Attachment 2
Block B.3.b.1.b
Subject: Power flux-density limiting method

Polylingual Experimental Terminal (PExT) is a relay station that will communicate with commercial relay satellites and Tracking and Data Relay Satellite System (TDRSS) located in LEO, MEO, and GEO. Based on PExT 3-dB beamwidth (1.1 degrees) scaled based on bandwidth,

$$Minimum\ bandwidth\ case\colon\ -162\ dBW + 10\log_{10}\frac{15x10^6}{40x10^3} = -136.25\ dB\left(\frac{W}{m^2}\right)$$
$$Maximum\ bandwidth\ case\colon\ -162\ dBW + 10\log_{10}\frac{60x10^6}{40x10^3} = -130.25\ dB\left(\frac{W}{m^2}\right)$$

When communicating with satellite in GEO (Inmarsat-GX), PExT's boresight EPFD will be around $-110\ dB\ \left(\frac{W}{m^2}\right)$. In order to meet the worst-case $-136\ dB\ \left(\frac{W}{m^2}\right)$ limit at the GEO belt we will limit PExT operations in this band when boresight is within 3 degrees of the satellite that also operated in the band. At this distance PExT's antenna gain will be 40 dB down from boresight, which will give us 20 dB of margin from the limit specification.