

stage systems and to control automatic checkout from vehicle erection through prelaunch activities and countdown to time of launch. In addition to these computers, a DEE 3 (SDS 910 computer) monitors the vehicle discretes during checkout. This information is displayed to test personnel in the Launch Computer Complex (LCC).

The ACE-Spacecraft was developed by MSC to permit efficient checkout of complex spacecraft subsystems. There are two separate ACE stations at KSC, one for CSM checkout, the other for LM checkout. Each system contains two CDC 160G computers, one used for command generation and the other used for processing the resulting telemetry. The Command System consists of test consoles, the command computer, and transmitting equipment. Using this system, test personnel manually initiate a wide variety of tests from controls on their consoles. The test commands are interpreted by the computer which sends the appropriate instructions to activate the equipment, as required, to perform the indicated tests.

3.3 TRAINING

3.3.1 Simulator Training Systems

All simulator computing is an integral part of a simulator and training system. The trainers are used for training flight crews and ground operations personnel in support of the Gemini and Apollo missions (fig. 3-3). The computer system equipment, DDP 024 and DDP 224, is used to provide a real-time solution for all mathematical and logic equations needed to realistically simulate vehicle dynamics and spacecraft-system performance. The computer system is interfaced with the trainer in such a way as to accept inputs from the simulated command module, instructor operator station console, and other simulated subsystems, and outputs in real-time all data required for actuation of the SCM and IOS displays, instruments, and visual drives. There are two Gemini mission simulators, one located at MSC and one at KSC, and there are two Apollo mission simulators at the same locations. When the Apollo trainers are modified to an Apollo Block II configuration, it is planned to add one DDP 224 to each trainer computer system. There are two LM Mission Simulators, one will be located at MSC and one at KSC. Another DDP 224 will be added to the present ones when these trainers are modified to the LM Block II configuration.

3.3.2 Simulation Checkout and Training System

The Simulation Checkout and Training System (SCATS) is used for the training of flight controllers in preparation for Gemini missions and the checkout of data systems at MCC, Houston.