

## ATTACHMENT 2

### TECHNICAL SUMMARY OF THE Ka-BAND TEST RANGE MODIFICATION

The material in this attachment is intended to summarize the data provide electronically in Form 442 and in Attachment 1.

#### A. 74 CM ANTENNA

Deployment location:	Can be deployed anywhere in the continental United States of America
Antenna Size:	98 by 56 cm elliptical antenna (gain is equivalent to a 74 cm circular dish).
Antenna pointing:	towards the GSO arc. The precise azimuth and elevation will vary depending on the specific terminal location and satellite used.
Antenna beamwidth:	0.9 degrees (from 3 dB to 3 dB point on GSO plane)
Transmit frequency range:	29.5 to 30.0 GHz
Receive frequency range:	19.7 to 20.2 GHz.
Antenna gain:	transmit 45.6 dBi, receive 42.2 dBi
Antenna off-axis gain	Complies with 25.209
Antenna model number	HNS1031929
Radio model number	unnumbered prototypes
Quantity	50 radio/antenna
Modulation	QPSK
Bandwidth	250 or 320 kHz
Power (clear sky)	0.4 Watts (250 kHz) or 0.5 Watts (320 kHz)
Power (rain)	2 Watts
EIRP (clear sky)	41.7 dBW (250 kHz), 42.8 dBW (320 kHz)
EIRP (rain)	48.6 dBW

#### B. 98 CM ANTENNA

Deployment location:	Can be deployed anywhere in the continental United States of America
Antenna Size:	98 cm parabolic
Antenna pointing:	towards the GSO arc. The precise azimuth and elevation will vary depending on the specific terminal location and satellite used.
Antenna beamwidth:	0.7 degrees (from 3 dB to 3 dB point on GSO plane)
Transmit frequency range:	29.5 to 30.0 GHz

Receive frequency range:	19.7 to 20.2 GHz.
Antenna gain:	transmit 48.0 dBi, receive 44.6 dBi
Antenna off-axis gain	Complies with 25.209
Antenna model number	Prodelin 3980-131
Radio model number	unnumbered prototypes
Quantity	25 radio/antenna
Modulation	QPSK
Bandwidth	250 or 320 kHz
Power (clear sky)	0.4 Watts (250 kHz) or 0.5 Watts (320 kHz)
Power (rain)	2 Watts
EIRP (clear sky)	44.1 dBW (250 kHz), 45.2 dBW (320 kHz)
EIRP (rain)	51.0 dBW

#### C. 120 CM ANTENNA

Deployment location:	Can be deployed anywhere in the continental United States of America
Antenna Size:	120 cm parabolic
Antenna pointing:	towards the GSO arc. The precise azimuth and elevation will vary depending on the specific terminal location and satellite used.
Antenna beamwidth:	0.6 degrees (from 3 dB to 3 dB point on GSO plane)
Transmit frequency range:	29.5 to 30.0 GHz
Receive frequency range:	19.7 to 20.2 GHz.
Antenna gain:	transmit 49.8 dBi, receive 46.4 dBi
Antenna off-axis gain	Complies with 25.209
Antenna model number	Prodelin 3120-131
Radio model number	unnumbered prototypes
Quantity	10 radio/antenna
Modulation	QPSK
Bandwidth	250 or 320 kHz
Power (clear sky)	0.4 Watts (250 kHz) or 0.5 Watts (320 kHz)
Power (rain)	2 Watts
EIRP (clear sky)	45.9 dBW (250 kHz), 47.0 dBW (320 kHz)
EIRP (rain)	52.8 dBW

#### D. 180 CM ANTENNA

Deployment location:	Can be deployed anywhere in the continental United States of America
Antenna Size:	180 cm parabolic

Antenna pointing:	towards the GSO arc. The precise azimuth and elevation will vary depending on the specific terminal location and the satellite used.
Antenna beamwidth:	0.45 degree (from 3dB to 3dB point on GSO plane)
Transmit frequency range:	29.5 to 30.0 GHz
Receive frequency range:	19.7 to 20.2 GHz.
Antenna gain:	transmit 53.3 dBi, receive 49.9 dBi
Antenna off-axis gain	Complies with 25.209
Antenna model number	Prodelin 3180-131
Radio model number	unnumbered prototypes
Quantity	10 radio/antenna
Modulation	QPSK
Bandwidth	250 or 320 kHz
Power (clear sky)	0.4 Watts (250 kHz) or 0.5 Watts (320 kHz)
Power (rain)	2 Watts
EIRP (clear sky)	49.6 dBW (250 kHz), 50.7 dBW (320 kHz)
EIRP (rain)	56.5 dBW

#### E. 350 CM ANTENNA

Deployment location:	2 units deployed in Germantown, MD 1 unit deployed in North Las Vegas, NV
Antenna Size:	350 cm parabolic
Antenna pointing:	towards the GSO arc. The precise azimuth and elevation will vary depending on the satellite used.
Antenna beamwidth:	0.2 degrees (from 3 dB to 3 dB point on GSO plane)
Transmit frequency range:	29.5 to 30.0 GHz
Receive frequency range:	19.7 to 20.2 GHz.
Antenna gain:	transmit 58.9 dBi, receive 55.5 dBi
Antenna off-axis gain	Complies with 25.209
Antenna model number	Andrew ES35SRT-1
Radio model number	unnumbered prototypes
Modulation	QPSK
Bandwidth	250 kHz, 320 kHz, 39 MHz
Power (clear sky)	0.4 Watts (250 kHz), 0.5 Watts (320 kHz), 64 Watts (39 MHz)
Power (rain)	2 Watts (250 kHz), 2 Watts (320 kHz), 80 Watts (39 MHz)
EIRP (clear sky)	55.0 dBW (250 kHz), 56.1 dBW (320 kHz), 76.9 dBW (39 MHz)
EIRP (rain)	61.9 dBW (250 kHz), 61.9dBW (320 kHz), 77.9 dBW (39 MHz)