

## 7.0 CONCLUSIONS

This survey was conducted to provide information on Manned Space Flight computer systems in terms of their use, capabilities, and the techniques used to manage these systems. It has become clear that the computer systems being used in the MSF programs are an essential part of the overall NASA mission, and the sustained growth of computers in MSF reflects the continual blending of this tool into on-going research and development programs. Not only has automatic data processing shown a growth in magnitude in MSF, but by its very nature, the diversity of its applications has also increased. Although, in many government agencies, emphasis still seems to be placed on the business and management applications, only 5 percent of the digital computers in Manned Space Flight are used for that purpose; the remaining 95 percent are used in scientific and technical research and development activities, including real-time mission control. The task of managing the computer systems in the MSF organization, then, has by necessity been tailored to the preponderance of the research and development computational activities.

The large number of computers in use in the Manned Space Flight program and the wide range of their applications have led to a classification of computer hardware that recognizes the functional area in which the equipment operates. As a result, computers in this survey report have been described in terms of mission control, test and checkout, training, and data processing, including real-time, general and special purpose, and service center operation. The capability of MSF computers has been carefully structured to match the missions and workload of the organization. Special efforts, as in the Mission Control Center, have been made to take optimum advantage of advanced techniques in planning the procedures and resources needed for the most advanced system design. Thus, the MSF organization has, by necessity, operated on the frontiers of computer technology to achieve an orderly and coordinated program of computer capability.

An inventory of computers has been included in this survey (appendix A). This inventory identifies each system, whether it is purchased or leased, the average monthly hours it is in service, and its location in the MSF organization. The inventory has been expanded over previously published inventories to include those special-purpose computers which, in the past, did not meet reporting criteria, since they were integral parts of total systems whose usage was dependent on total-system utilization. Although the computers have been categorized as being in category A (general purpose) or category B (special purpose), this