

INTRODUCTION

Our achievements in space to date have been many. These accomplishments have been primarily oriented towards exploration. The successes of our space program are a measure of the maturity of the men and machines which were brought together to meet the assignments of the NASA in the decade just past.

We are now preparing for a new era in space. The underlying theme of this era will be the utilization of space to conduct research and application activities to exploit space for human welfare and knowledge. A broad spectrum of missions will, from the vantage point of earth orbits, focus on the earth and its environment, our sun and celestial objects, and the usefulness of the unique features of the environment of space.

In order to realize the benefits which are achievable from space, a capability to transport personnel and equipment from the earth to space and return is required. Space vehicle logistics; the movement of personnel and equipment in space, is directly affected by the variety and magnitude of the activities being conducted there.

This paper describes some of the activities and vehicle concepts that are envisioned for future earth orbital missions. Mission requirements, payloads and vehicles are discussed with regard to their mutual interaction.

UTILIZATION OF SPACE FOR RESEARCH AND APPLICATIONS

Perhaps the single most important event of the last decade which has made man aware of the urgent need to preserve his environment was his first views of his home from outer space (figure 1). This view of the planet Earth, made possible by the technology of space flight, made man intimately aware of this unique and limited environment in which life must be sustained. Space technology, at the same time, has provided man with new tools with which he can better observe his environment and measure its properties. It is through such observations that man can develop a better understanding of broad scale interrelations and through this better understanding there is promise of developing the management of the environment and the resources that will be necessary for maintaining acceptable standards for mankind.

The vantage point of space will also be used to study radiation from the sun, planets, and stars throughout the spectral region from high energy gamma rays to long wavelength radio waves, (figure 2). The advantage of operating in space to avoid the spectral masking and resolution limitations imposed by the atmosphere, together with the importance of astronomy to our understanding of the universe and our earthly environment places the study of astronomy very high on the list of future research and applications activities in space. Space physics investigations are important in improving our understanding of the space environment and of basic and isnospheric plasma physics. The