

INSTALLATION INSTRUCTIONS

HELIAX[®] Coaxial Cables ANDREW

3, 4 and 5-Inch

Air dielectric cable is supplied pressurized in bulk quantities and when furnished with factory attached connectors. An air inlet valve is included with each pressurized length. Inner connectors, gaskets, silicone grease, connecting hardware and assembly instructions are packed with unattached connectors.

NOMINAL DIAMETER IN INCHES	MAJOR DIAMETER OVER JACKET IN INCHES (MM)		CABLE WEIGHT		RADIUS OF MINIMUM BEND IN INCHES (MILLIMETERS)		INTERNAL VOLUME	
			LB/FT	KG/M			FT ³ 1000 FT	(LITRES) 1000 M
3	3.02	(76.6)	1.78	(2.6)	30	(762)	36.7	(3410)
4	4.00	(102)	2.50	(3.7)	40	(1016)	69.9	(6494)
5	5.20	(133)	3.3	(4.9)	50	(1270)	117	(10870)

READ INSTRUCTIONS THOROUGHLY BEFORE ASSEMBLY

1. PREPARATION AND INSPECTION

Inspect cable for possible shipping damage and pressure loss. Cable and connector assemblies have been pressure tested at factory before shipping. Maximum allowable pressure drop for assembly over 25 ft (7.6 m) is 1 lb/in² (7 kPa) in 24 hours from initial pressure of 20 lb/in² (140 kPa). For shorter assembly, allowable pressure drop is 1 lb/in² in 24 hours from an initial pressure of 12 lb/in² (83 kPa). Each assembly is pressurized with dry air to 10 lb/in² (70 kPa) prior to shipping and result of factory pressure test is recorded on inspection tag tied to assembly. Tire gauge can be used to check pressure. If cable has pressure loss, check all joints for possible leaks especially at pipe threads. Refer to

Section 6 for pressure information. Notify Andrew Service Department if leaky condition cannot be corrected. Do not install cable if pressure loss is in excess of standard rates stated.

Factory attached connectors are shipped with metal caps attached to maintain pressure during shipment. Do not remove metal cap until after cable is installed. When bulk cable is used, field attachment of connector at antenna end must be completed before hoisting. Attach connector to end of cable in accordance with connector instructions received. Pressure test assembly prior to hoisting.

2. HOISTING

Obtain suitable hoist line to support weight of cable. Refer to table for weights per 1-foot lengths. Winch is essential for hoisting large diameter cable. Provide pulley high enough on tower to allow cable to be raised sufficiently to make antenna connection. Make certain winch and pulley can handle weight. Support reel on axle to permit free rotation as cable

is hoisted. Method illustrated (cable pays off top) is safest for heavily loaded reels. For lighter loads, less than 1000 lbs (450 kg) gross weight, which can be braked by hand, reel can be positioned 180 degrees opposite so cable pays off from bottom of reel. Uncoil short lengths not on reels along ground and away from tower.

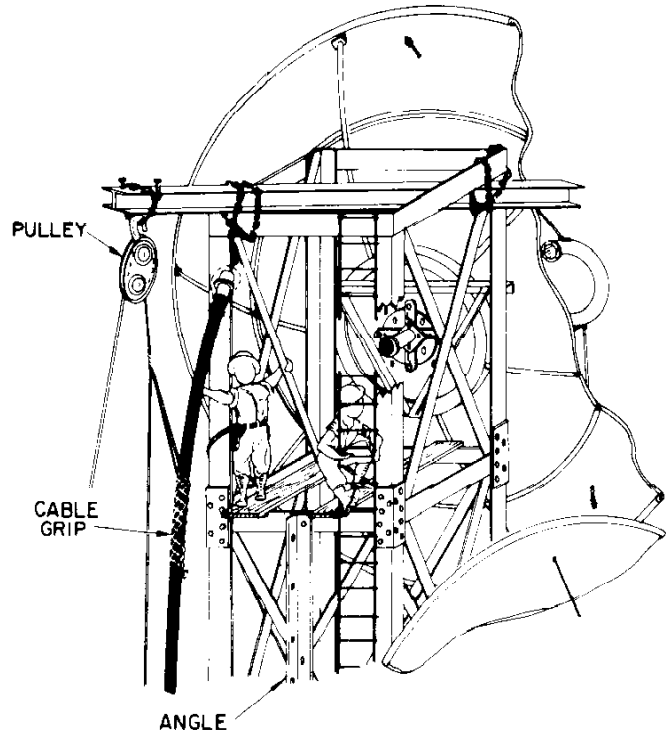
NOTICE

The installation, maintenance or removal of antenna systems requires qualified, experienced personnel. Andrew installation instructions have been written for such installation personnel. Antenna systems should be inspected once a year by qualified personnel to verify proper installation, maintenance and condition of equipment.

Andrew disclaims any liability or responsibility for the results of improper or unsafe installation practices.

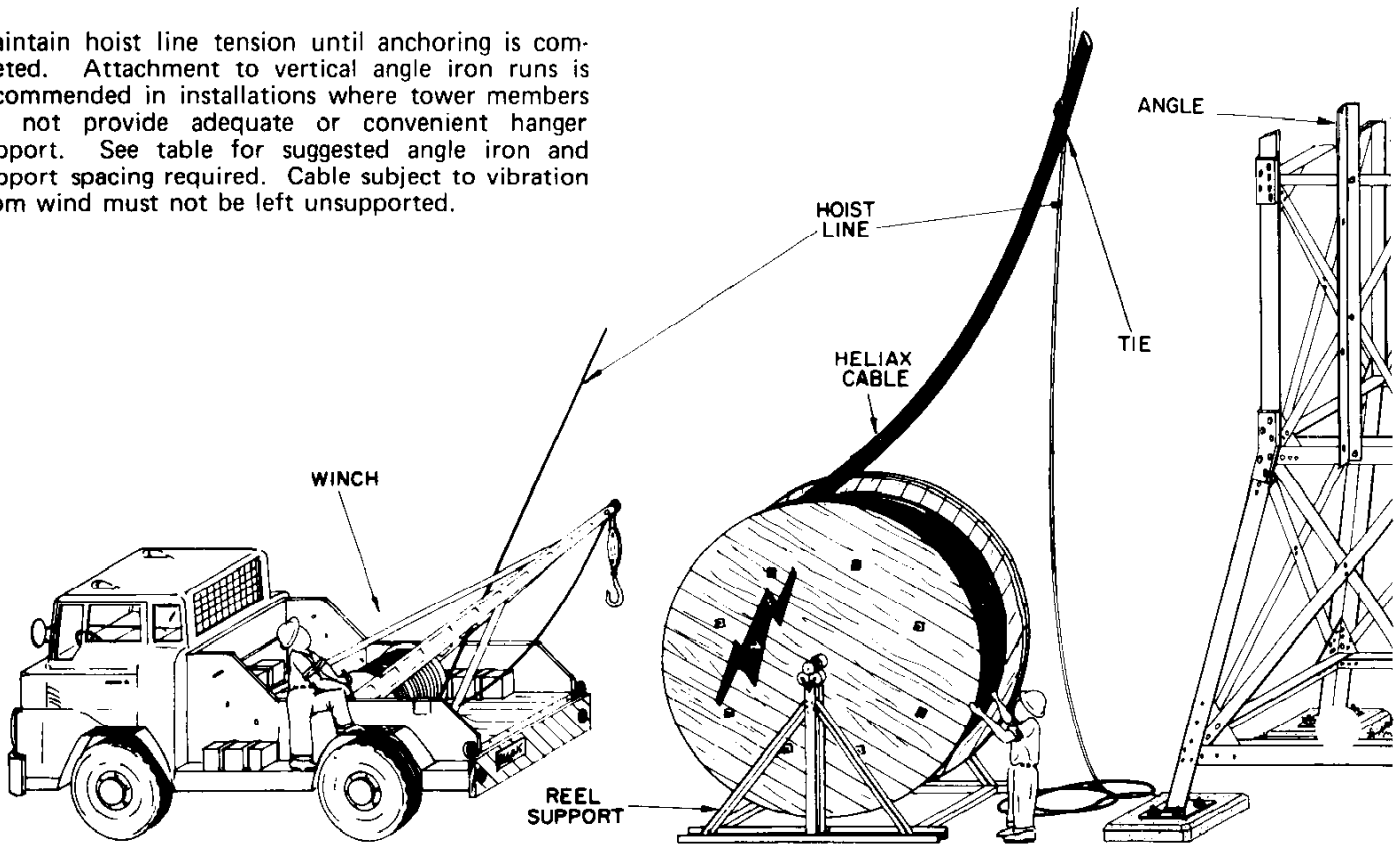
Place protective covering over connector to prevent damage during hoisting. Attach rope sling or cable grip near end of cable allowing sufficient length to reach antenna input from hoisted cable position. Tie end of cable to hoist line to keep from dangling. Rope sling may be used in lieu of cable grip for very short lengths. Use cable grips in accordance with instructions received. When installing lengths more than 200-ft (61 m), additional cable grips at 150 to 200-ft (46 to 61 m) intervals are required. Additional tying is done above and below cable grips to keep weight on hoist line and not on cable. Make certain to allow slack in cable when tying and that slack is maintained during hoisting. Tying is accomplished with strong fiber-reinforced tape or similar material applied generously at 50-ft (15.2 m) intervals as cable is raised.

Hoist cable slowly. To prevent kinking, rotation of reel must be retarded to control payout of cable. Avoid snags when hoisting or routing cable through and around tower members. Careless handling can cause kinks, dents, and scrapes. Do not make bends shorter than minimum bending radius shown in table. Care must be taken to apply an even pressure when forming cable. When routing is confined and shorter bends are required, an elbow or flex section should be used.



3. ANCHORING

Maintain hoist line tension until anchoring is completed. Attachment to vertical angle iron runs is recommended in installations where tower members do not provide adequate or convenient hanger support. See table for suggested angle iron and support spacing required. Cable subject to vibration from wind must not be left unsupported.



CABLE DIAMETER	ANGLE IRON IN (MM)	SUPPORT SPACING FT (M)	BOLT SIZE
3"	2 x 2 x 3/16 (51 x 51 x 5)	8 (2.4)	1/2"
4"	3 x 3 x 1/4 (76 x 76 x 6)	12 (3.7)	1/2"
5"	3 1/2 x 3 1/2 x 1/4 (89 x 89 x 6)	15 (4.6)	1/2"

Space hangers approximately 2-ft (0.6 m) apart for first three at top of vertical run and 5-ft (1.5 m) apart thereafter. If distance from feed termination to first hanger is more than 5-ft, cable must be supported. Position hangers to hold cable away from tower members. Rubbing against edges can cause damage. Do not tighten hangers excessively as dents or deformations can cause degradation in electrical performance. Follow hanger instructions included with hangers. If jacket has been cut, apply vinyl tape to damaged area.

Top and bottom of cable should be grounded to tower by low impedance conductors or to a suitable "down" conductor physically separated from cable if tower is non-metallic. Antenna input connection cannot serve as top ground. Cable itself must be grounded close to antenna. Cable should be grounded at point where it enters equipment building especially for long horizontal run. Some installers ground cable every 50-ft (15.2 m) along entire run. Local building codes should be followed. Grounds planned for 50 foot intervals can be prepared during hoisting operation.

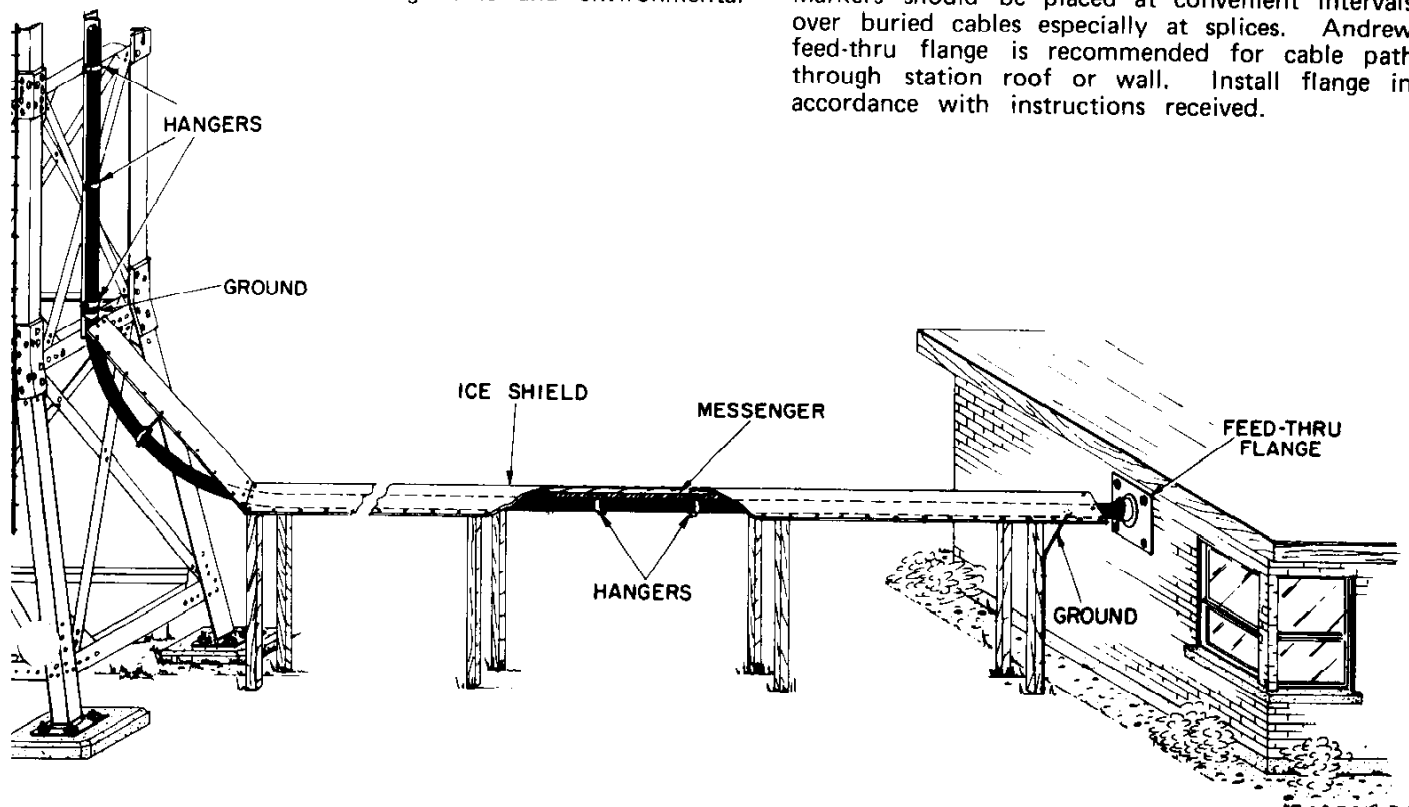
4. HORIZONTAL RUNS

Route cable from base of tower to station. It can be buried or supported above ground. Attach above-ground cable to horizontal support member using same type hangers and 5-ft intervals as in vertical run. Exposed horizontal runs must be protected from weight of accumulated ice and damage from falling ice or other objects.

corrosive action. Buried cable should be below area frost line and at least 3-ft (0.9 m) deep for protection against damage from heavy vehicles. A 4 in (102 mm) layer of sand under and over buried cable is adequate to protect jacket from stones or other sharp objects.

HELIX jacketed cables can be used in any environment such as salt air, direct burial or underwater. Jacket eliminates effects of galvanic and environmental

Splices on buried jacketed cables must be thoroughly covered with plastic cement and tape. Refer to instructions contained in Andrew splice wrap kit. Markers should be placed at convenient intervals over buried cables especially at splices. Andrew feed-thru flange is recommended for cable path through station roof or wall. Install flange in accordance with instructions received.



5. CABLE CONNECTIONS

Remove protective covering from ends of cable. If there are flange terminations, remove metal caps attached for shipment. Before cable connections are begun, continuity check should be made. Make short circuit across inner and outer conductors at one end of cable. An ohmmeter across conductors at opposite end should read at least 1000 megohms when short circuit is removed.

Attach cable connector directly to antenna input or to elbow or flex section if required, to make necessary alignment with mating flange. To make flange connection at antenna end of cable, start by seating an "O" ring into groove of cable connector. "O" ring and mating surfaces of flanges must be perfectly clean to insure pressure-tight connection. Use comothene, vythene, or other non-flammable fluid on clean cloth. Thin coating of silicone grease on the "O" ring and in grooves will aid in keeping ring in place. Push cable into position so end of inner connector, extending from cable connector, engages with inner conductor of antenna input. Be sure "O" ring remains in place and inner connector insulator seats properly in flanges. Rotate swivel flange on cable connector so alignment pins are opposite alignment holes, then join flanges. Add connecting hardware and bolt

flanges together, tightening evenly.

If cable has solid dielectric type cable connector (Type N, UHF, LC, etc.), remove dust cap and make connection to antenna. In low frequency applications (below 200 MHz) where slight increase in VSWR is not critical, use silicone grease inside connector to fill voids so moisture cannot form. Hand tighten connection. Weatherproof connection further by applying several layers of good weatherproofing tape.

Repeat procedure for connecting transmitter end of cable to output connection at equipment rack, making connection, where possible, directly to transmitter without any short interconnections. Generally, pressure barrier is required between transmitter and cable. If cable length must be changed, cut cable to appropriate length and reassemble connector in accordance with proper connector assembly instructions. Be especially careful not to damage "O" ring or insulator inside connector. When bulk cable is being installed, attach connector after required cable length has been determined. Follow connector assembly instructions. Replace pressurizing cap and repressurize remaining bulk cable.

6. PRESSURIZATION

After all connections have been completed, pressurize air dielectric cable. Changes in temperature can cause moisture from outside air that enters cable to condense and seriously impair efficiency, so cable must be under pressure at all times. If moist air has entered, it must be purged. Remove gas port plug located on connector at antenna end of cable, and purge cable continuously until it is dry. (In dual polarized system using Andrew antennas, purging can be performed from two cable connectors at transmitter end since there is gas path through feed from one input to other.) An alternative method is to pressurize to 8 lb/in² (55 kPa) and let air escape at transmitter end of cable after one hour. Repeat procedure several times allowing an hour each time for air to mix. After purging, replace gas port plug and pressurize cable.

Pressurization can be accomplished by manual or automatic means depending upon amount of cable in use at station and whether or not site is attended. Dry air hand pump is satisfactory for attended sites using relatively small amount of cable. Automatic electric dehydrators are recommended for unattended sites or those where large amounts of cable are employed. A cylinder of compressed air can also be used.

Guage pressure of 8 lb/in² is adequate for most

installations. Excessive pressure, exceeding 10 lb/in² (70 kPa), is unnecessary and not recommended as it may damage feed window. Some feed windows have lower pressure ratings than 8 lb/in², and care must be taken to insure that maximum pressure is not exceeded. Regulating tank in pressurization system can be employed to provide low pressure outputs. NOTE: HELIAX cable assemblies are not hermetically sealed and may exhibit low leakage rate; consequently, cable installations not having automatic air supply must be inspected periodically.

Dry air is normally used for pressurizing. Dry nitrogen may also be used. When pressurizing equipment is connected to gas port on cable connector, or whenever pipe fittings are reassembled, threads must be covered with Teflon tape to insure leak-proof connection.

Manifold assembly is used to provide number of pressure outlets from one pressure source. Each outlet has valve and gauge to provide individual pressure readings.

After installation, check cable connections for leaks. Use commercial leak detector or liquid detergent over joints and check for bubbles. Unbroken soap film over entire joint for several minutes will indicate very small leaks.

Andrew Corporation
Orland Park, IL U.S.A. 60462
Andrew Antennas
Weybridge, Surrey, England
Andrew Canada Inc.
Whitby, Ontario Canada

Andrew Antennas
Campbellfield, Victoria, Australia
Andrew AG
Zurich, Switzerland

Antenas de Transmision S.A. de C. V
Mexico, D.F. Mexico
Antennes Andrew S.A.R.L.
Buc, France

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Andrew S.R.L.
Milan, Italy
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