

### 7.3.3.1 Summary on Existing Spaceborne Systems

All past and current spaceborne rendezvous radars have relied on a cooperative target for ranges of greater than a few tens of nautical miles. With transponders ranges of several hundred nautical miles have been achieved with quite modest power and aperture resource demands.

### 7.3.4 Special Purpose Paksat Space Segment Radar

Within this section, a number of themes are followed. First, an introduction to some of the radar system trade-offs possible, with a typical trade-off against frequency. Secondly, an example design at C-band is explored, its spacecraft impacts enumerated and possible alternatives discussed. Thirdly, a similar example design at Ka-band is presented, alternative technologies examined and a baseline set chosen for Paksat against which the mass and power budgets were calculated.

The objectives are to determine the feasibility of a special purpose Paksat space segment radar bracket performance limitations and assess any particular technological difficulties.

#### 7.3.4.1 System Trade-offs

It is rare that sufficient information and/or constraints are imposed such that a unique radar solution for a given mission presents itself. The Paksat is no exception and within this subsection an outline of some of the trade-offs is presented. In later sections, performance is always quoted against certain constraints. These constraints may not always be rigid and this section outlines the effects of these constraints upon the radar performance and resource demands.

A table of various radar system parameters, which may determine either the performance or the design, is included as Table 7-8. The parameters have been divided into three columns; target parameters, system requirements and radar parameters.