

exploration operations. The Nerva II nuclear stage is planned for test as an upper stage on the Saturn V launch vehicle.

An example of the kinds of experiments payload packages under development for the follow-on missions program is shown here (fig. 81, ML66-9876). This chart shows a concept of a meteorology payload package assembled to meet a number of objectives. These include the flight testing of experimental meteorological instrumentation and the use of man's ability to direct sensors to meteorological events of moment to permit the improvement of knowledge of atmospheric composition and structure needed for long term forecasting of the weather.

Another example of an experiment payload package being considered for Apollo Applications follow-on mission involves Earth resources experiments (fig. 82, ML66-9873). Earth resources experiments will determine the agricultural, geological, and oceanographic information that can be obtained from orbit that would be useful for the evolution of earth resources on a global basis.

The above examples are typical of the payload packages under consideration in Apollo Applications follow-on missions. I shall now describe the overall follow-on missions program.

Long duration flight capability

The early development of long duration flight capability is clearly one of the most important areas to be pressed forward in the follow-on missions program. It is a key requirement for most of the possible significant advances in manned flight. Apollo Applications flights of up to 1 year or more in duration will represent a significant increase in the nation's operational capabilities in space and opportunities for important scientific and technological experimentation. Extended duration flight experience is also necessary to provide a sound basis for those future decisions on manned programs of the greatest interest and potential, such as permanent manned facilities in space or manned flights to the planets. Year long flights can be achieved on a cost-effective basis by reusing modified Apollo space vehicles with resupply.

The long duration flight objectives are to measure the effects on men and on manned systems of space flights of increasing duration; and to acquire operational experience with increasingly longer manned space flights. A third objective is to accomplish these flight objectives through modifications and adaptations

MAJOR BENEFITS FROM WORKSHOP AND ATM MISSIONS

- OBTAIN SOLAR ASTRONOMICAL OBSERVATIONS DURING PERIOD OF SOLAR MAXIMUM ACTIVITY
- DETERMINE MAN'S EFFECTIVENESS AS AN ASTRONOMICAL OBSERVER IN SPACE
- TEST ALTERNATE OPERATING MODES FOR FUTURE LARGE MANNED ORBITAL TELESCOPE
- DEVELOP CAPABILITY FOR REUSE OF SPACE HARDWARE WHICH WILL REDUCE PROGRAM COSTS
- DETERMINE EFFECTS OF EXTENDED DURATION SPACE ENVIRONMENT ON MEN AND SYSTEMS
- DETERMINE EFFECTS OF ARTIFICIAL GRAVITY ON MEN AND SYSTEMS
- DEVELOP EFFECTIVE MANNED EXTRAVEHICULAR CAPABILITY

NASA HQ ML66-9790
1-5-67