For Network Personnel Only

TECHNICAL INFORMATION BULLETIN

MANNED SPACE FLIGHT NETWORK

GODDARD SPACE FLIGHT CENTER, GREENBELT, MARYLAND

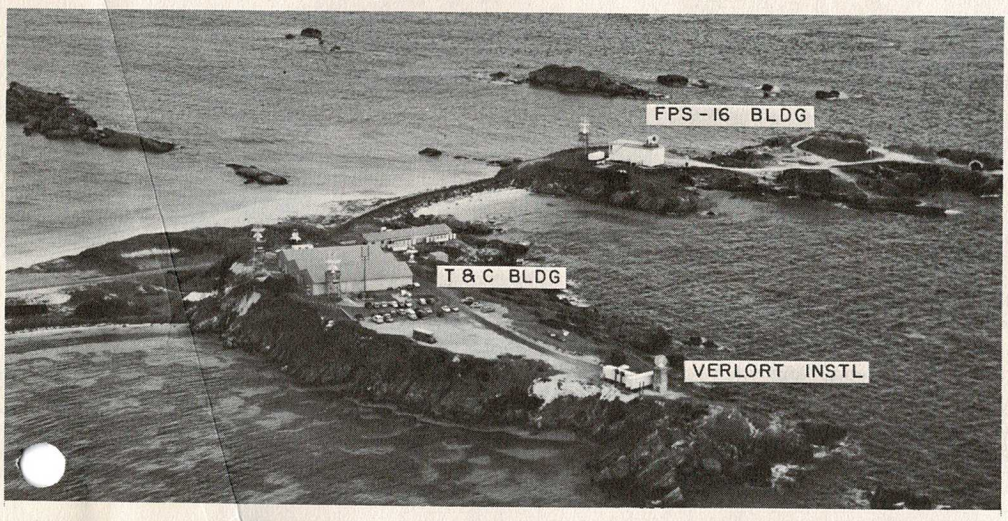
Vol. 2, No. 21 | NATIONAL AERONAUTICS AND SPACE ADMINISTRATION | October 16, 1964

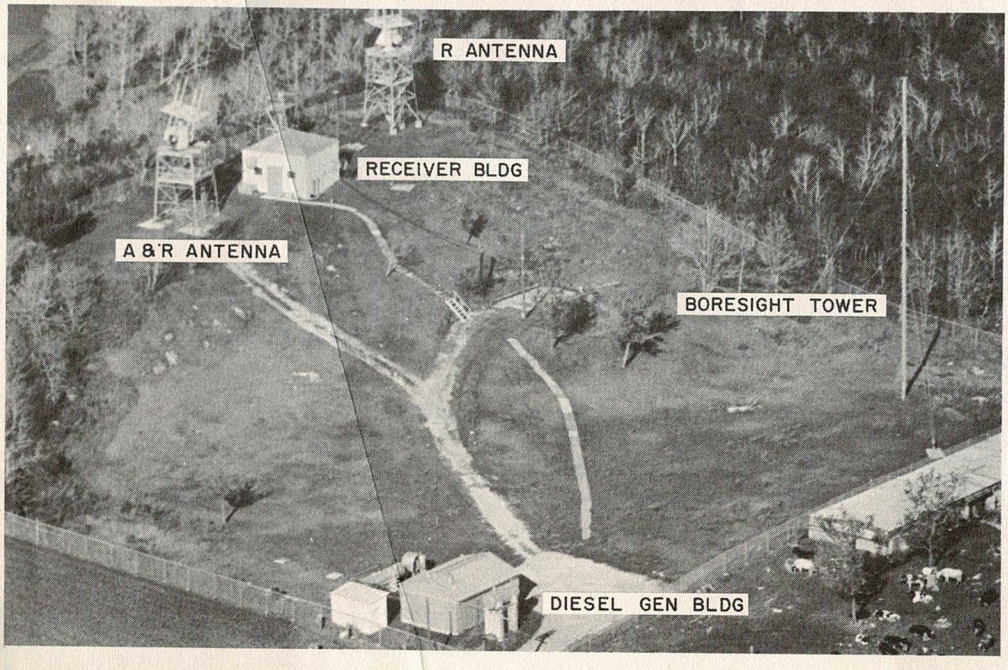
BERMUDA...

BDA is a dual-site station. The control and main body of equipment is located at the Cooper's Island site (upper); all of the station's spacecraft communications receiving equipment is located at the Town Hill site (lower), which is located some six airline miles from Cooper's Island.

The location of BDA in relation to Cape Kennedy allows it to play a dual role for the MSFN. At the time of launch, the primary mission of the station is to provide trajectory data to the GSFC computers. BDA normally acquires the spacecraft at approximately T+3 minutes and is usually able to supply a minimum of 60 seconds of valid radar data prior to engine cutoff and orbital insertion. For subsequent passes, BDA serves as a normal remote tracking station with command capabilities.

Because of the station's strategic location in relation to both Cape Kennedy and Wallops Island, it is often called upon to support launch missions other than those of the MSFN. Fully half of Bermuda's tracking activity in the past has been concerned with Scout vehicles launched from Wallops Island. The purpose of a number of these Scout launches is involved with obtaining reentry data. In connection with the reentry study, Arcas, Deacon-Judi, and Kisha-Judi meteorological rockets are launched from Cooper's Island and tracked by the station to obtain density and temperature measurements up to altitudes of 40 miles.





Jupiter Monitoring Network To Be Implemented

During the latter part of the current year, radio monitoring sites will be implemented at three MSFN stations—KNO, CRO, and HAW—and GSFC to form a worldwide radio monitoring network to aid in the study of the planet Jupiter.

As its primary function, this network will maintain a 24-hour radio monitor of low-frequency radio noises sporadically emitted from Jupiter. First noticed in 1955, these signals have been observed throughout the frequency range of from 10 to 50 megacycles.

Statistical data will be collected on two frequencies—16.5 and 22.2 megacycles—and will shed light on the mechanism of these low-frequency signals. This information will be used to reap further data about the planet's magnetosphere. It also will reveal valuable research information about the properties of the interplanetary medium and the earth's ionosphere.

The four radio monitoring sites comprising the worldwide network will be located approximately 90 degrees (longitude) apart around the world so that Jupiter will always be in sight of at least one of the sites.

Since only one of the four radio monitoring sites will be able to observe Jupiter during any given time period, the three remaining sites will be free for other astronomy studies. As a secondary function, the sites will monitor the sun to provide additional radio noise data. This will be correlated with the Jupiter data to see how solar activity affects the Jupiter radio emissions.

The monitoring sites will consist of a receiver, a strip chart recorder, an automatic antenna programmer, and two Yagi antennas mounted on 40-foot poles. The automatic antenna programming system, driven by sidereal and solar clocks, causes the antennas to track Jupiter when Jupiter's local hour angle is between 4-hours east and 4-hours west. If Jupiter is outside these limits, the antennas are automatically slewed to the position of the sun and track the sun between the limits of 4-hours east and 4-hours west. If neither object is within the local hour angle limits, the antennas set themselves directly overhead at the meridan. In this position, relative ionospheric opacity measurements will be made which will provide information on the absorption of the cosmic radio signals by the earth's atmosphere. This data will be correlated with the Jupiter and sun radio emission data.

Although a number of observatories have been studying Jupiter's low-frequency radio emissions since their discovery, none has been able to make uninterrupted observations. These observatories are generally located along the east coast of the United States and can monitor Jupiter only during the daily

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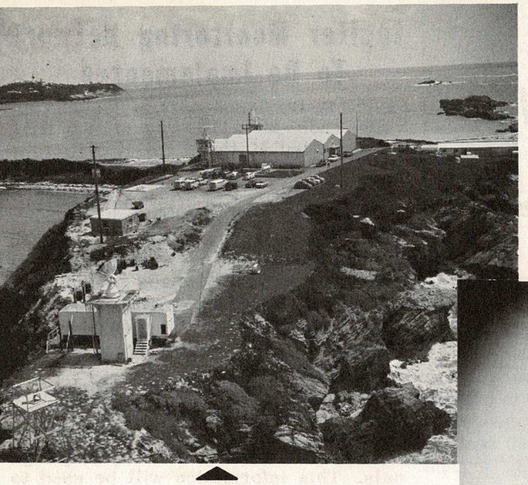
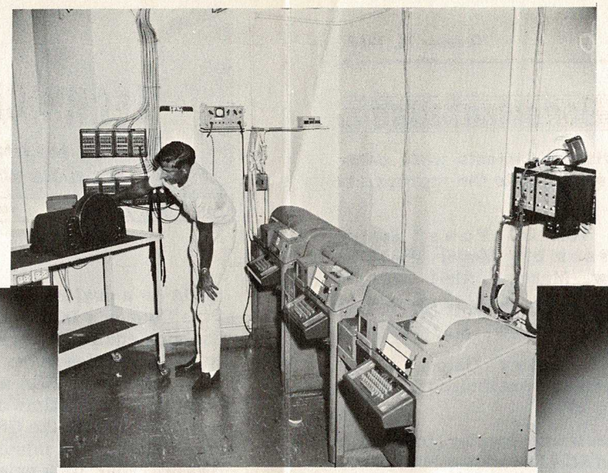
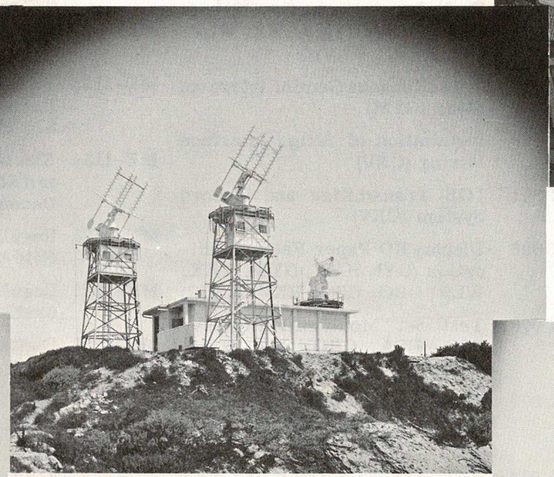


Aerial view of verlort installation.

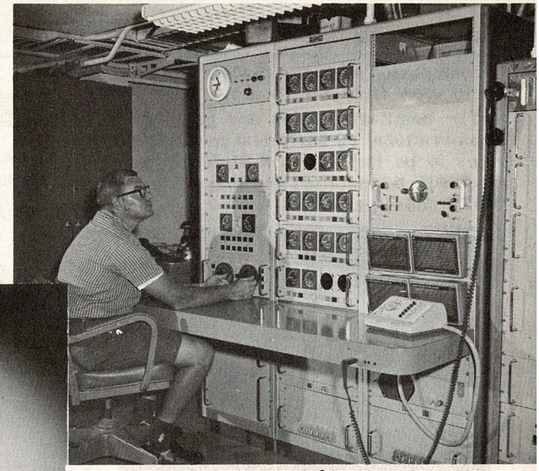
Verlort radar installation.



Communications center in the T&C building.



Acq aid antennas. In the background is the FPS-16 building.



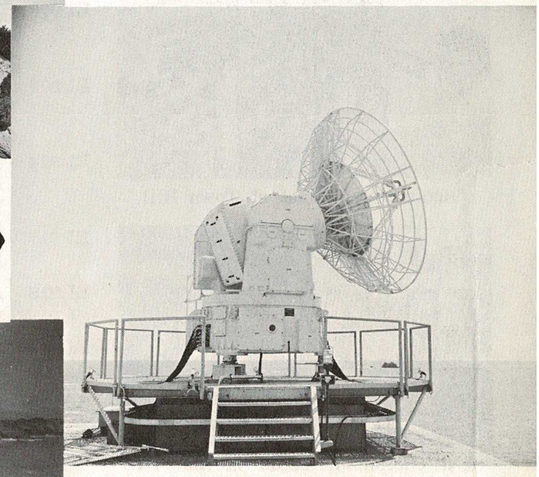
Acq bus monitor in FPS-16 building.

A/G and command area in the T&C building.

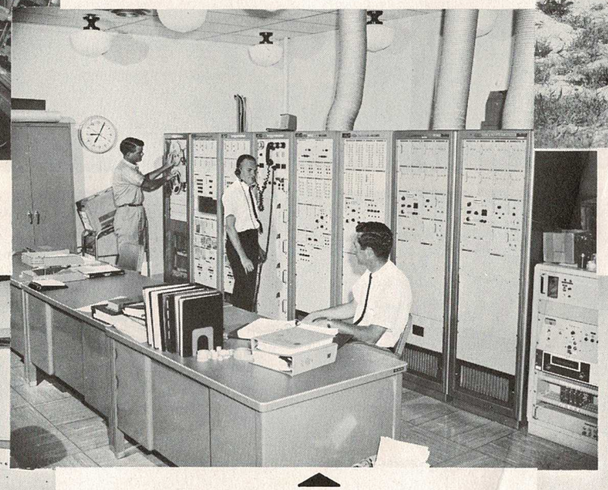
Interior of verlort van.

Centaur antenna, which was originally installed to support Centaur missions.

FPS-16 radar antenna.

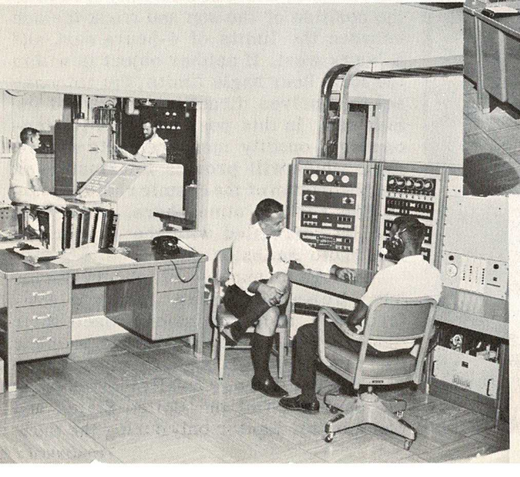


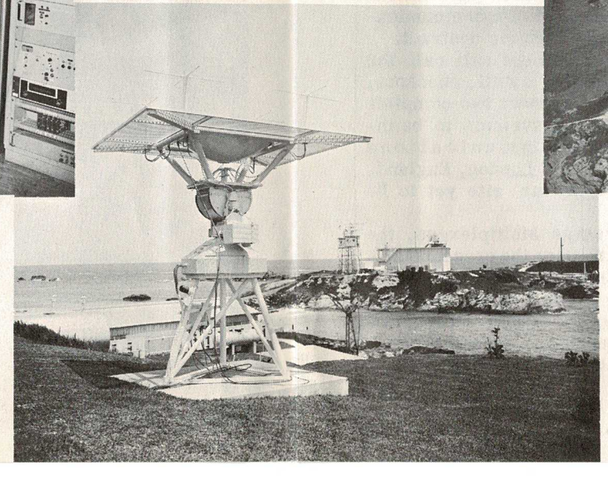
G. B. Gallup, BDA M&O Supervisor, at the M&O console.



IBM data room in the T&C building where BDA radar data is reformatted for high-speed transmission to the GSFC computers.

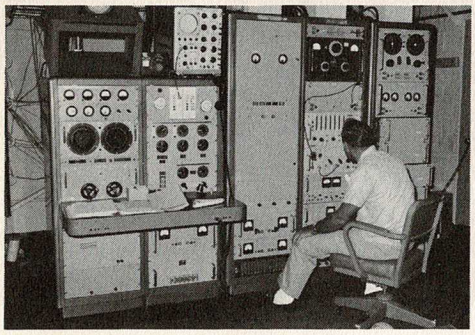
Aerial view of FPS-16 building.



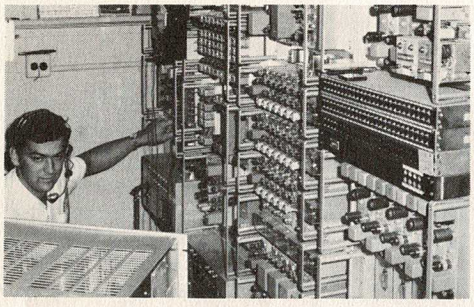


8-hour period when the planet is in good radio view from this coast.

The monitoring sites are planned to be operational by early next year. Those sites to be implemented at MSFN stations will be installed and maintained by MSFN M&O personnel.



Microwave system at Town Hill.



Acq aid equipment at Town Hill.

Test equipment room in the T&C building.

About EI's

The following Engineering Instructions were issued during the past two weeks:

EI 895A Recording MAP and Subbit Data—DCS (CNV)

EI 897 Additional Com Engineer/Com Tech Intercom Capabilities (CYI, HAW, GYM, TEX, WLP, CRO, CSQ, RKV)

EI 898 Miscellaneous Gemini Intercom Mods (GYM)

EI 899 Installation of Milgo Interface Wiring (CNV)

EI 901 IGS Transmitter and Record System (CNV)

EI 906 Display RO Paper Feed Modification (CYI, HAW, GYM, TEX, WLP, CRO, CSQ, RKV, MSCC)

EI 908 Test Set Modification (RKV, CSQ, BDA, CRO, CYI, GYM, WLP)

EI 909 Telegraph Control Panel Modification (CSQ, RKV, CYI, GYM, WLP, CRO)

EI 914 Recording DCS Subbit and MAP Modification (CNV, CYI, HAW, TEX, WLP, CRO, CSQ, RKV)

EI 917 DRUL Switchover and IGS Recording (CNV)

EI 918 Additions of a Monitor on the GSFC Loop for Acq Aid (CAL)

EI 919 True Azimuth Indicator (CSQ, RKV)

Addendum to EI's 614 and 744 — Signal Conditioning Mod (RKV, HAW, GYM, CYI, TEX, CSQ, WLP, CRO)

About Documentation

The following documents were completed and distributed to the appropriate stations:

ME-1096 28 Volt DC Power Supply Assembly Model PS-1393; new, March 1, 1964

ME-1097 6 Volt and 12 Volt DC Power Supplies; new, May 15, 1964

ME-1123 Telemetry Output Buffer Radiator; preliminary, August 31, 1964

ME-1154 Electronic Counter Model 5231 and AC 4 Decade Counter; new, December 1962

ME-1223 Regulated Power Supply Model 6344A; new

ME-1224 Regulated Power Supply Model 6267A; new

ME-1226 Digital Indicator Unit Model 4103; new, September 1964

ME-1227 Ser-Comp Test Set Model 4002; new, September 1964

ME-1239 True RMS Voltmeter Model 910A; new, December 29, 1964

BST-206 Telemetry; September 30, 1964. This test supersedes BST-206, Section B PCM Telemetry, dated March 23, 1964. All existing copies of the latter test should be destroyed.

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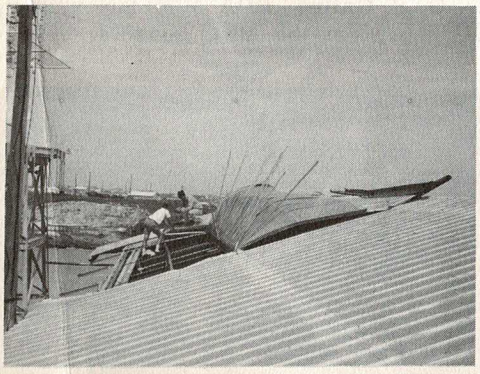

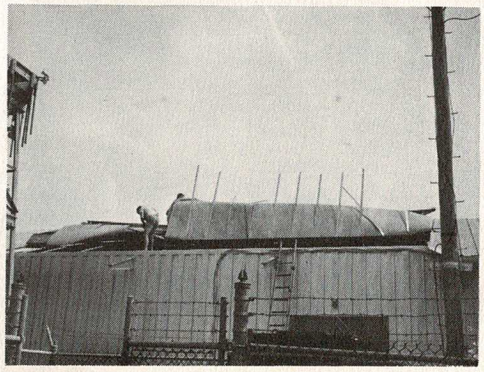

BDA personnel are shown patching the T&C building roof after 92 mph gusts from hurricane Ethel peeled back a 300-square foot section, September 13. The situation was aggravated by the hurricane's driving rains which poured through the open roof, soaking a major portion of the equipment.

As the station was scheduled to support a Wallops' launch the following day, the M&O personnel put forth an all-out effort to put the station in a GREEN condition. At 2000 (BDA time) the next day, the countdown for the Wallops' launch began and BDA was supporting it, although repair work still continued on some equipment.

The UNIVAC Division, Sperry Rand Corporation, Minneapolis, Minnesota has been selected for negotiations leading to the award of a communications processor systems contract.

The final agreement will call for UNIVAC to supply, install, checkout, program, and document two complete message handling systems to be installed in NASA communications switching centers at London, England, and an Australian site yet to be determined.

Called Message Multiplexers, the systems will replace the present NASA teletype systems and provide a more automatic method of handling the greater message traffic anticipated for future manned and second generation scientific spacecraft missions.

TIB Bits