

4.9 Meter ESA

Like all Kratos earth station antennas, the 4.9 Meter Earth Station Antenna provides high gain and exceptional pattern characteristics.

This antenna system is designed to address the stringent requirements of both the television broadcast industry and telecommunications network operators who demand unsurpassed flexibility and electrical performance in high-quality, cost-effective, and reliable packages.

The electrical performance and exceptional versatility provides the ability to configure the antenna with your choice of linearly- or circularly- polarized 2- or 4- port combining networks. That versatility is provided at the time of initial purchase, as well as in the future, as your satellite communication requirements evolve.

This antenna system is used worldwide in broadcast applications and high density data, voice and communications networks. The Kratos 4.9 meter earth station antenna features a computer-optimized dual reflector Gregorian optics system and close-tolerance manufacturing techniques.

This combination provides extremely accurate surface contour resulting in exceptionally high gain and closely controlled pattern characteristics. Kratos earth station antennas provide maximum durability with minimal maintenance.



Features

- Self-aligning main reflector - no optical field alignment
- 3 year warranty on all structural components
- FCC paragraph 25.209 for mandatory pattern requirements for 2 degree satellite spacing based on off satellite measurement at Ku-Band
- Configured for C-, X-, Ku-, K- and Ka- Band transmit and receive
- Low PIM Capabilities

4.9 Meter ESA

Design Standards

Reflector	Aluminum painted with highly diffusive white paint
Ground Mount	Hot-dipped galvanized steel, per ASTM-A123 for structural steel.
Hardware	Sizes \leq 3/8 in (9.5mm), stainless steel, passivated per MIL-F-14072-E300 Sizes \geq 3/8 in (9.5mm), hot-dipped galvanized stainless steel, passivated per ASTM-A123

Environmental Performances

Operating Temperature	-40° to 52°C (-40° to 125°F)
Seismic (Earthquake)	1 G Vertical and Horizontal acceleration. Equivalent to a Richter Magnitude 8.3, and Grade 11 on the modified Mercalli Scale
Operational Winds	45 mph (72 km/h) Gusts to 65 mph (105 km/h)
Survival Winds	125 mph (200 km/h) in any position of operation
Rain	4 in (102 mm) per hour
Solar Radiation	360 BTU/hr/ft ² (1135 Watts/m ²)
Relative Humidity	100%
Shock and Vibration	As encountered by commercial Air, Rail and Truck shipment.
Atmospheric Conditions	As encountered by Moderately Corrosive Coastal and Industrial Areas.

Mechanical Performances

The 4.9m Antenna mechanical general specifications and performances are listed in below table. Additional information, dimensions and layout may be provided by Kratos on a case-by-case basis.

Optics Type	Dual Reflector Gregorian
Reflector Material	Precision-Formed Aluminum
Reflector Segments	12
Mount Type	EI over Az, Pedestal Mount

Antenna Pointing Range, Coarse/(Continuous)

Elevation:	0-90° (90°)
Azimuth:	360° (120°)
Polarization	(180°)

Hub/Enclosure Dimensions

Diameter	1.32m (52 in)
Depth	0.81m (32 in)

Shipping Information

Packing Options

Standard Commercial Domestic Pack	Included
Ocean Export Pack - For non-containerized, packed for seal against salt water spray	OCEANSHP-MD
Air Export Pack - For freighter aircraft shipments. Lower deck AirPack requires specialized bids	AIR EXPORT PACK-MD
Container Packaging	CNTPCK-MD

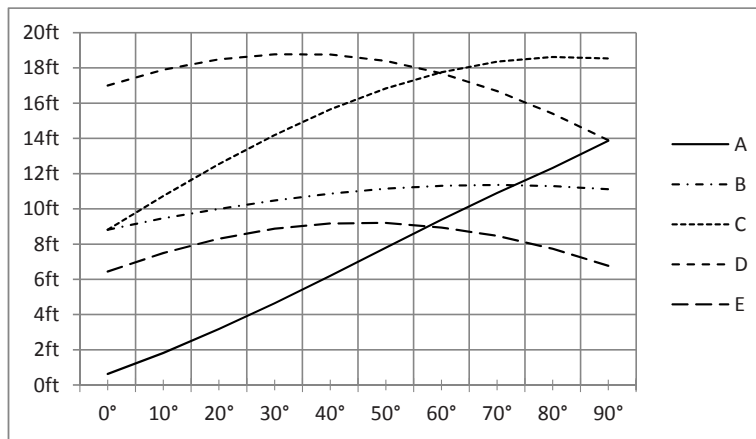
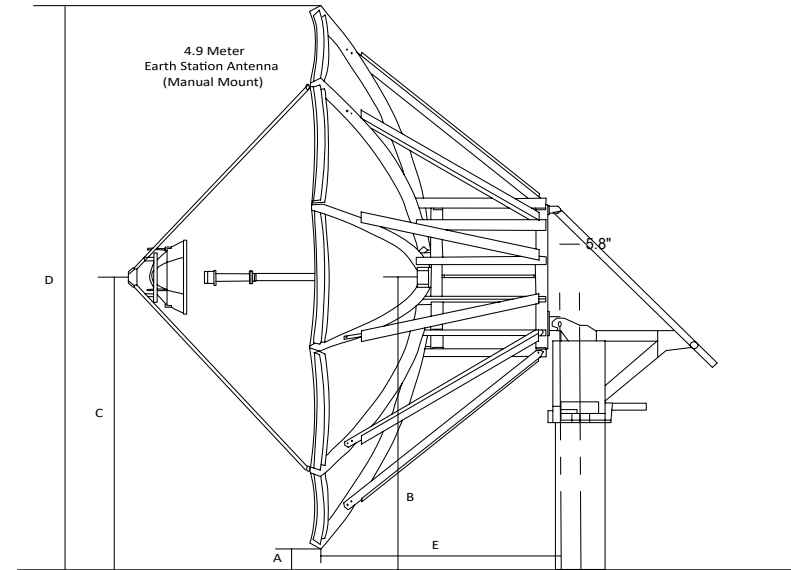
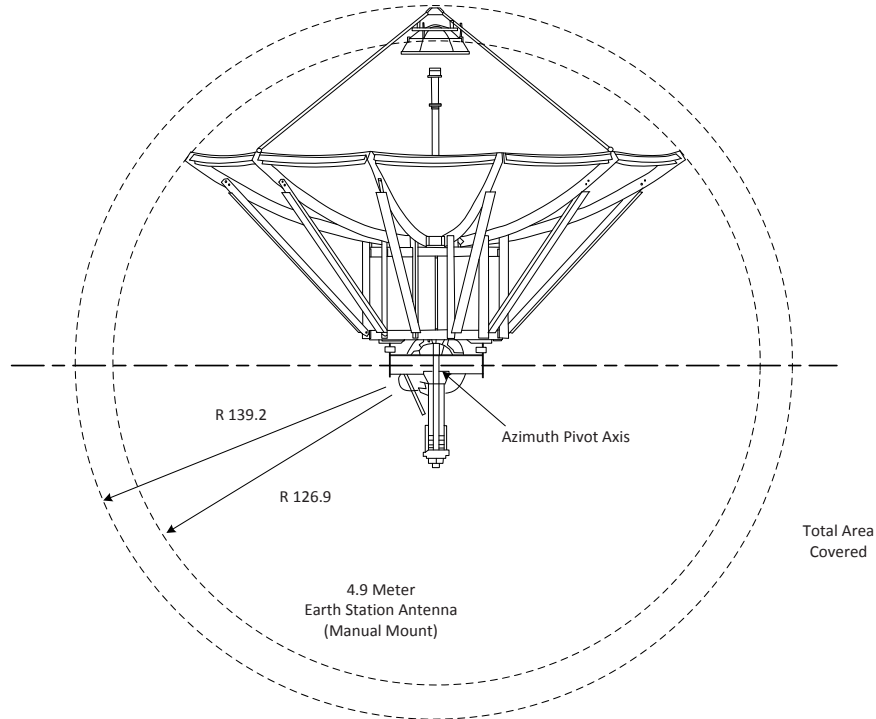
Required Shipping Container

Standard 20 ft land/sea container	Quantity 1
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Shipping container information is given for basic configuration and may vary depending on the selected options, please contact Kratos for specific container loading plan.

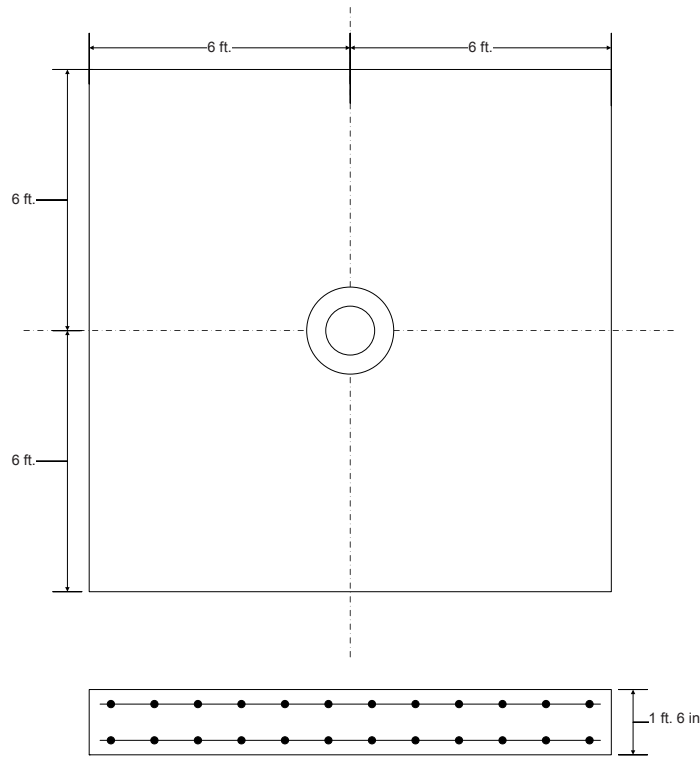
4.9 Meter ESA

Dimensional Drawings

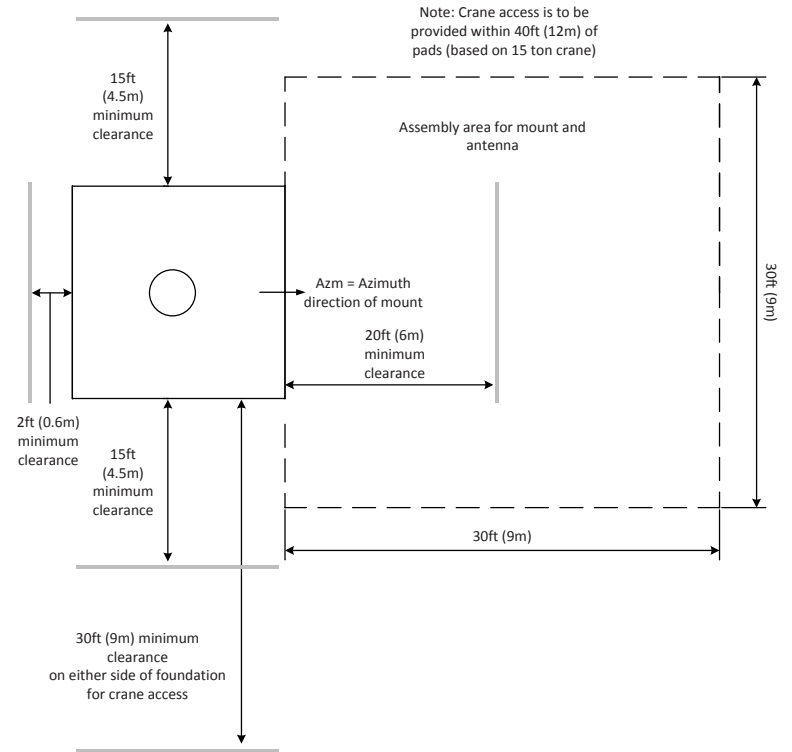


4.9 Meter ESA

Typical Foundation Design



Typical Foundation Information



Foundation information are provided in bulletin 237636, please contact Kratos.

Soil Bearing Capacity,	2000 lb/ft ² (9770 kg/m ²)
Reinforcing Steel,	821 lbs (372 kg)
Concrete Compressive Strength,	3000 psi (211 kg/cm ²)
Foundation Size:	(for specific standard soil and typical design)
Length	12 ft (3.66 m)
Width	12 ft (3.66 m)
Depth	1.5 ft (0.45 m)
Concrete Volume	8 yd ³ (6.1 m ³)
NOTE: Other typical foundation designs are available. Soil borings and foundation analysis should be performed by a qualified civil engineer.	

4.9 Meter ESA

Antenna Configurations

Earth Station Antennas	
Manual Pedestal Mount.	ES49-1
Motorizable Mount without Az/EI Jackscrews.	ES49MP-1
Motorizable Mount with Az/EI Jackscrews.	ES49MPJ-1
Ka Band Earth Station Antennas	
Manual Pedestal Mount.	ES49KA-1
Motorizable Mount without Az/EI Jackscrews.	ES49KAMP-1
Motorizable Mount with Az/EI Jackscrews.	ES49KAMPJ-1
Low PIM Earth Station Antennas	
Manual Pedestal Mount.	ES49-LP-1
Motorizable Mount without Az/EI Jackscrews.	ES49MP-LP-1
Motorizable Mount with Az/EI Jackscrews.	ES49MPJ-LP-1
Ka Band Low PIM Earth Station Antennas	
Manual Pedestal Mount.	ES49KA-LP-1
Motorizable Mount without Az/EI Jackscrews.	ES49KAMP-LP-1
Motorizable Mount with Az/EI Jackscrews.	ES49KAMPJ-LP-1

Antenna controller and motorization are detailed in specific bulletins, please contact Kratos.

4.9 Meter ESA

Motor Drive Speed Summary

	Variable	
Azimuth	0.05°/s	0.5°/s
Elevation	0.05°/s	0.5°/s
Polarization	1°/s	

Motorization

One motorization system is available for this antenna: the NGC tracking system that can support Steptrack, Smartrack and Ephemeris orbital tracking. The NGC-IDU controller can also operate the Sub-Reflector tracking system SRT-2-49, 2 axis Control Sub-Reflector Carriage, required for Ka application.

Motor Kit

Azimuth/Elevation Motor Kit	NGC-MK5
Azimuth/Elevation Motor Kit , High Accuracy	NGC-MK5KA

SRT Kit

2 axis Control Sub-Reflector Carriage	SRT-2-49
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Polarization Drive Kit (DC Step Motors)

Standard Temperature (> -20°C)	NGC-PK9DRA
Low Temperature operation (< -20°C)	NGC-PK9DRA-LO

Outdoor Unit Controller (Tracking)

Power 200 - 230 VAC, 3 Phase 50/60 Hz	NGC-ODU-208-3
Power 380 - 460 VAC, 3 Phase 50/60 Hz	NGC-ODU-380-3
Power 200 - 230 VAC, 3 Phase 50/60 Hz , High Accuracy	NGC-ODU-208-3-HA
Power 380 - 460 VAC, 3 Phase 50/60 Hz , High Accuracy	NGC-ODU-380-3-HA
NGC OUTDOOR INTERFACE FOR SRT	NGC-ODU-SRT

Antenna controller, motorization and options are detailed in specific bulletins, please contact Kratos.

Motorization and NGC Options

Indoor	
NGC-IDU	NGC Rack Mounted Antenna Controller W/LCD Touch Panel
NGC-001	NGC-IDU Analog Telephone Modem
NGC-002	NGC-IDU Spectrum Analyzer Card, Analog
NGC-003	NGC-IDU DVB Receiver Card
NGC-004-02	NGC IDU, L-Band Internal Beacon Receiver
NGC-006	NGC-IDU Emergency Stop Button
NGC-007	NGC-IDU 10 Mhz Reference Source
NGC-008	NGC-IDU Redundant Power Supply
NGC-009	NGC-IDU Rack Slides
NGC-101	NGC-IDU Step Tracking Software
NGC-102	NGC-IDU Smartrack Software
NGC-103	NGC-IDU Predictive Track Software
NGC-104	NGC-IDU Full Tracking Capability Software
NGC-106	NGC-IDU Remote Access Software Package
NGC-107	NGC-IDU Spectrum Analyzer Enhanced User Interface
NGC-108	Receive Pattern Test Tool
NGC-109	Redundancy Control Software
NGC-111	Sand/Dust Deviator Feature
NGC-119	NGC High Availability System Redundancy Software
Outdoor	
NGC-201	NGC ODU Low Temperature Kit (-40 C)
NGC-202	NGC ODU High Temperature Kit (+60 C)
NGC-205	NGC ODU AC Polarization Drive Interface
NGC-206	NGC Exterior Emergency Stop Button
NGC-207	Pre Movement Alert Warning Light And Annunciator
NGC-211	Dual Path NGC Redundancy
NGC-AESC	Environmental System Controller

Antenna controller, motorization and options are detailed in specific bulletins, please contact Kratos.

4.9 Meter ESA

Feed Matrix

C- BAND FEED SYSTEMS	PORT	Co-Pol	CP	LP	RX 3.625 - 4.2 GHz	RX 3.4 - 4.2 GHz	RX 4.5 - 4.8 GHz	TX 5.850 - 6.425 GHz	TX 5.850 -6.725 GHz	TX 5.725 - 6.725 GHz	TX 6.725 - 7.025 GHz
2CLPNC-49	2	X			X			X			
2CPNC-49-109	2		X		X			X			
2CPNCR-49-109	2		X		X						
2CPWCR-49-120	2		X			X					
2LPNC-49	2			X	X			X			
2LPNCR-49	2			X	X						
2LPUC-49	2			X			X				X
2LPWC-49	2			X		X				X	
2LPWCR-49	2			X		X					
4CPNC-49-206	4		X		X			X			
4LPNC-49	4			X	X			X			
4LPWWC-49	4			X		X				X	

X- BAND FEED SYSTEMS	PORT	CP	RX 7.25 - 7.75 GHz	TX 7.9 - 8.4 GHz
2CPX-49	2	X	X	X
2CPXF-49-C5	2	X	X	X

Low PIM X- BAND FEED SYSTEMS	PORT	CP	RX 7.25 - 7.75 GHz	TX 7.9 - 8.4 GHz
2CPMX-49	2	X	X	X

4.9 Meter ESA

Feed Matrix (cont)

Ku- BAND FEED SYSTEMS	PORT	LP	RX 10.95 - 12.75 GHz	RX 10.7 - 12.75 GHz	RX 10.7 - 11.7 GHz	TX 12.75- 13.25 GHz	TX 13.0 - 14.5 GHz	TX 13.75- 14.5 GHz	TX 13.75- 14.8 GHz
2LPKU-49	2	X		X					X
2LPKUR-49-W	2	X	X						
4LPKU-49-1	4	X		X					X
4LPKU-49-2	4	X			X	X			X
4LPKU-49-4	4	X		X			X		

K- BAND FEED SYSTEMS	PORT	LP	RX 10.7 - 12.75 GHz	TX 17.3 - 18.4 GHz
2LPKK-49	2	X	X	X
4LPKK-49	4	X	X	X

Ka- BAND FEED SYSTEMS	PORT	LP	CP	RX 17.7- 21.20 GHz	RX 20.2 - 21.2 GHz	TX 27.50 - 31.00 GHz	TX 30.0 - 31.0 GHz
4CPMKA-49-206	2		X		X		X
4CPWWKA-49	4		X	X		X	
4LPWWKA-49	4	X		X		X	

4.9 Meter ESA

Antenna Options and Spares

Anchor Bolt and Template Kits Option	
302689	Anchor Bolt and Template Kits
Azimuth and Elevation Cross Axis Waveguide Options	
XAPC-49	C-Band Cross Axis and Polarization Axis Waveguide Kit.
XAPC-49-UPG	C-Band Cross Axis and Polarization Axis Waveguide Kit Upgrade. Upgrades XAPC-49 for use with 4-Port C-Band Feeds. Provides Additional Waveguide Run.
XAPKA-49	Ka-Band Cross Axis and Polarization Axis Waveguide Kit..
XAPKA-49-UPG	Ka-Band Cross Axis and Polarization Axis Waveguide Kit Upgrade. Upgrades XAPKA-49 for use with 4-port Ka-Band Feeds. Provides Additional Waveguide Run.
XAPKK-49	K-Band cross Axis and Polarization Axis Waveguide Kit.
XAPKK-49-UPG	K-Band Cross Axis and Polarization Axis Waveguide Kit Upgrade. Upgrades XAPKK-49 for use with 4-port K-Band Feeds.
XAPKU-49	Ku-Band Cross Axis and Polarization Axis Waveguide Kit. Single run for 2-Port Ku-Band Feeds.
XAPKU-49-UPG	Ku-Band Cross Axis and Polarization Axis Waveguide Kit Upgrade. Upgrades XAPKU-49 for use with 4-Port Ku-Band Feeds. Provides Additional Waveguide Run.
Heating Options	
FH49C	C-Band Feed Heater Kit
FH49KA	Ka-Band Feed Heater
FH49KU-K	Ku and K-Band Feed Heater
WEC49R-208-100	Electric Hot Air De-Ice System, 208 VAC, 3 Phase (not for Ka band)
WEC49R-380-100	Electric Hot Air De-Ice System, 380 VAC, 3 Phase (not for Ka band)

Hub Equipment Options	
EMRGYLT-115	Emergency Hub Light Kit, 115 VAC
EMRGYLT-230	Emergency Hub Light Kit, 230 VAC
FV65-115	Fan and Vent Kit, 115 VAC
FV65-220	Fan and Vent Kit, 230 VAC
HUBHTR-230	Antenna Hub Heater, 230 VAC
HUBLCNTR-115/240	Hub Power Center, 115/240 VAC
HUBLCNTR-230	Hub Power Center, 230 VAC
HUBLT-115	Hub Light Kit, 115 VAC
HUBLT-230	Hub Light Kit, 230 VAC

Safety Options	
ANTGND-5	Foundation Installed Grounding Kit
LRK9	Lightning Rod Kit
OBWRNLT-UNV	Obstruction Warning Light Kit

Other Options	
221196	Azimuth or Elevation Handwheel Kit (2 required)
209906	Lubrication and Maintenance Kit
BRNG-49-KU	Guard, Feed Window Ku-band
FTST	Feed System Testing
TK-MAN-SML	Tool Kit, Small Manual Antennas
TK-MOT-SML	Tool Kit, Small Motorized Antennas

Environment Systems Options	
PDKA-49-208	Precipitation Deviator Ka-band, 208 VAC, 3 Phase
PDKA-49-380	Precipitation Deviator Ka-band, 380 VAC, 3 Phase
PDKU-49-208	Precipitation Deviator Ku-K-band, 208 VAC, 3 Phase
PDKU-49-380	Precipitation Deviator Ku-K-band, 380 VAC, 3 Phase



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