GCF-NOCC Reconfiguration

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The equipment and computer programs in the Network Operations Control Center (NOCC) and the Ground Communications Facility's (GCF's) Central Communications Terminal at JPL are being rearranged and supplemented to provide an improved operational capability.

The computer portion of the GCF's Central Communications Terminal (CCT) in the basement of the Space Flight Operations Facility was designed and implemented separate from the Network Data Processing (NDP) portion of the NOCC. These independent designs, implemented at different times, used more computers and programs than an integrated design would have required. The desire to reduce the computer count and to provide an improved operational capability led to the GCF-NOCC reconfiguration effort.

This effort, when completed in 1981, will:

(1) Require fewer minicomputers (16 versus 20).

(2) Require fewer computer programs (6 versus 8).

(3) Significantly reduce magnetic tape handling.

(4) Provide a much-improved monitor and control capability.

(5) Reduce operator requirements and provide the base for a two-operator CCT.

The present configuration of the CCT and elements of the NDP are shown in Fig. 1. High-speed data (HSD) are accepted by the Error Detection and Correction (EDC) processors, which operate interactively with the DSSs to correct HSD

transmission errors. The corrected HSD are fed to the High-Speed Switch computer, which routes the data, as appropriate, to the Mission Operations Centers (MOCs), the Network Log Processor (NLP) and (not shown) the Remote Mission Operations Centers (Ames and Germany). The NLP records both high-speed and wideband data (WBD) on magnetic tape to form a Network Data Log (NDL). The data are also forwarded to the Network Communications Equipment computers in Building 202, which routes the information to the proper NDP computer for analysis.

The Data Record Processors (DRPs) recall missing data from the DSSs (in response to data gaps sensed by the NDP machines) and record them on magnetic tape to generate a "fill" tape. An off-line DRP merges the NDL and fill tapes to produce an intermediate data record (IDR). The IDR is the prime deliverable product of the DSN.

The Central Communications Monitor (CCM) senses and displays the performance of the entire GCF, receiving reports from DSS and CCT equipments.

Display information generated by the NDP's Real-Time Monitor (RTM) computers is forwarded via the NLP to the Digital Display Processor (DDP), thence to the Video Assembly

Processor (VAP) for display in the Network Operations Control Center in Building 230.

The reconfigured GCF–NOCC, shown in Fig. 2, considerably simplifies the data paths and processing. Both high-speed and wideband data are routed through automated circuit switches and then accepted by the Error Correction and Switching (ECS) computers. The ECSs error correct the HSD, optionally record it on a Front End Record (FER) magnetic tape, and route it, as appropriate, to:

(1) The MCCC

(2) Remote Mission Operations Centers

(3) The Data Records Generation (DRG) computers

The DRG records HSD on disc, senses gaps, recalls the missing data from the DSS, and then merges the real-time and recalled data as it writes the IDR on magnetic tape. Wideband data are recorded in IDR format directly on magnetic tape. If recalls are needed, the DRG also merges the real-time and recalled data to form a complete WB IDR.

The CCM, NCE, DDP, and VAP functions are largely unchanged, though the NCE and the DDP communicate directly over their own interconnecting circuits, as do the ECSs and NCEs.

The reconfigured GCF–NOCC capability is scheduled to be completed in March 1981. Subsystem-level testing begins in May 1980, accompanied by a phased rearrangement of the hardware. Training and operational testing start in November 1980 and continue until the full capability is placed on-line in March 1981.
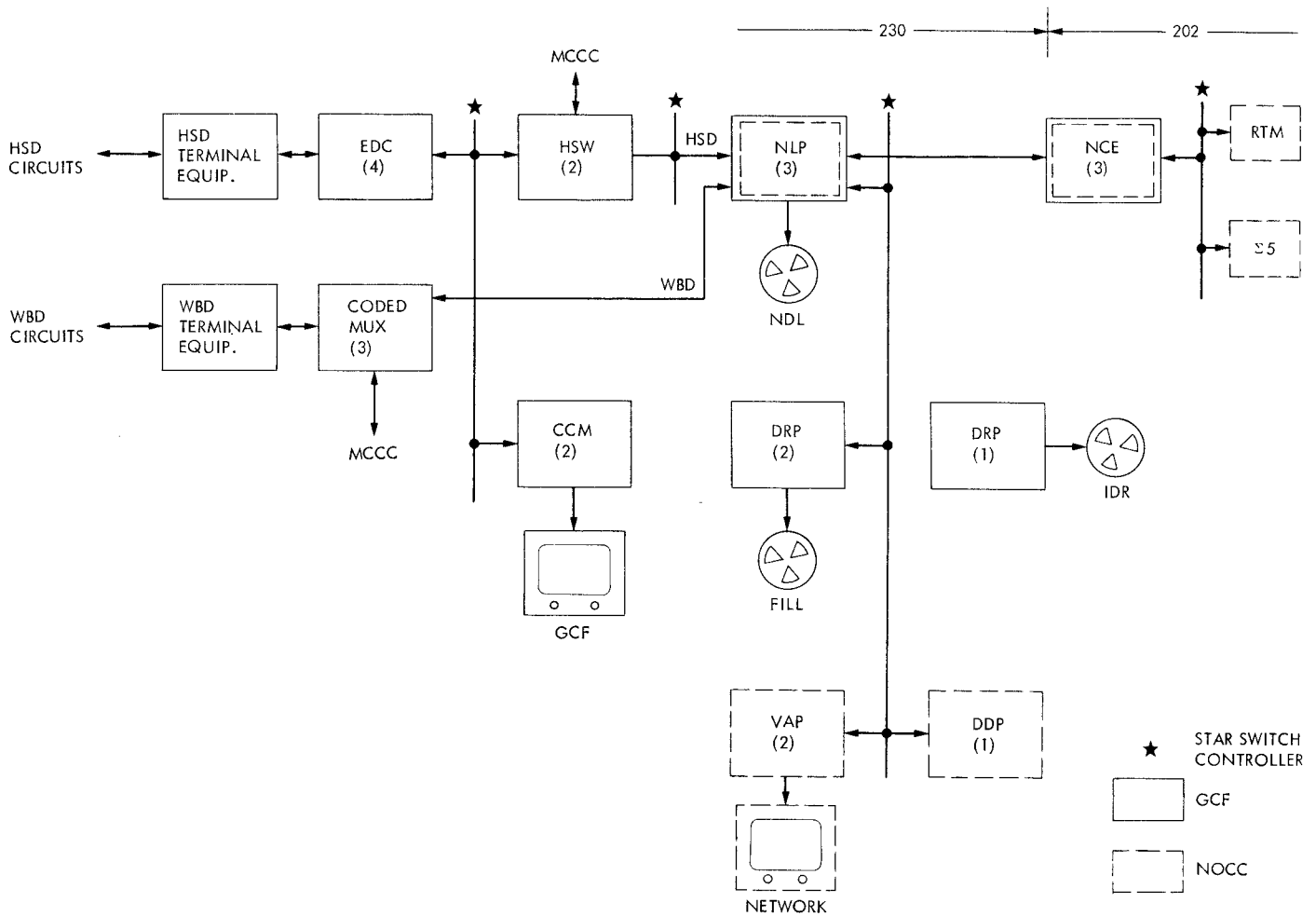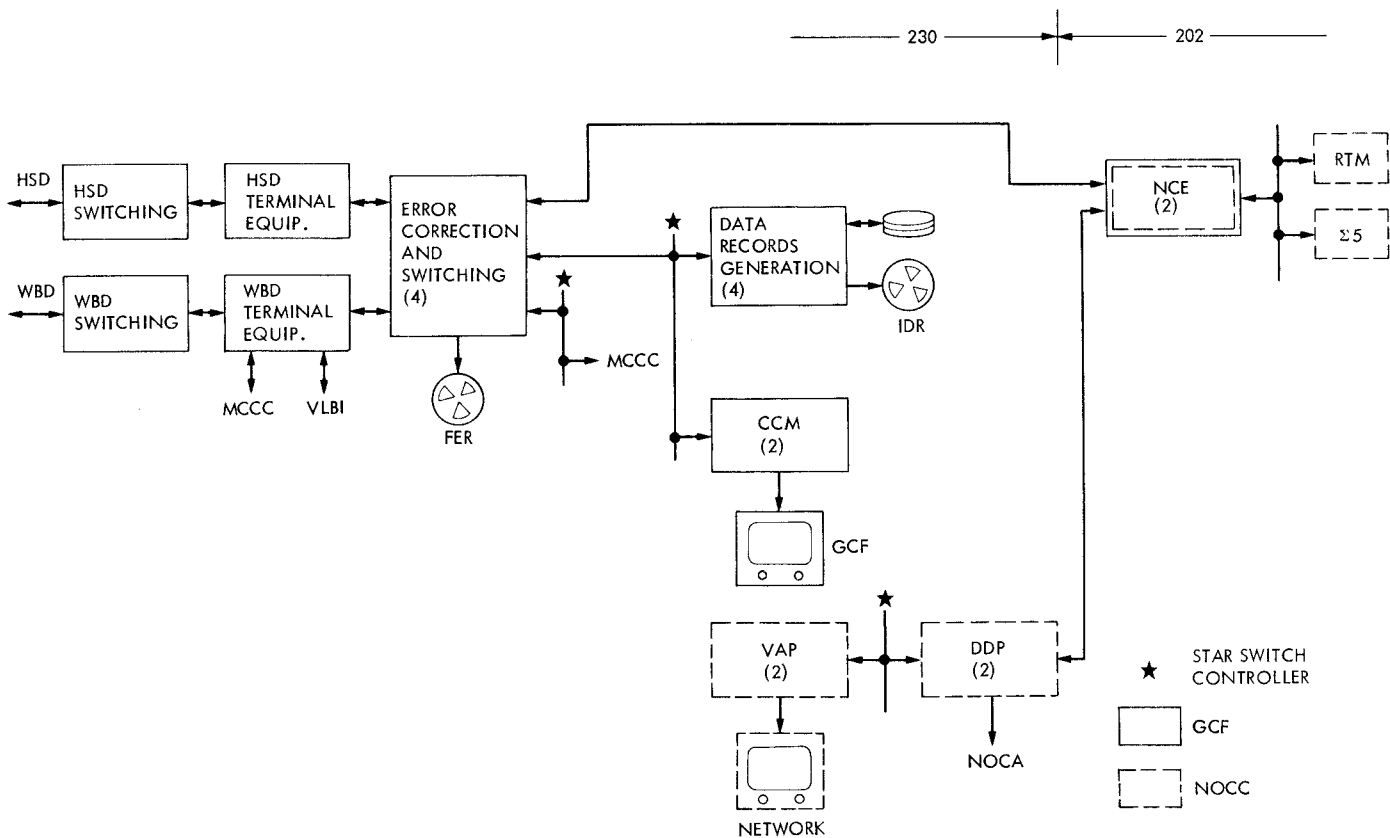
Fig. 1. Present configuration

Fig. 2. Reconfiguration