ES93B-1

9.3 Meter ESA

The Andrew 9.3 M earth station antenna system incorporates features and versatility unmatched in its class. The 9.3 M is capable of operation on all major satellite systems. Operation in C-band linear and circular, cross and co-polarization are possible with the proper selection of feed and combiner systems.

As the first 9.3 M antenna ever commissioned as a “B” station, fully compliant and meeting and exceeding Intelsat® and U.S. FCC requirements, Andrew 9.3 meter antenna is a proven performer. The system’s four-port circularly polarized combining network is state of the art. The elevation-over-azimuth mount enables horizon-to-horizon coverage from any worldwide location.

A computer optimized Gregorian dual-reflector system, together with precision stretch-formed reflector panel segments using close-tolerance manufacturing techniques, results in exceptional high gain, superior efficiency, and closely controlled pattern characteristics.

Features :

- High gain. Excellent pattern characteristics
- Rugged aluminum and steel construction

- Large equipment enclosure with doors for hub mounting electronic systems.

Electrical Performance Meets or Exceeds :

- U.S. FCC Regulation 25.209 for mandatory pattern requirements for 2 degree satellite spacing.
- Russian Homologation Certificate # OC/1-AO-136
- Meets or exceeds Intelsat® requirements for standard B, F-3

Design Standards

Material/Finish Reflector: Aluminum, conversion coated, painted with highly diffusive white paint

Ground Mount: Hot-dipped galvanized steel, per ASTM-A123 for structural steel

Hardware: Sizes < 3/8 in (9.5 mm), stainless steel, passivated per MIL-F-14072-E300
Sizes > 3/8 in (9.5 mm), hot-dipped galvanized steel per ASTM-A123

Mechanical Specifications

Optics Type: Dual-reflector, Gregorian

Reflector Material: Precision formed aluminum

Reflector Segments: 20

Hub/Enclosure Dimensions: Diameter 84.00" (2.31)
Depth 46.00" (1.17)

Mount Type: Tripod mount

Antenna Pointing Range, Course/(Continuous): Elevation 0 (85)
Azimuth 180 (120)
Polarization 360 (180)

Environmental Conditions

Operating Temperature: -40° to 125°F (-40° to 50°C)

Wind Loading, Survival: Antenna, with or without motor drives will survive 125 mph (200 km/h) winds while in a stationary position

Wind Loading, Operational: Antenna with motor drives or fixed antennas can be repositioned in winds of 45 mph (72 km/h), with gusts up to 65 mph (105 km/h)

Seismic (Earthquakes): 1 G vertical and horizontal acceleration ; equivalent to a Richter magnitude 8.3 and grade 11 on the modified Mercalli scale

Rain: 4 in (102 mm) per hour

Solar Radiation: 360 BTU/hr/ft^2 (1135 W/m^2)

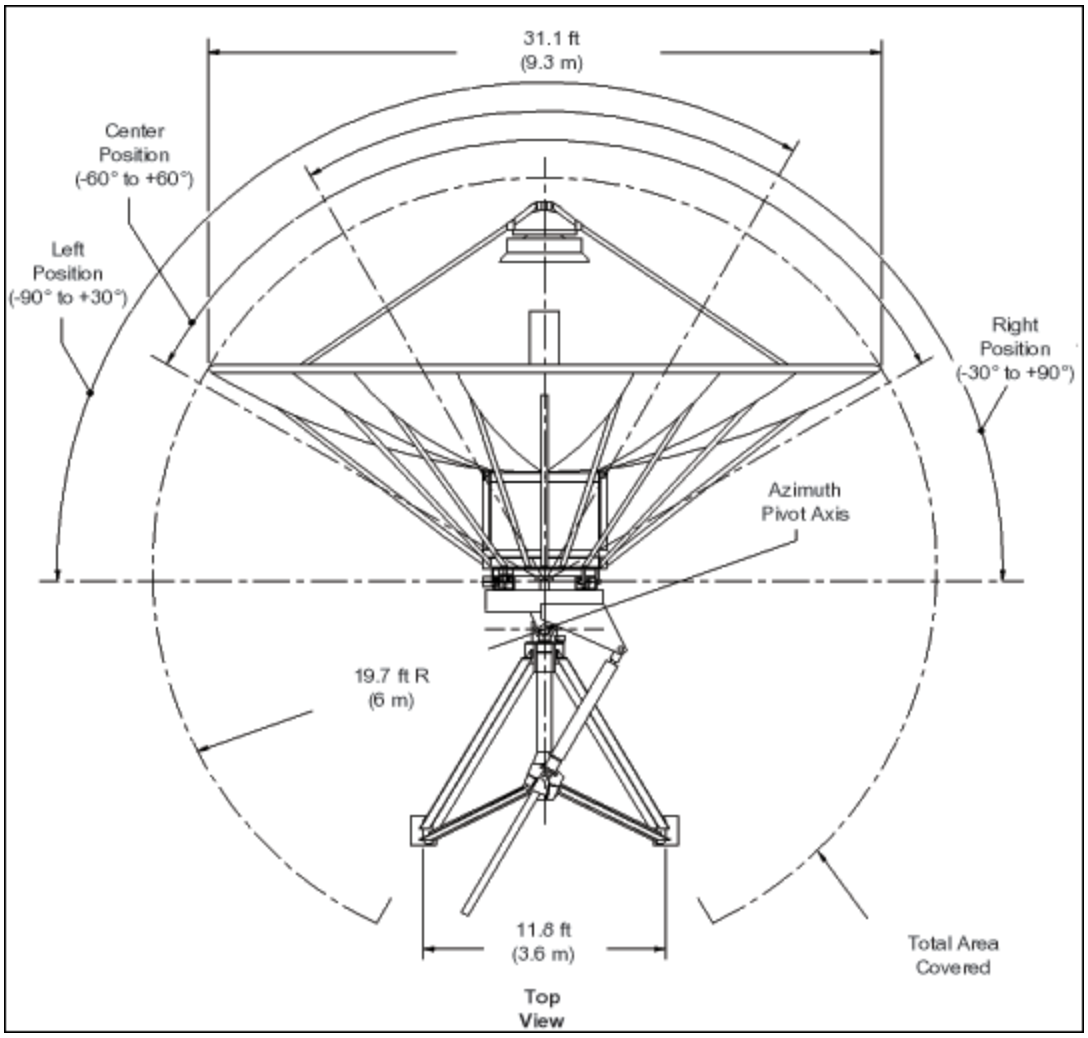
Relative Humidity: 100

Shock and Vibration: As encountered by commercial air, rail and truck shipment

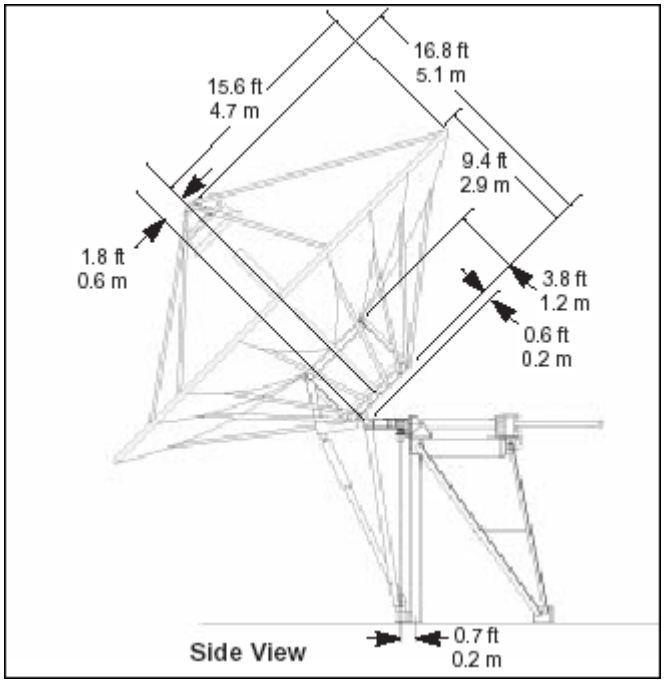
Atmospheric Conditions: As encountered in a moderately corrosive coastal and industrial area

Dimensional Drawings

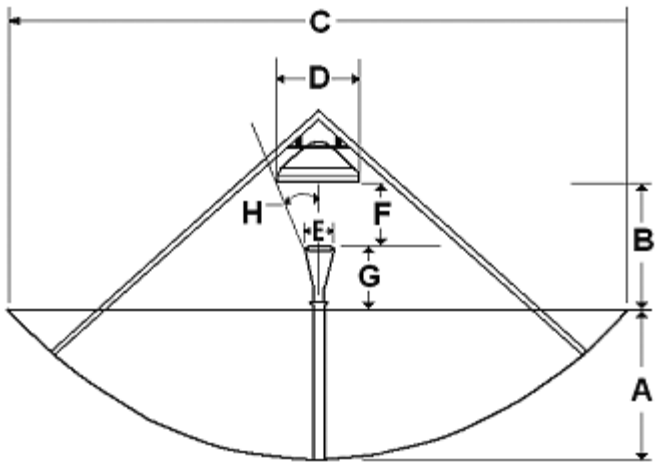
Tripod mount, Top View:



Tripod mount, Side View:



Energy Density Calculation



A:	Vertex to aperture plane of main reflector	5.14 ft (1.57 m)
B:	Aperture plane of main reflector to aperture plane of subreflector	4.79 ft (1.46 m)
C:	Diameter of main reflector	31.1 ft (9.48 m)
D:	Diameter of subreflector	4 ft (1.22 m)
E:	Diameter of feed horn	1.25 ft (0.381 m)
F:	Distance from feed aperture to aperture plane of	2.36 ft (0.72 m)

subreflector

G:	Distance from aperture plane of main reflector to feed horn aperture	2.43 ft (0.74 m)
H:	Angle from bore sight to subreflector edge	29.5°

Earth Station Antenna and Feed System Specifications

ES93B-1	9.3 M Intelsat(R_) Standard B Compliant transmit/receive Earth Station Antenna.

Nominal C Band G/T Antenna Performance

LNA/LNB Noise Temperature:	65 K	45 K	30 K
G/T @ 10 Degrees Elevation:	30 dB/K	30.9 dB/K	31.8 dB/K

Beamwidth, midband, degrees	C-Band Rx	C-Band Tx
3 dB	0.51°	0.34°

4 Port C Band Transmit / Receive Feed Systems

Feed Part Numbers	**4CPNC-9B-206**
Operation	Transmit / Receive
Polarization	Circular
Frequency, GHz	3.625-4.200 Rx 5.850-6.425 Tx
Insertion Loss dB Rx (Tx)	0.22 (0.22)
Port-to-Port Isolation, dB	
Rx to Rx	>/- 22
Tx to Rx	>/- 85
Interface Flange	
Tx Port	Plated Brass, CPR137G
Rx Port	Brass, CPR229G

Gain @ feed output flange (dBi ± 0.2 dB)

Frequency	
3.6250 GHz	50.0
4.0000 GHz	50.9
4.2000 GHz	51.3
5.8500 GHz	53.1
6.1750 GHz	53.7

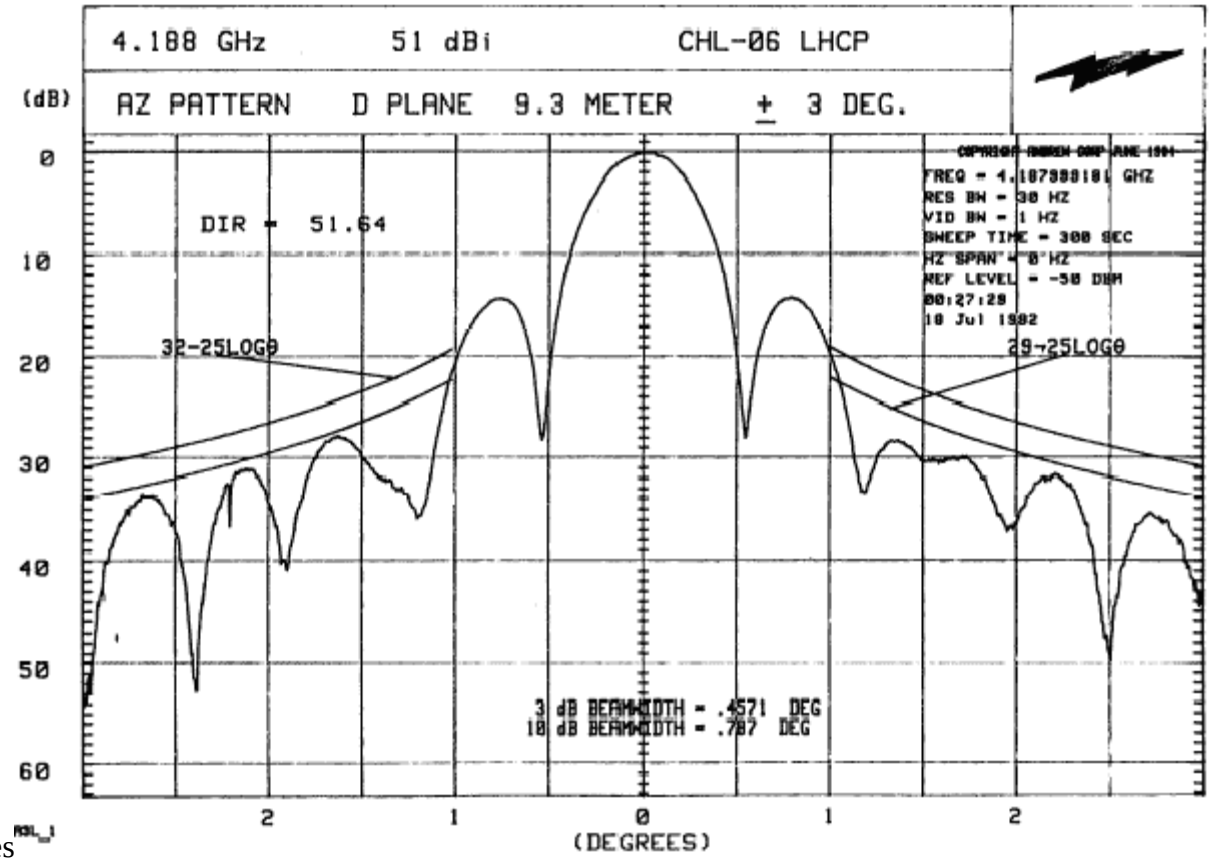
6.4250 GHz	54.1

Antenna Noise Temperature - clear sky conditions, at 68°F (20°C)

10° elevation	37
30° elevation	27
50° elevation	25
Tx Power Capacity	2500 W
Maximum Pressurization	0.50 psi

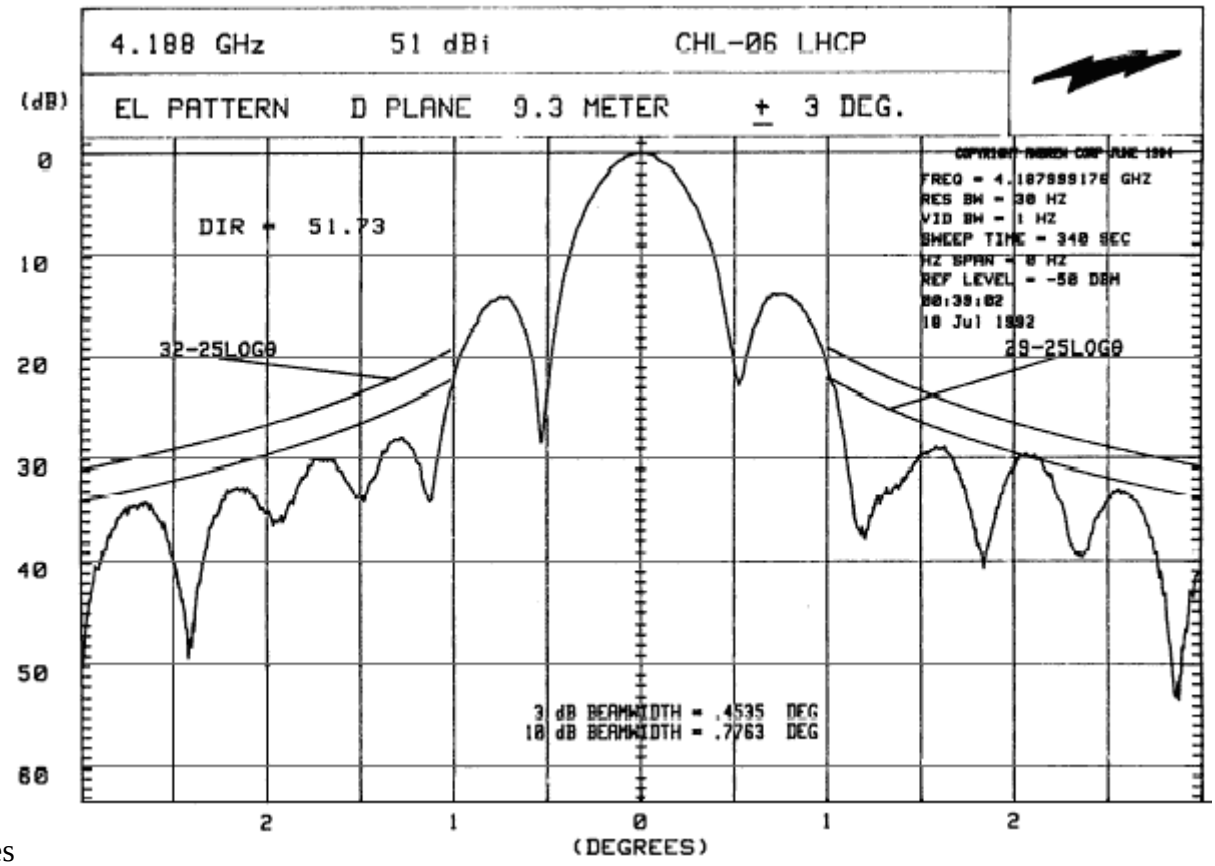
Typical Antenna Patterns - C Band

4 GHz Azimuth Rx @ 3



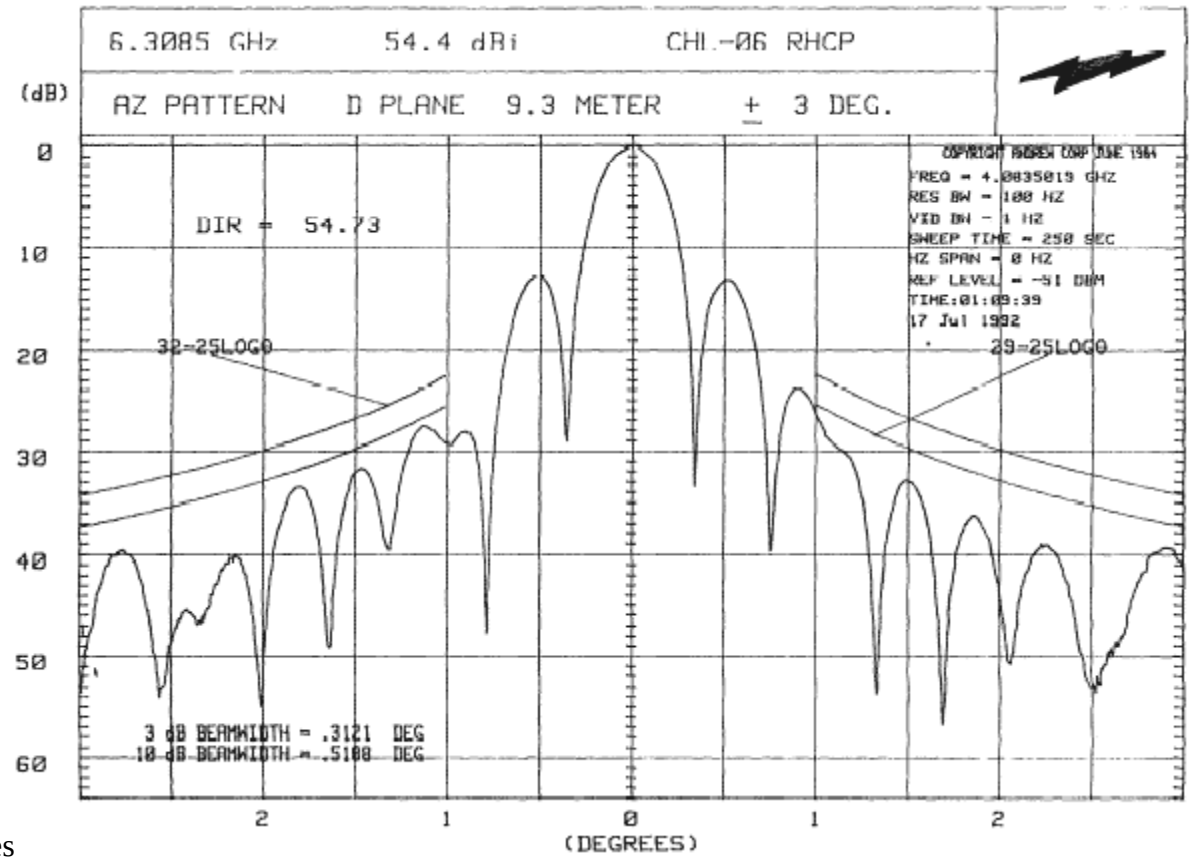
degrees

4 GHz Elevation Rx @ 3



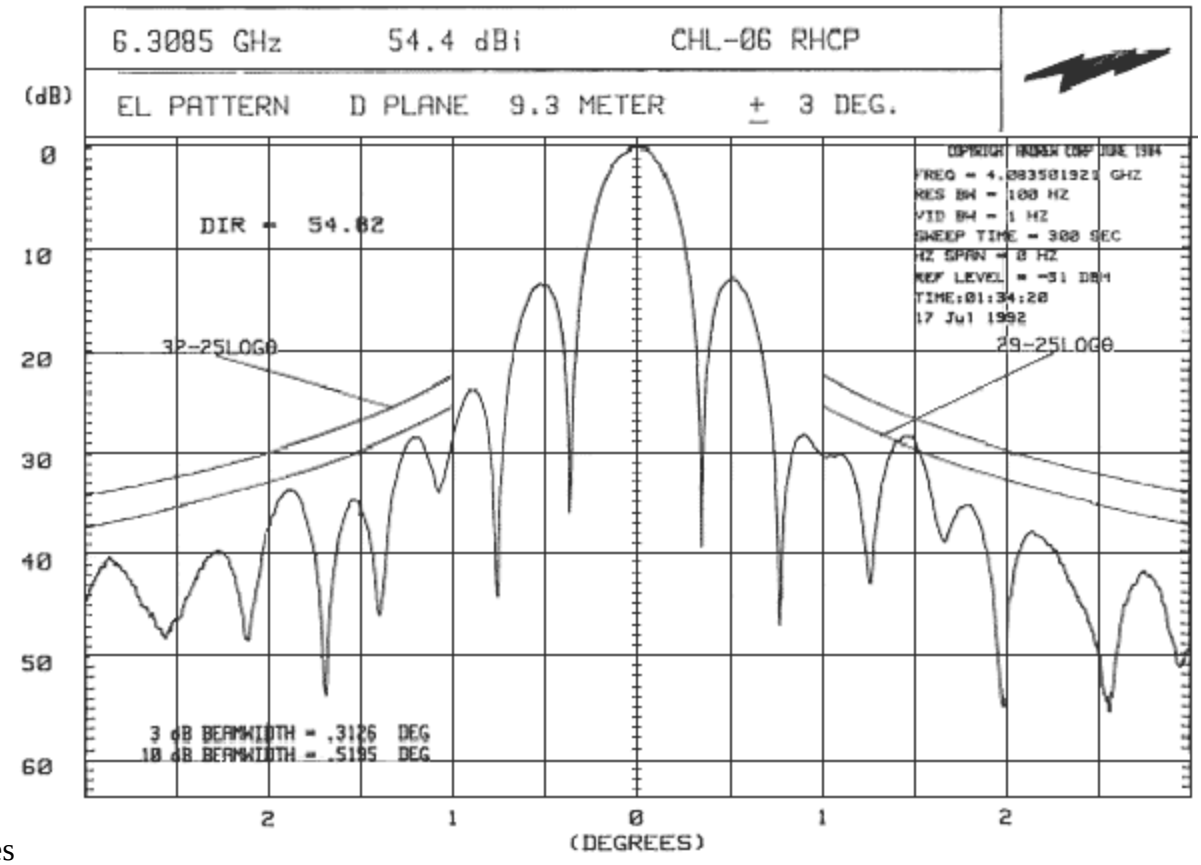
degrees

6.3 GHz Azimuth Tx @ 3



degrees

6.3 GHz Elevation Tx @ 3



degrees

Motorization and Antenna Controllers

The variable speed motor kits include 3 HP Az and El motors, line filters and mounting kits. The local motor controller provides electrical power distribution and local control of the motors at the antenna pedestal. The local motor controller is housed in an environmental protected enclosure that mounts to the side of the antenna pedestal. The hand held controller allows the operator or maintenance personnel to control the position the antenna and the feed polarization from the local motor controller.

The ACS100 automatically moves the antenna to the requested satellite position

A jog switch is provided on the front panel to allow manual movement of the antenna. 40 satellite positions can be entered and stored in the ACS100 memory

The ACS3000S-xx-93-xxx is an all-inclusive motorization and antenna controller package. Includes Outdoor Unit (ODU), Data Transmission Unit (DTU) and jack mounted gear motors. Can be run by customer-provided PC running a Web browser on a private local area network, an existing station monitor and control computer via serial interface, or the included Andrew handheld unit. Data transmission unit accepts external tracking signals supplied by either the customer or an optional tracking receiver. In addition to manual control, the ACS300S-() provides Andrew proprietary SmarTrack® and ephemeris data automated tracking with NORAD two Line or Intelsat® element sets.

Requires customer-provided PC. Beacon receiver (if required), ordered separately.

Typical weights and dimensions for ACS3000S products is: 48 in L x 43 in W x 56 in H, 275 lbs

Part Number	Description	Specifications
MK93VS-208	Variable speed motorization kit. 0.5 deg/sec fast, Az/El. 0.05 deg/sec slow, Az/El	Power: 200-230 VAC, 3 phase 50//60 Hz. 4 conductor (3 ph Delta_safety ground. or 5 conductor (3 ph WYE+safety ground.) Use with ACS100-100 controller
MK93VS-380	Variable speed motorization kit. 0.5 deg/sec fast, Az/El. 0.05 deg/sec slow, Az/El	Power: 380-460 VAC, 3 phase 50//60 Hz. 4 conductor (3 ph Delta_safety ground. or 5 conductor (3 ph WYE+safety ground.) Use with ACS100-100 controller
ACS100-100	Antenna programmable control system. Incl: positioner, local motor controller, 100 ft control cable	265 VAC 50/60 Hz, 1 Ph. Use with MK(*)VS-(*) variable speed motorization packages.
ACS100-100	Antenna programmable control system. Incl: positioner, local motor controller, 100 ft control cable	265 VAC 50/60 Hz, 1 Ph. Use with MK(*)VS-(*) variable speed motorization packages.
ACS3000S-05-93-208	Antenna control system, StepTrack. Incl: ODU,DTU, jackmount gearmotors, handheld unit. 50m cable	Run by customer-provided PC running a Web browser installed on a private LAN, an existing station M&C computer or the handheld unit. Beacon receiver ordered separately. 0.5 Fast/0.05 Slow Az/El. 200-230VAC/3Ph/50-60 Hz. 4 cond (3ph Delta+safety gnd) or 5 cond (3ph WYE+ safety gnd)
ACS3000S-05-93-380	Antenna control system, StepTrack. Incl: ODU,DTU, jackmount gearmotors, handheld unit. 50m cable	Run by customer-provided PC running Web browser installed on a private LAN, an existing station M&C computer or the handheld unit. Beacon receiver ordered separately. 0.5 Fast/0.05 Slow Az/El. 380-460 VAC/3Ph/50-60 Hz. 4 cond(3ph Delta+safety gnd) or 5 cond(3ph WYE+ safety gnd)
ACS3000S-10-93-208	Antenna control system, StepTrack. Incl: ODU,DTU, jackmount gearmotors, handheld	Run by customer-provided PC running a Web browser installed on a private LAN, an existing station M&C computer or the handheld unit. Beacon receiver ordered separately. 0.5

	unit. 100m cable	Fast/0.05 Slow Az/El. 200-230VAC/3Ph/50-60 Hz. 4 cond (3ph Delta+safety gnd) or 5 cond (3ph WYE+ safety gnd)
ACS3000S-10-93-380	Antenna control system, StepTrack. Incl: ODU,DTU, jackmount gearmotors, handheld unit. 100m cable	Run by customer-provided PC running Web browser installed on a private LAN, an existing station M&C computer or the handheld unit. Beacon receiver ordered separately. 0.5 Fast/0.05 Slow Az/El. 380-460 VAC/3Ph/50-60 Hz. 4 cond(3ph Delta+safety gnd) or 5 cond(3ph WYE+ safety gnd)
ACS3000S-F2-93-208	Antenna control system, StepTrack. Incl: ODU,DTU, jackmount gearmotors, handheld unit. 200m fiber	Run by customer-provided PC running a Web browser installed on a private LAN, an existing station M&C computer or the handheld unit. Beacon receiver ordered separately. 0.5 Fast/0.05 Slow Az/El. 200-230VAC/3Ph/50-60 Hz. 4 cond (3ph Delta+safety gnd) or 5 cond (3ph WYE+ safety gnd)
ACS3000S-F2-93-380	Antenna control system, StepTrack. Incl: ODU,DTU, jackmount gearmotors, handheld unit. 200m fiber	Run by customer-provided PC running Web browser installed on a private LAN, an existing station M&C computer or the handheld unit. Beacon receiver ordered separately. 0.5 Fast/0.05 Slow Az/El. 380-460 VAC/3Ph/50-60 Hz. 4 cond(3ph Delta+safety gnd) or 5 cond(3ph WYE+ safety gnd)

Cross and Polarization Axis Waveguide Kits

2XAC-9	4-Port C-band polarization axis w/g kit. Enclosure to mount, Tx, 2 runs. 0.34 dB total insertion l
2XPC-9B	4-Port C-band polarization axis w/g kit. Feed to enclosure, Tx. 2 runs. 0.42 dB total insertion los

Heating Options

Antenna De-Icing is forced heated air. A sensor and controller unit automatically senses moisture and activates the system whenever the need for heating is determined.

Feed heating is available.

Full reflector electric de-icing. Incl remote panel, controller and 100 ft cabling	**WEC93R-208-100**
Full reflector and feed electric de-Icing. Incl remote panel, controller and 100 ft cabling	**WEC93RF-208-100**
Full reflector electric de-icing. Incl remote panel, controller and 100 ft cabling	**WEC93R-380-100**
Full reflector and feed electric de-Icing. Incl remote panel, controller and 100 ft cabling	**WEC93RF-380-100**

Feed heater kit, C-band	**FH9A**

Options

Contact Sales for part number and pricing for your specific requirement.

Lubrication and Maintenance Kit	209906-2
Hub Heater Kit	HUBHTR-230 Antenna Hub Heater Provides Approx 3000 W/Heat C
Emergency Hub Light Kit	EMRGYLT-115 Emergency lighting, hub mounted
Emergency Hub Light Kit	EMRGYLT-230 Emergency lighting, hub mounted
Hub Light Kit	HUBLT-115
Foundation Grounding Kit	ANTGND-9 Antenna foundation grounding kit.t.
Hub Light Kit	HUBLT-230 Hub Light Kit, 230 VAC. Supplied w/ 100 W bulb.
Lightning Rod Kit	LRK9 Lightning rod kit
Obstacle Warning Light Kit	OBWRNLT-115 Operates at 108-132V, 1 Phase, 50-60 Hz
Obstacle Warning Light Kit	OBWRNLT-230 Obstruction Warning Light Kit. Operates at 216-26
Miscellaneous	TK-MAN-LG Tool Kit, Manual Antennas. Hand tools with tool b
Miscellaneous	TK-MOT-LG Tool Kit, Motorized Antenna. Hand tools with tool
Miscellaneous	223711 Theodolite alignment kit. Does not include theodo
Maintenance Ladder and Platform Kit	MANPL9

Typical Slab and Pier Foundation Specifications

Soil Bearing Capacity	2000 lb/ft² (9764 kg/m²)
Reinforcing Steel	2940 lb (1339 kg)
Concrete Compressive Strength	3000 lb/in² (211 kg/cm²)
Foundation Length	19.5 ft (5.94 m)
Foundation Width	19.5 ft (5.94 m)
Foundation Depth	2.5 ft (0.76 m)
Foundation Concrete Volume	35.2 yd³ (27 m³)
Foundation Specification Drawing	37737
Typical Pier Foundation Drawing	240000
Typical Slab Foundation Drawing	240007

Note: Foundation specifications provided are for a typical design only. Certification of suitability for a particular installation by a professional engineer is required prior to it's

use for actual fabrication.

Shipping Information

Typical Net Weight	8000 lb (3629 kg)
Typical Shipping Weight	11154 lb (5059 kg)
Typical Shipping Volume	1280 ft^3 (36.3 m^3)
Shipping Container	Qty 1 per standard 40 ft land/sea container.

Note: Weights and dimensions may vary based upon actual equipment ordered and consolidation of parts. This information should be considered typical for antenna only.

Part numbers, designs and specifications provided are subject to change without notice.
