New Display Consoles To Support Gemini

During the first half of the coming year, the Gemini display systems are due to be installed at the Gemini stations. They are being supplied by the Bendix-Pacific Division of The Bendix Corporation and are now passing from the design stage into the manufacturing stage. Each system includes five display consoles: Gemini system monitor console; Agena system monitor console; command communicator console; aeromedical monitor console; and M&O console.

Gemini and Agena System Monitor Consoles
At each station, two flight controllers will observe the performance of the vehicles in orbit from two system monitor consoles. Identical in design, the two consoles—one for the Agena and the other for the Gemini vehicle—will display telemetered information and permit command of vehicle events. The Agena and Gemini system flight controllers will have at their disposal at the respective console a method which selects binary coded words originating in the appropriate PCM telemetry system and converts the information for readout in both binary and decimal form. A method is provided for automatically recording the selected information, the Greenwich mean time (GMT) of printout, and the telemetry channel of the selected parameter.

During a mission, the flight controllers will read the physical parameters of each vehicle, such as attitude, fuel consumption, temperature, pressures, radar range, battery current, gas supply, and scores of other pertinent measurements, in the form of DC voltages on 45 meters at the respective console.

Meter alarm circuits will generate audible signals to warn the monitor when a meter indication exceeds the predetermined limits. To provide distinct signals for each console, the audible tones can be varied by adjusting the oscillators. The system monitors may find it necessary to assume control of certain spacecraft functions as it passes over any one of the stations. This purpose will be served by 36 illuminated switches permitting preconditioning, display, and execution of real-time commands. A panel of six mode select switches at each system monitor console will allow control of alarm and real-time command enable functions.

Command Communicator Console
The command communicator console, operated by the director of the flight control team, is located between the two system monitor consoles. The console will provide command capabilities for spacecraft events. In addition to the events displays, meters, status indicators, and selector switches with which the other consoles are furnished, the command communicator displays include nine digital clocks indicating three types of time: ground-based time, ground determined time, and telemetered time. GMT coincidence circuitry in the CCC allows presetting a future time at which the time-to-retrofire (TR) and the time-to-fix (TF) clocks at the digital command system console will automatically update the associated time registers at the rate of one pulse per second. Upon command, the time registers will be transferred to the Gemini spacecraft. Two of four alternate-action switches may be used separately or simultaneously for automatic updating of the TR and TF registers at coincidence. Various computer status conditions are indicated by seven front panel lights. For the conversion of received telemetry information into teletype format, a teletype summary select device is provided for the console operator to instruct the on-site data processing computer as to which sum-

Final Mercury Conference Held

Today ended the two-day Project Mercury Summary Conference that was held at MSC to summarize the results of Project Mercury before technical representatives from throughout U. S. Industry and the free world. Special emphasis was placed on the technical results achieved from the MA-9.

Representatives from many areas of Project Mercury participated. Mr. N. R. Heller, Chief of the Manned Flight Operations Division, reported on the development and performance of the Mercury worldwide network.

In addition to the various presentations and displays at the conference, the final "Blue Book" summarizing Project Mercury and emphasizing MA-9 was distributed.
Aeromedical Monitor Console

The aeromedical monitor console, operated by either one or two physicians, makes possible the observation of the physiological condition of the two orbiting astronauts and the monitoring of the life support system operation. The aeromedical observers, reading some of the telemetered spacecraft parameters that are also displayed on the other console panels, will evaluate the effect of any changes in environmental conditions on the astronauts' behavior and performance. As the Gemini spacecraft circles the earth, the medical console operators will watch closely the fluctuations of four electronically multiplexed EKG signals of the cardioscope which represent the heart functions of both astronauts.

As long as the spacecraft remains within tracking range of the respective station, the observers will follow the EKG and blood pressure curves of the astronauts as charted on the aeromedical recorder located adjacent to the console, will keep a check on the cabin pressure and oxygen consumption indicated on the DC meters, and will monitor the respiration and pulse rate carefully noting normal as well as abnormal reactions to any event.

M&O Console

The M&O console was discussed in the past issue of TIB, No. 15.

The Gemini display systems will be installed by the station M&O personnel and/or special NASA installation teams. In addition, one contractor engineer will be at each station to assist in the system installation, checkout, and training.

The following stations are due to receive the display system: RVK, CRQ, CYI, TEX, HAW, GYM, CSQ, WLP, and IMCC.

NCG Meeting Held At MSC

Operational plans for Network Support of Gemini launches G-1, -1A, and -2, Saturn launch SA-6, and two Gemini simulations were discussed by the Network Control Group meeting at Houston on September 26th. G-1 and -1A will be unmanned orbital shots calling for C-band radar tracking for a minimum of one orbit. G-2 will be a sub-orbital mission. Plans for SA-6 call for use of a C-band beacon to aid radar tracking for up to 1-1/2 orbits. The Gemini simulations—designated NS-1 and NS-2—are scheduled for next summer and will involve Flight Controller participation at those stations where Gemini instrumentation is then operational.

Network To Support G-1

During the last quarter of this year, portions of the network will support the first in a series of orbital flights involving the Gemini spacecraft. Designated the G-1 mission, it will be an unmanned structural qualification flight.

One primary objective of the mission is to evaluate the accuracy of the network in providing Gemini trajectory data. As it now stands the following stations will participate in the mission: CNV and BDA will supply the continuous coverage of the 3 spacecraft and 2 booster telemetry links required from T-240 seconds through orbital insertion; CVN, BDA, WOM, CAL, WBS, and HAW will supply C-band radar data; and CNV and the AMR downrange stations will meet the time command requirements during the launch phase.

The booster inserting the spacecraft into orbit will be a modified Titan II, which will be launched from pad 19 at Cape Canaveral. After insertion, the spacecraft, adapter, and launch vehicle second stage will orbit together and will be tracked for up to 2 orbits. The telemetry carrier will remain on during the orbital flight for acquisition purposes but no usable data will be transmitted. No recovery from orbit is planned since the vehicle is incapable of surviving reentry.

About E1s

The following E1 was issued during the past two weeks:

E1 621 Plate Capacitor in HF/UHF Signal Generator (all stations except WOM, WBS, and EQL)

Whenever possible, future E1s issued will include an estimated number of man hours necessary to perform the modification. This should aid the stations in arranging their work load.