

provide a wide spectral view of the phenomena that occur during the next solar activity cycle and should yield information of considerable value to our understanding of the basic processes of solar activity.

*Apollo Applications alternate missions operations*

The first mission (AAP-1) is planned for launch in 1968, with a payload and orbital configuration as shown in the next chart (fig. 74, ML66-9782A). The Command and Service Module carries three astronauts. The primary purpose of this mission is to test the Apollo-developed Lunar Mapping and Survey System. Test operations will be performed on the Lunar Mapping and Survey System in low earth orbit for 3-5 days.

The next chart (fig. 75, ML6-10,044) shows the mission sequence of how the first alternate mission (AAP-1) is supplemented by means of orbital transfer and rendezvous with the second alternate mission (AAP-2). After the Lunar Mapping and Survey System is in low altitude circular orbit for about 4 to 5 days, a Saturn I 2nd stage with airlock and docking adapter is launched unmanned into a high altitude circular orbit for use as an orbital workshop. The astronauts in the AAP-1 mission configuration perform a Hohmann transfer and rendezvous with the unmanned AAP-2 configuration. The orbital configuration of alternate missions AAP-1 and AAP-2 after rendezvous and docking is shown here (fig. 76, ML66-9611A). With this orbital configuration, the astronauts conduct airlock and spent stage operations for the remainder of the mission and perform experiments.

Upon completion of the orbital mission, the astronauts return to the Command and Service Module, separate it from the docking adapter, Lunar Mapping and Survey System and airlock and leave the airlock, adapter and spent stage in orbit in a gravity gradient orientation. The Command and Service Module performs a de-boost operation, the Command Module separates, enters the atmosphere and the scientist-astronauts are returned to earth. This completes the AAP-1 and AAP-2 missions with the orbital workshop remaining in orbital storage for the next series of alternate mission operations.

Apollo Applications mission AAP3 utilizes a Saturn I launch vehicle to place a Command and Service Module into a parking orbit with three astronauts aboard together with supplies and expendables for a mission of 28-56 days duration (fig. 77, ML6-10,043). The next mission, AAP-4, takes place by launching the Apollo Telescope Mount attached to the Lunar Module ascent stage into a high parking orbit about a day later. The astronauts in the Command and Service Module perform a Hohmann transfer to a high altitude orbit and perform rendezvous operations with the Lunar Module/Apollo Telescope Mount (LM/ATM). Next this configuration achieves rendezvous with the orbital workshop in orbit from the AAP1 and AAP2 missions. This configuration is shown here (fig. 78, ML66-9611). ATM solar observatory experiments are then conducted along with biomedical and other experiments. After about 28-56 days of operations in space in the orbital workshop, the astronauts enter the Command and Service Module, separate from the orbital workshop and de-boost. The Command Module is then separated from the Service Module and the astronauts reenter the earth's atmosphere and return to earth. The entire sequence of the AAP1, AAP2, AAP3, and AAP4 missions is shown here (fig. 79, ML66-8975). The major benefits from the orbital workshop and ATM missions are indicated in the next chart (fig. 80, ML66-9790).

FOLLOW-ON MISSIONS

Follow-on missions are being planned to use modified Apollo flight hardware with Standard Saturn launch vehicles. The program of investigations and development to be carried forward in the follow-on missions will be directed toward the development of a long duration flight capability. In addition, manned and unmanned flights in earth orbit are under consideration to meet earth oriented applications and requirements including meteorology, communications and earth resources analysis. Flights in earth orbit, including high inclination and synchronous orbits, are also under study for astronomical observations and space physics experiments. Space operations and technology experiments are also being planned. The extended exploration of the moon in the follow-on missions program will involve a series of orbital surveys and lunar surface