



4.6-Meter Dual-Reflector C-*, Ku-* or X-Band



* C- and Ku-band versions are INTELSAT Type Approved

X-Band option now available

Electrical Performance Meets or Exceeds:

- **INTELSAT F-1 Type Approved – Reference SP38-06**
Type Number: ES46()-CCP2 Registration Number: IA015A00
Type Number: ES46()-CCP2-24 Registration Number: IA015AA0
Type Number: ES46()-CCP4 Registration Number: IA015B00
Type Number: ES46()-CCP4-24 Registration Number: IA015BA0
– Reference SP38-10
Type Number: ES46()-4124W Registration Number: IA021B00
Type Number: ES46()-4124W-24 Registration Number: IA021BA0
Type Number: ES46()-124W Registration Number: IA021A00
Type Number: ES46()-124W-24 Registration Number: IA021AA0
- **INTELSAT, Requirements for standard F-1, D-1 and G (C-band) and E-1 or E-2 (Ku-band).**
- **EUTELSAT requirements for pattern and polarization discrimination.**
- **U. S. FCC regulation 25.209, for mandatory pattern requirements for 2° satellite spacing (Ku-band).**
- **Approved for use in the territory of Russia by the Ministry of Communications of the Russian Federation. (Reference: Homologation Certificate No. OC/1-AΦ-1).**

Control Options

Microprocessor or Steptrack Control Options Available for Motorized Antennas.

Equipment Enclosure

A 48 inch (1219 mm) Diameter by 24 inch (610 mm) Deep Equipment Enclosure with Doors for Hub Mounting of LNA Systems.

Field Changeable Feed System

C-Band Feed System is Field Switchable from Circular to Linear Polarization.

No Field Alignment

Self-Aligning Main Reflector Requires No Field Alignment.

High Performance Dual-Reflector Feed System.

The Andrew 4.6-meter earth station antenna incorporates a uniquely formed dual-reflector Gregorian system, coupled with close-tolerance manufacturing techniques, resulting in extremely accurate surface contours and providing superior electrical performance characteristics.

Economical Shipping Costs. The segmented aluminum reflector panels are precisely cut from a single piece, precision spun reflector to minimize shipping costs.

Horizon-To-Horizon Coverage. The elevation-over-azimuth pedestal ground mount enables horizon-to-horizon coverage from virtually any worldwide location.

Non-Critical Pedestal Mount Installation. The easily installed pedestal mount allows from non-critical foundation orientation and is capable of 180° of azimuth

travel via three 120° continuous ranges with 30° overlap. Elevation travel is continuous from 0 to 90°.

Manual Or Motorizable Mount Configurations.

Multiple mount configurations provide a wide variety of options to enable custom system designs to meet initial and future optional requirements.

Motorizable Mount Enables Future Motorized Operation.

The motorizable pedestal mount features self-aligning bearings for the elevation pivots, resulting in “zero” backlash and the ability to upgrade the antenna for motorized operation, including steptracking or program-tracking applications.

Minimal Field Testing.

These antennas can be deployed in the field with minimal testing of G/T to become fully certified as an INTELSAT standard E-2, E-1, or F-1 station. Coordination with the local signatory is required on INTELSAT Type Accepted antennas.





Electrical

Operating Frequency Band*

C-Band Receive	3.625-4.2 GHz
C-Band Transmit	5.850-6.425 GHz
Ku-Band Receive	10.95-12.75 GHz
Ku-Band Transmit	14.0-14.5 GHz
X-Band Receive	7.25-7.75 GHz
X-Band Transmit	7.90-8.40 GHz

Gain*, at circular waveguide flange of feed. (dBi, ±0.2dB)

Rx Frequency	Rx Gain	Tx Frequency	Tx Gain
3.625 GHz	43.2	5.850 GHz	48.0
4.000 GHz	44.3	6.175 GHz	48.4
4.200 GHz	44.8	6.425 GHz	48.8
7.250 GHz	49.7	7.90 GHz	50.2
7.500 GHz	49.9	8.15 GHz	50.4
7.750 GHz	50.1	8.40 GHz	50.6
10.950 GHz	53.0	14.00 GHz	55.0
11.950 GHz	53.8	14.25 GHz	55.1
12.750 GHz	54.3	14.50 GHz	55.2

Polarization*

Circular, switchable to linear in the field (C-Band)
Linear (Ku-Band)

Polarization Discrimination*, (Linearly-Polarized):

>35 dB across 1 dB beamwidth - (C- or Ku-Band)

Voltage Axial Ratio*, C-Band, circularly-polarized with 4-port combiner

<1.06:1 on axis
X-Band, <1.20:1 on axis, Tx and Rx

Bandwidth, Mid-band, Degrees	C-Band	Ku-Band	X-Band
3 dB Receive (Transmit)	0.92 (0.63)	0.34 (0.29)	0.51 (0.47)
15 dB Receive (Transmit)	1.82 (1.21)	0.67 (0.54)	1.01 (0.93)

Antenna Noise Temperature* - under clear sky conditions, at 68°F (20°C), at the circular waveguide flange of the feed.

Elevation	Kelvin (C-Band)	Kelvin (Ku-Band)	Kelvin (X-Band)
10°	32	42	37
30°	27	32	27
50°	25	29	24

Antenna VSWR*, Transmit and Receive <1.25:1

* Actual antenna specifications are amended by the choice of feed/combiner options. For further feed/combiner option information, ask for Andrew Bulletin 1669 (C-Band), Bulletin 1670 (Ku-Band) and Bulletin 3653A (X-Band).

Typical Slab Foundation Information

Soil Bearing Capacity	3000 lb/ft ² (14.646 kg/m ²)
Reinforcing Steel	284 lb (129 kg)
Concrete Compressive Strength	3000 lb/in ² (211 kg/cm ²)
Foundation Size:	
Length	10.0 ft (3.05 m)
Width	10.0 ft (3.05 m)
Depth	1.5 ft (0.5 m)
Concrete Volume	5.56 yd ³ (4.25 m ³)

Note: Other typical foundation designs are available.

G/T Performance* (C-Band)

LNA/LNB Noise Temperature	65K	45K	30K
ES46 G/T at 10° EL (dB/K)	23.3	24.1	24.7

* Based on a 2-port, linearly-polarized antenna configuration at 4 GHz and at 10° elevation under clear sky conditions.

G/T Performance* (Ku-Band)

LNA/LNB Noise Temperature	165K	125K	90K
ES46 G/T at 10° EL (dB/K)	30.2	31.1	32.0

* Based on a 2-port, linearly-polarized antenna configuration at 12 GHz and at 10° elevation under clear sky conditions.

G/T Performance* (X-Band)

LNA/LNB Noise Temperature	50K	75K	100K
ES46 G/T at 10° EL (dB/K)	29.7	28.7	27.9

* Based on a 2-port, linearly-polarized antenna configuration at 7.50 GHz and at 10° elevation under clear sky conditions.

Mechanical

Feed Type	Dual-Reflector, Gregorian
Reflector Material	Precision-Formed Aluminum
Reflector Segments	8
Mount Type	EI over AZ, Pedestal

Antenna Pointing Range, Coarse/(Continuous)

Elevation	0-90° (90°)
Azimuth	180° (120°)
Polarization	180° (180°)

Hub/Enclosure Dimensions

Diameter	48 in (1.22 m)
Depth	24 in (0.61 m)

Wind Loading, Survival

125 mph (200 km/h) in any position of operation

Wind Loading, Operational

(motor drives) 45 mph (72 km/h), gusting to 65 mph (105 km/h)

Temperature, Operational

-40° to 125°F (-40° to 52°C)

Rain

4 in (102 mm) per hour

Solar Radiation

360 BTU/hr/ft² (1135 Watts/m²)

Relative Humidity

100%

Shock and Vibration

As encountered by commercial air, rail and truck shipment

Atmospheric Conditions

Moderate coastal/industrial areas. Severe conditions require additional protection.

Motor Drive Speed Summary

Drive System Type	High	Speed Summary Medium	Low
HS	Fast	Slow	-
MS	-	Fast	Slow
STHS	Fast	-	Slow

Note: All motorization drive packages are comprised of dual-speed motors, yielding a "fast" and "slow" speed for each speed range per the above chart. All 50 Hz motor drive speeds are approximately .83 the speed of the 60 Hz motor.

For antenna series: ES46MPJ- equipped with the MK5HS- series drive systems with 60 Hz motors.

Nominal Speed, (degrees/second)

Elevation, Slow/Fast	0.22°/1.03°
Azimuth, Slow/Fast	0.37°/1.6°
Polarization	1.5°

For antenna series: ES46MPJ- equipped with the MK5MS- series drive systems with 60 Hz motors.

Nominal Speed, (degrees/second)

Elevation, Slow/Fast	0.015°/.065°
Azimuth, Slow/Fast	0.025°/0.1°
Polarization	1.5°

For antenna series: ES46MPJ- equipped with the MK5STHS- series drive systems with 60 Hz motors.

Nominal Speed, (degrees/second)

Elevation, Slow/Fast	0.014°/0.98°
Azimuth, Slow/Fast	0.023°/1.5°
Polarization	1.5°

Uplink EIRP Capability* (C-Band)

HPA Output (Watts)	50	300	1000
Uplink EIRP (dBW)	65.0	72.8	78.0

* Based on a 2-port antenna configuration at 6.175 GHz and 0 dB allowance for waveguide (IFL) loss between the HPA and the antenna.

Uplink EIRP Capability* (Ku-Band) and X-Band

HPA Output (Watts)	(50) 25	(300) 100	(600) 400
Uplink EIRP (dBW)	(72.0) 64.2	(79.8) 70.2	(82.8) 76.2

* Based on a 2-port antenna configuration at 14.25 GHz and 0 dB allowance for waveguide (IFL) loss between the HPA and the antenna.



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