ITEM: LOWER SERIAL SHIFT REGISTER, ABE O/P
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) DIGITAL INTERFACE BOARD
3)
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5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2]. B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.DI.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/14/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 661 ABORT: /

ITEM: UPPER SERIAL SHIFT REGISTER, ABE I/P
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) DIGITAL INTERFACE BOARD
3)
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6)
7)
8)
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.DI.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ERRONEOUS DATA TO THE ABE AND DISPLAY AND CONTROL PANEL.
POSSIBLE UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/14/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 662 ABORT: /

ITEM: UPPER SERIAL SHIFT REGISTER, ABE I/P
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) DIGITAL INTERFACE BOARD
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7)
8)
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.DI.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/15/86
SUBSYSTEM: RMS
MDAC ID: 663

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: ABE OUTPUT DRIVER
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) DIGITAL INTERFACE BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.DI.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ERRONEOUS DATA TO THE ARM. LOSS OF ALL COMPUTER AUGMENTED MODES. POSSIBLE UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/15/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 664 ABORT: /

ITEM: ABE OUTPUT DRIVER
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) DIGITAL INTERFACE BOARD
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5)
6)
7)
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9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.DI.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/15/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 665 ABORT: /

ITEM: LOWER SERIAL SHIFT REGISTER, D & C O/P
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) DIGITAL INTERFACE BOARD
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7)
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: MCIU
PART NUMBER: MCU.DI.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ERRONEOUS DATA TO DISPLAY AND CONTROL PANEL. INDICATORS ARE UNRELIABLE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/15/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 666 ABORT: /

ITEM: LOWER SERIAL SHIFT REGISTER, D & C O/P
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) DIGITAL INTERFACE BOARD
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7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: MCIU
PART NUMBER: MCU.DI.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF SOME DISPLAY AND CONTROL PANEL INDICATORS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/15/86
SUBSYSTEM: RMS
MDAC ID: 667

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: UPPER SERIAL SHIFT REGISTER, D & C O/P
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) DIGITAL INTERFACE BOARD
3)
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5)
6)
7)
8)
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: MCIU
PART NUMBER: MCU.DI.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ERRONEOUS DATA TO DISPLAY AND CONTROL PANEL. INDICATORS ARE UNRELIABLE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/15/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 668 ABORT: /

ITEM: UPPER SERIAL SHIFT REGISTER, D & C O/P
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) DIGITAL INTERFACE BOARD
3)
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5)
6)
7)
8)
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: MCIU
PART NUMBER: MCU.DI.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF SOME DISPLAY AND CONTROL PANEL INDICATORS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/15/86
SUBSYSTEM: RMS
MDAC ID: 669

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: D & C STROBE
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) DIGITAL INTERFACE BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.DI.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. DIRECT AND BACKUP REMAIN.
POSSIBLE UNCOMMANDED RELEASE AND DERIGIDIZATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/15/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 670 ABORT: /

ITEM: D & C STROBE
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) DIGITAL INTERFACE BOARD
3)
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7)
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9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.DI.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/15/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 671 ABORT: /

ITEM: D & C CLOCK
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) DIGITAL INTERFACE BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.DI.7

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. DIRECT AND BACKUP REMAIN.
POSSIBLE UNCOMMANDED RELEASE AND DERIGIDIZATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/15/86
SUBSYSTEM: RMS
MDAC ID: 672

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /

ITEM: D & C CLOCK
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) DIGITAL INTERFACE BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.DI.7

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/15/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 673 ABORT: /

ITEM: ABE INPUT OPTO ISOLATORS
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) DIGITAL INTERFACE BOARD
3)
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.DI.8

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. POSSIBLE UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/15/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 674 ABORT: /.

ITEM: ABE INPUT OPTO ISOLATORS
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) DIGITAL INTERFACE BOARD
3)
4)
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6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.DI.8

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/16/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 675 ABORT: /

ITEM: SERIAL-PARALLEL SHIFT REGISTERS (2) ABE I/P
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) DIGITAL INTERFACE BOARD
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8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.DI.9

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. POSSIBLE UNCOMMANDED MOTION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/16/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 676 ABORT: /

ITEM: SERIAL-PARALLEL SHIFT REGISTERS (2) ABE I/P
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) DIGITAL INTERFACE BOARD
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8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.DI.9

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/16/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 677 ABORT: /

ITEM: SERIAL-PARALLEL SHIFT REGISTERS (2) D & C I/P
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) DIGITAL INTERFACE BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F] .

LOCATION: MCIU
PART NUMBER: MCU.DI.10

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/16/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 678 ABORT: /

ITEM: SERIAL-PARALLEL SHIFT REGISTERS (2) D & C I/P
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) DIGITAL INTERFACE BOARD
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7)
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.DI.10

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/16/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 679 ABORT: /

ITEM: PARITY CHECK LOGIC
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) DIGITAL INTERFACE BOARD
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: MCIU
PART NUMBER: MCU.DI.11

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CONSTANT CHECK CRT AND MASTER ALARM ON DISPLAY AND CONTROL PANEL.
NORMAL SYSTEM OPERATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/16/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 3/3
MDAC ID: 680 ABORT: /

ITEM: PARITY CHECK LOGIC
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) DIGITAL INTERFACE BOARD
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7)
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: MCIU
PART NUMBER: MCU.DI.11

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
NO DISPLAY AND CONTROL PARITY ERROR ANNUNCIATION.

REFERENCES:

C-6

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/17/86
SUBSYSTEM: RMS
MDAC ID: 681

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: CPU
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MICROCOMPUTER
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.MC.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. POSSIBLE UNCOMMANDED MOTION. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/17/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 682 ABORT: /

ITEM: CPU
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MICROCOMPUTER
3)
4)
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7)
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.MC.1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86
SUBSYSTEM: RMS
MDAC ID: 683

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: 200 KHZ CLOCK
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MICROCOMPUTER
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.MC.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. POSSIBLE UNCOMMANDED MOTION. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 684 ABORT: /

ITEM: 200 KHZ CLOCK
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MICROCOMPUTER
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.MC.2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 685 ABORT: /

ITEM: PARALLEL DATA CONVERTER
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MICROCOMPUTER
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.MC.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. POSSIBLE UNCOMMANDED MOTION. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 686 ABORT: /

ITEM: PARALLEL DATA CONVERTER
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MICROCOMPUTER
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.MC.3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86
SUBSYSTEM: RMS
MDAC ID: 687

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: DIRECT MEMORY ACCESS CONTROLLER
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MICROCOMPUTER
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.MC.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. POSSIBLE UNCOMMANDED MOTION. DIRECT AND BAKCUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: •688 ABORT: /

ITEM: DIRECT MEMORY ACCESS CONTROLLER
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MICROCOMPUTER
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.MC.4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 689 ABORT: /

ITEM: POWER ON INIT ROUTINE LOGIC
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MICROCOMPUTER
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.MC.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. POSSIBLE UNCOMMANDED MOTION. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 690 ABORT: /

ITEM: POWER ON INIT ROUTINE LOGIC
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MICROCOMPUTER
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.MC.5

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86
SUBSYSTEM: RMS
MDAC ID: 691

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: RAM
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MICROCOMPUTER
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.MC.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. POSSIBLE UNCOMMANDED MOTION. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86
SUBSYSTEM: RMS
MDAC ID: 692

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /

ITEM: RAM
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MICROCOMPUTER
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.MC.6

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 1/1
MDAC ID: 693 ABORT: /

ITEM: ROM
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MICROCOMPUTER
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.MC.7

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. POSSIBLE UNCOMMANDED MOTION. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: RMS FLIGHT: 2/1R
MDAC ID: 694 ABORT: /

ITEM: ROM
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MICROCOMPUTER
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.MC.7

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86
SUBSYSTEM: RMS
MDAC ID: 695

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: O/P LATCH (2)
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MICROCOMPUTER
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CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.MC.8

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. POSSIBLE UNCOMMANDED MOTION. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86
SUBSYSTEM: RMS
MDAC ID: 696

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /

ITEM: O/P LATCH (2)
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MICROCOMPUTER
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.MC.8

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86
SUBSYSTEM: RMS
MDAC ID: 697

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: I/P LATCH (2)
FAILURE MODE: SHORTED

LEAD ANALYST: B. GRASMEDER

SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MICROCOMPUTER
3)
4)
5)
6)
7)
8)
9)

FLIGHT PHASE	CRITICALITIES HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.MC.9

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTE AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. POSSIBLE UNCOMMANDED MOTION. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86
SUBSYSTEM: RMS
MDAC ID: 698

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /

ITEM: I/P LATCH (2)
FAILURE MODE: OPEN

LEAD ANALYST: B. GRASMEDER

SUBSYS LEAD: G. RAFFAELLI

BREAKDOWN HIERARCHY:
1) MCIU
2) MICROCOMPUTER
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: MCIU
PART NUMBER: MCU.MC.9

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL COMPUTER AUGMENTED MODES. LOSS OF AUTO EE CAPABILITIES. DIRECT AND BACKUP REMAIN.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 801 ABORT: /

ITEM: SNARE
FAILURE MODE: JAMMING

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MECHANISMS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MCH.1

CAUSES: OVERLOAD, DEBRIS

EFFECTS/RATIONALE:
LOSS OF CAPTURE AND RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 802

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: SNARE
FAILURE MODE: STRUCTURE FAILURE

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MECHANISMS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA .]

LOCATION: ARM
PART NUMBER: EE.MCH.1

CAUSES: OVERLOAD, CORRISION

EFFECTS/RATIONALE:
INADVERTANT RELEASE. POSSIBLE ORBITER PL CONTACT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 803 ABORT: /

ITEM: CARRIAGE
FAILURE MODE: JAMMING

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MECHANISMS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MCH.2

CAUSES: OVERLOAD, DEBRIS

EFFECTS/RATIONALE:
LOSS OF RIGIDIZE DERIGIDIZE. IF FAILURE OCCURS DURING RIGIDIZATION. PL CAN SWING INTO ORBITER

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 804

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: CARRIAGE
FAILURE MODE: STRUCTURAL FAILURE

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MECHANISMS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MCH.2

CAUSES: OVERLOAD, CORROSION

EFFECTS/RATIONALE:
INADVERTANT DERIGIDIZATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 805

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: CAPTURE BRAKE
FAILURE MODE: BRAKE FAILED ON

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MECHANISMS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: ARM
PART NUMBER: EE.MCH.3

CAUSES: LOSS OF INPUT

EFFECTS/RATIONALE:
LOSS OF PRIMARY CAPTURE AND RELEASE. PL CAN SWING INTO ORBITER.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 806 ABORT: /

ITEM: CAPTURE BRAKE
FAILURE MODE: FAILED OFF

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MECHANISMS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MCH.3

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
INADVERTANT RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 807

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: RIBIDIZE BRAKE
FAILURE MODE: FAILED ON

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MECHANISMS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MCH.4

CAUSES: LOSS OF INPUT OR JAMMING

EFFECTS/RATIONALE:
LOSS OF RIGIDIZE/DERIGIDIZE. PL COULD SWING INTO ORBITER.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 3/1R
MDAC ID: 808 ABORT: /

ITEM: RIBIDIZE BRAKE
FAILURE MODE: FAILED OFF

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MECHANISMS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: ARM
PART NUMBER: EE.MCH.4

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CAPTURE BRAKE WILL TAKE RIGIDIZE LOAD. IF CAPDTURE BRAKE OR RIGIDIZE OR CAPTURE CLUTCH FAILS, PL WILL RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 809

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: CAPTURE CLUTCH
FAILURE MODE: FAILED ON ENGAGED

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MECHANISMS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MCH.5

CAUSES: LOSS OF INPUT

EFFECTS/RATIONALE:
CLUTCH WILL SLIP WHEN MOTOR DRIVES RIGID OR DERIGID. MAY CAUSE LONGER RIGIDIZE/DERIGIDIZE DRIVE TIME.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 810 ABORT: /

ITEM: CAPTURE CLUTCH
FAILURE MODE: FAILED ON ENGAGED

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MECHANISMS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MCH.5

CAUSES: JAMMING

EFFECTS/RATIONALE:
LOSS OF RIGIDIZE DERIGIDIZE. PL CAN SWING INTO ORBITER.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 811

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: CAPTURE CLUTCH
FAILURE MODE: FAILED OFF DISENGAGED

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MECHANISMS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MCH.5

CAUSES: STRUCTUAL FAILURE

EFFECTS/RATIONALE:
LOSS OF CAPTURE PL CAN SWING INTO ORBITER IF FAILURE OCCURS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 3/3
MDAC ID: 812 ABORT: /

ITEM: RIGIDIZE CLUTCH
FAILURE MODE: FAILED ENGAGED

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MECHANISMS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MCH.6

CAUSES: LOSS OF INPUT

EFFECTS/RATIONALE:
NONE. CLUTCH WILL SLIP DURING CAPTURE/RELEASE, MAY BE SLUGGISH.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 813

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: RIGIDIZE CLUTCH
FAILURE MODE: FAILED DISENGAGED

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MECHANISMS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MCH.6

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF RIGID/DERIGIDIZE. PL COULD SWING INTO ORBITER.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 814

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: CAPTURE DRIVE TRAIN
FAILURE MODE: JAMMING

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MECHANISMS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MCH.7

CAUSES: OVERLOAD, CONTAMINATION

EFFECTS/RATIONALE:
LOSS OF CAPTURE RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 815 ABORT: /

ITEM: CAPTURE DRIVE TRAIN
FAILURE MODE: FAILS FREE

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MECHANISMS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MCH.7

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
INADVERTANT RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 816

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: RIGIDIZE DRIVE
FAILURE MODE: JAMMING

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MECHANISMS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MCH.8

CAUSES: OVERLOAD, CORROSION

EFFECTS/RATIONALE:
LOSS OF RIGID/DERIGID FUNCTION. PL MAY CONTACT ORBITER, IF FAILURE OCCURS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 817 ABORT: /

ITEM: RIGIDIZE DRIVE
FAILURE MODE: FAILS FREE

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MECHANISMS
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MCH.8

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
INADVERTANT DERIGIDIZATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 3/3
MDAC ID: 818 ABORT: /

ITEM: DERIGID MICROSWITCH
FAILURE MODE: FAILS ON

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MICROSWITCHES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MSW.6

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
OPERATOR WILL NOT KNOW WHEN HE IS DERIGID. AUTO RELEASE WILL RELEASE WITHOUT DERIGIZING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 819 • ABORT: /

ITEM: DERIGID MICROSWITCH
FAILURE MODE: FAILS OFF

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MICROSWITCHES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MSW.6

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
OPERATOR WILL NOT KNOW WHEN HE IS DERIGID. AUTO RELEASE WILL DERIGIDIZE TO THE EXTEND POSITION AND NOT RELEASE PLAYLOAD.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 3/3
MDAC ID: 820 ABORT: /

ITEM: CLOSED MICROSWITCH
FAILURE MODE: FAILS ON

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MICROSWITCHES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MSW.5

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
OPERATOR WILL NOT KNOW WHEN SNARES ARE CLOSED. LOSS OF AUTO CAPTUE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 821

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: CLOSED MICROSWITCH
FAILURE MODE: FAILS OFF

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MICROSWITCHES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MSW.5

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
OPERATOR WILL NOT KNOW WHEN SNARES ARE CLOSED. LOSS OF AUTO CAPTUE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 822

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: CAPTURE MICROSWITCH
FAILURE MODE: FAILS OFF

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MICROSWITCHES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MSW.2

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CAPTURE WILL ALWAYS BE INDICATED. ONCE EE IS RIGIDIZED, LOADED RATE FLAG WILL BE SET.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 823

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: /

ITEM: CAPTURE MICROSWITCH
FAILURE MODE: FAILS ON

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MICROSWITCHES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: ARM
PART NUMBER: EE.MSW.2

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CAPTURE WILL NEVER BE INDICATED. LOADED RATE FLAG WILL NOT BE SET. PL MAY BE MOVED AT UNLOADED RATES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 824 ABORT: /

ITEM: OPEN MICROSWITCH
FAILURE MODE: FAILS ON

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MICROSWITCHES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MSW.4

CAUSES: CONTAMINATION

EFFECTS/RATIONALE:
OPERATOR WILL NOT KNOW IF SNARES ARE OPEN. AUTO RELEASE LOST.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 3/3
MDAC ID: 825 ABORT: /

ITEM: OPEN MICROSWITCH
FAILURE MODE: FAILS OFF

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MICROSWITCHES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MSW.4

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
OPERATOR WILL NOT KONW IF SNARES ARE OPEN. LOSS OF AUTO RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 3/3
MDAC ID: 826 ABORT: /

ITEM: EXTEND MICROSWITCH
FAILURE MODE: FAILS OFF

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MICROSWITCHES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MSW.1

CAUSES: LOSS OF INPUT

EFFECTS/RATIONALE:
UNABLE TO DETERMINE IF EE IS EXTENDED. LOSS OF AUTO RELEASE BECAUSE EE WILL CONTINUE TO DRIVE DERIGID.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 3/3
MDAC ID: 827 ABORT: /

ITEM: EXTEND MICROSWITCH
FAILURE MODE: FAILS ON

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MICROSWITCHES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MSW.1

CAUSES: CONTAMINATION

EFFECTS/RATIONALE:
UNABLE TO DETERMINE IF EE IS EXTENDED. LOSS OF AUTO RELEASE BECAUSE EE WILL NOT RESPOND TO AUTO RELEASE COMMAND.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 3/3
MDAC ID: 828 ABORT: /

ITEM: EXTEND MSW SIGNAL CONDITIONER
FAILURE MODE: FAILS ON

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.3

CAUSES: OP AMP FAILS ON OR SHORTED

EFFECTS/RATIONALE:
EXTEND INDICATION FAILS TRUE. LOSS OF AUTO RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 829

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: EXTEND MSW SIGNAL CONDITIONER
FAILURE MODE: FAILS OFF

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.3

CAUSES: OP AMP OR RESISTOR FAILS OPEN

EFFECTS/RATIONALE:
LOSS OF AUTO RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 3/3
MDAC ID: 830 ABORT: /

ITEM: RIGIDIZE MSW SIGNAL CONDITIONER
FAILURE MODE: FAIL ON

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.3

CAUSES: OP AMP FAILS SHORTED

EFFECTS/RATIONALE:
RIGIDIZE INDICATION FAILED TRUE. AFTER FIRST CAPTURE LOADED RATE FLAG WILL BE SET.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 831 ABORT: /

ITEM: RIGIDIZE MSW SIGNAL CONDITIONER
FAILURE MODE: FAIL OFF

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.3

CAUSES: OP AMP OR RESISTOR FAILS OPEN

EFFECTS/RATIONALE:
RIGIDIZE INDICATION FAILED TRUE. AUTO CAPTURE IS LOST.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 3/3
MDAC ID: 832 ABORT: /

ITEM: DERIGIDIZED MSW SIGNAL CONDITIONER
FAILURE MODE: FAIL ON

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.3

CAUSES: OP AMP FAILS ON OR SHORTED CIRCUIT

EFFECTS/RATIONALE:
DERIGIDIZE INDICATION FAILS FALSE. LOSS OF AUTO RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 833

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: DERIGIDIZED MSW SIGNAL CONDITIONER
FAILURE MODE: FAIL OFF

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.3

CAUSES: OP AMP OR TRANSISTOR FAILS OPEN

EFFECTS/RATIONALE:
DERIGIDIZE INDICATION FAILS TRUE. AUTO RELEASE WILL RELEASE WITHOUT DERIGIDIZING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 3/3
MDAC ID: 834 ABORT: /

ITEM: CLOSED MSW SIGNAL CONDITIONER
FAILURE MODE: FAIL ON

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.3

CAUSES: OP AMP FAILS SHORTED

EFFECTS/RATIONALE:
CLOSED INDICATION FAILS TRUE. LOSS OF AUTO CAPTURE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 835

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: CLOSED MSW SIGNAL CONDITIONER
FAILURE MODE: FAIL OFF

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.3

CAUSES: OP AMP OR RESISTOR FAILS OPEN

EFFECTS/RATIONALE:
CLOSED INDICATION FAILS FALSE. LOSS OF AUTO CAPTURE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 3/3
MDAC ID: 836 ABORT: /

ITEM: PL CAPTURE MSW SIGNAL CONDITONER
FAILURE MODE: FAIL ON

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.3

CAUSES: OP AMP FAILS SHORTED

EFFECTS/RATIONALE:
CAPTURE INDICATION FAILS TRUE. LOSS OF AUTO CAPTURE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 837

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: PL CAPTURE MSW SIGNAL CONDITONER
FAILURE MODE: FAIL OFF

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.3

CAUSES: OP AMP FAILS OPEN

EFFECTS/RATIONALE:
CAPTURE INDICATION FAILS OFF. LOADED RATE FLAG WILL NOT SET WHEN PL IS CAPTURED. LOADED ARM WILL MOVE AT UNLOADED RATES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

DATE:
SUBSYSTEM:
MDAC ID: 838

ITEM: OPEN MSW SIGNAL CONDITIONER
FAILURE MODE: FAIL ON

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.3

CAUSES: OP AMP FAILS SHORTED

EFFECTS/RATIONALE:
OPEN INDICATION WILL FAIL TRUE. AUTO RELEASE LOST.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 839

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: OPEN MSW SIGNAL CONDITIONER
FAILURE MODE: FAIL OFF

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.3

CAUSES: OP AMP FAILS OPEN

EFFECTS/RATIONALE:
OPEN INDICATION WILL FAIL FALSE. LOSS OF AUTO RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 840

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: CAPTURE/RELEASE BRAKE/CLUTCH POWER SWITCH DRIVER
FAILURE MODE: OPEN POWER SWITCH

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.2

CAUSES: TRANSISTOR OR RESISTOR FAILS OPEN

EFFECTS/RATIONALE:
SNARE BRAKE WOULD FAIL ON AND RIGIDIZE CLUTCH WOULD FAIL ENGAGED. CAPTURE AND RELEASE LOST. ARM WOULD BE LIMP WHEN CAPTURE COMMANDED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 841

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: RIGID/DERIGID BRAKE/CLUTCH POWER SWITCH DRIVER
FAILURE MODE: OPEN POWER SWITCH

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.1

CAUSES: TRANSISTOR OR RESISTOR FAILS OPEN

EFFECTS/RATIONALE:
SNARE CLUCH WOULD FAIL ENGAGED AND RIGIDIZE BRAKE WOULD FAIL ON. RIGIDIZE/DERIGIDIZE FUNCTION WOULD BE LOST, BUT ARM WOULD BE LIMP WHEN RIGIDIZE COMMANDED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 2/1R
MDAC ID: 842 ABORT: /

ITEM: MOTOR POWER SIGNAL CONTROLLER
FAILURE MODE: FAILS ON

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: ARM
PART NUMBER: EE.EU.6

CAUSES: TRANSISTOR FAILS SHORTED

EFFECTS/RATIONALE:
MOTOR PHASE ON CONTINOUSLY. MOTOR WILL RUN SLUGGISHLY. IF IT STOPS IN A DEADZONE IT WILL NOT START AGAIN. PL CAN NOT BE CAPTURED OF RELEASED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 2/1R
MDAC ID: 843 ABORT: /

ITEM: MOTOR POWER SIGNAL CONTROLLER
FAILURE MODE: FAILS OFF

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: ARM
PART NUMBER: EE.EU.6

CAUSES: TRANSISTOR FAILS OPEN

EFFECTS/RATIONALE:
MOTOR PHASE ON CONTINOUSLY. MOTOR WILL RUN SLUGGISHLY. IF IT STOPS IN A DEADZONE IT WILL NOT START AGAIN. PL CAN NOT BE CAPTURED OF RELEASED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 844

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: EEEU BITE
FAILURE MODE: FAILS OFF

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.5

CAUSES: INVERTOR OR GATE FAILS ON

EFFECTS/RATIONALE:
BITE WILL NOT ANNUNCIATE FAILURES.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 845

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: EEEU BITE
FAILURE MODE: FAILS ON

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.5

CAUSES: INVERTOR OR GATE FAILS OFF

EFFECTS/RATIONALE:
BITE WILL BE ON WHILE ARM IS SELECTED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 846

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: /

ITEM: POWER SWITCH DRIVERS
FAILURE MODE: FAILS ON

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: ARM
PART NUMBER: EE.EU.4

CAUSES: TRANSISTOR SHORTED

EFFECTS/RATIONALE:
EE MOTOR WILL NOT OPERATE IF IT HAS STOPPED IN THE DEAD ZONE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 847

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: /

ITEM: POWER SWITCH DRIVERS
FAILURE MODE: FAILS OFF

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

FLIGHT PHASE	CRITICALITIES HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [F] C [F]

LOCATION: ARM
PART NUMBER: EE.EU.4

CAUSES: TRANSISTOR FAILS OPEN

EFFECTS/RATIONALE:
EE MOTOR WILL NOT OPERATE IF IT HAS STOPPED IN THE DEAD ZONE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

DATE:
SUBSYSTEM:
MDAC ID: 848

ITEM: MULTIPLE ACTIVATE CMD INHIBIT
FAILURE MODE: FAILS OFF

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.7

CAUSES: NAND GATE U18B FAILS ON

EFFECTS/RATIONALE:
NO SAFEGUARD AGAINST TWO COMMANDS AT THE SAME TIME.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 849

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: MULTIPLE ACTIVATE CMD INHIBIT
FAILURE MODE: FAILS ON

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.7

CAUSES: NAND GATE U18B FAILS OFF

EFFECTS/RATIONALE:
UNABLE TO CAPTURE OR RELEASE IN PRIMARY MODE. BACKUP RELEASE AVAILABLE. PL COULD CONTACT ORBITER IF FAILURE OCCURED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 850 ABORT: /

ITEM: RIGIDIZE MICROSWITCH
FAILURE MODE: FAILS ON

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MICROSWITCHES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MSW.3

CAUSES: CONTAMINATION

EFFECTS/RATIONALE:
RIGIDIZE WILL NEVER BE INDICATED OPERATOR WILL NOT KNOW IF HE IS RIGIDIZED. AUTO CAPTURE IS LOST BECAUSE RIGIDIZE COMMAND WILL NOT SHUT OFF UNTIL THE EE MODE SWITCH IS TURNED OFF.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 851

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: RIGIDIZE MICROSWITCH
FAILURE MODE: FAILS OFF

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MICROSWITCHES
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MSW.3

CAUSES: STRUCTURAL FAILURE DEBIS

EFFECTS/RATIONALE:
RIGIDIZE WILL ALWAYS BE INDICATED. AFTER FIRST CAPTURE LOADED RATE FLAG WILL BE SET.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 852

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: BEARINGS
FAILURE MODE: PHYSICAL BINDING

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MOTOR
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MTR.7

CAUSES: STRUCTURAL FAILURE CONTAMINATION

EFFECTS/RATIONALE:
LOSE ALL EE CAPABILITIES EXCEPT FOR BACKUP RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 853

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: BU GEARTRAIN
FAILURE MODE: STRUCTURAL FAILURE

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) BU RELEASE SYSTEM
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: ARM
PART NUMBER: EE.BRS.3

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CAN NOT RELEASE PAYLOAD

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 854 ABORT: /

ITEM: BU GEARTRAIN
FAILURE MODE: PHYSICAL BINDING

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) BU RELEASE SYSTEM
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: ARM
PART NUMBER: EE.BRS.3

CAUSES: STRUCTURAL FAILURE HIGH LOW TEMPERATURE

EFFECTS/RATIONALE:
CAN NOT RELEASE PAYLOAD

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 855

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: BU SPRING
FAILURE MODE: STRUCTURAL FAILURE

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) BU RELEASE SYSTEM
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: ARM
PART NUMBER: EE.BRS.2

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CAN NOT RELEASE PAYLOAD

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 856 ABORT: /

ITEM: BU SPRING
FAILURE MODE: STRUCTURAL FAILURE

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) BU RELEASE SYSTEM
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: ARM
PART NUMBER: EE.BRS.2

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CAN NOT RELEASE PAYLOAD

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 857 ABORT: /

ITEM: BU CLUTCH
FAILURE MODE: FAILURE TO CLOSE

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) BU RELEASE SYSTEM
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] · B [F] C [F]

LOCATION: ARM
PART NUMBER: EE.BRS.1

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CAN NOT RELEASE PAYLOAD

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 858

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: BU CLUTCH
FAILURE MODE: FAILURE TO OPEN

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) BU RELEASE SYSTEM
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: ARM
PART NUMBER: EE.BRS.1

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CAN NOT RELEASE PAYLOAD

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 859

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: BU CLUTCH
FAILURE MODE: SHORTED

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) BU RELEASE SYSTEM
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: ARM
PART NUMBER: EE.BRS.1

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CAN NOT RELEASE PAYLOAD

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 860 ABORT: /

ITEM: BU CLUTCH
FAILURE MODE: OPEN

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) BU RELEASE SYSTEM
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: ARM
PART NUMBER: EE.BRS.1

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CAN NOT RELEASE PAYLOAD

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 861

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: STATOR
FAILURE MODE: SHORTED

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MOTOR
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: ARM
PART NUMBER: EE.MTR.6

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSE ALL EE FUNCTIONS. BACKUP RELEASE WORKS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 862 ABORT: /

ITEM: STATOR
FAILURE MODE: OPEN

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MOTOR
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: ARM
PART NUMBER: EE.MTR.6

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSE ALL EE FUNCTIONS. BACKUP RELEASE WORKS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 863

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: ROTOR
FAILURE MODE: PHYSICAL BINDING

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MOTOR
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: ARM
PART NUMBER: EE.MTR.8

CAUSES: STRUCTURAL FAILURE COMTAMINATION HIGH LOW TEMPERATURE

EFFECTS/RATIONALE:
LOSE ALL EE FUNCTIONS. BACKUP RELEASE WORKS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 864 ABORT: /

ITEM: PHOTO CELL (3)
FAILURE MODE: OPEN

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MOTOR
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MTR.2

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL EE CAPABILITIES EXCEPT BACKUP RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 865

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: LED
FAILURE MODE: SHORTED

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MOTOR
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MTR.1

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL EE CAPABILITIES EXCEPT BACKUP RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 866 ABORT: /

ITEM: LED
FAILURE MODE: OPEN

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MOTOR
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MTR.1

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL EE CAPABILITIES EXCEPT BACKUP RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 867

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: COMMUTATOR AMP
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MOTOR
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MTR.3

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL EE CAPABILITIES EXCEPT BACKUP RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 868

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: COMMUTATOR AMP
FAILURE MODE: ERRONEOUS

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MOTOR
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MTR.3

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL EE CAPABILITIES EXCEPT BACKUP RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 869

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: OUTPUT DRIVER
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MOTOR
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MTR.4

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL EE CAPABILITIES EXCEPT BACKUP RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 870 ABORT: /

ITEM: OUTPUT DRIVER
FAILURE MODE: ERRONEOUS OUTPUT

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MOTOR
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MTR.4

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF ALL EE CAPABILITIES EXCEPT BACKUP RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 871

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /*

ITEM: ROTATING DISK
FAILURE MODE: PHYSICAL BINDING

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) MOTOR
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.MTR.5

CAUSES: STRUCTURAL FAILURE CONTAMINATION HIGH LOW TEMPERATURE

EFFECTS/RATIONALE:
LOSS OF ALL EE CAPABILITIES EXCEPT BACKUP RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 872 ABORT: /

ITEM: CAP/REL BRAKE & CLUTCH ACTIVATE CONTROL
FAILURE MODE: SHORTED

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.8

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO & MANUAL EE CAPABILITIES. BACKUP RELEASE REMAINS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 873

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: CAP/REL BRAKE & CLUTCH ACTIVATE CONTROL
FAILURE MODE: OPEN

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.8

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO & MANUAL EE CAPABILITIES. BACKUP RELEASE REMAINS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 874 ABORT: /

ITEM: RIG/DERIG BRAKE & CLUTCH ACTIVATE CONTROL
FAILURE MODE: SHORTED

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.4

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO & MANUAL EE CAPABILITIES. BACKUP RELEASE REMAINS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 875

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: RIG/DERIG BRAKE & CLUTCH ACTIVATE CONTROL
FAILURE MODE: OPEN

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.4

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO & MANUAL EE CAPABILITIES. BACKUP RELEASE REMAINS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 876 ABORT: /

ITEM: CAP/REL BRAKE & CLUTCH FAIL SAFE ENABLE
FAILURE MODE: SHORTED

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.10

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO & MANUAL EE CAPABILITIES. BACKUP RELEASE REMAINS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 877

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: CAP/REL BRAKE & CLUTCH FAIL SAFE ENABLE
FAILURE MODE: OPEN

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.10

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO & MANUAL EE CAPABILITIES. BACKUP RELEASE REMAINS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 878 ABORT: /

ITEM: RIG/DERIG BRAKE & CLUTCH FAIL SAFE ENABLE
FAILURE MODE: SHORTED

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
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6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.11

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO & MANUAL EE CAPABILITIES. BACKUP RELEASE REMAINS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 879

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: RIG/DERIG BRAKE & CLUTCH FAIL SAFE ENABLE
FAILURE MODE: OPEN

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.11

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO & MANUAL EE CAPABILITIES. BACKUP RELEASE REMAINS.

REFERENCES:

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INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 880

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: MOTOR POWER FAIL SAFE ENABEL
FAILURE MODE: SHORTED

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.12

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO & MANUAL EE CAPABILITIES. BACKUP RELEASE REMAINS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 881 ABORT: /

ITEM: MOTOR POWER FAIL SAFE ENABEL
FAILURE MODE: OPEN

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.12

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO & MANUAL EE CAPABILITIES. BACKUP RELEASE REMAINS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 882 ABORT: /

ITEM: MOTOR POWER ACTIVATE CONTROL
FAILURE MODE: SHORTED

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.13

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO & MANUAL EE CAPABILITIES. BACKUP RELEASE REMAINS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 883

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: MOTOR POWER ACTIVATE CONTROL
FAILURE MODE: OPEN

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.13

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO & MANUAL EE CAPABILITIES. BACKUP RELEASE REMAINS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 884 ABORT: /

ITEM: CAP/REL/OFF TRISTATE LEVEL DETECTOR
FAILURE MODE: SHORTED

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.14

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO & MANUAL EE CAPABILITIES. BACKUP RELEASE REMAINS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 885 ABORT: /

ITEM: CAP/REL/OFF TRISTATE LEVEL DETECTOR
FAILURE MODE: OPEN

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.14

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO & MANUAL EE CAPABILITIES. BACKUP RELEASE REMAINS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 886 ABORT: /

ITEM: RIG/DERIG/OFF TRISTATE LEVEL DETECTOR
FAILURE MODE: SHORTED

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.15

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO & MANUAL EE CAPABILITIES. BACKUP RELEASE REMAINS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 887

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: RIG/DERIG/OFF TRISTATE LEVEL DETECTOR
FAILURE MODE: OPEN

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.15

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO & MANUAL EE CAPABILITIES. BACKUP RELEASE REMAINS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 888 ABORT: /

ITEM: FAIL SAFE COMMAND ON/OFF LEVEL DETECTOR
FAILURE MODE: SHORTED

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.16

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO & MANUAL EE CAPABILITIES. BACKUP RELEASE REMAINS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 889 ABORT: /

ITEM: FAIL SAFE COMMAND ON/OFF LEVEL DETECTOR
FAILURE MODE: OPEN

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.16

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO & MANUAL EE CAPABILITIES. BACKUP RELEASE REMAINS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 890 ABORT: /

ITEM: EE POWER CONDITIONER
FAILURE MODE: SHORTED

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.17

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO & MANUAL EE CAPABILITIES. BACKUP RELEASE REMAINS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 891

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: CAPTURE COMMAND ENABLE LOGIC
FAILURE MODE: OPEN

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.18

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO & MANUAL EE CAPABILITIES. BACKUP RELEASE REMAINS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 1/1
MDAC ID: 892 ABORT: /

ITEM: CAPTURE COMMAND ENABLE LOGIC
FAILURE MODE: SHORTED

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) END EFFECTOR
2) EEEU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: ARM
PART NUMBER: EE.EU.18

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF AUTO & MANUAL EE CAPABILITIES. BACKUP RELEASE REMAINS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 901

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: /

ITEM: BOOM
FAILURE MODE: RUPTURED, FRACTURED

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) ARM
2)
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	1/1	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: ARM
PART NUMBER: ARM.BM.1

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
ARM WILL HAVE INCORRECT PATH.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 3/1R
MDAC ID: 902 ABORT: /

ITEM: ELEMENTS, HEATER
FAILURE MODE: OPEN

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) ARM
2) THERMAL
3) ACTIVE, ELECT.
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: ARM
PART NUMBER: ARM.TH.1

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
INABILITY TO HEAT ARM JOINT PLUS ELECTRONICS

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 903

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: /

ITEM: THERMOSTAT
FAILURE MODE: OPEN/SHORTED

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) ARM
2) THERMAL
3) ACTIVE, ELECT.
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: ARM
PART NUMBER: ARM.TH.2

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
MAY CAUSE LOSS OF BACK UP RELEASE, DUE TO CRITICAL HEAT UNCONTROLLED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 3/1R
MDAC ID: 904 • ABORT: /

ITEM: THERMISTOR
FAILURE MODE: FAILS OUT OF TOLERANCE

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) ARM
2) THERMAL
3) ACTIVE, ELECT.
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [NA] B [F] C [F]

LOCATION: ARM
PART NUMBER: ARM.TH.3

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
FALSE READING MAY CAUSE TEMPERATURE TO GO HIGHER THAN LIMITS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 905

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: BLANKETS
FAILURE MODE: PHYSICAL SEPARATION OR DEGRADED

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) ARM
2) THERMAL
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: ARM
PART NUMBER: ARM.TH.4

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF HEAT TRANSFER, MAY EFFECT TEMPERATURE REQUIREMENTS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 906

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: MICROSWITCH
FAILURE MODE: FAILS CLOSED

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) ARM
2) SHOULDER BRACE
3) ELECTRICAL
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: ARM
PART NUMBER: ARM.SB.1

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
LOSS OF RELEASE INDICATION

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 907

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: MICROSWITCH
FAILURE MODE: FAILS OPEN

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) ARM
2) SHOULDER BRACE
3) ELECTRICAL
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] . B [ ] C [ ]

LOCATION: ARM
PART NUMBER: ARM.SB.1

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
CONTINUOUS RELEASE INDICATION

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 2/2
MDAC ID: 908 ABORT: /

ITEM: LINEAR MOTOR (ACTUATOR)
FAILURE MODE: BINDING

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) ARM
2) SHOULDER BRACE
3) ELECTRICAL
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: ARM
PART NUMBER: ARM.SB.2

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
FAILURE TO RELEASE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:
SUBSYSTEM:
MDAC ID: 909

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /

ITEM: PLUNGER
FAILURE MODE: RUPTURED, FRACTURED, BREAKAGE

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) ARM
2) SHOULDER BRACE
3) MECHANICAL
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	3/3	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: ARM
PART NUMBER: ARM.SB.3

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
POSSIBLE REDUCTION IN LIFE OF ARM/ARM JOINT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 2/2
MDAC ID: 910 ABORT: /

ITEM: SPLIT COLLET
FAILURE MODE: RUPTURED, FRACTURED, BINDING

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) ARM
2) SHOULDER BRACE
3) MECHANICAL
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION:
PART NUMBER: ARM.SB.4

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
FAILURE TO RELEASE SHOULDER BRACE

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: FLIGHT: 2/2
MDAC ID: 911 ABORT: /

ITEM: LOCKING STUB
FAILURE MODE: RUPTURED, FRACTURED, BINDING

LEAD ANALYST: SUBSYS LEAD:

BREAKDOWN HIERARCHY:
1) MECH. ARM
2) SHOULDER BRACE
3) MECHANICAL
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	/
DEORBIT:	/	ATO:	/
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: ARM
PART NUMBER: ARM.SB.5

CAUSES: STRUCTURAL FAILURE

EFFECTS/RATIONALE:
FAILURE TO RELEASE SHOULDER BRACE

REFERENCES:

APPENDIX D
POTENTIAL CRITICAL ITEMS

MDAC ID	ITEM	FAILURE MODE
101	ENTER PUSH BUTTON INDICATOR	SHORTED
102	ENTER PUSH BUTTON INDICATOR	OPEN
103	10V CONTACT	SHORTED
104	10V CONTACT	OPEN
105	6.2V CONTACT	SHORTED
106	6.2V CONTACT	OPEN
107	6.2V CONTACT	OPEN DIODE
132	10V CONTACT	SHORTED
133	10V CONTACT	OPEN
134	6.2V CONTACT	SHORTED
135	6.2V CONTACT	OPEN
136	6.2V CONTACT	OPEN DIODE
137	10V CONTACT	SHORTED
139	12.4V CONTACT	SHORTED
140	12.4V CONTACT	OPEN
142	12.4V CONTACT	OPEN DIODE
143	10V CONTACT	SHORTED
144	10V CONTACT	OPEN
145	10V CONTACT	SHORTED
146	10V CONTACT	OPEN
147	28V CONTACT	SHORTED
148	28V CONTACT	OPEN
152	SAFING SWITCH	OPEN
153	28V CONTACT	SHORTED
155	RIGIDIZE/DERIGIDIZE CONTACT	SHORTED
156	CONTACT	OPEN
157	RIGIDIZE/DERIGIDIZE CONTACT	SHORTED
158	RIGIDIZE/DERIGIDIZE CONTACT	OPEN
159	CAPTURE/RELEASE CONTACT	SHORTED
160	CAPTURE/RELEASE CONTACT	OPEN
161	10V CONTACT	SHORTED
162	10V CONTACT	OPEN
163	CAPTURE/RELEASE CONTACT	SHORTED
164	CAPTURE/RELEASE CONTACT	OPEN
165	10V CONTACT	SHORTED
166	10V CONTACT	OPEN
167	10V CONTACT	SHORTED
168	10V CONTACT	OPEN
171	STOP CONTACT	SHORTED
172	STOP CONTACT	OPEN
173	PROCEED CONTACT	SHORTED
177	BACKUP CONTACT	SHORTED
178	BACKUP CONTACT	OPEN
179	BACKUP CONTACT	SHORTED
180	BACKUP CONTACT	OPEN
181	PRIMARY CONTACT	SHORTED
182	PRIMARY CONTACT	OPEN
183	PRIMARY CONTACT	SHORTED

MDAC ID	ITEM	FAILURE MODE
184	PRIMARY CONTACT	OPEN
185	12.4V CONTACT	SHORTED
186	12.4V CONTACT	OPEN
188	12.4V CONTACT	SHORTED DIODE
189	10V CONTACT	SHORTED
190	10V CONTACT	OPEN
192	DC CONTACT	OPEN
196	AC CONTACT	OPEN
197	ENABLE CONTACT	SHORTED
198	ENABLE CONTACT	OPEN
200	DC CONTACT	OPEN
201	ENABLE CONTACT	SHORTED
202	ENABLE CONTACT	OPEN
203	28V CONTACT	SHORTED
204	28V CONTACT	OPEN
205	COMMAND CONTACT	SHORTED
206	COMMAND CONTACT	OPEN
207	COMMAND CONTACT	SHORTED
208	COMMAND CONTACT	OPEN
209	28V CONTACT	SHORTED
210	28V CONTACT	OPEN
213	28V ENABLE CONTACT	SHORTED
214	28V ENABLE CONTACT	OPEN
215	28V ENABLE CONTACT	SHORTED
216	28V ENABLE CONTACT	OPEN
217	12V CONTACT	SHORTED
218	12V CONTACT	OPEN
220	12V CONTACT	SHORTED DIODE
221	6V CONTACT	SHORTED
222	6V CONTACT	OPEN
223	6V CONTACT	OPEN DIODE
224	10V CONTACT	SHORTED
225	10V CONTACT	OPEN
226	10V CONTACT	SHORTED
227	10V CONTACT	OPEN
228	10V CONTACT	SHORTED
229	10V CONTACT	OPEN
230	12V CONTACT	SHORTED
231	12V CONTACT	OPEN
236	D & C ADDRESS DECODER INPUT LINES	SHORTED
237	D & C ADDRESS DECODER INPUT LINES	OPEN
238	D & C ADDRESS DECODER OUTPUT LINES	SHORTED
239	D & C ADDRESS DECODER OUTPUT LINES	OPEN
240	D & C ADDRESS DECODER OUTPUT LINES	LOSS OF WORD 0
241	D & C INVERTOR NETWORK	SHORTED
242	D & C INVERTOR NETWORK	OPEN

MDAC ID	ITEM	FAILURE MODE
243	D & C TEST WORD SELECTOR	SHORTED
244	D & C TEST WORD SELECTOR	OPEN
245	D & C TEST WORD SELECTOR	SHORTED
247	CLOCK PULSE	OPEN
248	STROBE PULSE	OPEN
249	SERIAL TO PARALLEL CONVERTER	SHORTED
250	SERIAL TO PARALLEL CONVERTER	OPEN
256	PARALLEL TO SERIAL CONVERTER	SHORTED
257	PARALLEL TO SERIAL CONVERTER	OPEN
258	PARALLEL TO SERIAL CONVERTER	SHORTED
259	PARALLEL TO SERIAL CONVERTER	OPEN
264	OUTPUT TRANSISTOR DRIVER CIRCUIT	OPEN
265	OUTPUT TRANSISTOR DRIVER CIRCUIT	SHORTED
266	OUTPUT TRANSISTOR DRIVER CIRCUIT	SHORTED
267	OUTPUT TRANSISTOR DRIVER CIRCUIT	OPEN
268	OUTPUT TRANSISTOR DRIVER CIRCUIT	LOSS OF WORD 0
269	VERNIER CONTACT	SHORTED
270	COARSE CONTACT	SHORTED
271	10V CONTACT	SHORTED
272	LINKAGE	PHYSICAL BINDING, LINKAGE DISCONNECTS
278	115V CONTACT	SHORTED
279	115V CONTACT	OPEN
282	115V CONTACT	SHORTED
283	115V CONTACT	OPEN
285	K1	SHORTED
286	K1	OPEN
287	K2	OPEN, DIRECT DRIVE CIRCUIT
288	K2	OPEN, CAPTURE CIRCUIT
290	K3	OPEN
292	K4	OPEN, DIRECT DRIVE CIRCUIT
293	K4	OPEN, CAPTURE CIRCUIT
295	K6	SHORTED
296	K6	OPEN
297	28V CONTACT	SHORTED
298	28V CONTACT	OPEN
299	28V CONTACT	SHORTED
301	LINKAGE	PHYSICAL BINDING, LINKAGE DISCONNECTS
340	TRANSDUCER	OPEN
341	TRANSDUCER	SHORTED
342	TRANSDUCER	OPEN
343	TRANSDUCER	SHORTED
344	SIGNAL CONDITIONING DEMODULATOR	LOSS OF OUTPUT
345	SIGNAL CONDITIONING DEMODULATOR	OPEN
346	SIGNAL CONDITIONING DEMODULATOR	SHORTED
347	SIGNAL CONDITIONING DEMODULATOR	LOSS OF OUTPUT
348	SIGNAL CONDITIONING DEMODULATOR	OPEN
349	SIGNAL CONDITIONING DEMODULATOR	SHORTED
350	OSCILLATOR	LOSS OF OUTPUT
351	OSCILLATOR	OPEN

MDAC ID	ITEM	FAILURE MODE
352	OSCILLATOR	SHORTED
362	AUTO CONTACT	SHORTED
363	AUTO CONTACT	OPEN
364	AUTO CONTACT	SHORTED
365	AUTO CONTACT	OPEN
401	ENCODER PHOTO DETECTORS	ERRATIC OUTPUT
402	ENCODER PHOTO DETECTORS	FAIL OFF
403	ENCODER ROTATING DISK	ERRATIC OUTPUT
404	MOTOR-STATOR	MOTOR FAILS OFF
405	MOTOR BEARINGS	MOTOR FAILS DUE TO SEIZED BEARINGS
406	MOTOR SHAFT	MOTOR FAILS DUE TO BROKEN MOTOR SHAFT OR QUILL COUPLER
407	MOTOR SHAFT AND PININON GEAR	MOTOR FAILS DUE TO BROKEN DRIVE SHAFT OR PINION GEAR
408	COMMUTATOR ROTATING DISK	ERRATIC OUTPUT
409	COMMUTATOR BUFFER AMPLIFIER ELECTRONICSELECT	NO OUTPUT. ALL THREE CHANNELS FAIL OFF
410	COMMUTATOR BUFFER AMPLIFIER ELECTRONICSELECT	LOSS OF ONE CHANNEL
411	COMMUTATOR LED	NO OUTPUT
412	COMMUTATOR PHOTO SENSOR	LOSS OF ONE CHANNEL
413	COMMUTATOR PHOTO SENSOR	LOSS OF 2 OR MORE CHANNELS
414	COMMUTATOR OUTPUT DRIVER	NO OUTPUT
415	COMMUTATOR OUTPUT DRIVER	LOSS OF ONE CHANNEL
416	GEARBOX (G1)	SHAFT FRACTURES
417	GEARBOX (G1)	GEARBOX JAM
418	GEARBOX (G2)	SHAFT FRACTURES
419	GEARBOX (G2)	GEARBOX JAMS
420	TACHOMETER ROTOR	NO OUTOUT OR ERRATIC OUTPUT
421	TACHOMETER ROTOR	ERRONEOUS OUTPUT
424	POWER-ON RESET CONTROL	SHORTED
425	POWER-ON RESET CONTROL	OPEN
426	CONTROLLER, POWER CONDITIONER	OPEN
427	CONTROLLER, POWER CONDITIONER	ERRONEOUS OUTPUT
428	CONVERTER, POWER CONDITIONER	OPEN
429	CONVERTER, POWER CONDITIONER	ERRONEOUS OUTPUT
430	CONVERTER, POWER CONDITIONER	ERRONEOUS OUTPUT
433	TACH BITE	SHORTED
435	PROTECTOR, POWER CONDITIONER	SHORTED
439	SCU	OPEN
440	SCU	ERRONEOUS OUTPUT
441	POSITION ENCODER DATA PROCESSING	ERRONEOUS OUTPUT
442	POSITION ENCODER DATA PROCESSING	ERRATIC OUTPUT
443	POSITION ENCODER DATA PROCESSING	OPEN
444	+ 10V	SHORTED
445	+ 10V	OPEN
446	+ 28V	SHORTED
447	+ 28V	OPEN
448	D/A CONVERTER	SHORTED

MDAC ID	ITEM	FAILURE MODE
449	D/A CONVERTER	OPEN
450	ENCODER FEEDBACK	ERRONEOUS OUTPUT
451	ENCODER FEEDBACK	LOSS OF OUTPUT
452	I/P CLOCK OR SYNCH SIGNAL	ERRONEOUS OUTPUT
453	I/P CLOCK OR SYNCH SIGNAL	LOSS OF OUTPUT
454	O/P CLOCK OR SYNCH SIGNAL	ERRONEOUS OUTPUT
455	O/P CLOCK OR SYNCH SIGNAL	LOSS OF OUTPUT
456	3.2 MHZ OSC	ERRONEOUS OUTPUT
457	3.2 MHZ OSC	LOSS OF OUTPUT
458	SHIFT REGISTERS	SHORTED
459	SHIFT REGISTERS	OPEN
460	DIGITAL F/B (ENCODER)	ERRONEOUS OUTPUT
461	DIGITAL F/B (ENCODER)	SHORTED
462	ANALOG F/B (COMMUTATOR)	ERRONEOUS OUTPUT
463	ANALOG F/B (COMMUTATOR)	LOSS OF OUTPUT
464	+ 10V	OPEN
465	+ 28V	OPEN
466	+ 5.1V	OPEN
467	- 15V	OPEN
468	+ 15V	OPEN
469	MDA INHIB	SHORTED
471	MTR TRANSFER RELAY	SHORTED
472	MTR TRANSFER RELAY	OPEN
473	PWM GENERATOR	OPEN
474	PWM SWITCH DRIVERS	OPEN
475	COMMUTATOR I/P SIGNAL	OPEN
476	DIR/ B/U /BRAKE SWITCHING LOGIC	SHORTED
477	DIR/ B/U /BRAKE SWITCHING LOGIC	OPEN
478	MDA BITE LOGIC	SHORTED
479	MDA BITE LOGIC	OPEN
480	MTR CURRENT SENSE RESISTOR	SHORTED
481	MTR CURRENT SENSE RESISTOR	OPEN
482	POWER "ON" RESET	SHORTED
483	POWER "ON" RESET	OPEN
484	CURRENT LIMITER	SHORTED
485	CURRENT LIMITER	OPEN
486	MTR TRANSFER RELAY	SHORTED
487	MTR TRANSFER RELAY	OPEN
488	PWM	SHORTED
489	PWM	OPEN
490	PWM SWITCH ELECTRONICS	SHORTED
491	PWM SWITCH ELECTRONICS	OPEN
492	+ 28V	OPEN
493	BDA PWR CONDITIONER	SHORTED
494	BDA PWR CONDITIONER	OPEN
495	ANALOG PROCESSOR	SHORTED
496	ANALOG PROCESSOR	OPEN
497	POWER SIGNAL CONDITIONER	SHORTED
498	POWER SIGNAL CONDITIONER	OPEN
499	B/U COMMUTATOR	OPEN
500	ELECTRICAL	SHORTED

MDAC ID	ITEM	FAILURE MODE
501	ELECTRICAL	OPEN
502	MECHANICAL	FAILS TO CLOSE
503	MECHANICAL	FAILS TO OPEN
601	16 CHANNEL ANALOG MULTIPLEXOR (3)	SHORTED
602	16 CHANNEL ANALOG MULTIPLEXOR (3)	OPEN
603	BINARY COUNTERS (2)	SHORTED
604	BINARY COUNTERS (2)	OPEN
605	SAMPLE AND HOLD GATED OP AMP	SHORTED
606	SAMPLE AND HOLD GATED OP AMP	OPEN
607	VOLTAGE COMPARATOR	SHORTED
608	VOLTAGE COMPARATOR	OPEN
609	ANALOG TO DIGITAL CONVERTER	SHORTED
610	ANALOG TO DIGITAL CONVERTER	OPEN
611	QUAD 3-STATE R/S LATCHES (2)	SHORTED
612	QUAD 3-STATE R/S LATCHES (2)	OPEN
613	MULTIWINDING OUTPUT TRANSFORMER	SHORTED
614	MULTIWINDING OUTPUT TRANSFORMER	OPEN
615	2-PHASE PWM	SHORTED
616	2-PHASE PWM	OPEN
617	POWER SWITCHING TRANSISTORS	SHORTED
618	POWER SWITCHING TRANSISTORS	OPEN
619	30-KHZ TRIANGULAR WAVE GENERATOR	SHORTED
620	30-KHZ TRIANGULAR WAVE GENERATOR	OPEN
621	DIFFERENTIAL AMPLIFIER PWM ADJUSTER	SHORTED
622	DIFFERENTIAL AMPLIFIER PWM ADJUSTER	OPEN
623	OP AMP, 30 KHZ TRIANGULAR WAVE WIDTH ADJUSTER	SHORTED
624	OP AMP, 30 KHZ TRIANGULAR WAVE WIDTH ADJUSTER	OPEN
625	RECTIFIER MODULES	SHORTED
626	RECTIFIER MODULES	OPEN
627	MIA	SHORTED
628	MIA	OPEN
629	CLOCK DIVIDER CIRCUIT	SHORTED
630	CLOCK DIVIDER CIRCUIT	OPEN
631	16 MHZ CRYSTAL OSCILLATOR	ERRONEOUS OUTPUT
632	16 MHZ CRYSTAL OSCILLATOR	OPEN
633	O/P PARALLEL TO SERIAL SHIFT REGISTER (3)	SHORTED
634	O/P PARALLEL TO SERIAL SHIFT REGISTER (3)	OPEN
635	I/P SERIAL TO PARALLEL SHIFT REGISTER	SHORTED
636	I/P SERIAL TO PARALLEL SHIFT REGISTER	OPEN
637	TRANSMIT TIMING CONTROL	SHORTED
638	TRANSMIT TIMING CONTROL	OPEN

MDAC ID	ITEM	FAILURE MODE
639	RECEIVE TIMING CONTROL	SHORTED
640	RECEIVE TIMING CONTROL	OPEN
641	BRAKE STATUS OPTO ISOLATOR	SHORTED
642	BRAKE STATUS OPTO ISOLATOR	OPEN
643	BRAKE DRIVE SWITCHES	SHORTED
644	BRAKE DRIVE SWITCHES	OPEN
645	AUTO BRAKE CIRCUIT	SHORTED
646	AUTO BRAKE CIRCUIT	OPEN
647	EE AUTO LOGIC	SHORTED
648	EE AUTO LOGIC	OPEN
649	DUAL 4-BIT LATCH	SHORTED
650	DUAL 4-BIT LATCH	OPEN
651	4-BIT MAGNITUDE COMPARATOR (2)	SHORTED
652	4-BIT MAGNITUDE COMPARATOR (2)	OPEN
653	FRAME SYNC FAILURE DETECTOR TIMING CIRCUIT	SHORTED
654	FRAME SYNC FAILURE DETECTOR TIMING CIRCUIT	OPEN
655	7-BIT BINARY COUNTER	SHORTED
656	7-BIT BINARY COUNTER	OPEN
657	READ IN/WRITE OUT MAGNITUDE COMPARATOR	SHORTED
658	READ IN/WRITE OUT MAGNITUDE COMPARATOR	OPEN
659	LOWER SERIAL SHIFT REGISTER, ABE O/P	SHORTED
660	LOWER SERIAL SHIFT REGISTER, ABE O/P	OPEN
661	UPPER SERIAL SHIFT REGISTER, ABE I/P	SHORTED
662	UPPER SERIAL SHIFT REGISTER, ABE I/P	OPEN
663	ABE OUTPUT DRIVER	SHORTED
664	ABE OUTPUT DRIVER	OPEN
669	D & C STROBE	SHORTED
670	D & C STROBE	OPEN
671	D & C CLOCK	SHORTED
672	D & C CLOCK	OPEN
673	ABE INPUT OPTO ISOLATORS	SHORTED
674	ABE INPUT OPTO ISOLATORS	OPEN
675	SERIAL-PARALLEL SHIFT REGISTERS (2) ABE I/P	SHORTED
676	SERIAL-PARALLEL SHIFT REGISTERS (2) ABE I/P	OPEN
677	SERIAL-PARALLEL SHIFT REGISTERS (2) D & C I/P	SHORTED
678	SERIAL-PARALLEL SHIFT REGISTERS (2) D & C I/P	OPEN
681	CPU	SHORTED
682	CPU	OPEN
683	200 KHZ CLOCK	SHORTED

MDAC ID	ITEM	FAILURE MODE
684	200 KHZ CLOCK	OPEN
685	PARALLEL DATA CONVERTER	SHORTED
686	PARALLEL DATA CONVERTER	OPEN
687	DIRECT MEMORY ACCESS CONTROLLER	SHORTED
688	DIRECT MEMORY ACCESS CONTROLLER	OPEN
689	POWER ON INIT ROUTINE LOGIC	SHORTED
690	POWER ON INIT ROUTINE LOGIC	OPEN
691	RAM	SHORTED
692	RAM	OPEN
693	ROM	SHORTED
694	ROM	OPEN
695	O/P LATCH (2)	SHORTED
696	O/P LATCH (2)	OPEN
697	I/P LATCH (2)	SHORTED
698	I/P LATCH (2)	OPEN
801	SNARE	JAMMING
802	SNARE	STRUCTURE FAILURE
803	CARRIAGE	JAMMING
804	CARRIAGE	STRUCTURAL FAILURE
805	CAPTURE BRAKE	BRAKE FAILED ON
806	CAPTURE BRAKE	FAILED OFF
807	RIBIDIZE BRAKE	FAILED ON
808	RIBIDIZE BRAKE	FAILED OFF
810	CAPTURE CLUTCH	FAILED ON ENGAGED
811	CAPTURE CLUTCH	FAILED OFF DISENGAGED
813	RIGIDIZE CLUTCH	FAILED DISENGAGED
814	CAPTURE DRIVE TRAIN	JAMMING
815	CAPTURE DRIVE TRAIN	FAILS FREE
816	RIGIDIZE DRIVE	JAMMING
817	RIGIDIZE DRIVE	FAILS FREE
819	DERIGID MICROSWITCH	FAILS OFF
821	CLOSED MICROSWITCH	FAILS OFF
823	CAPTURE MICROSWITCH	FAILS ON
824	OPEN MICROSWITCH	FAILS ON
831	RIGIDIZE MSW SIGNAL CONDITIONER	FAIL OFF
837	PL CAPTURE MSW SIGNAL CONDITONER	FAIL OFF
838	OPEN MSW SIGNAL CONDITIONER	FAIL ON
840	CAPTURE/RELEASE BRAKE/CLUTCH POWER SWITCH DRIVER	OPEN POWER SWITCH
841	RIGID/DERIGID BRAKE/CLUTCH POWER SWITCH DRIVER	OPEN POWER SWITCH
842	MOTOR POWER SIGNAL CONTROLLER	FAILS ON
843	MOTOR POWER SIGNAL CONTROLLER	FAILS OFF
846	POWER SWITCH DRIVERS	FAILS ON
847	POWER SWITCH DRIVERS	FAILS OFF
849	MULTIPLE ACTIVATE CMD INHIBIT	FAILS ON
850	RIGIDIZE MICROSWITCH	FAILS ON
851	RIGIDIZE MICROSWITCH	FAILS OFF
852	BEARINGS	PHYSICAL BINDING
853	BU GEARTRAIN	STRUCTURAL FAILURE
854	BU GEARTRAIN	PHYSICAL BINDING

MDAC ID	ITEM	FAILURE MODE
855	BU SPRING	STRUCTURAL FAILURE
856	BU SPRING	STRUCTURAL FAILURE
857	BU CLUTCH	FAILURE TO CLOSE
858	BU CLUTCH	FAILURE TO OPEN
859	BU CLUTCH	SHORTED
860	BU CLUTCH	OPEN
861	STATOR	SHORTED
862	STATOR	OPEN
863	ROTOR	PHYSICAL BINDING
864	PHOTO CELL (3)	OPEN
865	LED	SHORTED
866	LED	OPEN
867	COMMUTATOR AMP	LOSS OF OUTPUT
868	COMMUTATOR AMP	ERRONEOUS
869	OUTPUT DRIVER	LOSS OF OUTPUT
870	OUTPUT DRIVER	ERRONEOUS OUTPUT
871	ROTATING DISK	PHYSICAL BINDING
872	CAP/REL BRAKE & CLUTCH ACTIVATE CONTROL	SHORTED
873	CAP/REL BRAKE & CLUTCH ACTIVATE CONTROL	OPEN
874	RIG/DERIG BRAKE & CLUTCH ACTIVATE CONTROL	SHORTED
875	RIG/DERIG BRAKE & CLUTCH ACTIVATE CONTROL	OPEN
876	CAP/REL BRAKE & CLUTCH FAIL SAFE ENABLE	SHORTED
877	CAP/REL BRAKE & CLUTCH FAIL SAFE ENABLE	OPEN
878	RIG/DERIG BRAKE & CLUTCH FAIL SAFE ENABLE	SHORTED
879	RIG/DERIG BRAKE & CLUTCH FAIL SAFE ENABLE	OPEN
880	MOTOR POWER FAIL SAFE ENABEL	SHORTED
881	MOTOR POWER FAIL SAFE ENABEL	OPEN
882	MOTOR POWER ACTIVATE CONTROL	SHORTED
883	MOTOR POWER ACTIVATE CONTROL	OPEN
884	CAP/REL/OFF TRISTATE LEVEL DETECTOR	SHORTED
885	CAP/REL/OFF TRISTATE LEVEL DETECTOR	OPEN
886	RIG/DERIG/OFF TRISTATE LEVEL DETECTOR	SHORTED
887	RIG/DERIG/OFF TRISTATE LEVEL DETECTOR	OPEN
888	FAIL SAFE COMMAND ON/OFF LEVEL DETECTOR	SHORTED
889	FAIL SAFE COMMAND ON/OFF LEVEL DETECTOR	OPEN
890	EE POWER CONDITIONER	SHORTED
891	CAPTURE COMMAND ENABLE LOGIC	OPEN

MDAC ID	ITEM	FAILURE MODE
892	CAPTURE COMMAND ENABLE LOGIC	SHORTED
901	BOOM	RUPTURED, FRACTURED
902	ELEMENTS, HEATER	OPEN
903	THERMOSTAT	OPEN/SHORTED
904	THERMISTOR	FAILS OUT OF TOLERANCE
908	LINEAR MOTOR (ACTUATOR)	BINDING
910	SPLIT COLLET	RUPTURED, FRACTURED, BINDING
911	LOCKING STUB	RUPTURED, FRACTURED, BINDING

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Title: Independent Orbiter Assessment

Author(s):

Originating NASA Organization: JSC VA

Performing Organization (if different) McDonnell - Douglas

Contract/Grant/Interagency/Project Number(s) NAS9-17650

Document Number(s) Various CR 185585 Document Date: Various

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