

RENOVATION AND REUSE OF THE APOLLO COMMAND MODULE

(From appendix D; North American Aviation)

Renovation and reuse of the Apollo Command Module is discussed. It is brought out that studies have shown that this concept is practical, technically feasible and its accomplishment would not interfere with ongoing lunar program commitments. The contractor has limited himself to examining the accomplishment of a second flight in Earth orbit only as opposed to using a vehicle for a second lunar mission. Under this Renovated Command Module (RCM) program, existing facilities and GSE would be fully applicable with only very insignificant modifications. Under this concept, the Command Module is recovered in the normal fashion; i.e. by recovery ships. Some preliminary postflight operations would be performed, and the vehicle would then be returned to the contractors plant where inspection and tests would be accomplished. Certain subsystems would be removed, if necessary, and these would be returned to the subcontractors for refurbishment and/or replacement of individual elements. The vehicle would be reassembled, using the same primary structure, and after checkout would be shipped, with a new service module, a new launch escape system, and a new adapter, back to the Cape for a second flight. Cost studies show that over \$9 million could be saved by this refurbishment and flying again as opposed to production of a new vehicle. The flight experience on which this concept is based consists of two unmanned spacecraft flights of Apollo; i.e., spacecraft 009 and 011.

Another study effort described is that pertaining to advanced landing systems for Apollo Command Modules. With these systems—which would include steerable gliding chutes and landing retro-rockets—great mission flexibility and choice of landing areas would be realized. Landings could be made on land rather than on ocean areas, reducing recovery force requirements greatly. Reusability of the Command Module could be greatly enhanced. Lastly, it would be possible to carry three more men in the Command Module. If six men can be carried to a space station, instead of three, then the cost of transporting each man is cut in half. Reuse of the Command Module coupled with the ability to carry twice as many men will result in major economics.

FUTURE IMPROVED SATURN PROGRAMS

(From appendix C; Chrysler Corp.)

Means of filling the "payload gap" between Saturn I-B and Saturn V rockets are discussed. Strap-on solid rockets of five- and seven-segment construction can be used to raise the near earth orbit payload capability of Saturn I-B from 40,000 pounds to 78,000 and 106,000 pounds, respectively. Also escape capability is raised from 1,650 pounds to 1,800 and 28,500 pounds, respectively.

It was noted that the solid rockets strap-ons would be man-rated in connection with the DOD MOL program and that therefore, this effort would be within the current state-of-the-art.