

The second Test and Training Satellite (TETR-B) is scheduled to be launched on November 6 as a secondary payload aboard an improved Delta launch vehicle.

As was the case with the first TETR Satellite, launched December 13, 1967 TETR-B will be inserted into an elliptical orbit and will provide an active, orbiting target for training MSFN Unified S-band system personnel. TETR-1 successfully completed its mission and reentered on April 28, 1968 after 138 days in orbit.

Using the orbiting TETR-B as a target, MSFN personnel operating USB systems will receive training in the following areas:

1. Premission checkout of USB systems at MSFN stations

2. Mission simulation

3. Development and verification of acquisitions and handover procedures, and

4. Development and verification of orbits determination programs.

In addition, TETR-B will be used in performing MSFN engineering and operational tests to aid in defining and/ or correcting possible USB systems problem areas.

The TETR-B will contain an S-band transponder which is compatible with the USB systems of the MSFN. The S-band transponder will provide a means of exercising the USB systems by turning around an uplinked composite signal of PCM telemetry (1.6, 51.2 or 72 kbps), voice, angle tracking, ranging, and biomed information. These signals will be used singularly or simultaneously.

It is expected that TETR-B will be in orbit for approximately 16 months. TETR-C will be launched in late 1969. At that time TETR-B will become a backup or secondary spacecraft. For training purposes, MSFN stations will be scheduled on a regular basis to track the TETR-B and accomplish the mission objectives.

The TETR-B Satellite will be launch-

ed from Cape Kennedy, on a 108 degree launch azimuth and inserted into an elliptical orbit with an apogee of 502 nautical miles and a perigee of 203 nautical miles at a 33 degree inclination.

The launch vehicle will be a threestage improved Delta with the TETR-B enclosed in the second stage engine compartment. The TETR-B will be ejected into earth orbit about 21 minutes after liftoff.

Interferometer tracking, telemetry data acquisition, and commanding will be conducted by STADAN by direction of the MSFN TETR Operations Manager. Tracking with the USB systems will be performed by the MSFN for the duration of the mission.

The TETR-B mission has been divided into functional phases so as to provide a better definition of the mission objectives and support requirements. These phases are:

Prelaunch Phase (Launch minus 20 days to launch)--Achieve and demon-strate operational readiness.

Launch and Early Orbit Phase (Launch to launch plus 4 hours)--Insert spacecraft into planned orbit, verify Continued on Next Page



Test and Training Satellite B

# Final Design Plans For AAP Telescope

NASA has announced plans, for final design, fabrication, assembly, integration, test qualification and acceptance of a prototype and flight unit X-ray Spectrographic Telescope to be used in the Apollo Applications Program.

The telescope will fly in the 1970's as part of a giant Apollo Telescope Mountwhich is to be attached to a spent Saturn rocket stage, called the Saturn I workshop. The orbiting spent stage will be converted into a space workshop in which men will stay for prolonged periods and perform various experiments.

The Spectrographic Telescope will be used to accumulate data on X-ray emissions from the quiet and active regions of the Sun.

It is estimated that deliveries of the prototype and flight unit to Marshall Center will begin in late 1969 and the Center will integrate the equipment into the Apollo Telescope Mount.

### **Training Schedule**

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

Course 110, MSFTP-2 PCMDecom, 9 weeks--September 30.

Course 200, 642B Computer System, 8 weeks--October 28.

Course 230, RSDP Peripheral Equipment, 6 weeks--October 7.

Course 510, MSFN Recorders, 5 weeks--September 30.

Course 520, Apollo Timing System, 4 weeks--November 4.

Course 610, Digital Computer Fundamentals, 4 weeks--September 16 and September 30.

Course 320, USB Land Antenna System, 6 weeks--October 28.

Course 330, USB Receiver/Exciter System, 7 weeks--September 30.

Course 340, USB Power Amplifier Group, 7 weeks--October 28.

Course 350, USB Ranging, 5 weeks --September 30.

Course 360, USB Tracking Data Handling, 7 weeks--October 28.

Course 372, USB System II, 3 weeks --September 30.

Course 400, Teletype Operations, 2 weeks--October 28.

Course 410, Teletype Maintenance, 5 weeks--November 11.

Course 430, Apollo Data Modems, 3 weeks--October 28.

Course 640, MSFN Operations Center, 1 week--September 23 and November 18.

Course 600, Apollo Program, 1 week --September 23, October 21, and No-vember 4.

Syste	Station	GSC	BDA	ACN	ANG	GBM	MIL	TEX	GYM	GDS	GDSX	HAW	CRO	HSK	HSKX	GWM	MAD	MADX	CYI	HTV	MER	RED	VAN
Acqu	isition Aid																						1
C-Ba	and Radar																						
Unified S-Band			X	x	X	х	х	х	x	х	х	х	X	x	X	X	х	х	х	х	x	х	X
TLM	PAM/FM/PM		x													x		1	x				
	PCM/PM/PM 1.6 kbps		x	x	x	x	X	х	x	x		x	X	x		x	x		x				
	PCM/PM/PM 51.2 kbps		x	x	X	x	X	х	x	x		x	х	x	-	x	х		x				
	PCM/PM/PM 72 kbps		x	x	x	x	x	х	x	x		x	X	X		X	х		x			-	
	Biomed (1.25 MHz)								1														
	Mag Tape		x	x	x	x	X	x	x	x		x	x	x		x	x		x				
	Real-time Readouts												-						-				
	Displays	x							-														
CMD	Digital																						
	Tone										-								x				
	Updata (70 kHz)		X	x	x	X	x	x	X	x		x	X	X		x	x		X				
Upvoice (30 kHz)			x	X	X	X	X	х	х	x		X	X	X		X	х		X		1		
Voice (1.25 MHz)		1	x	X	x	x	X	x	X	x		x	x	x		x	x		x				
Voice (SCAMA)		x	x	X	x	x	x	x	x	x	x	x	x	X	X	x	x	x	x	x	x	x	x
Teletype		x	x	x	X	X	X	x	x	x	х	x	X	x	X	x	x	x	x	x	x	x	x
High-speed Data		x	x	x	x	x	x	x	x	x	x	x	x	x	x	X	x	x	x				
Dopp	ler Tracking																						
Rang	e Safety																						
Computers		x					-				2									x	x	x	x

Second TETR

#### basic systems operation and determine USB systems operation. Determine USB system capability to track the unstabilized spacecraft.

Spacecraft Subsystem Test and Stabilization Phase (Launch plus 4 hours to launch plus 7 days)--Verify the operational readiness and determine the constraints of the subsystems. Determine in-flight battery characteristics. Allow spacecraft to attain stable attitude.

Test and Training Phase (Launchplus 7 days to end of useful spacecraft life)-Exercise all MSFN Apollo stations USB systems, personnel, and equipment. Conduct operations and engineering tests.

Reentry Phase (Reentry minus 2 days)--Obtain USB tracking data for refinement of MSFN reentry program.

While the basic mission objectives are to provide an active orbiting satellite to permit extensive training of the MSFN systems personnel, and a means of performing USB systems operational and engineering tests, specific objectives include:

1. Providing a minimum of three hours USB acquisition and tracking experience for each MSFN land station and operational Apollo ship.

2. Perform a minimum of 10 handovers between each of the following station combinations:

> MIL to GBM, MIL to BDA, MIL to ANG, GBM to ANG, CYI to MAD, BDA to ANG, BDA to CYI, CRO to HSK, CRO to GWM, HAW to GDS, GDS to GYM, GDS to TEX, GDS to MIL, GYM to TEX, GYM to MIL, GYM to GBM, TEX to MIL, TEX to GBM, TEX to BDA, and TEX to ANG.

3. Perform a minimum of eight

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handovers with each Apollo ship.

4. Each land station will exercise the spacecraft PCM telemetry and voice turnaround capability a minimum of six times. PCM telemetry bit rate (1.6, 51.2, 72 kbps) will be a station option unless specified by TETR Operations.

5. Perform a minimum of six remote voice tests with each land station. The MSFN Network Controller will provide a voice count from GSFC, via SCAMA to the participating station, to the spacecraft. Voice will be received at the 2-way and supporting 3-way stations.

6. Perform a minimum of 12 tracking exercises with maximum MSFN participation using GSFC real-time computer support.

7. Perform a minimum of eight handovers between all MSFN 85-foot antenna prime stations and the JPL/ DSN 85-foot antenna wing stations.

8. Check stations and ship equipment prior to and/or following major EI's and verify and/or update USB acquisition and handover procedures as required.

9. Provide the spacecraft for the Network Test and Training Facility (NT&TF) for USB systems testand personnel training as required.

10. These tests should be performed by all operational ARIA's:

A minimum of one hour USB tracking for each aircraft (A/C),

A minimum of two data transfers for each ARIA to a MSFN land station using data transmitted from a land station through the spacecraft to the ARIA, and

A minimum of four handovers between each ARIA (A/C to A/C), and four handovers with each ARIA and a land station at Apollo ship.

## **Ops Doc Status**

Operations documentation published recently includes:

Premission Briefing Report for AS-205 Mission (launch scheduled October 11, 1968)--distributed September 20.

Network Operations Plan for Minuteman III (future ETR missions)--distributed September 16. (MSFN supporting station: BDA).

NASA-GSFC Operations Plan for OAO-A2 Mission (launch scheduled October 23, 1968)--distributed September 5. (MSFN supporting station: BDA).

Network Operations Plan for Pioneer D Launch Vehicle Support (lanuch scheduled November 6)--distributed October 12. (MSFN supporting stations: BDA, ACN, ANG, CRO, GWM, HAW, GBM, MIL, TAN).

Network Operations Plan for Poseidon (launch scheduled 4th quarter 1968) -- distributed September 16. (MSFN supporting station: BDA).

Network Operations Plan for Titan IIIC, Vehicle 5--distributed September 6, 1968. (MSFN supporting stations: BDA, CRO, HAW).

Manned Space FlightNetwork Mission Support Commitment Document--distributed September 23.

Mission Planning Guide, Change 1-distributed September 27.

Documentation scheduled for distribution in the next month includes:

AS-503 Supplements to the Network Operations Directive.

Network Operations Plan for Intelsat III-A.

Network Operations Plan for Mariner Mars 69.

Network Operations Plan for Pioneer D Launch Vehicle Support.

Instrumentation Ships Office Postmission Report for RAE-A/Delta Mission.

Network Operations Plan for Test and Training Satellite-B Mission.

Change 1 to Revision 2 of the Network Operations Directive.

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