7.3.2 Ground Based Radar Systems

This section of the report summarizes the findings on the applicability of current ground based systems to the Paxsat mission.

A number of possible candidates were identified and are listed below:

(a) Millstone Hill

(b) FPQ-6

(c) Cobra-Dane

Table 7-1 lists some of their principle characteristics [48 through 50]. As can be seen from Table 7-1, the technology base spans over two decades of radar development.

The MIT Millstone Hill radar was built during the 1950's. It is a civilian radar specifically designed for the track of extraterrestial objects. The maximum quoted range is 2000 nm against a target with a radar cross section of 1 m^2. Table 7-2 is a more detailed list of the Millstone Hill radar parameters, including tracking accuracy.

The RCA AN/FPQ-6 radar was built during the 1960's and is an upgrade of a previous radar, the AN/FPS-16. The original purpose of the AN/FPQ-6 was to track guided missiles for instrumentation purposes. The quoted maximum rage is 1000 km against a 1 m^2 target. Table 7-3 is a more detailed list of the AN/FPQ-6 radar parameters. This radar was successfully used in the GEOS program [51]. However, this was basically a transponder/SSR experiment. Skin tracking was only possible at the point of closest approach despite the fact the GEOS-II satellites had enhanced skin returns by virtue of carrying a Van Atta array (passive C-band retro-reflector). The AN/FPQ-6 was also fitted with an integrated laser rangefinder, slaved to the radar boresight [52]. Bias errors between the radar and laser of only about 1 m were reported.