

2.2 The Power Supply

The primary electrical power for operating the electronic equipment is obtained from solar cells. Individual cells can generate only small amounts of power, and therefore, arrays of cells in series-parallel connection are required.

Figure shows the solar cell panels for the HS 376 satellite manufactured by Hughes Space and Communications Company.

In geostationary orbit the telescoped panel is fully extended so that both are exposed to sun- light. At the beginning of life, the panels produce 940 W dc power, which may drop to 760 W at the end of 10 years.

During eclipse, power is provided by two nickel-cadmium (Ni-Cd) long- life batteries, which will deliver 830 W. At the end of life, battery recharge time is less than 16 h.

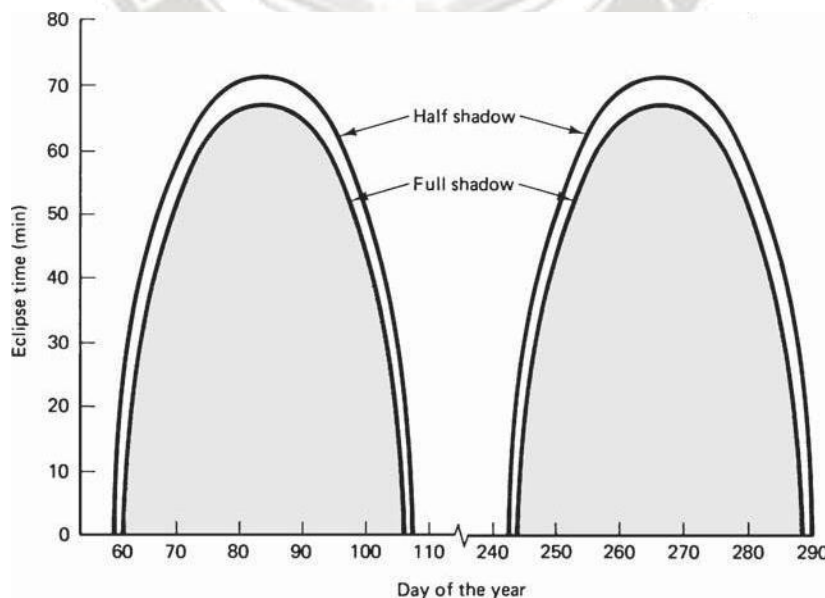


Figure 2.1.(b) Satellite eclipse time as a function of the current day of the year. (Courtesy of Spilker, 1977. Reprinted by permission of Prentice-Hall, Englewood Cliffs, N.J.)

capacity of cylindrical and solar-sail satellites, the cross-over point is estimated to be about 2 kW, where the solar-sail type is more economical than the cylindrical type (Hyndman, 1991).

