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National Aeronautics and  
Space Administration

Washington, D.C.  
20546

AUG 5 1983

MOE-8

Post Flight  
Flight Operations Report  
No. M-989-03-07

TO: A/Administrator

FROM: M/Associate Administrator for Space Flight

SUBJECT: Space Transportation System Mission - STS-7

The enclosed STS-7 Post Flight, Flight Operations Report No. M-989-83-07 is herein submitted as required by HQMI 8610.1B dated December 27, 1982.

JAMES A. ABRAHAMSON  
Lieutenant General, USAF  
Associate Administrator for  
Space Flight

Enclosure

(NASA-TM-85337) SPACE TRANSPORTATION SYSTEM  
MISSION STS-7 (National Aeronautics and  
Space Administration) 5 p HC A02/MF 201

N83-31711

CSC 22A

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Unclas

28462

# NASA Post Flight Operation Report

MISSION: STS-7 (Challenger OV-099)

LAUNCH DATE: June 18, 1983

LAUNCH VEHICLE: Scout \_\_\_\_\_ Delta \_\_\_\_\_ A/Centaur \_\_\_\_\_ Atlas-F \_\_\_\_\_ Shuttle XX  
 Edwards AFB, CA

LAUNCH FROM: KSC (7:33 am EDT) SHUTTLE LANDING AT: June 24 (Orbit 98) DURATION: 146hr. 23min. 59sec.

ACTUAL ORBITAL PARAMETERS: Apogee (km) 296.3 (160 nmi) Perigee (km) 296.3 (160 nmi)  
 Inclination (Deg) 28.45° Period (Min) 90.3  
 Launch Azimuth Due East (90°) Altitude (km) 296.3 (160 nmi)

ASSESSMENT OF VEHICLE PERFORMANCE OR STS OBJECTIVES: The mission is judged a success.

ASSESSMENT OF MISSION OBJECTIVES:

PAYLOAD	ORGANIZATION	ASSESSMENT
1. <u>TELESAT (ANIK C-2)/PAM-D</u>	<u>Telesat, Canada</u>	<u>Successfully Deployed. Status to be supplied by Code MC-7</u>
2. <u>PALAPA-B1/PAM-D</u>	<u>PERUMTEL, Indonesia</u>	<u>Successfully Deployed. Status to be supplied by Code MC-7</u>
3. <u>OSTA-2</u>	<u>NASA</u>	<u>Data taken. Status to be supplied by Code EM-8</u>
4. <u>SPAS-01 (Shuttle Pallet Sat.01)</u>	<u>MBB, Germany</u>	<u>Successful attached and detached ops. All DTO's and 8 exp'm't data taken. Film and data removed by MBB.</u>
5. <u>CFES (Cont. Flow Electrophoresis)</u>	<u>MDAC/NASA</u>	<u>Data takes were successful. Data to MDAC for analysis</u>
6. <u>GAS (Get-away Special)</u>		
G002	Kayser Threde, W. Ger.	The data takes for all GAS experiments were successful. Data delivered to the various experimenters.
G009	Purdue University	
G012	RCA/Camden, N.J. Schools	
G033	Cal. Instit. of Tech.	
G088	Edsyn, Inc.	
G305	USAF/NRL	
G345	GSFC/NRL	
7. <u>MLR (Monodisperse Latex React.)</u>	<u>NASA</u>	<u>Data taken. Status to be supplied by Code EM-8</u>

MAJOR ACCOMPLISHMENTS

See Page 2.

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Major Accomplishments

The second flight of Challenger (OV-099) was another exceptional flight in that 11 major objectives were accomplished. The TELESAT-F and PALAPA-B1 were deployed exactly on time. The SPAS-01 attached and detached operations went extremely well despite some heating problems with the SPAS. The OSTA-2 experiments for the Material Experiments Assembly (MEA) and Material Wissenschaftliche Autone Unter Schwerelosigkeit (MAUS) were activated as planned with no indications of anomalies, and the MLR and CFES experiment packages in the middeck area were operated by the crew as planned. Ninety-six percent (56 of 58) of the assigned flight test objectives were completed. This flight accomplished 12 firsts for the Shuttle Program: repeat crewman, Capt. Crippen; five-person crew; detached payload operations; Ku-band antenna deployed and tested; U.S. woman in Space (Dr. Sally Ride); prolonged use of 10.2 psi cabin pressure; landing without full convoy support; landing without chase aircraft support; use of ground cameras for landing support; weather wave-off and landing on the same day at a back-up site; landing without MSBLS guidance; and use of Training Aircraft (STA) for weather flights at maximum separated distance in the U.S. The turnaround time at DFRF was accomplished in the least time to date (only 99.5 hours) and the return to KSC was completed with a total of only 5 days loss of program time.

Approved: \_\_\_\_\_

*James A. Abraham*  
Associate Administrator for Space Flight

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M-989-83-07

STS-7 MISSION SUMMARY

The STS-7 was launched at 7:33 am EDT on June 18, 1983, at Kennedy Space Center (KSC) from Launch Pad A using MLP-1. The flight crew was Capt. R. L. Crippen, USN, Commander; Capt. F. Hauck, USN, Pilot; and Lt. Col. J. M. Fabian, USAF; Dr. S. K. Ride and Dr. N. E. Thagard (MD) Mission Specialists. A nominal launch, ascent and OMS firing resulted in the planned circular orbit of 160 nmi and an inclination of 28.45°. The mission met all the time lines for payload deployment, experiment and test objectives data takes but due to weather conditions, the first planned landing at KSC was scrubbed. Significantly, Capt. Crippen became the first repeat crewman to fly in an Orbiter and Dr. S. K. Ride became the first U.S. woman astronaut as part of the first 5-person crew into space. The Challenger landed at Edwards Air Force Base, CA, at 9:57 am EDT on June 24, 1983.

The KSC crews readied the Challenger for a 1:30 pm EDT takeoff from DFRF to Kelly AFB, San Antonio, Texas, on June 28. The SCA/OV-099 arrived at KSC at 10:26 am EDT on June 29 to complete the STS-7 mission.

The countdown for the launch was exceptionally smooth, the SRB recovery went well, and the KSC and DFRF crews at DFRF did an outstanding turnaround performance resulting in the Challenger returning to KSC with only a 5-day loss of program time (versus landing at KSC).

With the detached SPAS-01 payload operations, rendezvous, proximity operations and RMS loaded arm tests all a great success, the Shuttle program took another "giant leap" in fulfilling the Shuttle System requirement as a universal launch system.

The enclosure is a list of significant ascent and other mission events.

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Enclosure

N-989-83-07

STS-7 SIGNIFICANT EVENTS

MAJOR EVENTS	HEIGHTS (NMI) Hp/Ha	MISSION ELAP. TIME HRS:MIN:SEC	EASTERN DAY:TIME	DELTA V (fps)	ORBIT NUMBER
DAY 1					
LAUNCH		0:00:00	7:33 AM		
MAX DYNAMIC PRESSURE		0:01:03	7:34 AM		1
SRB SEPARATION		0:02:06	7:35 AM		1
MAIN ENGINE CUTOFF		0:08:20	7:41 AM		1
EXTERNAL TANK SEPARATION		0:08:38	7:42 AM		1
OMS-1 (155 Seconds)	52/160	0:10:21	7:43 AM	240	1
OMS-2 (123 Seconds)	160/160	0:43:30	8:17 AM	194	1
ACTIVATE MEA		0:02:24	9:57 AM		2
TELESAT DISPLAY	160/160	9:29:00	5:02 PM		7
OMS-3 (6 Seconds)	160/165	9:43:23	5:16 PM	10	7
TELESAT PGM	160/19823	10:13:38	5:47 PM		8
DAY 2					
PALAPA DEPLOY		26:03:00	9:33 AM		18
OMS-4 (6 Seconds)	160/170	26:18:10	9:51 AM	10	18
PALAPA PGM	160/19872	26:48:04	10:21 AM		19
SPAS-01 CHECKOUT		29:15:00	12:48 PM		20
ACTIVATE MLR		29:16:30	12:49 PM		20
RMS CHECKOUT		30:30:00	2:03 PM		21
MEA-1 & MAUS-C ON		33:37:00	5:10 PM		23
DAY 3					
MLR DEACTIVATE		49:25:00	8:58 AM		33
OMS-5 (4 Seconds)	157/170	51:17:11	10:50 AM	6.5	35
OMS-6 (13 Seconds)	157/157	52:02:33	11:36 AM	22.7	35
SPAS-01 APPROACH		52:05:00	11:38 AM		35
MAUS A & B ON		53:02:00	12:35 PM		36
DAY 4					
CPES OPERATIONS		69:15:00	4:48 AM		47
MEA-2 ON		74:31:10	10:40 AM		50
END SPAS APPROACH ACTIVITY		75:45:00	12:18 PM		52
DAY 5					
START SPAS DETACHED OPS.		92:10:00	3:43 AM		62
SPAS-01 RELEASE		93:05:00	4:48 AM		63
VBAR APPROACH		96:00:00	7:33 AM		64
SPAS-01 RMS GRAPPLE (First)		96:40:00	8:13 AM		65
INERTIAL APPROACH ON SPAS		99:25:00	10:58 AM		67
SPAS-01 RMS GRAPPLE (2nd)		99:55:00	11:28 AM		67
MEA-3 ON		102:45:00	2:18 PM		69
DAY 6					
RMS LOADED ARM TESTING		117:10:00	4:43 AM		79
RMS STW		120:15:00	7:48 AM		81
DAY 7					
DEACTIVATE MEA & MAUS		139:00:00	2:33 AM		93
DEORBIT BURN (155 Seconds)	0/156	145:23:00	8:56 AM		97
ENTRY INTERCEPT (400K FT)		145:53:00	9:26 AM		98
ALTERNATE LAND. EARTH-15		146:23:59	9:57 AM		98