7.3.1. Introduction (Continued)

converted to relative target position and rate for the purpose of vectoring the Paxsat onto the target while maintaining a safe distance between them.

Secondary roles include slaving the Paxsat optical sensor(s) onto the target and measuring target acceleration, which in conjunction with other data may be used to estimate the mass of the target.

Three distinct classes of radar have been examined to determine their usefulness for the Paxsat mission.

(a)   Existing ground based systems which are required to estimate the orbital parameters of the target.

(b)   Existing space-borne 'docking' radars as used by the USA in Gemini, Apollo and STS (shuttle) programs.

(c)   Special purpose space-borne radars for the Paxsat mission.

Radar operation is commonly divided into three distinct phases:

(a)   Search

The search phase consists of searching a given volume of space and indicating the presence of targets. Important radar system characteristics during this phase include the volume of space to be searched, the elapsed time between successive searches, the acceptable time between false alarms and the required probability of detection of the target. Some of these parameters may be determined by other system impacts while others are subject to engineering judgements and trade-off. It is usual during this phase to obtain course estimates of the target position.