

9.1 Meter ESA

The Kratos 9.1 Meter Earth Station Antenna gives you high-performance in C-, X-, Ku- or K-band geostationary satellite applications. This earth station antenna provides superior performance through the use of precision stretch-formed reflector panels and a dual-shaped Cassegrain feed. Corrugated conical feed horns ensure excellent antenna gain and sidelobe performance.

Forty-eight high-strength aluminum panels are durable enough to withstand rough handling and a range of environmental conditions. Antenna panels mount to radial trusses attached to a central hub. The hub also provides a protective enclosure for sensitive electronics. The high-strength structural steel mount employs an elevation over azimuth geometry for easy pointing to any satellite within the visible orbital arc. The mount's stiff, rugged construction provides pointing accuracy for continuous operation, even under adverse wind conditions.

This antenna includes a TORQUETUBE™ mount with continuous 120° of motorized azimuth coverage in three overlapping sectors.



Features

- Compliant with FCC, ASIASAT, INTELSAT, EUTELSAT, ITU and more
- Meets INTELSAT Standard F-3 requirements
- High-efficiency shaped Cassegrain optics
- Use with C-, X-, Ku or K-band systems
- Minimal satellite repointing time with highspeed motorized option
- Large electronics space in hub
- Precision high-strength structural steel TORQUETUBE™ mount
- 180° continuous azimuth coverage option
- Full line of feed, reflector, and mount options available including TT&C pointing upgrade
- CE compliant

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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 65°C (-40° to 150°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 | 45mph (72km/h) Gusting to 65mph (105km/h) |
| Drive-to-stow | 90 mph (145 km/h) |
| Survival Winds | 100 mph (161 km/h) any position; 125 mph (201 km/h) stowed |
| 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 9.1m 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, shaped axi-symmetric |
| Reflector Material | Precision-Formed Aluminum |
| Reflector Segments | 48 |
| Mount Type | EI over Az |

Antenna Pointing Range Coarse/(Continuous)

| | |
|--------------|--|
| Elevation: | 0-90° (90°) |
| Azimuth: | 160° in 3 overlapping 120° sectors Optional 180° continuous |
| Polarization | 180° (180°) |

Hub/Enclosure External Dimensions

| | |
|----------|----------------|
| Diameter | 74 in (1.87 m) |
| Depth | 37 in (0.94 m) |

Shipping Information

Packing Options

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

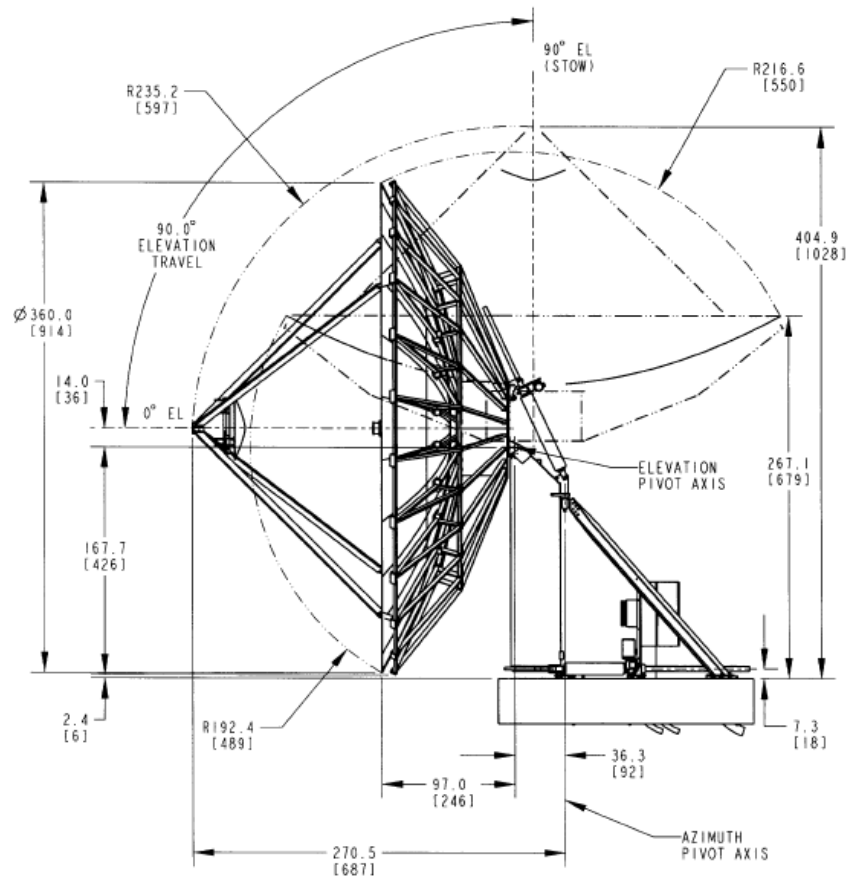
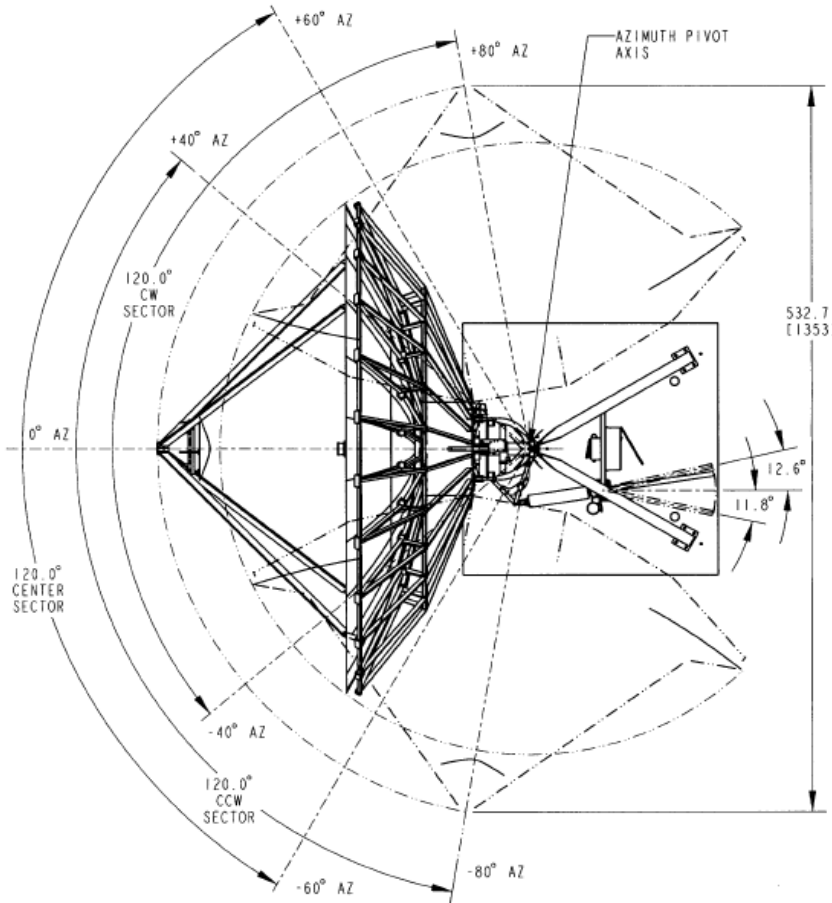
Required Shipping Container

| | |
|-----------------------------------|----------------|
| Standard 20 ft land/sea container | contact Kratos |
| Standard 40 ft land/sea container | contact Kratos |

Shipping container information is given for basic configuration and may vary depending on the selected options, please contact Kratos for specific container loading plan.

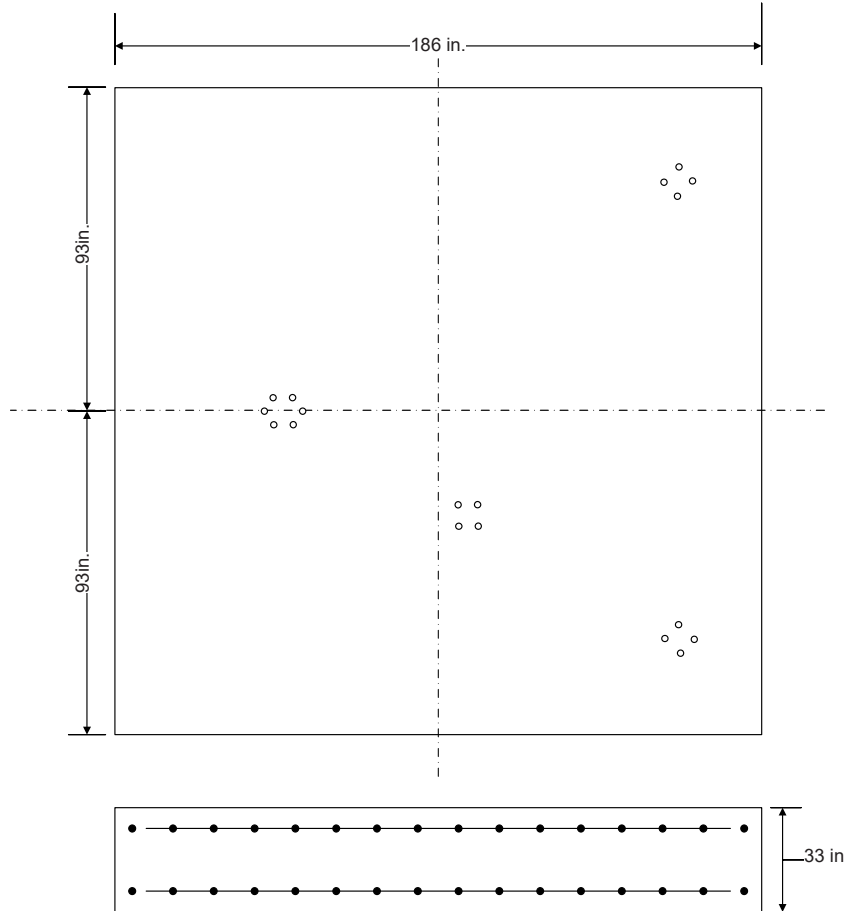
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Dimensional Drawings



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Typical 120deg Foundation Design



| | |
|---|---|
| Soil Bearing Capacity, | not less than 2,000 lb. per sq. foot [96 kPa] |
| Reinforcing Steel, | |
| Concrete Compressive Strength, | 3000 lb. per sq. inch [20685 kPa] |
| Foundation Size: | |
| Length | 186 in (4.7 m) |
| Width | 186 in (4.7 m) |
| Depth | 33 in (0.84 m) |
| Concrete Volume | 23.6 yd ³ (18.6 m ³) |
| NOTE: Other typical foundation designs are available. Soil borings and foundation analysis should be performed by a qualified civil engineer. | |

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

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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.

Motor Kit

| | |
|---|------------|
| Azimuth/Elevation Motor Kit | NGC-MK91 |
| Azimuth/Elevation Motor Kit High Accuracy | NGC-MK91HA |

Outdoor Unit Controller (Tracking)

| | |
|---|------------------|
| Power 200 - 230 VAC, 3 Phase 50/60 Hz | NGC-ODU-208-5 |
| Power 380 - 460 VAC, 3 Phase 50/60 Hz | NGC-ODU-380-5 |
| Power 200 - 230 VAC, 3 Phase 50/60 Hz High Accuracy | NGC-ODU-208-5-HA |
| Power 380 - 460 VAC, 3 Phase 50/60 Hz High Accuracy | NGC-ODU-380-5-HA |

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

Antenna Configuration

Earth Station Antennas

| | |
|---|-------------------|
| 120° Motorizable Mount with Az/EI Jackscrews. | ES91-1 |
| 180° Motorizable Mount with Az/EI Jackscrews. | ES91MPEX-1 |
| Extreme Environment 120° Motorizable Mount with Az/EI Jackscrews. | ES91-EE-1 |
| Extreme Environment 180° Motorizable Mount with Az/EI Jackscrews. | ES91MPEX-EE-1 |
| TT&C 120° Motorizable Mount with Az/EI Jackscrews. | ES91-EE-1-TTC |
| TT&C 180° Motorizable Mount with Az/EI Jackscrews. | ES91MPEX-EE-1-TTC |

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-002-EDR | NGC-IDU Spectrum Analyzer Card, Analog, Enhanced Dynamic Range |
| NGC-003 | NGC-IDU DVB Receiver Card |
| NGC-004-02 | NGC IDU, L-Band Internal Beacon Receiver |
| NGC-004-02-IDU | NGC 1RU, L-Band 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-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.

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Feed Matrix

| C- BAND FEED SYSTEMS | PORT | Co-Pol | CP | LP | RX 3.625 - 4.2 GHz | RX 3.4 - 4.2 GHz | TX 5.850 - 6.425 GHz | TX 5.850 -6.725 GHz | TX 5.725 - 6.725 GHz |
|----------------------|------|--------|----|----|--------------------|------------------|----------------------|---------------------|----------------------|
| 4CPWWC-91-206 | 4 | | X | | | X | | | X |
| 4LPWWC-91-VP | 4 | | | X | | X | | | X |

| Ku- BAND FEED SYSTEMS | PORT | LP | RX 10.7 - 12.75 GHz | RX 10.7 - 11.7 GHz | TX 12.75- 13.25 GHz | TX 13.75- 14.8 GHz |
|-----------------------|------|----|---------------------|--------------------|---------------------|--------------------|
| 4LPKU-91-1 | 4 | X | X | | | X |

| K- BAND FEED SYSTEMS | PORT | CP | LP | RX 10.7 - 12.75 GHz | TX 17.3- 18.4 GHz |
|----------------------|------|----|----|---------------------|-------------------|
| 4CPKK-91 | 4 | X | | X | X |
| 4LPKK-91-1-VP | 4 | | X | X | X |

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Antenna Options and Spares

| Anchor Bolt and Template Kits Options | |
|---------------------------------------|-----------------------------|
| 519083 | 120° Foundation Kit |
| 726772-0001 | 180° Foundation Kit |
| 360061 | 120° Foundation Kit EE/TT&C |
| 268817 | 180° Foundation Kit EE/TT&C |

| Azimuth and Elevation Cross Axis Waveguide Options | |
|--|---|
| XAPC-91 | C-Band cross Axis and Polarization Axis Waveguide Kit. |
| XAPC-91-UPG | C-Band Cross Axis and Polarization Axis Waveguide Kit Upgrade. Upgrades XAPKK-91 for use with 4-port C-Band Feeds. |
| XAPKU-91 | Ku-Band Cross Axis and Polarization Axis Waveguide Kit. Single run for 2-Port Ku-Band Feeds. |
| XAPKU-91-UPG | Ku-Band Cross Axis and Polarization Axis Waveguide Kit Upgrade. Upgrades XAPKU-91 for use with 4-Port Ku-Band Feeds. Provides Additional Waveguide Run. |
| XAPKK-91 | K-Band Cross Axis and Polarization Axis Waveguide Kit. Single run for 2-Port K-Band Feeds. |
| XAPKK-91-UPG | K-Band Cross Axis and Polarization Axis Waveguide Kit Upgrade. Upgrades XAPKK-91 for use with 4-Port K-Band Feeds. Provides Additional Waveguide Run. |

| Heating Options | |
|-----------------|--|
| FHC-91 | C-Band Feed Heater |
| FHX-91 | X-Band Feed Heater |
| FHKUK-91 | Ku-K-Band Feed Heater |
| WEC91R-208-100 | Electric Hot Air De-Ice System, 208 VAC, 3 Phase |
| WEC91R-380-100 | Electric Hot Air De-Ice System, 380 VAC, 3 Phase |

| Hub Equipment Options | |
|-----------------------|----------------------------------|
| EMRGYLT-115 | Emergency Hub Light Kit, 115 VAC |
| EMRGYLT-230 | Emergency Hub Light Kit, 230 VAC |
| 721734 | Fan Vent Kit, 115 VAC |
| 578904 | Fan 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-91 | Foundation Installed Grounding Kit |
| LRK9 | Lightning Rod Kit |
| MANPL113-120 | Maintenance Platform and Ladder Kit 120° Mnt |
| MANPL113-180 | Maintenance Platform and Ladder Kit 180° Mnt |
| MANPL113-ENH | Full Maintenance Platform and Ladder Kit use with 120° or 180° Mounts |
| OBWRNLT-UNV | Obstruction Warning Light Kit |

| Other Options | |
|---------------|------------------------------------|
| 209906-91 | Lubrication and Maintenance Kit |
| 201769-91 | Handwheel Kit |
| FTST | Feed System Testing |
| TK-VEP-LG | Tool Kit, Large Motorized Antennas |
| 1011807 | TT&C Mount Alignment Kit |
| 516212 | Theodolite Alignment Kit |
| ANGVERN-91 | Manual Angle Indicator |

| Environment Systems Options | |
|-----------------------------|---|
| PDKUK-91-208 | Precipitation Deviator Ku-K, 208/230 VAC. |
| PDKUK-91-380 | Precipitation Deviator Ku-K, 380/415 VAC. |



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