A fifth possibility is navigation and traffic control stations to achieve increased efficiency of transportation, particularly the operation of ships and aircraft.

A sixth possibility is furthering space technology by developing and using man's ability to assemble, test, repair and maintain large space structures. In addition, the presence of man in space with his abilities to reason, to analyze, to make decisions, and to improvise can contribute much to the scope and range of space activity. For example, Apollo Applications experiments performed by man on a wide variety of sensing devices can test the feasibility and utility of advanced types of meteorological observations and earth resource surveys from space. These experiments and tests will provide the data for decisions on future space systems—manned or unmanned—to derive additional practical benefits from space observations

To develop the capabilities to carry out such missions, we must learn much more about man's capabilities and limitations in space flight. We must determine, for example, how long man can operate effectively in space without returning to earth. We must learn the most effective means of accomplishing extravehicular activities such as those which would be required for the assembly of large structures in space and we must develop the most efficient and economical means of control and communications.

The Apollo-developed hardware gives us the means to study these requirements and to do it economically. The Apollo Applications program is designed to make use of this capability, by revisitation of hardware in orbit, by resupply, and by minor modification to provide expendables for longer duration of the spacecraft themselves.

Basically, the space vehicle designs developed to conduct the Apollo program will be used for Apollo Applications (fig. 63, MPR66–7783). New development requirements to adapt this hardware for Apollo Applications missions are modest and center primarily on increasing the life span of basic systems and subsystems to meet the requirements of longer duration missions.

We plan to demonstrate our ability to reuse basic orbiting space vehicle hardware. An orbital workshop will be established in space by using the spent 2nd stage of the uprated Saturn I launch vehicle which places a mission payload in orbit. This orbital workshop will provide an economical and convenient sheltered area for many operations in space capable of reactivation and reuse on subsequent launches. Its airlock and adapter, using Gemini subsystems and the capability of resupply, will provide for long duration missions. We believe

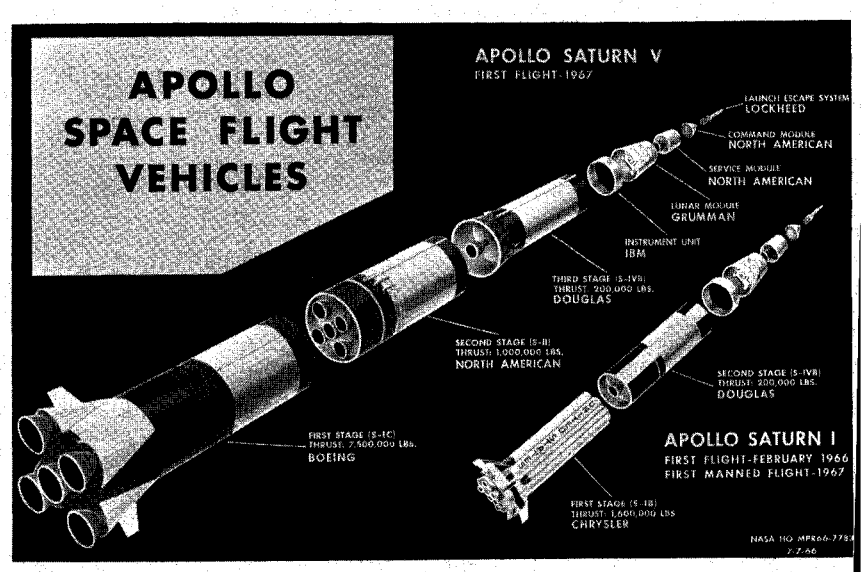

FIGURE 63