

For Network Personnel Only

TECHNICAL INFORMATION BULLETIN

MANNED SPACE  FLIGHT NETWORK

GODDARD SPACE FLIGHT CENTER, GREENBELT, MARYLAND

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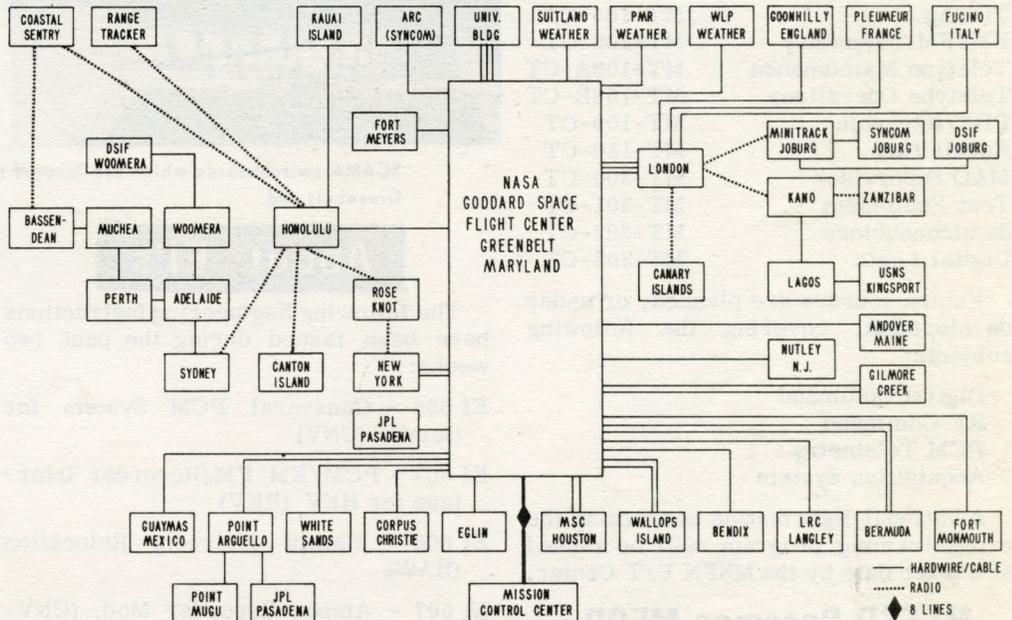
August 9, 1963

Control Center For Voice Network

Literally at the fingertips of any MSF Network personnel is the means to carry on a two-way conversation with other project personnel in 12 countries, 11 states of the U.S., and a couple of ships on the high seas. This capability exists through the NAS COM voice network known as SCAMA (Switching, Conferencing, and Monitoring Arrangement). The control point for the network is a manually operated switchboard located at Goddard Space Flight Center which is manned on a round-the-clock, 7-day per week basis. The switchboard can link any combination of two or more network facilities using such diverse media as telephone lines, underground cables, microwave relay, submarine cable, and HF radio.

Originally designed and established to link nine of the original Mercury tracking sites to Goddard and the Mercury Control Center, the network quickly proved its worth and was extended to encompass all MSF Network sites, including the two ships. Its application has similarly been extended from the comparatively limited support of Project Mercury to the point where it is now used to support practically all east coast orbital launches of scientific satellites. Continuing daily support is given Relay, Tiros, and Syncom satellites now in orbit.

During this growth period, the original 22 lines comprising 32,000 circuit miles has been increased to 63 lines and 90,000 circuit miles. The facilities at Goddard have kept pace with this expansion. Two switchboards, with a 71-line capability, are now used in place of the once-sufficient 31-line single board. New facilities, to be in operation by November, will give even greater capability and speedier operation. These include two cordless operated 220-line boards in parallel that will permit almost unlimited conferencing capabilities. The switchboards are handled by five voice circuit controllers and one day supervisor working under the direction of Voice System Manager, D. Robertson.



The above diagram shows the SCAMA network as of August 1, 1963. Seven more lines will be installed soon.

Network Supports Syncom II

The Syncom II mission is presently of all concerned and especially the being supported by portions of the MSFN. Facilities Control at Goddard Space Flight Center. This includes both teletype and voice circuits.

Teletype information being fed to Goddard includes range, range rate data, and telemetry. At all times during and after the launch, information was being received simultaneously via three separate routes. To insure a continuous flow of data in the event of a circuit failure, two backup circuits were employed. The London/Lagos circuit was backed up by the AMR circuit and the RA30 (RCA NY/Pretoria) circuit was backed up by the RA54 Jetlab circuit. Both of the backup circuits were utilized as a result of failures in the main circuits. Two new circuits designed specifically for Syncom and located at Kingsport (USNS)/Lagos Control (Nigeria) were also used. These two circuits supported Syncom I as well as the present Syncom II mission.

In general, teletype communications were successful despite adverse atmospheric conditions. This was due to the redundancy in the network configuration and to the high degree of reliability obtained through the combined efforts

also playing a role in the Syncom II mission. Prior to launch time, extensive voice checkouts were conducted with Kingsport at Lagos Harbor via Kano. After the launch and during Apogee firing and reorientation SCAMA provided continuous voice support. At this writing, continuous daily support is still being given Syncom II by SCAMA.

Sites Receive Cross-training Packages

The MSFN Engineering and Training (E/T) Center has developed eleven cross-training courses which have been sent to all sites. This is the first such documentation produced specifically for on-site training.

The courses are designed for on-site M&O personnel and can be used for proficiency training of these personnel within their own specialty area as well as for cross-training in secondary specialty areas. They consist of Lesson

Guides which provide outlines of the material to be taught; Supplement Sheets for student reference; Equipment Exercises which provide detailed guides for system OJT work in alignment, calibration, and performance checks; and Examinations.

Subjects covered by the courses are:

Subject	Course Designator
Spacecraft Communications	MT-102-CT
Timing	MT-104-CT
FM/FM Telemetry	MT-106-CT
Teletype Maintenance	MT-108A-CT
Teletype Operations	MT-108B-CT
PBX/Intercom	MT-109-CT
Acquisition	MT-110-CT
M&O Supervisor	MT-300-CT
Test Equipment	MT-301-CT
Semiconductors	MT-302-CT
Digital Logic	MT-303-CT

Future courses are planned, or under development, covering the following subjects:

Digital Command
RF Command
PCM Telemetry
Acquisition System

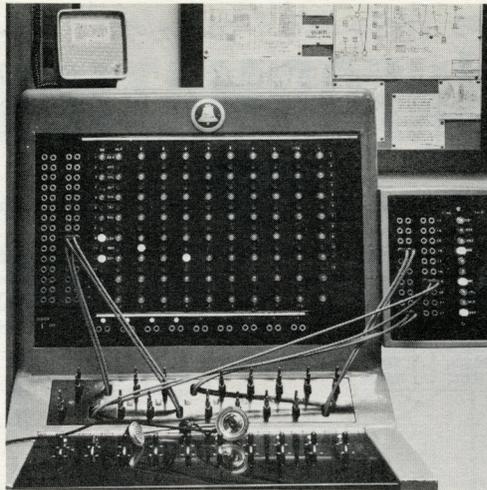
Additional information concerning the cross-training program will be issued at a later date by the MSFN E/T Center.

MSFSD Becomes MFOD

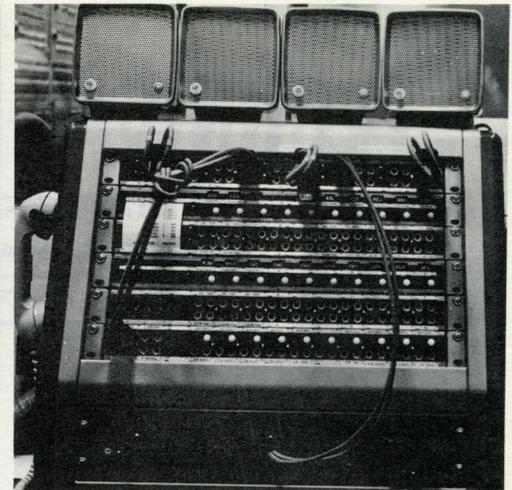
Reorganizational changes at Goddard Space Flight Center were accompanied by a change in name of the Manned Space Flight Support Division. The MSFSD is now the MFOD—Manned Flight Operations Division. The former Network Operations Branch has been consolidated with the Procedures and Evaluation Branch to form the Manned Flight Operations Branch. This unit, together with the Manned Flight Engineering Branch (former Network Engineering Branch) and the Data Operations Branch, make up the Division.

On August 3, most MFOD personnel will move off Goddard Space Flight Center proper to a newly constructed building near College Park, Maryland. Teletype and SCAMA facilities in the new location—the University Building—should be completed as of this writing. Mail for the Division should be addressed to GSFC as in the past. The new telephone number for the MFOB is 439-8515; for the MFEB 439-8501 (Area Code 301). The Data Operations Branch office will remain at Goddard.

The Technical Information Bulletin is published biweekly by the Manned Space Flight Support Division for network personnel only. Since information contained herein may not have been released outside the project organization, it is to be considered privileged. Release of this information to others must be approved by the Public Information Office, GSFC. Address other communications to TIB Editor, NASA, Goddard Space Flight Center, Code 551, Greenbelt, Maryland, or use the MSFN teletype facilities.



SCAMA switchboards which are located at the Goddard Space Flight Center, Greenbelt, Md.



About EI's

The following Engineering Instructions have been issued during the past two weeks:

- EI 598 - Canaveral PCM System for Gemini (CNV)
- EI 603 - PCM/FM FM/Recorder Interface for RKV (RKV)
- EI 606 - Hawaii Intercom Relocation (HAW)
- EI 607 - Ampex Recorder Mod. (CNV, BDA, RKV, CYI, KNO, ZZB, CSQ, MUC, CTN, HAW, CAL, GYM, TEX, WLP, CRO)
- EI 608 - Sherwood Amplifier Mod. (CNV, BDA, RKV, CYI, KNO, ZZB, CSQ, MUC, CTN, HAW, CAL, GYM, TEX, WHS, EGL, WOM, WLP)
- EI 612 - DC/DC Converter Mod. (CNV, BDA, RKV, CYI, KNO, ZZB, CSQ, MUC, CTN, HAW, CAL, GYM, TEX, WLP, WHS, EGL, WOM)

Tricks of the Trade

Recently, one of the sites suggested a modification for the purpose of protecting the UHF transmitter, AN/GRT-3, while not connected to an antenna or dummy load. This proposed modification is not necessary when standard procedures are followed. Normally, relay K1 will place the load on the proper transmitter (UHF) and this is controlled remotely at the communications technicians console. However, while the transmitter is being serviced, the master or standby transmitter could be remotely keyed. Such a situation can be prevented by the existing switch S301 located in the modulator which will open the necessary lead. This, in combination with the master-standby-remote switch (Bendix service spec. No. 2076, 221-1), will prevent any miskeying.

HELP WANTED

The local mod coordinator has noted that the titles which some sites are applying to their local mods contain 20 words or more. This poses a problem in record keeping since space for recording the title is limited to about 8 words. It would be appreciated if all sites would make an effort to limit local mod titles to approximately 8 words or less.

About Documentation

The following documents were reissued or revised and distributed to the sites:

Procedures Nos. BEA-7370-006 and HEA-606A-055 of Instrument Calibration Procedures, Volume I - 7/12/63.

Modification Installation Record - 8/1/63.

Brief Description of EI's Originated by GSFC - 9/1/63.

An Interim Network Operations Plan will be issued shortly to supplement Network Operations Directive 61-1 until Network Operations Directive 63-1 can be published and implemented. The interim plan covers only those nonmission aspects of Ops. Dir. 61-1 which are to be changed or deleted during the transition period from Project Mercury to the Gemini program. The remainder of Ops. Dir. 61-1 will remain in force during this period.

The interim plan includes changed requirements in performance of DST/BST's, daily status reporting, telemetry system maintenance, communication coverage times, and CADFISS tests.

Network Operations Directive 63-1 is currently being prepared through the joint efforts of representatives of MSC, DDRG, and GSC. The format is being revised to reduce to a minimum the chore of inserting new pages each time a mission requirement changes.