Viasat Products Manual – Earth Station Specs

Summary

The following information discusses the ViaSat components used in providing Internet service.

This Job Aid covers:

This job aid support all audiences.

VSAT Earth Station Technical Specifications

Station Class:

Earth Station for Fixed Satellite Services, of VSAT type. Licensed under the FCC blanket license provisions for Ka-band, transmit in 29.5 to 30 GHz, and receive in 19.7 to 20.2 GHz.

Emission (Modulation BW-Type):

Digital Phase Modulation for both Transmit and Receive signals.

- The Transmit signal to the satellite functions at QPSK at one of the following symbol rates 2560 ksps, 1280 ksps, 640 ksps, 320 ksps, or 160 ksps, with correspondingly occupied bandwidth of 3.2 MHz, 1.6 MHz, 800 kHz, 400 kHz, and 200 kHz. (Designations 3M20G7W,

1M60G7W, 800KG7W, 400KG7W, 200KG7W)

- The Receive signal from the satellite functions at 8-PSK or QPSK, at symbol rates of either 22.5 Msps, or 15 Msps, with occupied bandwidth of 27 MHz or 18 MHz (designation 27M0G7W or 18M0G7W)

Power (TX-RF):

Maximum TX- RF power is 49.1 dBWi at antenna boresight (towards satellite at -111.1 deg W GSO), Off-axis patter complies with FCC regulatory mask of 29-25log10 (off-axis angle) for larger than 2 degrees.

Equipment Nomenclature (i.e. C, Channel Master Satellite System):

WB1000 (WildBlue model 1000), manufactured by Raven Antenna Systems, and ViaSat Surfbeam® product line

Equipment Components:

Each WildBlue/Exede Communications system consists of:

- One Indoor Unit: Consisting of the Power Supply and Satellite Modem
- One Outdoor Unit: Consisting of an Antenna, Ka-band Transceiver, OMT, Polarizer, and Feed Horn Assembly; as well as dual RG-6 coaxial cables for interconnecting Indoor and Outdoor units.

Antenna Type (Name):

The antenna is a VSAT type, Manufactured by Raven, Offset parabolic main reflector with average physical diameter of 66 cm, and with a 15.4 cm flat Sub-reflector.

Antenna Nomenclature:

WB 66 cm antenna

Antenna Gain (dBi):

Transmit gain at 30 GHz is 44.6 dBi, and Receive gain at 20.2 GHz is 41.2 dBi

Antenna Height (Meters AGL):

Minimum of 5 ft AGL

Orientation (Pointing or Rotate):

Azimuth, Elevation, and Skew capability for pointing towards GSO arc from anywhere in the CONUS.

Antenna Polarization:

The antenna uses Circular Polarization for both Transmit and Receive. The polarization of the Transmit and Receive signals are orthogonal to each other.

Ka-band Usage:

While the Ka-band extends from 27 GHz to 40 GHz, it also includes the upper part of the Super-high Frequency (SHF) band and the lower part of the Extremely-High Frequency (EHF) range. These ranges extend from 30 to 300 GHz. Broadband satellite systems typically employ the 27.5-30.0 GHz SHF frequency range for uplink transmissions (earth-to-space) and the 17.7- 20.2 GHz range for downlink transmissions (space-to-earth). Note that the broadband application actually overlaps a part of the Ku-band in its downlink frequency band. Because the Ka-band frequency is highly concentrated, it provides high gain and a narrow beam-width along with the possibility of

multiple beams.