

Long duration Earth orbital capability has been identified as one of the major long-term building block capabilities that must be acquired within 5 to 20 years. Obtaining this experience will begin with the first orbiting workshop. The end product of that experience will be the accumulation of data to describe a space station that will function with optimum efficiency in Earth orbit or on planetary missions.

Many concepts for permanent orbiting space stations have been advanced. The configuration shown in figure 54 is one which both NASA and Douglas have studied extensively. The most unique feature of this concept consists of the optimization of subsystems to reduce resupply requirements. In this instance, resupply requirements were reduced by incorporating a sophisticated environmental control system which, because of its closed cycle operation, reduces the logistics requirement for that subsystem by a factor of three. The other subsystems amenable to that kind of approach are also designed to reduce resupply requirements to a minimum. The size of the vehicle is limited to a level which affords sufficient space to accommodate the mission-required equipment and personnel, but which is no larger than necessary to perform the functions for which it was intended. Again, with optimized logistics requirements as a basic design constraint, the vehicle is as small as possible in order to limit the amount of drag; additional drag increases the amount of propellant that must be resupplied to maintain the station in orbit.

When these permanent space stations have been orbited, they will make it possible to consider methods for employing scientific and engineering personnel who are not astronauts or pilots. When this has

ORL INBOARD PROFILE

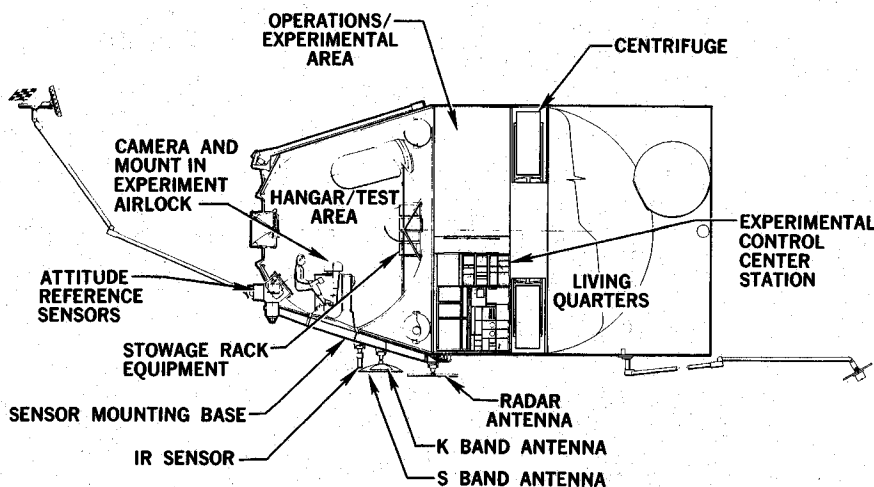


FIGURE 54