APOLLO APPLICATIONS

APOLLO ALTERNATE MISSIONS

- USE OF BASIC APOLLO SPACE VEHICLES WHICH MAY BECOME AVAILABLE FROM THE MANNED LUNAR LANDING PROGRAM TO:

  1. ACQUIRE THE MAXIMUM YIELD OF SOLAR DATA DURING THE SOLAR MAXIMUM.
  2. PLACE IN ORBIT OPERATING MODULES FOR RE-USE.
  3. PROVIDE AN EARLY CAPABILITY FOR A LARGE ENVIRONMENTALLY CONTROLLED VOLUME TO EVALUATE HUMAN PERFORMANCE, ENGINEERING CONCEPTS AND TECHNOLOGY LEADING TO A SPACE STATION.
  4. DEMONSTRATE UP TO THREE MONTH ORBITAL FLIGHT CAPABILITY.

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FIGURE 66

utilized for reference and calibration purposes for the Lunar Mapping and Survey mission, which in turn may prove invaluable as a tool to unlock the mystery of the origin of the solar system.

Orbital workshop

The orbital workshop concept permits Apollo astronauts to work and perform experiments in the empty hydrogen tank of a spent Saturn I 2nd stage by means of a 65-inch diameter airlock between the Apollo spacecraft and hydrogen tank (fig. 67, MG66–8987). A hatch in the airlock will permit egress into space without depressurization of the tank or the spacecraft. In orbital flight the Command and Service Modules will dock with the airlock and the crew will activate systems to pressurize the spent hydrogen tank for habitation.

The orbital workshop will enable us to investigate the feasibility of using a launch vehicle spent stage in orbit as a large habitable space structure and develop the capability to carry out long duration manned space flight missions in such a structure.

The Airlock and Spent Saturn I 2nd Stage experiment, called the orbital workshop, is shown here (fig. 68, MG66–9611A). The airlock provides a physical connection between the docked Command Module and the uprated Saturn I 2nd stage. It also provides an airlock connection between the Command Module and the habitable 2nd stage hydrogen tank; oxygen and nitrogen for pressurization of the hydrogen tank; solar cell panels to provide electrical power for experiments in the airlock and for those to be performed in the spent stage; and environmental control for the airlock and the hydrogen tank.

Extension of the lifetime of the assembly is provided for by additional expendables stored on the airlock to support activities in the Command and Service Module and the orbital workshop. Experiment equipment for use in the orbital workshop is to be stored within the airlock during transport to orbit.

The interior of this tank will be modified to permit certain experimental operations to be conducted in a shirtsleeve environment within its 10,000 cubic foot enclosed space. A two-gas (oxygen/nitrogen) atmosphere life support and environmental control system, a modification of the Apollo system, is also planned. Efforts will include development of nitrogen storage tanks, partial pressure atmosphere sensors, and controls and the integration of associated hardware in the spacecraft. Gemini and Apollo subsystems, subassemblies, components and methods will be utilized wherever feasible.