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7.3.1. Introduction (Continued)

- (d) Elevation Angular rate
- (e) Azimuth angular rate
- (f) Range rate
- (g) Acceleration

The accuracy and rate at which these parameters are estimated is subject to engineering trade-offs dependent upon the requirements of other parts of the Paxsat system.

Radar stages may be considered as passive or active. Passive targets are indicated by their skin return only. They may or may not be specifically designed to either enhance or suppress their skin echo. Active targets contain transponders or Secondary Surveillance Radars (SSR's) which react when illuminated by an interrogator. The transponders retransmit a signal, usually on a different frequency which may simply be an echo of the received signal or a more complex waveform identifying the target. Active transponders have found great application in both civil and military aviation, as well as space-space tracking and docking. Long ranges and great accuracy may be achieved with relatively modest equipment. However, for the purpose of this study, it has been assumed that the target does not contain an active transponder. The reasons for this assumption are two-fold, namely:

- (a) Problems/objections might be encountered in negotiating a treaty requiring all future satellites to carry such a device. Commercial satellites are highly optimized and it is unlikely that requiring extra 'black boxes' with all their implied spacecraft impacts would be welcome.
- (b) In the event of a malfunctioning transponder in the target, then the Paxsat must still be capable of a rendezvous or else the treaty verification process is open to abuse through the deliberate sabotage of the SSR.