

double the flight time of the longest mission flown in the Gemini program and also double the longest mission duration currently planned in Apollo.

This significant increase in mission duration will provide essential information on the physiological behavior of man during long periods of orbital flight. It is interesting to note that all major space flight goals beyond Apollo require significantly longer flight time than the basic 14-day capability that now exists. Therefore, we consider the development of the capability to fly longer and longer duration missions as vital to our future as a space-fairing nation. In addition to studying mans physiological behavior, we must also develop the systems necessary for longer flights, and provide better living conditions for the flight crews during these longer flight periods. Thus, advances in spacecraft habitability are most important to our progress. The vehicle summary shown on figure 4 is an indication of the requirement for new resources in order to accomplish these AAP-1/2 objectives. Relatively significant modifications are required to vehicle modules (CSM, M&SS and S-IVB) developed within Apollo and in addition some new development is required. It is important to note, however, that the modifications to Apollo modules represent only a small fraction of their initial development cost and do provide for significant improvements in operating capability, thus capitalizing on our investment to date. These improvements in vehicle capability will allow us to operate open ended for longer flight times, and to utilize basic Apollo vehicles in new and unique modes.

The significant new development necessary for the AAP-1/2 mission is the airlock/multiple docking adapter. The airlock development will be the responsibility of the Manned Spacecraft Center and this module is discussed in further detail. I would like to emphasize that a comprehensive briefing on our total Apollo Applications planning is beyond the scope of this discussion and we have selected one or two items for discussion in some detail in order to convey a feeling for the activity involved. The airlock, depicted on figures 5 and 6, has the following purpose: It provides additional expendables for extending the mission duration up to 28 days. In combination with the multiple docking adapter, the airlock provides the capability of effectively clustering several vehicle modules together into a configuration suitable for long term habitation and experimentation. In this clustered configuration, access between modules and to the outside of the vehicle is provided. This capability significantly enhances our orbital usage of Apollo vehicles such as the CSM and the S-IVB. This clustered vehicle becomes an arrangement wherein the flight crews can live and work effectively for long periods of time. Approximately 25 very useful experiments have been proposed for this first AAP mission. They group conveniently into engineering, scientific, and medical disciplines and a majority of these experiments effectively utilize the large volume and long flight time provided by this grouping of vehicles. Additional (to CSM) subsystems, required to make the airlock, MDA, and S-IVB tank habitable, are provided by the airlock. We plan to incorporate solar panels on the airlock as a part of the electrical power system. They have not been used