Relocation of the Network Data Processing Area

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Rationale for relocation of the Network Data Processing Area is presented along with background information regarding the Network Operations Control Center.

The Network Operations Control Center is the functional entity for centralized operational control of the Network and interfaces with the users. It has two separable functional elements; namely, Network Operations Control and Network Data Processing. The functions of the Network Operations Control are:

(1) Control and coordination of Network support to meet commitments to Network users.

(2) Use of the Network data processing computing capability to generate all standards and limits required for Network operations.

(3) Use of Network data processing computing capability to analyze and validate the performance of all Network systems.

The personnel who carry out the above functions are located in the Space Flight Operations Facility (SFOF), where mission operations functions are carried out by certain flight projects. Network personnel are directed by an Operations Control Chief.

The functions of Network Data Processing are:

(1) Processing of data used by Network Operations Control for control and analysis of the Network.

(2) Generating displays in the Network Operations Control area.

(3) Providing the interface with communications circuits.

(4) Logging of data and production of the intermediate data records.

Prior to relocation, the personnel and equipment that carry out a portion of these functions were located approximately 200 meters from the Space Flight Operations Facility. The equipment is referred to as the Network Data Processing Area (NDPA). The equipment consists of minicomputers for real-time data system monitoring, two XDS Sigma 5s, display devices, magnetic tape recorders, and appropriate interface equipment with the ground communications facility.

Figure 1 is a functional block diagram that depicts data flow from the Deep Space Stations (DSSs) to the Flight Projects. The hashed area is the equipment referred to as the NDPA. As one can readily discern, the functional processes performed by the Network Data Processing Area do not interrupt, delay or alter Project real-time data flow since they are performed in a parallel mode.

As previously stated, the Network Data Processing Area was housed apart from the SFOF, where the bulk of the Network and Mission Control facilities are located. With the consolidation of the Network Operations Control Center (NOCC) and the Mission Control Center Operations coupled with the availability of space in the SFOF (Bldg. 230) an excellent opportunity existed to colocate the NDPA with these major

operations centers. As a result of this colocation some major benefits could be realized:

(1) Lower operations cost.

(2) Improve operations efficiency in the areas of reliability, maintainability, and troubleshooting.

(3) Enhance further NOCC/MCC consolidation.

(4) Provide a more suitable computer operating environment.

(5) Provide a more convenient location for development activities.

(6) Release JPL technical space for other users.

After careful consideration of the above-mentioned factors, a plan was initiated to relocate the NDPA to the SFOF. A move date was negotiated with the Voyager Project, the primary flight project user, that would impose the least impact to Voyager data requirements. A low activity period of February-March 1981 was selected. The plan was designed to be completed in two phases. Phase one relocated the minimum equipment required to support network and project processing requirements; phase two relocated the remainder of the equipment.

A commercial moving company, specializing in electronic equipment movement, was contracted to perform the physical move. The Federal Electric Company Digital Maintenance Group prepared equipment under their cognizance for movement by disconnecting, labeling, and coiling all cabling, packing computers and peripherals, and supervising positioning of equipment at the new location. Western Computer Corporation, the contractor responsible for the maintenance of the Sigma 5, performed similar functions on that equipment.

Phase one of the move was completed as scheduled and the minor problems that were encountered served as lessons learned in expediting phase 2. The major problem was movement of the ModComp II double bay computer through doors, hallways, and under lowered ceilings with fire sprinklers protruding. Once these obstacles were overcome, the move proceeded without incident. The natural elements did not go unnoticed as rain fell heavily during phase one; however, the commercial mover supplied the necessary protection. Phase two of the move was also completed on schedule with no major problems. The system was completely operational in its new location on 16 March 1981, one week ahead of schedule (Fig. 2). The actual time that Voyager Project and other users had no computer-generated real-time displays from the NDPA during the relocation period was four days. During these four days, display information was provided to the NDPA users via workaround procedures which included voice interfaces. Computer-generated priority data was restored on the fifth day.
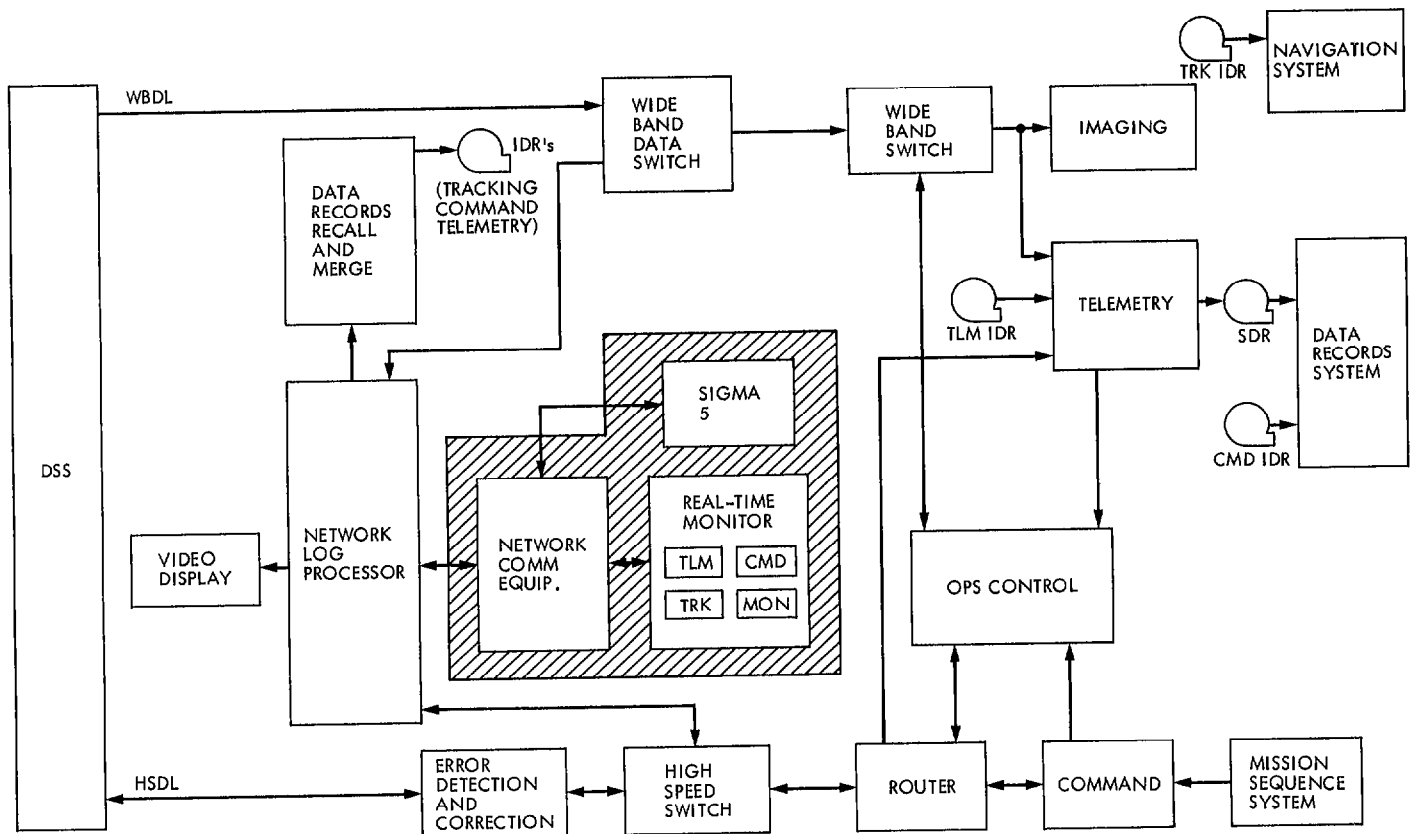
Fig. 1. Data flow functional block diagram

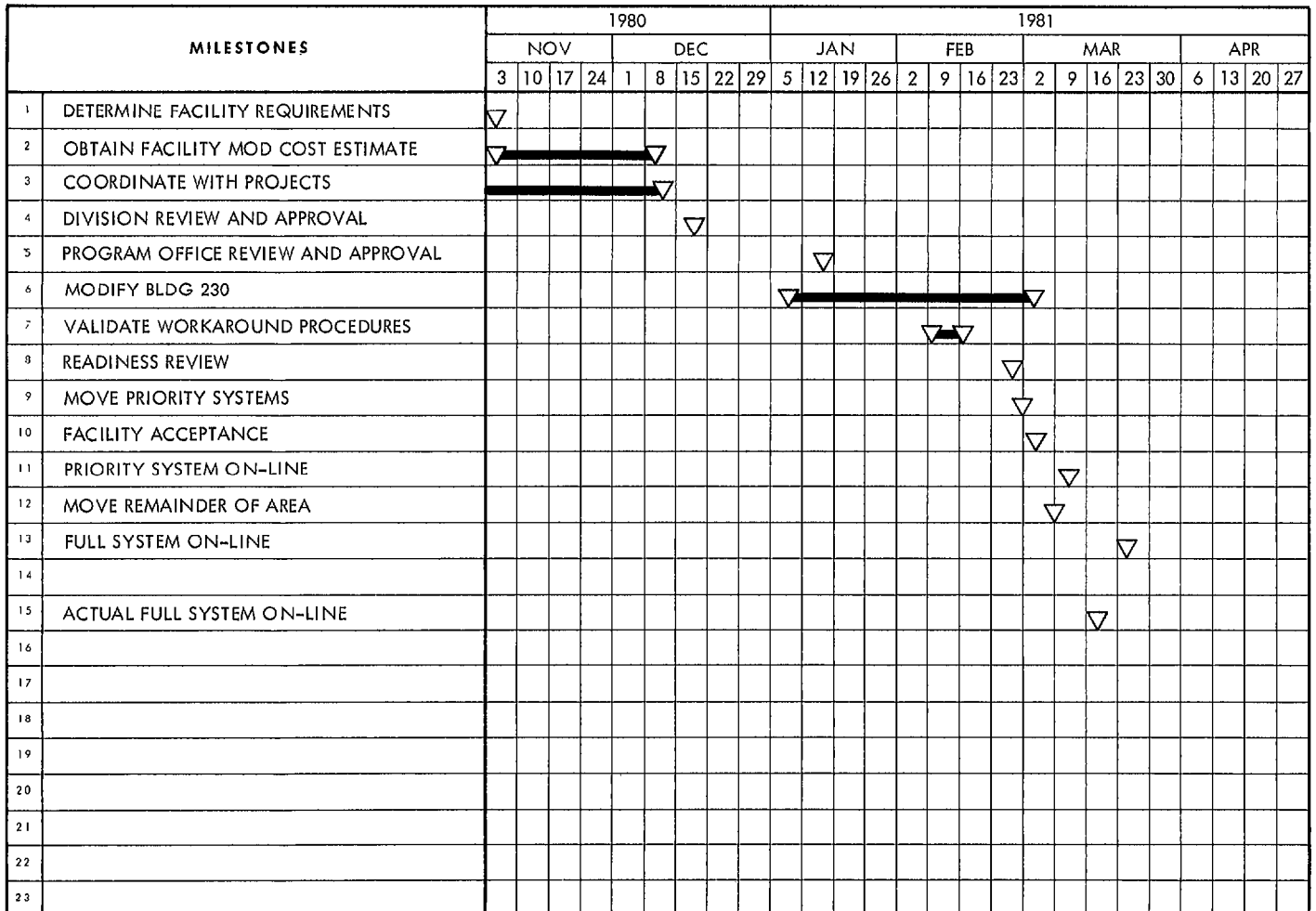|	MILESTONES	1980									1981															
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3	COORDINATE WITH PROJECTS	━━━━━━▽																									
4	DIVISION REVIEW AND APPROVAL						▽																				
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Fig. 2. Implementation schedule