7.4 Command and Data Handling (C&DH)(Continued)

and data relay may be optimal from the point of view of reliability and the capability to provide a graceful degradation of performance in the face of equipment failures.

Finally, the C&DH will be required to provide a measure of satellite autonomy through the on-board computer. For example, the satellite will need to operate in a safe manner while unsupervised by ground control. Also, some data reduction will probably need to be made on-board the satellite to reduce the volume of data needed to transmit the desired information.

A preliminary assessment of the computer hardware requirements was performed for the purpose of mass and power estimation, and is included in Appendix D.

7.5 Attitude and Orbit Control

7.5.1 Requirements

The Attitude and Orbit Control System (AOCS) maintains the spacecraft in the commanded orientation. During periods of time when the spacecraft is not investigating a target, this orientation is not critical, the only requirement being that sufficient sunlight falls on the solar arrays to provide needed electrical power and that a low data rate link to the ground be available. In this respect, Paxsat is more typical of some early science satellites than of modern earth resources, communications or scientific missions.

During an investigation though, the Paxsat attitude control system must also maintain its payload face pointed roughly at the target (in the current conception, to within 10^{o}). This means that the AOCS must take information from a sensor which identify the angular displacement of the target from the payload face boresight. This sensor is nominally the radar with back-up being provided by the optical sensor.

Whereas the EM Receiver system is not very sensitive to angular rates in the satellite body, the optical imaging system is due to possible image blurring during lengthy exposure times. There exists therefore a trade-off between image stabilization within the optical sensor