

FEED: K-band (26.5 – 40.0 GHz)

The desired taper at the edge of the subreflector (15 degrees) is -13 dB at Ka-Band for optimum Gain/Tsystem. The bandwidth ratio for the Ka-Band is 1.51:1. Two broad-band designs were considered for the feed.

A linear taper horn with an aperture inside diameter of 3.75" and half angle of 18.2 degrees gives an average taper of -12.8 dB and -13.2 dB in the H and E planes respectively over the entire band. The mode converter section of the feed has ring-loaded corrugations for broad-band performance.

A compact horn with a sinusoidal inside profile between the mode converter and the aperture is considered as an alternative feed. This feed has an aperture inside diameter of 2" and length of 5". The average taper is -13 dB in the H plane and -13.2 dB in the E plane, over the 26.5-40 GHz band. This feed also has ring-loaded corrugations in the mode converter.

Radiation patterns of the feeds are shown along with tables of comparison of the two feeds.