

## 2.2

Space-to-Space Weapons Situation (Continued)

database with a cross-sectional view of the earth and LEO orbits. These two figures illustrate the degree to which satellites are employed in quantized orbital bands.

Figure 2-4 illustrates the entire population of satellites launched in the past four years into the LEO domain, while Figure 2-5 only illustrates the military launches. Comparison of these figures illustrates that both civilian and military launches utilize low earth orbits and that the LEO military satellites occupy a narrowband of inclinations between  $50^{\circ}$  and  $105^{\circ}$ . Both civilian and military satellites utilize the four principle orbit domains illustrated in Figure 2-2. Tables 2-3 and 2-4 specifically identify the orbits of American and Soviet military satellites found in employment today. Figure 2-6 illustrates the typical distribution of these satellites in the four characteristic orbits. Evident from these tables and figures is the degree to which satellite missions exploit the advantages of the specific orbit regimes.

In terms of vulnerability from an antisatellite weapon, a satellite is more or less at risk in terms of the type of satellite it is, the orbit into which it is placed, and the type of mission it is to carry out.

Delicate optical sensors for remote sensing or on-board altitude control of satellites can be readily burnt-out by a powerful laser beam. The maneuver to bring a damaging beam into the field of view of an optical sensor can be made very difficult but once accomplished, it only requires a momentary exposure to cause irreparable damage through permanent blindness.

All satellites are easily damaged by physical contact. Their light weight construction entails the use of structural members that are just adequate to withstand a launch environment. The only exception might be small bomb which, because of its size, could be physically robust in the space environment.

Solar arrays can also be damaged by powerful lasers because like other optical sensors they are tuned for maximum absorption of visible light. Under threat of an