

9.0 CONCLUSION (Continued)

discussion of weapons to include space-to-ground weapons and ballistic missile defenses and concluded from a space-to-space remote surveillance point of view the range of technological alternatives for an antisatellite system encompasses those for the added weapon systems under consideration.

The relatively primitive technologies like chemical explosives and nuclear weapons, covertly deployed within otherwise normal looking spacecraft to serve antisatellite functions, pose the most difficult verification role for a Paxsat System Concept. As weapon systems develop more technical finesse like employing laser or particle beam technologies, the characteristics of the system become more conducive to the determination of function. Thus, it was concluded that not only must the spacebased, space-to-space remote sensing system detect the presence of exotic weapon systems, but also possess sufficient faculties to determine the function of legitimate spacecraft missions.

The high degree of optimization inherent in the design of all spacecraft and in their orbital parameters, together with the nature of signals to and from the spacecraft, provide highly significant data as to function. Clearly to the extent that form follows function, visual images of the spacecraft were deemed to be highly determinate of its function and its purpose in space. If the images can also be acquired in the thermal-infrared region, then important data can be derived regarding the enemy balance and utilization of the unknown spacecraft. The operation of almost any type of spacecraft involves substantial communications to and generally from the spacecraft. The nature of these transmissions, particularly the data rate, frequency band of operations, radiated power and the operational cycle are of extremely high diagnostic value. Other sensors including gas analyzers to detect materials of chemically powered lasers, or of chemical explosives, and radiation detectors to infer the materials associated with power sources or weapons extend the faculties of spacebased, remote sensing system for the determination of weapons in space.