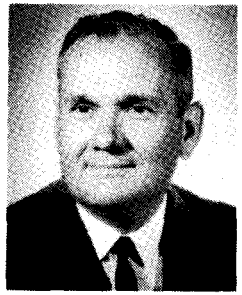

Engineering Services

Robert R. Godman
Director

Six years of design and construction culminated in 1972 with the completion of test chambers 3 and 4 of the Propulsion Systems Laboratory, a project valued at more than $14 million. The new facility will begin operation in February of next year.

The test chambers, each 24 feet in diameter and 30 feet long, can provide for the operation of full scale prototype or production aircraft jet engines in an environment that simulates the pressure, temperature, and Mach number to be encountered in flight operation. In anticipation of future needs, the test chambers, exhaust gas coolers and associated piping systems are sized to accommodate engines requiring twice the combustion air flow and exhaust pumping capacity is presently available.

Nearly 5,000 tons of steel were used in the facility, much of it associated with unique, specially designed items such as coolers that withstand engine exhaust gas temperatures of 3,400°F. and internally-insulated pressure piping that conducts air at 1,200°F. from the heaters to the test chamber. The heaters also are unique in that they utilize the exhaust gases from J-57 aircraft engines as the heat source for combustion air supplied to the test chamber.

The PSL project, clearly a major undertaking required a closely-coordinated team effort which involved all divisions in the Engineering Services Directorate.

Among the accomplishments of Facilities Engineering during the year was the publication of the second edition of the Master Plan, a 130-page book which describes all facilities at Lewis-Cleveland and Plum Brook. The Division also managed the refurbishment of the Office Building at the 8x6 supersonic wind tunnel, the Materials and Stresses Laboratory, and the Chemistry Laboratory, and provided new computer data rooms for the Aerospace Safety Research and Data Institute and the Spacecraft Technology Division. The Heating Plant was upgraded with the installation of a new 70,000 pound-per-hour boiler that can handle one-half of the Center's heating load.

Among the many important contributions of the Engineering Design Division during 1972 were two major projects. One of these major jobs was the vertical lift engine facility which provides all mechanical, electrical and sound recording systems to test engines, up to 30,000 pounds thrust, mounted in wing sections. A unique aspect of the facility is a moveable 50-foot engine service building. The division also designed the hangar noise test facility which provides support systems for testing jet engines up to 100,000 pounds thrust. In addition, the division designed a number of other smaller test systems, research hardware, and provided technical direction on Lab projects. And none of these projects would ever materialize without the managerial expertise of the Construction Division.