

For Network Personnel Only

TECHNICAL INFORMATION BULLETIN

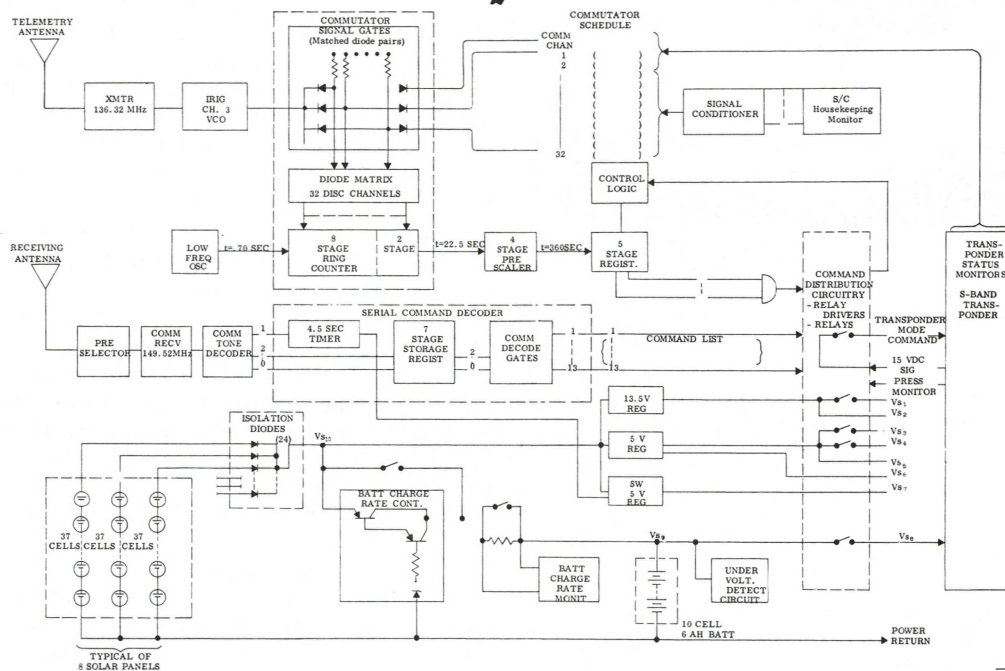
THE MANNED SPACE FLIGHT NETWORK

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Goddard Space Flight Center

December 1, 1967

First TTS Ready For Launch



This block diagram shows the systems of the Test and Training Satellite.

A unique method of exercising the Manned Space Flight Network will be put into operations this month when the Test and Training Satellite is launched into earth orbit.

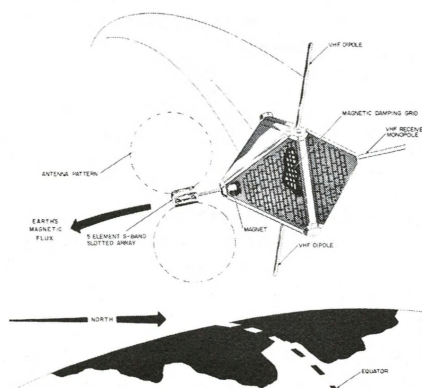
The basic concept of the TTS is to provide an economical and dynamic medium capable of exercising the USB systems of the MSFN.

The TTS is scheduled for launch about December 13, into an elliptical earth orbit as a secondary payload aboard the second stage of an improved Delta launch vehicle. Pioneer C will be the primary spacecraft for the first TTS launch.

A second TTS will be launched after the decay of the first in approximately seven months.

The TTS will afford station personnel the opportunity and experience in tracking and acquisition, handover proce-

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THE FIRST TEST AND TRAINING Satellite which is due to be launched about December 13 will give the MSFN land stations and ships an active target for acquisition, tracking, handover and communications procedures.

Six Apollo Missions

An Apollo mission schedule of six flights in 1968 and five in 1969 has been announced.

NASA Associate Administrator for Manned Space Flight, Dr. George Mueller, said the new schedule and alternative plans provide a schedule under which a limited number of Apollo Command and Service Modules and Lunar Landing Modules configured for lunar landing may be launched on test flights toward the Moon by the end of the decade.

Training Schedule Set For Next Year

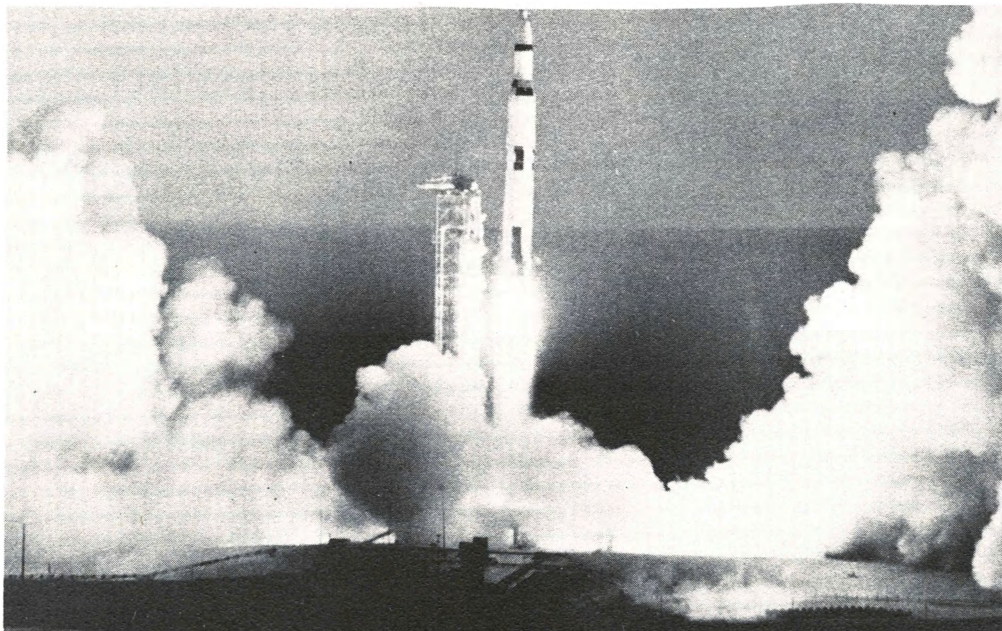
The course schedule at the Network Test and Training Facility, GSFC, for the first six months of 1968 is as follows:

No.	Course	Dates
110	MSFTP-2 PCM Decom	Jan. 29 to March 29 Apr. 22 to June 21
132	Site/Network Interface and Data Flow	Feb. 26 to March 1 Apr. 15 to Apr. 19 June 10 to June 14
200	642B Modified Computer	Feb. 26 to Apr. 19 June 3 to July 26
210	1218 Computer/Multiplexer	Feb. 26 to April 19
230	RSDP Peripheral Equipment	Apr. 22 to May 31
320	Unified S-Band Land Antenna	Feb. 26 to Apr. 5 Jan. 15 to Mar. 1
330	USB Receiver/Exciter	Apr. 8 to May 24 Jan. 29 to Mar. 15
340	USB Power Amplifier	May 20 to July 5 Jan. 29 to Mar. 1
350	USB Digital Ranging	Apr. 22 to May 24
360	USB Tracking Data Processor/Antenna Position Programmer	Jan. 29 to Mar. 15 Apr. 22 to June 7
372	USB Systems, Level II	Mar. 18 to Apr. 5 June 24 to July 12
400	Teletype Operations	Jan. 22 to Feb. 2 Apr. 8 to Apr. 19 June 24 to July 12
410	Teletype Maintenance	Feb. 5 to Mar. 8 Apr. 22 to May 24
420	112A Key Intercom	Mar. 11 to April 5 May 27 to June 21
430	Apollo Data Modems	Jan. 29 to Feb. 16 Apr. 22 to May 10
510	MSFN Recorders	Jan. 8 to Feb. 9 Mar. 1 to Apr. 3
520	Apollo Timing	Apr. 22 to May 17
600	Apollo Program	Feb. 12 to Feb. 16 Apr. 1 to Apr. 5 May 27 to May 31
610	Digital Devices	Jan. 15 to Jan. 26 Feb. 12 to Feb. 23 Apr. 8 to Apr. 19 May 20 to May 31 June 24 to July 5
620	Apollo M&O Supervisors	Mar. 11 to Mar. 29 May 27 to June 11
640	MSFN Operations Center	Feb. 5 to Feb. 9 Apr. 22 to Apr. 26

Courses This Month

Courses still in session and their completion dates at the network test and training facility, GSFC, through the end of December include:

MSFTP-N PCM Decom System (110), December 22; Site/Network Data Flow, Level II (132), December to December 18; USB Land Antenna Systems (320), December 8; USB Receiver/Exciter Group (330), December 8; USB Power Amplifier Group (340), December 8; USB Tracking Data Handling (360), December 8, Data Handling (372), December 22; Teletype Maintenance (410), December 22; Apollo Timing System (520), December 22.



THE START OF A SUCCESSFUL MISSION.—Amid billowing smoke and flame, the Saturn V blasts from its launch pad at Cape Kennedy on the start of the AS-501 Mission. The outstanding success of the mission in launching the World's largest rocket was shared by the Manned Space Flight Network. The support of the MSFN has been labeled outstanding in this first full-scale test of the Unified S-band Apollo Tracking Network.

MSFN AS-501 Support Successful

The Manned Space Flight Network provided excellent support to the AS-501 Mission.

While several problems were encountered, generally attributed to a combination of new systems, hardware and software, personnel, and procedures, the MSFN support was considered exceptional.

As the Apollo spacecraft lifted off of Complex 39A at Cape Kennedy on November 9, the MSFN status was Green with the exception of the MPS-26 radar at Canary Island, the command circuit to the Vanguard, and the GRTS "B" computer.

As far as Network system performance, it was noted that:

... The overall support by USB equipped stations was very good. There were no USB equipment failures that resulted in a loss of data, although some procedural and operator errors did result in lost data. It was noted that the performance by BDA, GWM and GDS was very good for all passes. The support

at GBM, HAW, GYM and MAD was good with only minor problems encountered.

... Generally, it was noted that the Network radars performed well.

... The telemetry, air to ground and acquisition aid systems performed exceptionally well. The operation of the acq aid antennas exceeded expectations by tracking the spacecraft to 6,000 nautical miles with good decom lock to 5,000 miles. Decom lock was not expected to be good above 4,000 miles.

Ops Doc Status

Operations documentations scheduled for publication in the next month or which has been recently published includes the following:

Revision to AS-204 LM Supplements to the NOD (launch scheduled 1st quarter, 1968) -- Distributed November 14. (Supporting stations: MLA, CNV, PAT, MIL, GBI, ANT, BDA, CYI, ASC, ANG, ACN, PRE, TAN, CRO, GWM, CAL, HAW, GDS, GYM, WOM, WHS, GBM, TEX, ARIA, RED, RKV, CSQ, GTK, and Powered Flight Ship.)

Network Operations Manager's Report for AS-501 Mission (launched November 9) -- Distributed November 17.

AS-502 Supplements to the NOD (launch scheduled 1st quarter, 1968) -- Distribution scheduled January 2. (Supporting stations: TEL-IV, CNV, KSC, PAT, CIF, MIL, ATF, MLA, BDA, GBI, GBM, GTK, ANT, ANG, CYI, MAD, ASC, ACN, SEN, TAN, CRO,

TTS Launch

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dures between various combinations of stations and ships. The satellite will also enable the MSFN to exercise the voice communications system when the satellite is in view of two stations simultaneously by uplinking voice from one station and receiving it at the second station.

The TTS is an Orbiting Relay Satellite-III model of the environmental research satellite series. It carries a payload consisting of an S-band transponder compatible with the MSFN USB system. After launch the TTS will separate from the Delta launch vehicle and establish its own independent orbit, with an inclination of 33 degrees, an apogee of 324 nautical miles, and a perigee of 165 nautical miles.

Besides the transponder the spacecraft will have a VHF command system for operating the transponder, a VHF telemetry system for obtaining spacecraft and transponder status data as well as providing a modulated tracking beacon, a magnetic attitude control system to align the spacecraft with the earth's magnetic field, and a power supply system.

The spacecraft is octahedron shaped with dimensions of 11 inches on each side. It weighs 40 pounds. The open framework is closed with eight triangular panels to which solar cells are mounted. The top apex supports the S-band antenna. At the bottom is the fitting for mounting and ejecting the spacecraft from its launch canister. The VHF command telemetry antenna section is located near the bottom apex.

CNB, GWM, HAW, CAL, GDS, GYM, WHS, TEX, Instrumented Ship, C-band Ship, Powered Flight Ship, ARIA 1-5).

Network Operations Plan for GEOS-B Mission (launch scheduled December 20) -- Distribution scheduled December 6. (MSFN Supporting stations: BDA, CYI, TAN, CRO, HAW.)

Postmission Report for Intelsat II-F-4 Mission (launched September 28) -- Distributed November 14. MSFN Supporting stations: BDA, TAN, CRO, HAW.)

Network Operations Plan for Pioneer C Mission (launch scheduled December 13) -- Distributed November 24. (MSFN Supporting stations: BDA, TAN, CRO, HAW, GYM, HAW.)

GSFC Network Operations Plan for TTS-A Mission (launch scheduled December 13 as part of Pioneer C Mission) -- Distributed November 20. (Supporting stations: All MSFN USB stations, including Apollo Instrumented ships and aircraft.)

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