

5.4.1 Antenna LOS Position Displays

Figure 5-7 shows a representation of Ku-band antenna elevation and azimuth angles in relation to orbiter XYZ coordinates. The elevation/azimuth values depicted in Figure 5-7 are read in the orbiter on the ANTENNA display and on the Panel A2 elevation and azimuth digital display (Figure 5-8).

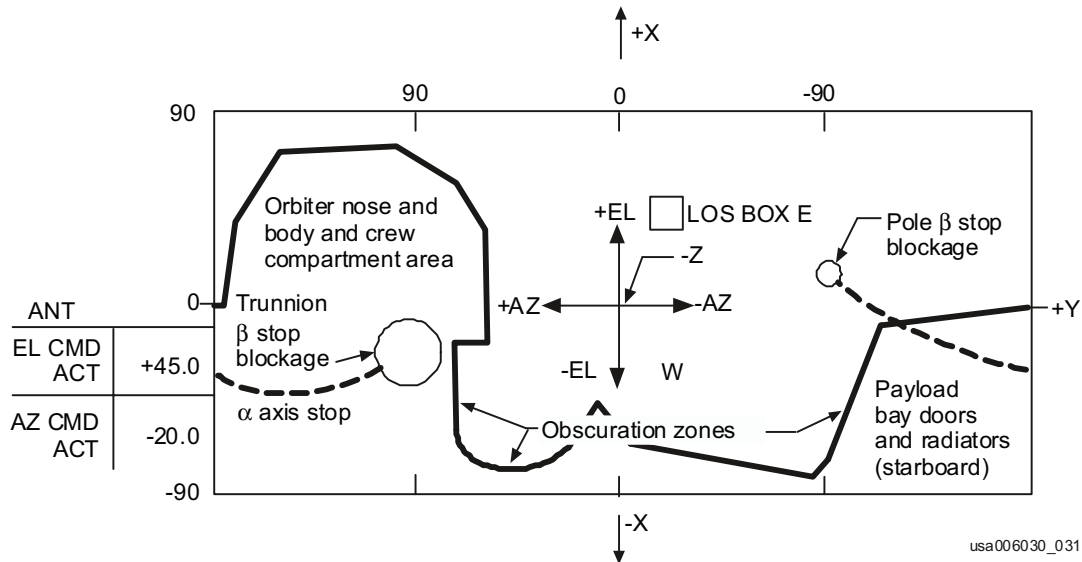


Figure 5-7. Elevation/azimuth in relation to XYZ coordinates

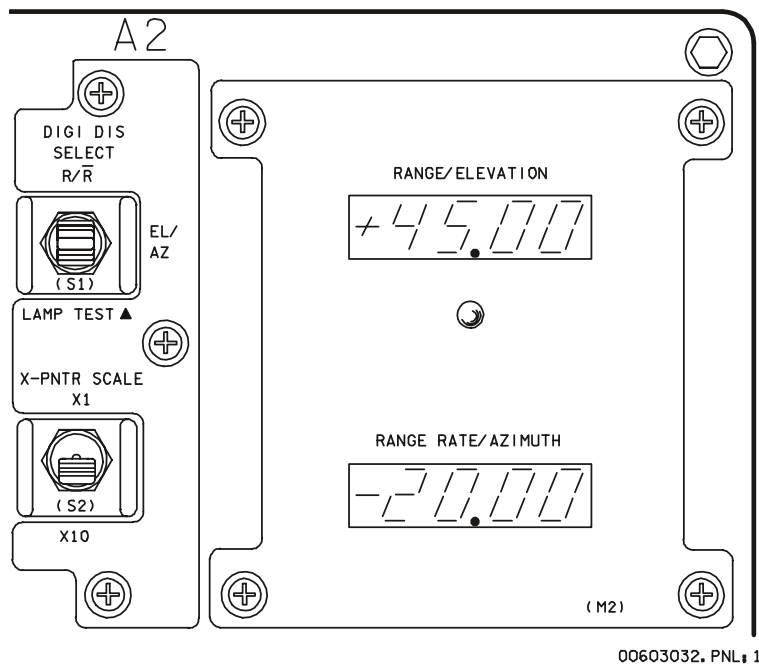


Figure 5-8. Panel A2 elevation/azimuth digital display

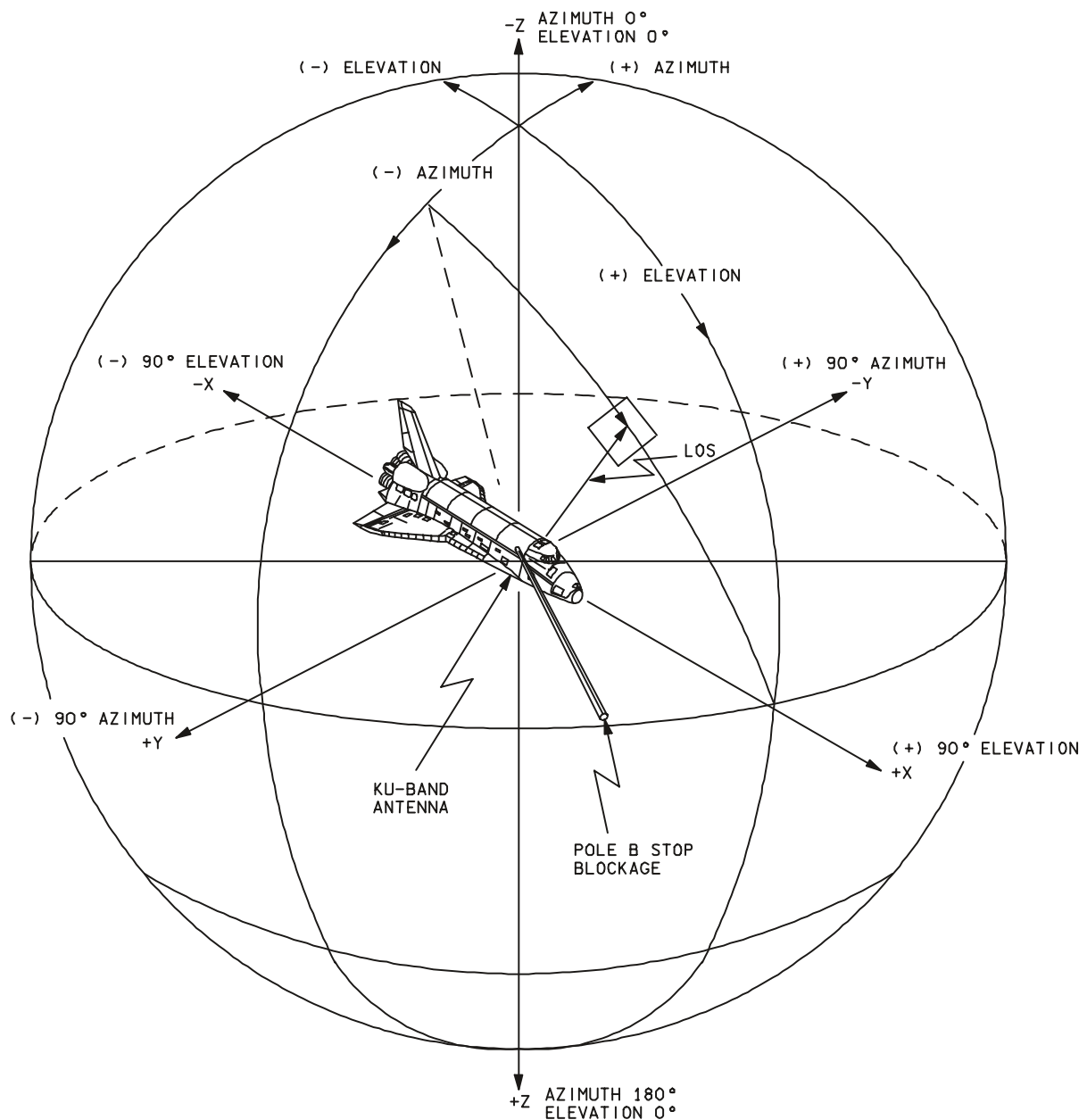
Panel A2 digital readouts display range/range rate or elevation/azimuth, depending on the position of the DIGI-DIS SEL switch. With the switch in the EL/AZ position, the digital display indicates Ku-band antenna elevation/azimuth pointing angle (LOS position).

The antenna display indicates antenna-pointing angle in two ways

- ANT EL ACT and ANT AZ ACT represent actual antenna pointing angles in elevation and azimuth.
- The “box” on the pictorial portion of the display represents the Ku-band antenna-pointing angle relative to the spacecraft coordinate system.

Note: ANT EL CMD and ANT AZ CMD represent GPC commanded antenna pointing angles.

Figure 5-7 to Figure 5-9 have been annotated to illustrate an actual LOS pointing angle of +45.0° elevation and -20.0° azimuths. The 0° elevation/0° azimuth antenna beam position is along a line parallel to the -Z-axis. Positive (up) elevation movements are along the +X-axis toward the orbiter nose. Positive (right) azimuth movements are away from the -Z-axis along the -Y-axis, toward the orbiter port side. Figure 5-7 also illustrates the alpha and beta stops as seen by the antenna.



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Figure 5-9. Ku-band antenna azimuth and elevation

5.5 OPERATIONAL MODES

The Ku-band system has four antenna steering modes for locating and tracking a target or a TDRS. These include crew-controlled automatic and manual antenna steering with programmed spiral search routines for angular acquisition, plus range tracking. Range tracking is discussed in the subsection entitled "Tracking." In addition, there are two antenna stabilization modes. Table 5-1 illustrates the available combinations of antenna steering, tracking, search, and stabilization modes. These topics are also discussed in the following paragraphs.