

be used as a management aid. This is done throughout MSF, as illustrated by the following typical examples:

- (1) Computers are used to help in lease versus purchase determinations.
- (2) Computers are used to compute and store up-to-date budget and allocation records in the workload control systems.
- (3) Computers are used for the generation of PERT reports and schedule predictions.
- (4) Computers are used to keep track of the specifications and documents that describe complex computer-based systems.
- (5) Computer simulations are used to aid management in making decisions regarding alternate strategies.

5.4.3 Special Considerations for Mission Contracts

Several factors of a technical nature tend to make the management control of mission contracts more complex and more individualized than management control of support contracts. In many of these contracts, the end items (computer hardware, computer programs) are parts of large systems which contain complex interfaces. The development of each end item must be controlled so that the items will work together when the system is assembled. Since a change to an end item may affect a number of other items, different groups and levels of management in a Center may be affected. Further, the equipment and computer programs developed may be extremely complex and require the efforts of several MSF elements in the monitoring task. For example, the RTCC effort requires the production of a program with more than 1,000,000 instructions. The requirements for this program are developed in one branch (which is assisted by a support contractor), technical monitoring is done by another branch, and contractual monitoring done in yet another branch.

In many of these mission contracts, software development is a major consideration. The traditional methods of management available for hardware development have to be modified or abandoned for software and new techniques developed. Most of the resulting management techniques have been tailored to individual software requirements. Despite these considerations, some progress has been made in simplifying and standardizing management techniques for mission contracts.

One significant development is the initial effort in the Apollo spacecraft program to bring certain computer-based systems into the