7.2.1 Orientation in Flight During Stand-Off Observation (Continued)

and calls for the line formed by the solar array axis to be directed at all times to the center of the earth. A third orientation, which is preferred by many earth observation satellites in dawn-dusk orbits aligns the solar arrays along the direction of flight, was not acceptable because it would not allow the Paxsat payload face to be directed along the flight vector at the target.

7.2.2 Orientation in Flight During Maneuvers

In order to observe the target from all sides, Paxsat requires the capability to circumnavigate the target.

For the purpose of determining Paxsat orientation during such maneuvers, two distinct types of maneuvers were considered.

7.2.2.1 Out-of-Plane Maneuver

For the out-of-plane maneuver, the Paxsat orbit is perturbed slightly so that it is no longer coplanar with that of the target. Paxsat then appears to drift from side to side relative to the target, while staying behind (or in front) of the target and maintaining the same attitude.

This maneuver poses no difficulty for the zenith orientation because the Paxsat body can rotate about the solar array axis to maintain the target in view at the same time as keeping the solar arrays pointed towards the sun.

For the out-of-plane orientation (i.e. with the solar arrays perpendicular to the orbit plane), the solar arrays must also be rotated along with the body if the target is to be kept in view. This implies that solar power input is redduced. Because the sensor heads are conceived as being able to slew to some extent (approximately $\pm 10^{o}$), a maneuver in which the aspect angle of the target changed by 35^{o}, would experience a power loss of only 10% while 45^{o} would be available with a 20% power loss, and 55^{o} with a 30% power loss.