

2.2

Space-to-Space Weapon Situation (Continued)

The importance of these systems to the intelligence communities of the superpowers mark them as high priority targets for antisatellite weapons.

A combination of the current surveillance satellite systems, ocean reconnaissance, photo reconnaissance, communications and navigation satellites can provide near real-time data for targeting purposes of associated weapon systems. Future satellites dedicated for real-time targeting are likely to evolve and become an integral part of the weapons system itself. These targeting satellites will utilize sophisticated technologies both to locate itself, and hence, its remotely sensed targets, and to process the data into a form that is immediately useable by the aiming or the guidance portion of the weapon system it supports. Such an exotic system would be a formidable weapon and a high priority target for an ASAT system.

The other satellite applications in Table 2-2 are self-explanatory and will not be discussed further.

The energy required and thus the cost of placing spacecraft in orbit is such that the spacecraft design and its orbit must be highly optimized in terms of its required function. The result of this constraint is that all spacecraft whether scientific, remote sensing, experimental, commercial, or of military application are found in several specific volumes of space defined by orbital parameters. These orbits are illustrated in Figure 2-2. Most application satellites are found in one of the four orbit regimes identified. Notable exceptions are the interplanetary spacecraft who employ particular trajectories to escape from the gravitational pull of the earth. As such, these satellites do not orbit the earth.

The geosynchronous orbit (GEO) is a particular circular orbit above the equator of the earth with a unique feature; the period of the orbit is equal to the period of the earth's rotation about its spin axis. Such a characteristic translates into the fact that there does not exist any relative motion between points on the ground and the orbiting satellite. From a point on the ground then, the satellite appears to remain at one spot in the sky. Thus, receiving stations are greatly