

SPACE TEST PROGRAM SMALL SATELLITE INITIATIVES

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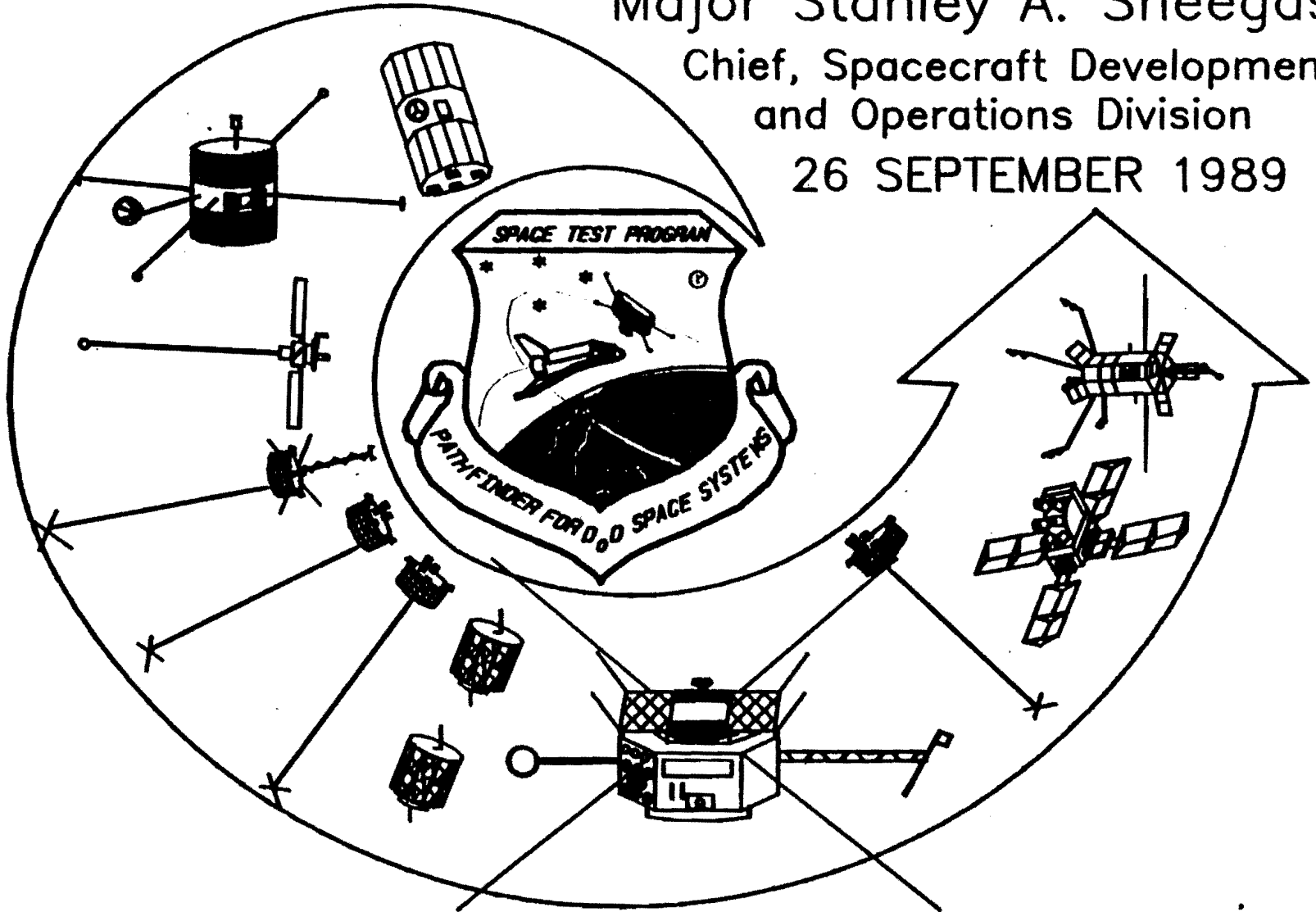
ABSTRACT

The Department of Defense (DOD) Space Test Program (STP) has been and will continue to provide spaceflight for DOD experiments on small satellites. STP past, present and future small satellite missions will be described. The currently planned small satellite missions, P87-2 STACKSAT, P89-1 Independent Space Experiment System (ISES), P89-A Profile and SIIO on Scout (PASS), and P90-1 Space Test Experiments Platform (STEP) will be highlighted.



SPACE TEST PROGRAM (STP) SMALL SATELLITE INITIATIVES

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THIRD ANNUAL AIAA/USU CONFERENCE ON SMALL SATELLITES



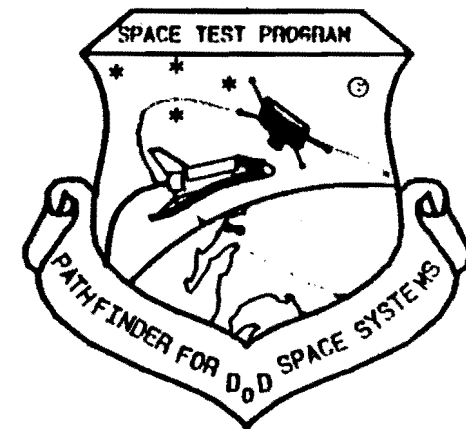
OVERVIEW

- 0 STP BACKGROUND
- 0 PAST STP SMALL SATELLITE MISSIONS
- 0 CURRENT SMALL SATELLITE MISSIONS



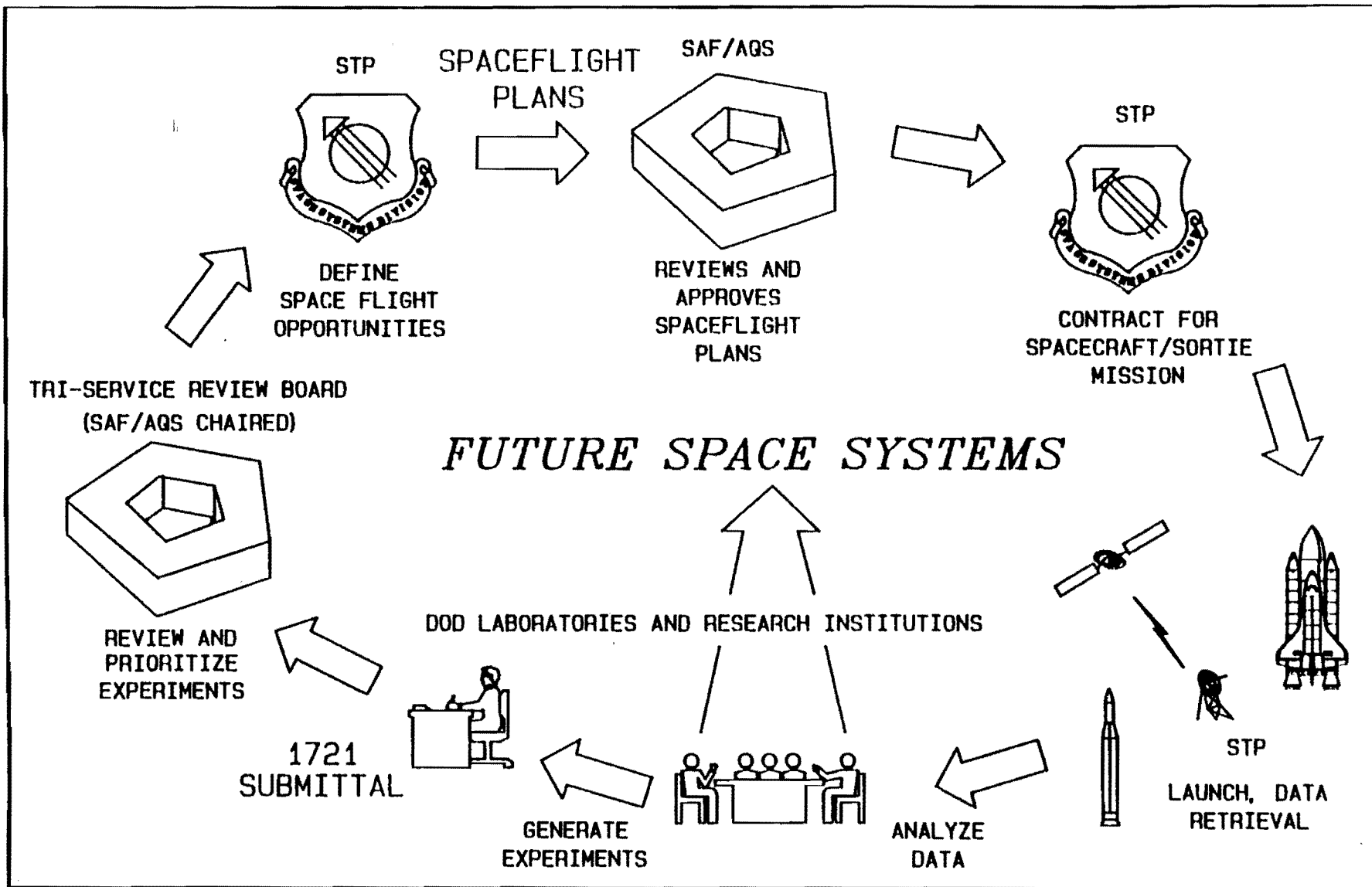
SPACE TEST PROGRAM OVERVIEW

- TRI-SERVICE ORGANIZATION, ESTABLISHED IN 1965 (AFR 80-2)
- USAF EXECUTIVE MANAGEMENT, PE 63402F
- PROVIDE SPACEFLIGHTS OF DOD R&D EXPERIMENTS
 - LABS, DARPA, DNA, AFTAC,
- PATHFINDER FOR MAN-IN-SPACE
- UTILIZE FLIGHT MODES
 - FREE-FLYING, SHUTTLE CAPTIVE
 - DEDICATED, PIGGYBACK
 - STS, ELV
 - NASA, COMMERCIAL
- DEVELOP AND USE STANDARD HARDWARE
- NUMBER OF EXPERIMENTS
 - FLOWN: 170 (SINCE FIRST LAUNCH 29 JUNE 1967)
 - ASSIGNED NOW: 6
 - TO BE ASSIGNED: 38





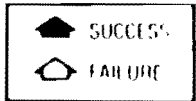
THE STP EXPERIMENT CYCLE





Space Test Program Launch History

SPACE FLIGHT NUMBER	EXPERIMENTS	LAUNCH DATE CALENDAR YEAR														
		67	68	69	70	71	72	73	74	75	76	77	78	79	80	81
S67 1	2	▲														
S67 3	2	▲														
S68 2	1		▲													
S68 4	10		▲													
S67 2	14		▲													
S69 1	11			▲												
S69 2	1			▲												
S68 1	3			▲												
S69 4	1			▲												
S70 3	1				▲											
S70 4	1				▲											
P70 1	2				▲											
P70 2	9				▲											
P71 2	4				▲											
S71 3	2					▲										
S71 5	2					▲										
P72 1	5					▲										
S73 7	1						▲									
P73 3	1							▲								
S73 5	3							▲								
P72 2	4								▲							
S75 1	1									▲						
S73 6	7									▲						
P74 1	2										▲					
P76 5	1											▲				
S74 2	7												▲			
S76 1	1													▲		
P76 4	1														▲	
S77 1	1															▲
S77 2	4															▲
P78 2	3															▲
P78 1	9															▲
S78 1	1															▲





Space Test Program Launch History (Cont'd)

SPACE PROJECT NUMBER	EXPERI- MENTS	LAUNCH DATE CALENDAR YEAR																
		87	88	89	90	91	92	93	94	95	96	97	98					
S81 1	2	▲																
P269	7	▲																
S81 1	1		▲															
P81 1	5		▲															
S81 2	1			▲														
S84 5	1				▲													
S80 1	5				▲													
S85 1	2				▲													
S84 1	1				▲													
S85 6	1					◻												
S84 4	1					▲												
S85 6	1						▲											
S84 6	1							▲										
S85 4	1							▲										
S86 1	1								◻									
P87 1	4									▲								
P87 3	1																	▲

▲ SUCCESS

◻ FAILURE



PAST STP SMALL SATELLITE MISSIONS

0 P83-1 HILAT

0 P87-1 POLAR BEAR



P83-1 HIGH LATITUDE (HILAT)

OBJECTIVE: STUDY EFFECTS OF IONOSPHERIC PLASMA ON RADIO PROPAGATION. OBTAIN DAY AND NIGHT SIMULTANEOUS MULTISPECTRAL VISIBLE AND ULTRAVIOLET IMAGES OF GLOBAL AURORAL DISPLAYS.

INTEGRATING CONTRACTOR: JOHN HOPKINS UNIVERSITY/APPLIED PHYSICS LABORATORY/RCA

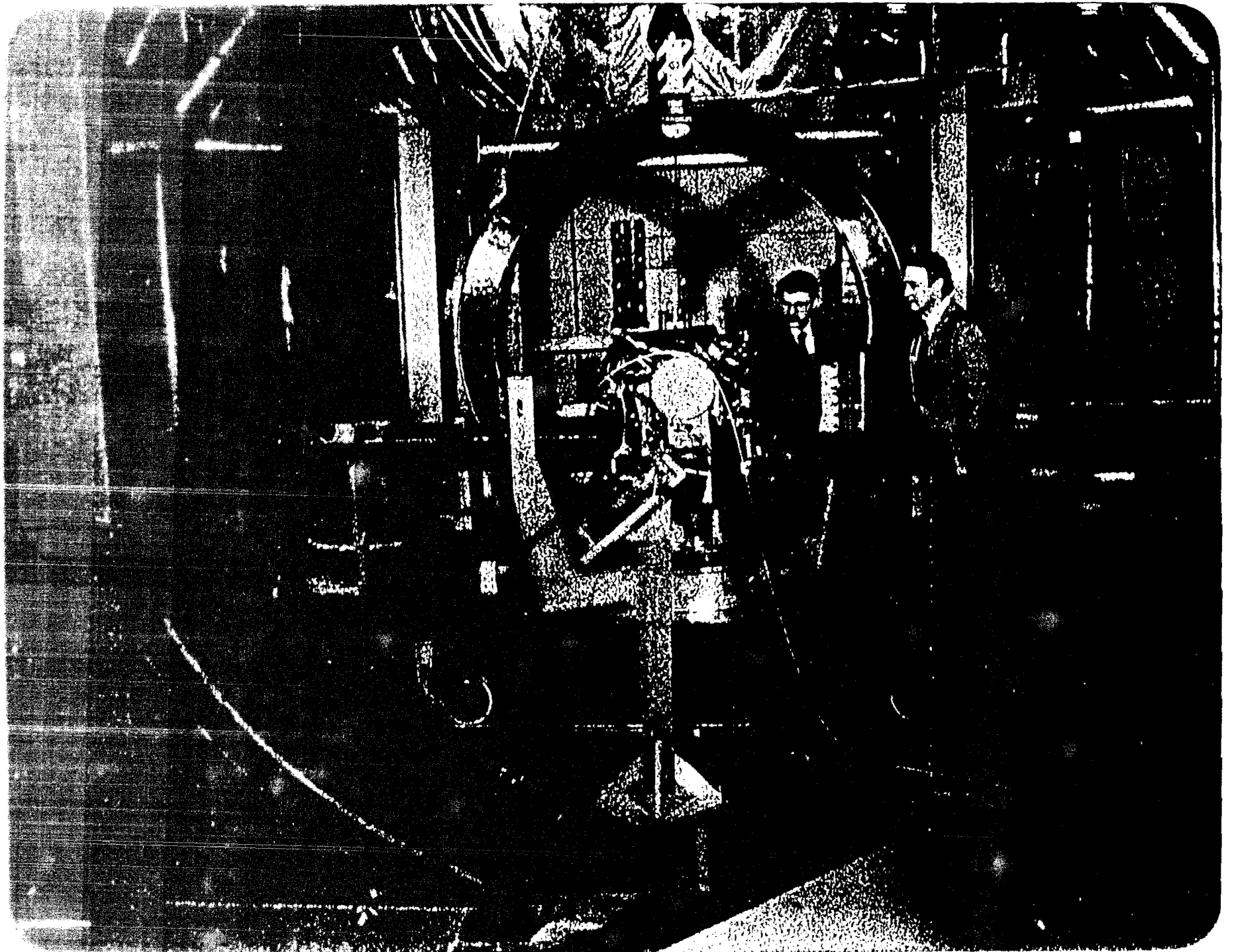
SATELLITE: MODIFIED TRANSIT

LAUNCH DATE: 27 JUN 83

VEHICLE: SCOUT

ORBIT: 480 X 484 NMI, 82° INCLINATION

EXPERIMENTS: MULTIFREQUENCY RADIO BEACON
AURORAL IONOSPHERIC MAPPER
VISIBLE SPECTRUM TELEPHOTOMETERS
PLASMA MONITOR
ELECTRON SPECTROMETER
MAGNETOMETER





P87-1 POLAR BEACON AND AURORAL RESEARCH (POLAR BEAR)

OBJECTIVE: MEASURE SCINTILLATION EFFECTS CAUSED BY STRUCTURED IONOSPHERIC PLASMA ON RADIO FREQUENCIES USED FOR RADAR AND COMMUNICATIONS. MEASURE POLAR FIELD ALIGNED CURRENTS, OBTAIN DAY AND NIGHT SIMULTANEOUS MULTISPECTRAL VISIBLE AND ULTRAVIOLET IMAGES OF GLOBAL AURORAL DISPLAYS

INTEGRATING

CONTRACTOR (S): JOHN HOPKINS UNIVERSITY/APPLIED PHYSICS LABORATORY/RCA

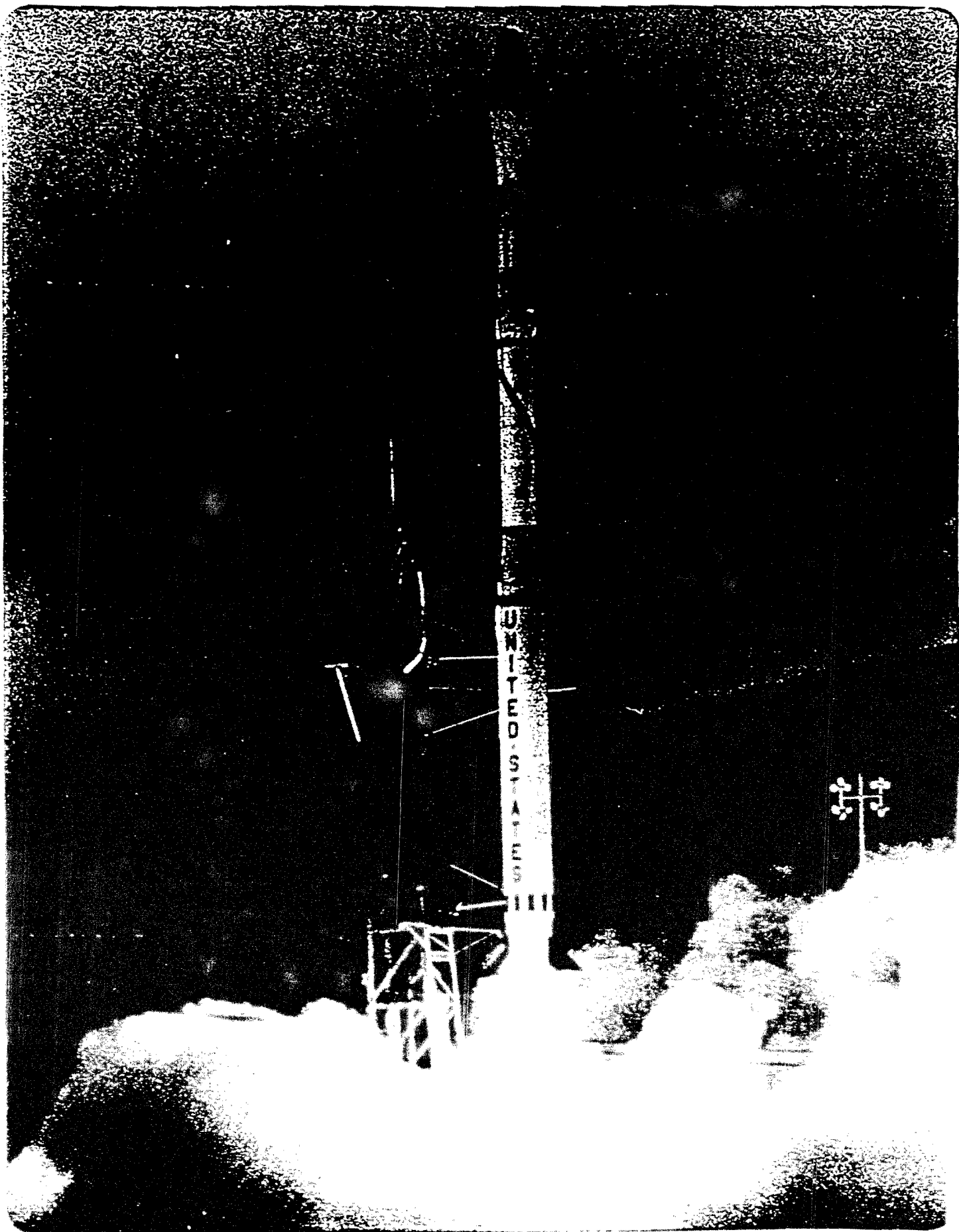
SATELLITE: MODIFIED TRANSIT

LAUNCH DATE: 17 NOV 86

VEHICLE: SCOUT

ORBIT: 582 X 607 NMI, 89.5° INCLINATION

EXPERIMENTS: MULTIFREQUENCY RADIO BEACON
MATS
AURORAL/IONOSPHERIC REMOTE SENSOR
MAGNETOMETER





CURRENT SMALL SATELLITE MISSIONS

- 0 P87-2 STACKSAT
- 0 P89-1 ISES
- 0 P89-A PASS
- 0 P90-1 STEP



P87-2 STACKSAT

OBJECTIVE: COLLECT MAGNETIC VARIATION DATA, ENHANCE COMMUNICATIONS UNDER ADVERSE CONDITIONS, AND PROVE RELIABILITY OF SOLID STATE MEMORY

INTEGRATING CONTRACTOR: DEFENSE SYSTEMS INC (DSI)
THROUGH MOA BETWEEN STP/
OFFICE OF NAVAL RESEARCH (ONR)

SATELLITE: 3 GRAVITY GRADIENT SATELLITES

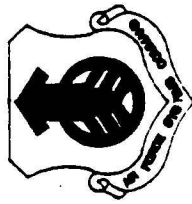
LAUNCH DATE: 13 DEC 89, FROM VANDENBERG AFB

VEHICLE (S): ATLAS E/ALTAIR

ORBIT: 400 NMI CIRCULAR, 90 DEGREES INCLINATION
MAJOR

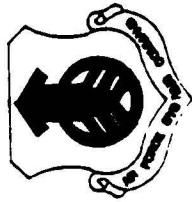
EXPERIMENTS: TRANSCEIVER EXPERIMENT (TEX)
SELECTIVE COMMUNICATIONS EXPERIMENT (SCE)
POLAR ORBITING GEOMAGNETIC SURVEY (POGS)
SOLID STATE RECORDER (SSR)

SECONDARY EXPERIMENTS: PROTOTYPE DEPLOYMENT DEVICE (PDD)



P87-2 INNOVATIONS

- 0 3 SPACECRAFT STACK
- 0 SIMPLE ADAPTABLE SATELLITE
- 0 PC BASED GROUND STATIONS



P89-1 INDEPENDENT SPACE EXPERIMENT SYSTEM (ISES)

OBJECTIVE: COMMUNICATIONS WITH A GROUND BASED SENSOR AND DETECT
ULTRASOFT X-RAYS BEING EMITTED FROM LOCATIONS IN SPACE

INTEGRATING

CONTRACTOR(S): DEFENSE SYSTEMS INCORPORATED (DSI)
LANL MANAGED CONTRACT WITH THE ASTRONAUTICS COMPANY

SATELLITE(S): GRAVITY GRADIENT, SPINNING

LAUNCH DATE: 3RD QTR, FY 91 FROM WTR

VEHICLE: PEGASUS

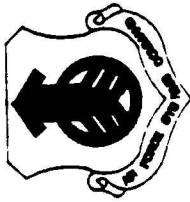
ORBIT: 400 NMI CIRCULAR, 90 DEGREES INCLINATION

MAJOR EXPERIMENTS: RADIATION EXPERIMENT (REX)
ARRAY OF LOW ENERGY X-RAY IMAGING SENSORS (ALEXIS)



P89-A INNOVATIONS

- 0 LAST AF SCOUT
- 0 1ST SPACE APPLICATION OF FULLY INTEGRATED
VLSI ENCRYPTION SET
- 0 LST-5B TRANSCEIVER BOARDS



P89-A PROFILE/SIIO

OBJECTIVE: GEOLOCATE SOURCES OF RFI TO FLTSATCOM
DEMONSTRATE THE SURVIVABILITY OF PHOTONICS TO
SPACE EFFECTS

INTEGRATING CONTRACTOR: ARDAK/FAIRCHILD (UNDER ONR CONTRACT)

SATELLITE(S): PASSIVE SPINNERS

LAUNCH DATE: 2QTR FY91 FROM VANDENBERG

VEHICLE: SCOUT

ORBIT: 300 NMI CIRCULAR, 72 DEGREES (PROFILE)
300 X 600 NMI ELLIPTICAL, 72 DEGREES (SIIO)

MAJOR EXPERIMENTS: PASSIVE RADIO FREQUENCY INTERFERENCE LOCATOR
EXPERIMENT (PROFILE)
SPACE IRRADIATED INTEGRATED OPTICS (SIIO)



SPACE TEST EXPERIMENTS PLATFORM (STEP)

OBJECTIVE: ACCESS TO SPACE FOR MANY STP
EXPERIMENTS ON STEP SATELLITE BUSES

CONTRACTOR: TBD - COMPETITIVE ACQUISITION

SATELLITE: TBD

LAUNCH DATE: P90-1 FY92
P90-B FY93
P91-A FY94

VEHICLE: PEGASUS/SCOUT CLASS LV

ORBIT: VARIES - ALL POLAR, NEAR EARTH

EXPERIMENTS: P90-1
DUCTED IONOSPHERE (DUCTED)
COUPLING OF HIGH ATTITUDE MAGNETOSPHERIC PROCESSES
INTO THE IONOSPHERE (CHAMPION)
PLASMA ENVIRONMENT ANALYZER (PEA)
ATMOSPHERIC DENSITY SPECIFICATION (ADS)



STEP INNOVATIONS

- 0 EXTENSIVE GOVERNMENT/INDUSTRY INTERACTION
- 0 GOVERNMENT TRADES CONTROL FOR COST SAVINGS
- 0 GOVERNMENT REWARDS PERFORMANCE
- 0 VARIATION IN QUANTITY MATRIX



INNOVATIONS SUMMARY TO SUPPORT EXPERIMENTERS

- 0 PROCURE ADAPTABLE SMALL SATELLITES
 - P87-2
 - P89-1
 - P89-A
 - P90-1 & FUTURE STEP MISSIONS

- 0 FLY MULTIPLE SMALL SATELLITES PER BOOSTER CAPABILITY

- 0 TAILOR ACQUISITION TO EXPERIMENT REQUIREMENTS

- 0 FLEXIBLE ON-ORBIT SUPPORT