Procedures Trainer for Project Mercury

Yet another research activity in Building 643 produced critical contributions to the U.S. aerospace program in the late 1950s and early 1960s for the embryonic NASA space program. As the U.S. raced to meet the Russian challenge of Sputnik, leading Langley managers and researchers realized how ignorant they were of space and rocket technologies. The massive education process included developing basic understandings of celestial flight, meeting the challenges of designing a rocket/capsule configuration that would be reliable and safe, and developing technical and political means to communicate, track, and recover astronauts after space missions.

When Langley's Christopher C. Kraft was assigned the incredibly difficult job of organizing and directing the flight operations for the nation's first manned space flights in Project Mercury in the late 1950s, he quickly recognized the special challenges facing his team within the NASA Space Task Group (STG) in the areas of procedures and communication. Kraft conceived the idea for flight procedures trainers that could be tied into a central command center and provide realistic training for routine and emergency operations for astronauts, controllers, and the tracking station personnel. Under NASA contracts to McDonnell, two Mercury procedures trainers were built by the Link Trainer Company, which was famous for building airplane trainers for pilots in WWII. One of the procedures trainers was installed at the Cape and the second was located in Building 643 at Langley.

A photograph of the Langley procedures trainer showing astronaut John Glenn in the capsule simulator and NASA engineer Charles Olasky at the computer console appears in the collection of photographs at this site.

A special enclosed room was built beneath the exit cone flooring of the Full-Scale Tunnel (under the tunnel air circuit) to house Mercury Procedures Trainer No. 1 which consisted of a complete mock up of the Mercury capsule with operating instruments and controls interconnected to an analog computer. The trainer provided practice in sequence monitoring and familiarization with the cockpit systems. External reference through the capsule's periscope was simulated by means of a cathode-ray tube display; and provision was included for pressurizing the astronaut's suit and for simulating heat and noise. Also included in the same room, for the equally essential training of the personnel who would man the 17 Mercury tracking stations across the world, were three ground-control consoles (for doctor, spacecraft communicator and systems monitor) which formed the minimum equipment at any one of the tracking stations.

By simulating the entire mission, the fledging team could interact during training sessions, which were held dozens of times a day in the build up for manned missions. Virtually all the original seven astronauts used the Langley procedures trainer. With the use of the trainers, the STG team built up the procedural elements during Mercury-Redstone and Mercury-Atlas missions that would become the backbone of future NASA manned space activities. The Mercury astronauts who flew the suborbital missions claimed that the most useful pre-flight training for normal and abnormal conditions was obtained in the trainer.

Mercury Procedures Trainer No. 1, redesignated the Mercury Simulator, was moved from Building 643 at Langley to a Manned Spacecraft Center building at Ellington AFB, Houston, Texas on July 23, 1962. The room that had been occupied by the trainer then became a model preparation room for tests in the Full-Scale Tunnel.