

Hardware for advanced missions

The space hardware required for this evolutionary program would be based, to the greatest extent possible, on a common family of modules which would have application to several missions. A space station could serve as the mission module for planetary reconnaissance as well as an advanced shelter on the lunar surface or as a lunar orbiting station. Similarly, certain of the modules for a Mars mission could also serve as the basis for the direct flight stages in the advanced lunar missions.

Step-by-step program decisions

In discussing possible future planetary missions, I want to emphasize that these missions may be viewed in terms of goals rather than in terms of early programmatic decisions implying long-term commitments. In fact, this example of an evolutionary baseline program has the unique advantage that the commitment for each step can be made complete in itself. Although each such decision prepares the way for the next development, it does not require a premature commitment to the next mission.

All of the proposed operations of Apollo Applications provide direct progress toward the manned space station capability. While meeting the experiment requirements of such a program, we also would be resolving basic questions with application to future programs, without future commitment. We thus can continue our evolutionary progress toward increased knowledge of space and towards a capability in the application of space technology.

I will now describe briefly the proposed implementation of the baseline program discussed, and indicate the studies required to support it.

EARTH ORBITAL MISSIONS

The manned earth orbital program is based on a progression of missions and experiments which began with the Mercury system. Advancement of the program has been achieved with Gemini and will continue to advance with the Apollo and the planned Apollo Applications programs.

The earth orbit experiment program objectives which I discussed here last year are still valid. Our inherent capability to carry them out has increased with our additional in-orbit manned flight experience and the availability of larger and more versatile payload carriers. This experience and hardware availability, coupled with the unique capabilities of man as an on-board investigator, indicates that manned spaceborne research is now both practical and potentially highly productive in terms of broad beneficial returns to humanity. In addition, missions now under study could also promote the capability to safely conduct deep space travel, and could provide continued effective research and development support to the Department of Defense.

Primary objectives

To meet our broad overall objectives, we are carrying on a study program with five succinct objectives (fig. 108, MT66-7996). First, we identify potentially important manned earth orbital missions and derive from these missions the system requirements. Based on the mission-derived system requirements, we determine attractive overall space station concepts capable of meeting these requirements. Then by comparative analyses of space station concepts and considerations of the projected technology base, we formulate an implementation plan, including station configuration for manned earth orbital missions. In addition, we define and evaluate supporting ferry/logistics/rescue concepts and auxiliary experiment facilities as an adjunct to the planned space station. Finally, we identify research and development technology requirements needed for space station implementation by analysis of realistic station configurations.

Mission requirements

As we progress into considerations of continuing manned earth orbital space flight capabilities, it becomes clear that a significant broadening of the total scope of experimentation utilizing man will occur. The catalytic ingredients necessary for an effective earth orbital experiment program are shown in this chart (fig. 109, MC66-5361).