

MODEL QK-710

"QUAD-BAND KIT" FOR THE EXPLORER 14

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CHAPTER 1

General Description

The Hy-Gain QK-710 will allow the conversion of the Explorer 14 antenna to cover either the 30, 20, 15 and 10 meter bands or the 40, 20, 15, and 10 meter bands. This kit will allow the driven element of this beam to resonate on either 30 or 40 meters with VSWR less than 1.6:1 at resonance. The 2:1 VSWR bandwidth is typically 100 kHz on 30 meters and 175 kHz on 40 meters.

Stainless steel hardware and clamps are supplied for all electrical and most mechanical connections. A driven element support rope is supplied to help support the additional weight of the driven element with either 30 meters or 40 meters added. The Ham IV or T²X Rotators are recommended to be used with the modified Explorer 14 antenna.

NOTE: Throughout this manual references will be made to refer to your Explorer 14 manual. Have your Explorer 14 manual handy during the entire installation.

Specifications

Electrical

Frequencies of Operation:	<u>40 Meters</u>	<u>30 Meters</u>
2:1 VSWR Bandwidth (at 45')	210 kHz	110 kHz
(at 60')	175 kHz	110 kHz
(at 80')	125 kHz	100 kHz
Minimum VSWR (at 45')	1.10	1.45
(at 60')	1.30	1.35
(at 80')	1.60	1.55
Maximum Power	—— Maximum Legal ——	

Mechanical

	<u>40 Meters</u>	<u>30 Meters</u>
Driven Element Length (max.)	42' 4 3/4" (12.92 m)	30' 11 3/4" (9.44 m)
Turning Radius (max.)	21' 2 3/8" (6.46 m)	17' 3" (5.26 m)
Net Weight (entire antenna)	51 lbs. (23.1 kg)	48.5 lbs. (22 kg)
(quad kit)	6 lbs. (2.72 kg)	3.5 lbs. (1.59 kg)
Maximum Wind Survival	80 mph (129 kmph)	80 mph (129 kmph)
Wind Surface Area (entire antenna)	8.2 sq. f (.762 sq. m)	8.0 sq. ft. (.743 sq. m)
Wind Load at 80 mph	210 lbs. (95.3 kg)	205 lbs. (93 kg)
Hardware	Stainless Steel	Stainless Steel
Suitable Rotators for EX-14 plus the QK-710	Ham IV or T ² X	Ham IV or T ² X

CHAPTER 4

Preparation for Assembly

Choose a large clear area to work on your Explorer 14 antenna. The area must be at least 14' x 31' (4.27 m x 9.45 m) for the 30 meter modification or 14' x 43' (4.27 m x 13.11 m) for the 40 meter modification. You may wish to drive a 5 foot (1.53 m) length of mast material into the ground to attach the antenna to while working on it.

Tools - The following tools are required for modification of the EX-14:

Type Tool	Qty
Tape Measure, 12 foot.....	1
Nut Driver, 7/16".....	1
Nut Driver, 3/8".....	1
Nut Driver, 5/16".....	1

Check all parts against the Parts List to make sure no parts are missing.

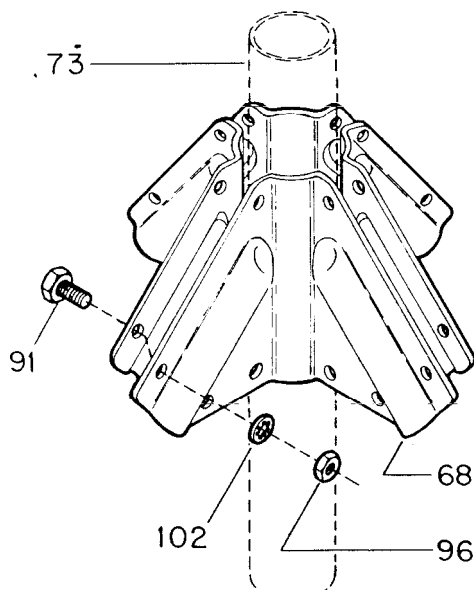
All tubing supplied with the QK-710 telescopes together. Make all measurements to the given dimensions, plus or minus, no more than 1/8 inch! Double and Triple check ALL dimensions after assembly.

Assembly of the QK-710 for 7 MHz

Operation

Select the capacity-hat clamps (Item 68) and loosely assemble a set of four (4) clamps onto each of the 1" x 6" tubes as shown in Figure 1. Center these clamps on the tubes, before tightening.

Install a #10 tubing clamp at each end of the 1" x 6" tube and insert the 7/16" x 15" tubes into the capacity-hat clamps. At this time tighten all bolts used on the capacity-hat clamp. Place 7/16" endcaps on the ends of the 15" tubes.



Item No.	Description
68	Capacity-Hat Clamp
73	Tube, aluminum, 1" x 6"
91	Bolt, #10-24 x 5/8", hex head
96	Nut, #10-24, hex
102	Lockwasher, #10, internal

Figure 1 Capacity-Hat Clamp

Remove the DE-3 (7/16" x 37") and the 1/2" compression clamps (older system) or the #6 tubing clamp (new system) from the Explorer 14 driven element. Adjust the DE-2 to 37 1/2" and slide the 15 meter trap all the way into the DE-2. Retighten these two clamps securely on both sides of the antenna. Loosen the sleeve-spacer insulators and the sleeve boom-to-element brackets and adjust the spacing of the sleeves to 7 inches.

In addition to the capacity-hat assemblies, select the following parts:

Description	Qty
DE-5, tube, 7/16" x 62".....	2
DE-4, swaged tube, 7/8" x 18"	2
DE-3A, tube, 1" x 18"	2
20-Meter Trap	2
Tubing Clamp#10.....	4
Compression Clamp Assembly (from EX-14), 1/2" or #6 tubing clamp.....	2
Endcap, 7/16"	2
Extension Strap, aluminum, 1 1/2"	4
Bolt, #10-24 x 1", hex, stainless steel	4
Nut, #10-24, hex, stainless steel.....	4

Assemble these parts as shown in Figure 2.

Determine Dimensions "A" from Figure

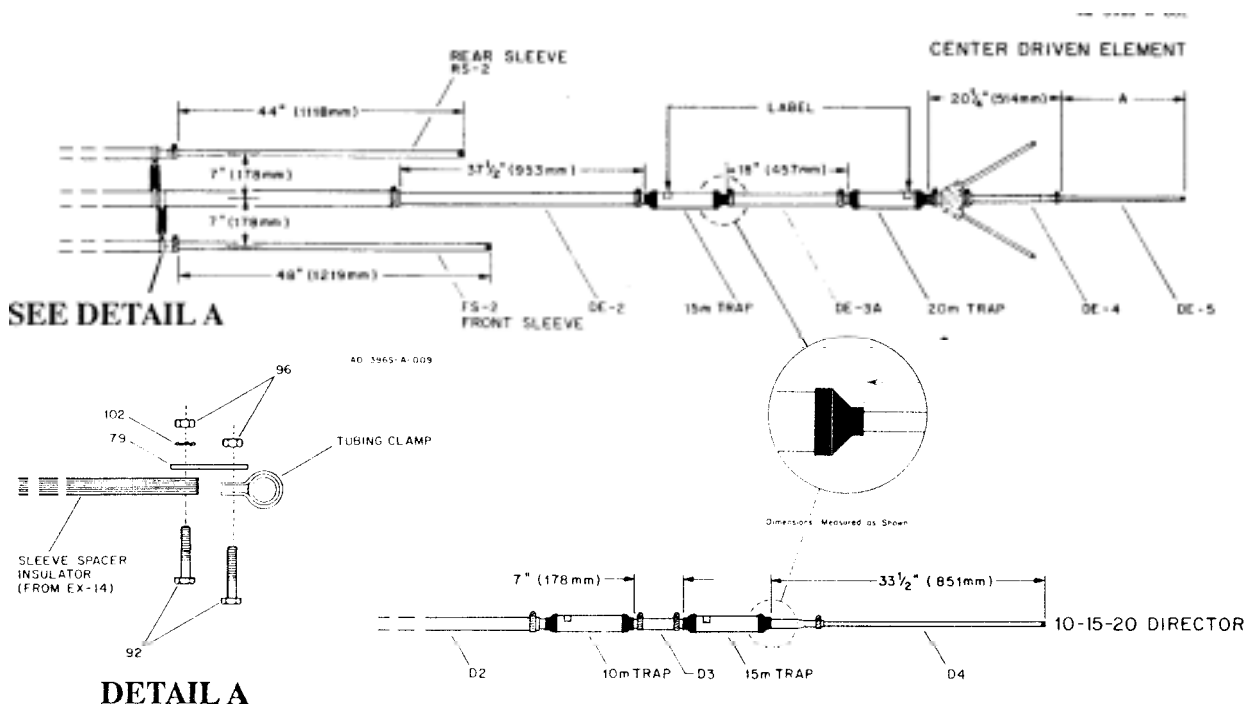
Use the 1 1/2" aluminum extension straps, #1024 x 1" bolts and #10-24 hex nuts to extend the sleeve spacer insulators to 7 inches.

Assemble the element with the drain holes of the 20 meter trap facing toward the ground.

Also, adjust sections D-3 and D-4 to the dimensions shown in Figure 2.

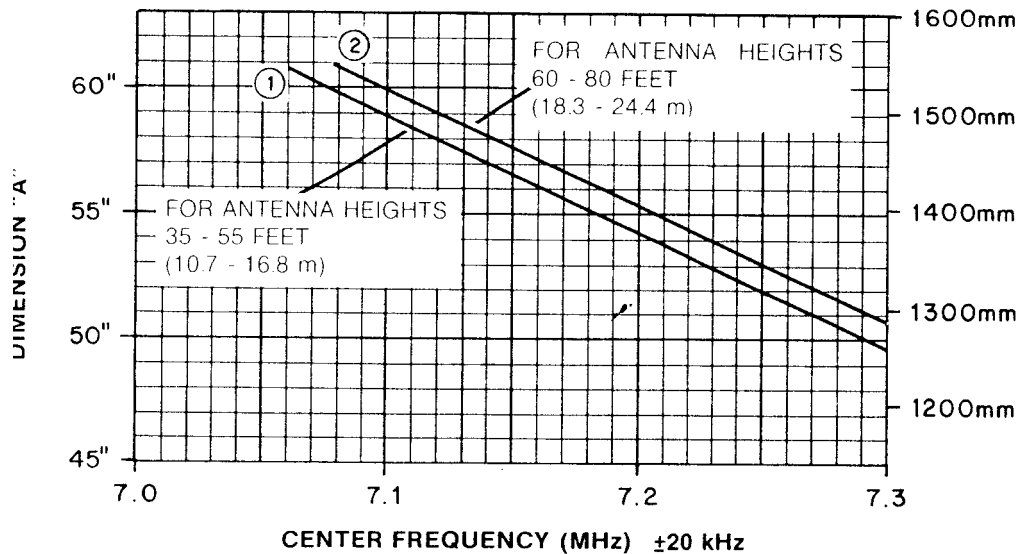
The beta match will not be used in this configuration, so the beta match assembly from the Explorer 14 may be completely removed. This includes Items 21 and 37 (two), beta shorting clamp assembly, beta support clamp, and insulator assembly and all other hardware used to connect these assemblies together. See Figure 8, of the Explorer 14 manual.

Tighten all clamps and brackets that were previously loosened.



Item No.	Description
79	Extension strap
92	Bolt, #10-24 x 1", hex head
96	Nut, #10-24, hex
102	Lockwasher, #10, internal

Figure 2 Antenna Dimensions for Operation of the Explorer 14 at 7 MHz



If the antenna is to be mounted between 35 and 55 feet above ground, use Line 1. Typical 2:1 VSWR bandwidth at these heights is 200 kHz. with a minimum VSWR less than 1.2.

If the antenna is to be mounted between 60 and 80 feet above ground, use Line 2. Typical 2:1 VSWR bandwidth at these heights is 150 kHz with a minimum VSWR less than 1.6.

For antenna heights above 80 feet, use Line 2. Antenna heights less than 35 feet are not recommended.

• Figure 3

Assembly of the QK-710 for 10 MHz Operation

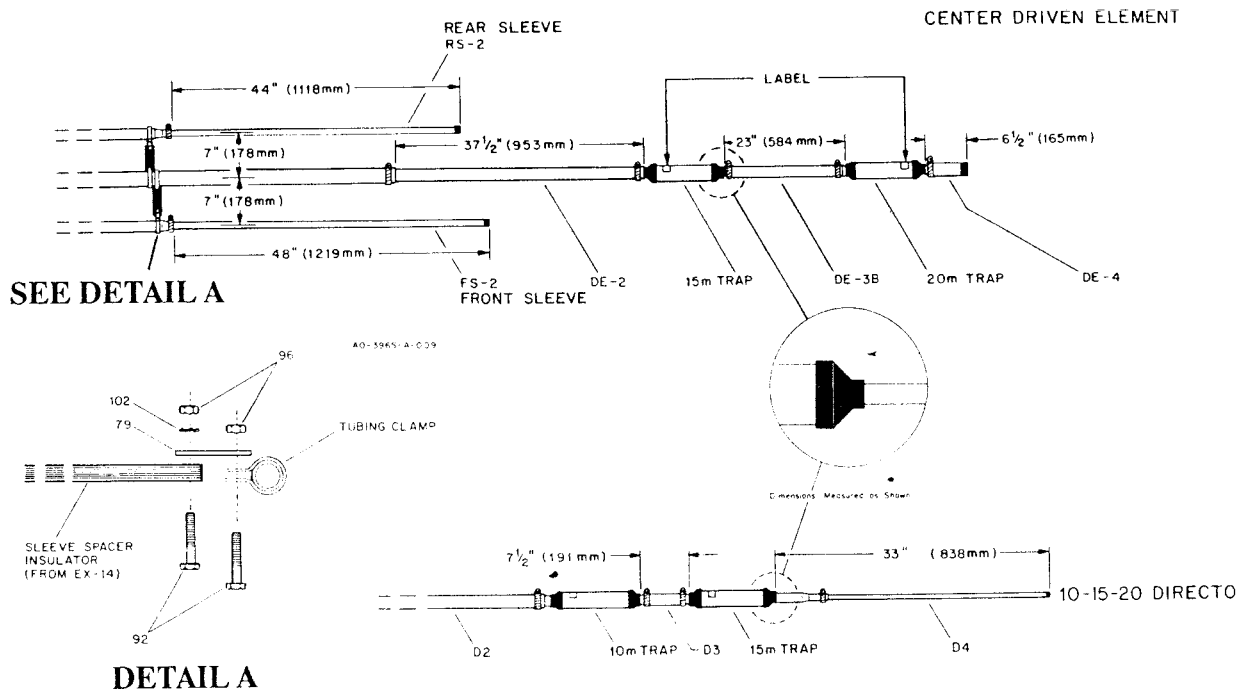
Remove the DE-3 (7/16" x 37") and the 1/2" compression clamps (older system) or the #6 tubing clamp (new system) from the Explorer 14 driven element. Adjust the DE-2 to 37 1/2" and slide the 15 meter trap all the way into the DE-2.

Retighten these two clamps securely on both sides of the antenna. Loosen the sleeve-spacer insulators and the sleeve boom-to-element brackets and adjust the spacing of the sleeves to 7 inches.

Select the following

Description	Qty
DE-4, tube, 1" x 6"	2
DE-3B, tube, 1" x 2 3"	2
20-Meter Trap.....	2
Tubing Clamp #10.....	6
Compression Clamp Assembly (from EX-14), 1/2" or #6 tubing clamp	2
End Cap, 1".....	2
Extension Strap, aluminum, 1 1/2".....	4
Bolt, #10-24 x 1", hex.....	4
Nut, #10-24, hex.....	4

Assemble these parts as shown in Figure 4. Use the 1 1/2" aluminum extension straps, #10-24 x 1" bolts and # 10-24 hex nuts to extend the sleeve spacer insulators to 7 inches.







Description
 Extension strap
 Bolt, #10-24 x 1", hex head
 Nut, #10-24, hex
 Lockwasher, #10, interna

Figure 4 Antenna Dimensions for Operation of the Explorer 14 at 10.1 MHz

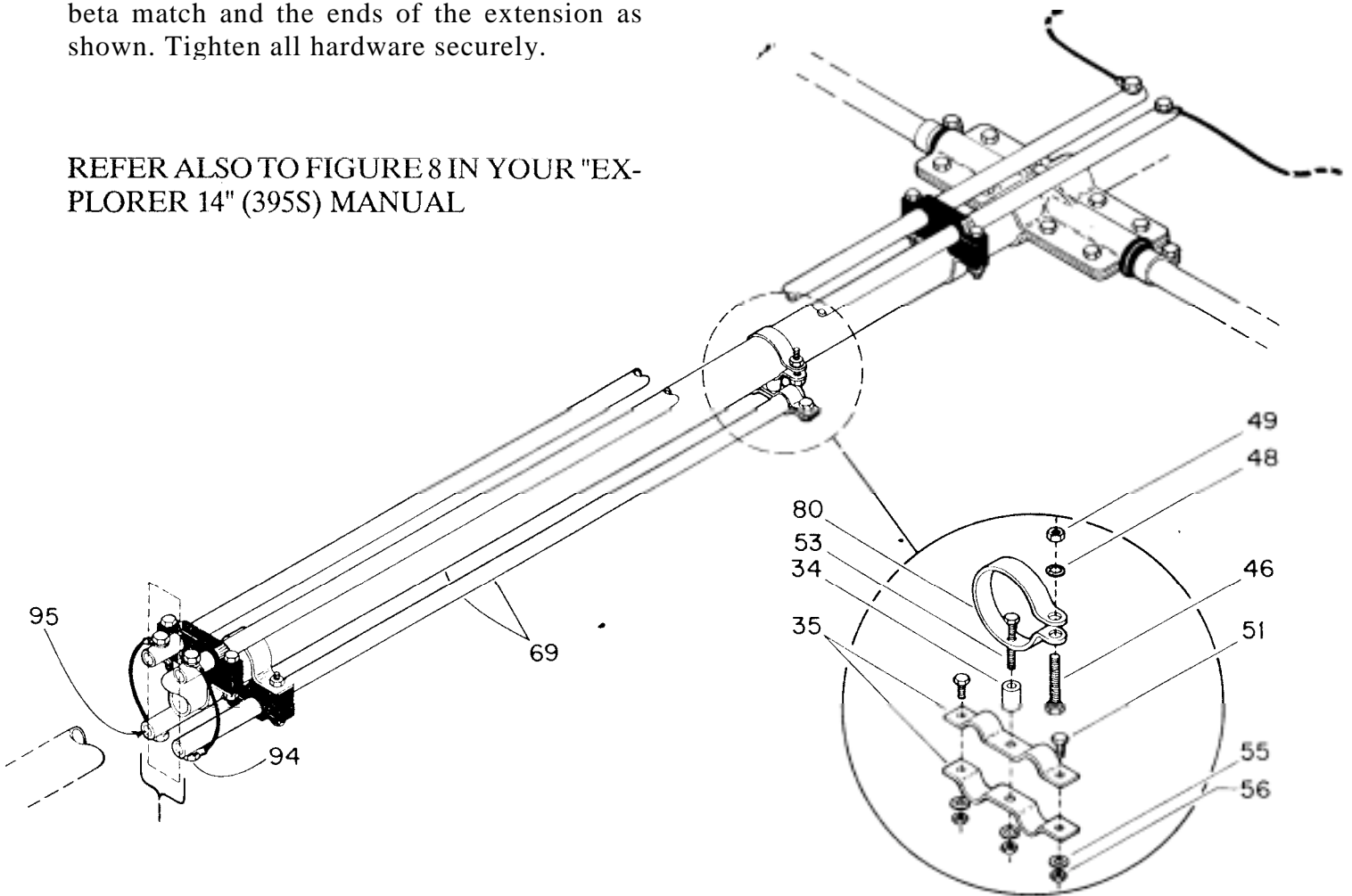
Assemble the element with the drain holes of the 20 meter trap facing toward the ground.

Also, adjust sections D-3 and D-4 to the dimensions shown in Figure 4.

Assemble the beta match extension as shown in Figure 5. Remove the existing beta shorting clamp assembly from the Explorer 14 and reassemble it on the end of the extension, as shown. Replace boom-to-beta strap (Item 33) with new boom-to-beta strap (Item 80). Attach the 5 1/2 inch pigtail wires (Item 83) between the ends of the existing beta match and the ends of the extension as shown. Tighten all hardware securely.

REFER ALSO TO FIGURE 8 IN YOUR "EXPLORER 14" (395S) MANUAL

Item	Description
34	Sleeve, beta shorting
35	Strap, beta shorting, 3/8" radius
46	Bolt, 1/4"-20 x 1 1/2", hex head, stainless steel
48	Lockwasher, internal, 1/4", stainless steel
49	Nut, hex, 1/4"-20 stainless steel
51	Bolt, #10-24 x 5/8", hex head, stainless steel
53	Bolt, #10-24 x 1 1/2", hex head, stainless steel
55	Lockwasher, internal, #10, stainless steel
56	Nut, #10-24, hex, stainless steel
69	Beta Tube, aluminum, 3/4" x 38 3/4", drilled
80	Boom-to-Beta Strap
94	Bolt, 1/4"-20 x 3/4", hex head
95	Nut, 1/4"-20, square



NOTE: THE ENDS OF BOTH SETS OF BETA TUBES, AT THIS LOCATION, SHOULD BE ON THE SAME VERTICAL PLANE.

Figure 5 10 MHz Beta Match Extension

CHAPTER 9

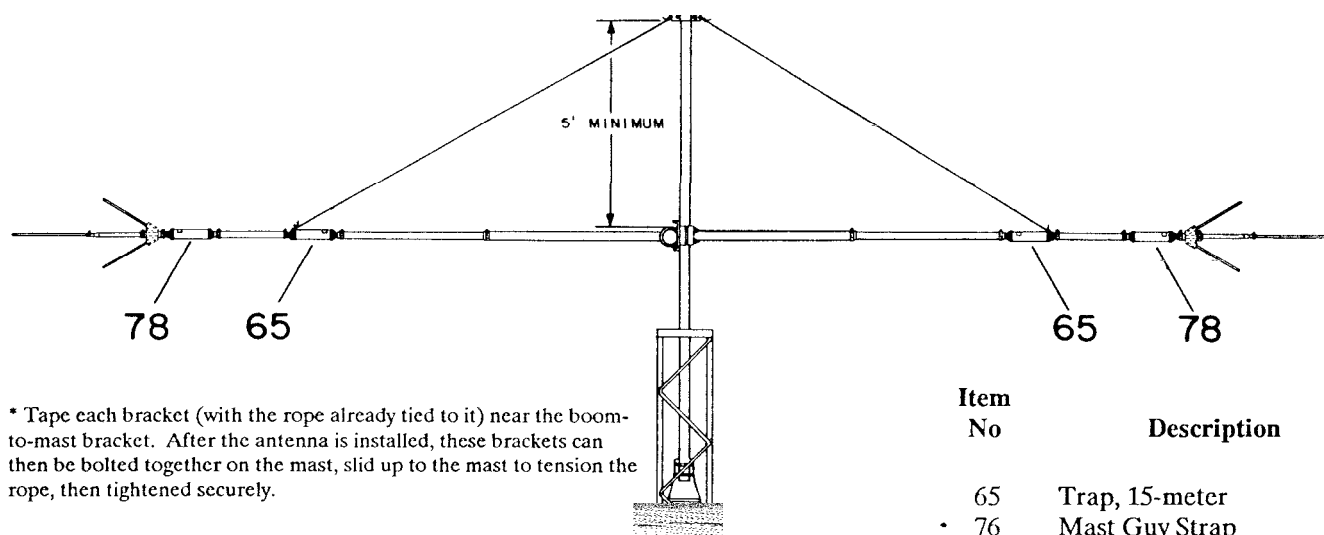
Installation

IMPORTANT

The Explorer 14, plus 7 or 10 MHz, makes a fairly large antenna and requires some consideration as to how you will safely get it to the top of your tower. Allow plenty of room between any power lines and your new antenna. Installation of this product near power lines is dangerous! Also check the rating of your tower and rotor against the new wind loading specifications of your modified Explorer 14.

Attachment of Driven Element Support Ropes

Due to the element tip loading produced by the large 20 meter traps, we recommend that you add vertical support ropes to the central driven element. The ropes should be tied to the outer ends of the 15 meter traps and tied to the support bracket attached to the mast. The support bracket should be at least 5 feet above the antenna boom. Horizontal support ropes are not required due to the construction of the PARASLEVVE driven element. See Figure 6.



* Tape each bracket (with the rope already tied to it) near the boom-to-mast bracket. After the antenna is installed, these brackets can then be bolted together on the mast, slid up to the mast to tension the rope, then tightened securely.

Item No	Description
65	Trap, 15-meter
76	Mast Guy Strap
77	Rope, 14 feet
78	Trap, 20-meter
88	Bolt, 3/8"-16 x 2", hex head
97	Nut, 3/8"-16, hex
101	Lockwasher, 3/8", internal
103	Rope Thimble

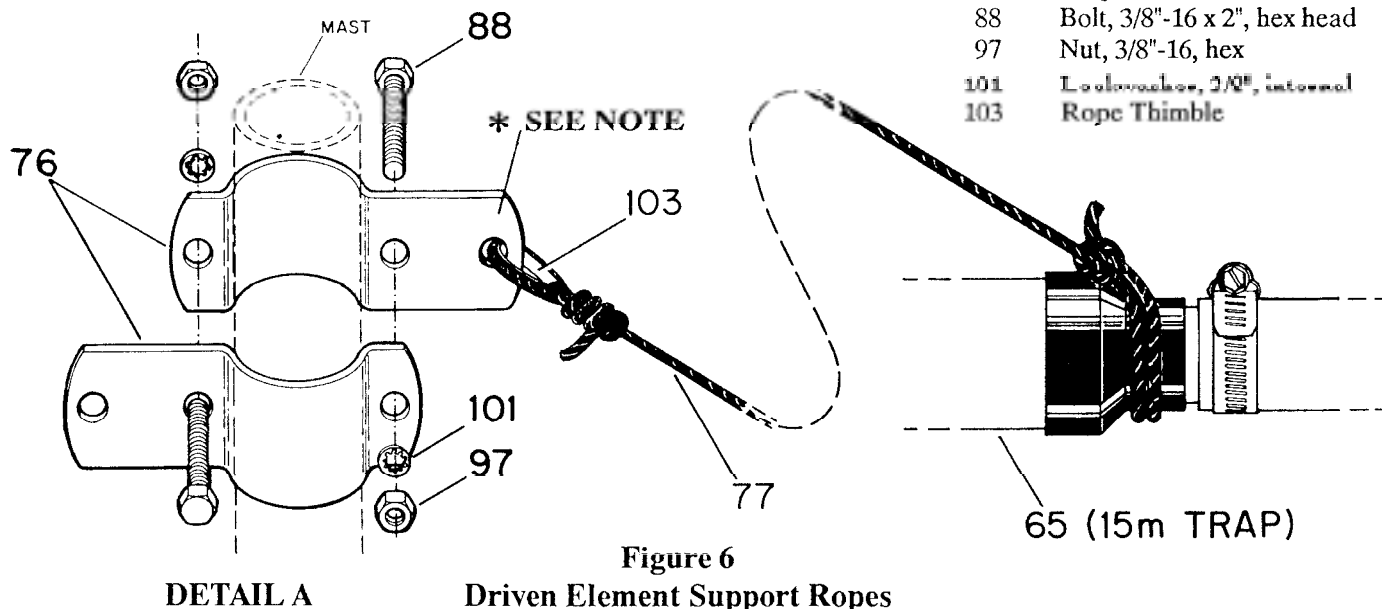


Figure 6
Driven Element Support Ropes

VSWR Curves for 30 and 40 Meters

These VSWR Curves are typical for this antenna mounted between 35 and 80 feet above ground, horizontally polarized. Similar curves may be expected for this antenna mounted between 30 and 100 feet above the ground. DO NOT TRY TO TUNE THIS ANTENNA FOR LOW VSWR AT GROUND LEVEL.

NOTE: The VSWR on 20 meters may be slightly higher than that of the Explorer 14 alone. This is normal.

See the Explorer 14 manual for more installation hints.

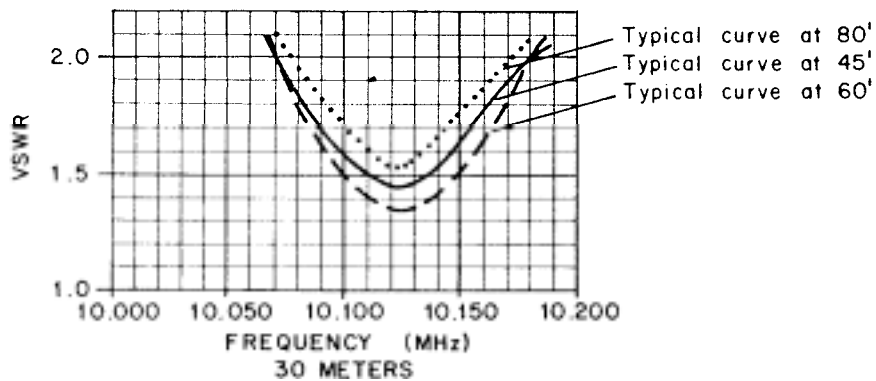
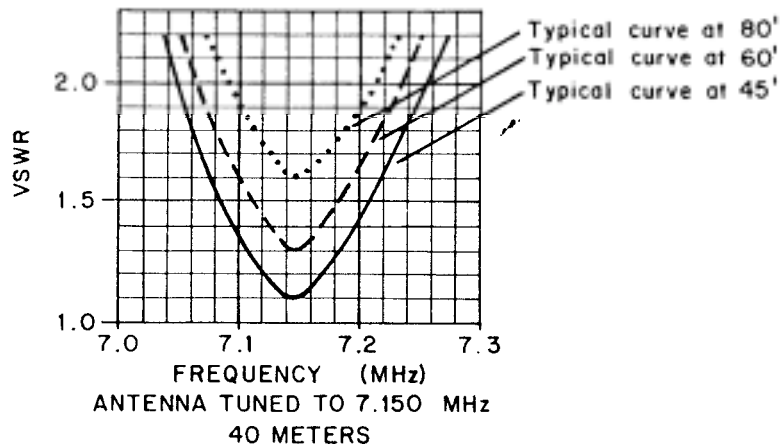


Figure 7
VSWR
Curves

CHAPTER 11

Operation

Connect the end of your transmission line to a good quality SWR meter or Thruline® watt-meter and then to your radio. While using lower power (less than 200 watts output), check the VSWR across each band from 7.0 to 29.7 MHz (or 10.1 to 29.7 MHz). Record this information for future reference. See Attachment 1 on the last page of this manual. Check the VSWR periodically to ensure proper operation.

This completes your installation of the Explorer 14 plus 7 (or plus 10). Happy DX'ing.

Maintenance

The Explorer 14 antenna is designed to be relatively maintenance free. All hardware, except for seven (7) long bolts used in the boom-tomast bracket, are made of passivated stainless steel. The seven long bolts are plated with a thick layer of cadmium with protective coating of clear chromate. The internal tooth type lockwashers used in this antenna are made of a slightly magnetic grade of stainless steel. The element tubing clamps are made of stainless steel. All other metallic parts are aluminum. All insulators are made of either black polyethylene or black Cylolac®.

Telex does not recommend the use of any type of conductive paste within the element assemblies. Most pastes do not allow the proper tightening of element assemblies and are usually not true conductive pastes.

A light amount of clear lacquer or an acrylic spray may be used to coat the exterior surface of the element assemblies if heavy oxidation is likely to occur. DO NOT use any coating on trap assemblies. Heavy oxidation of aluminum may occur if the antenna is installed within 5 miles of salt water.

When storing this antenna (or if awaiting installation), care should be taken not to damage any trap assembly or allow any dirt or insects to enter any trap assembly. DO NOT leave the elements in a grassy area, as wet grass will stain the aluminum.

CHAPTER 12

Troubleshooting

If you encounter problems with the operation of your Explorer 14 plus 7 (or 10), follow these steps to isolate the cause.

Usually you can isolate problems that occur in either your antenna or feedline/feedpoint. If you experience high VSWR on all bands, your problem is probably in the feedline or balun. If you experience high VSWR on some bands but not all bands, look for problems in the antenna element lengths or traps or nearby resonant structures.

SYMPTOM	POSSIBLE CAUSES
Consistently high VSWR on all bands.	<ul style="list-style-type: none"> o Balun damaged by lightning or excessive power. Shorted coaxial connector. o Water inside of balun or transmission line.
High VSWR dependent upon direction of beam	<ul style="list-style-type: none"> o Resonant guy wires too close to antenna. e Metallic structures or wiring too close to antenna.
Intermittent high VSWR not dependent on weather or power level or direction of beam or band selection.	<ul style="list-style-type: none"> o Loose connection on feed system, matching system or transmission line.
High VSWR after rain showers or with high humidity.	<ul style="list-style-type: none"> o Trap(s) installed with drain holes up instead of down. o Water inside of balun or coax cable. o Tubing installed with slots up instead of down.
High VSWR with high power, low VSWR with low power.	<ul style="list-style-type: none"> o Balun damaged or defective.
Low VSWR, but only near band edge(s).	<ul style="list-style-type: none"> o Loose coaxial connection on transmission line.
High VSWR on only one or two bands.	<ul style="list-style-type: none"> o Trap(s) damaged or reversed. o Resonant guy wires or nearby metallic structure. o Another HF antenna too close. o Antenna not assembled correctly. o Beta match not removed for 40 meters.
High VSWR on only 30 meters	<ul style="list-style-type: none"> o 20 meter trap(s) damaged or reversed. o Too low to ground. o Beta Match not modified correctly. o DE-4 not adjusted to the right length.
High VSWR on only 40 meters.	<ul style="list-style-type: none"> o 20 meter trap(s) damaged or reversed. Too low above ground. Beta Match not removed. Too high above ground

CHAPTER 13

Service Information

If you are unable to resolve your problem or if you need to order replacement parts, you should contact the Hy-Gain Customer Service Department in Starkville, MS.

You should fully research your problem by going through the Troubleshooting Guides in Chapter 5 before you contact the Customer Service Department. You should also record your VSWR across all four bands before calling.

You should retain your sales receipt or other proof of purchase for antennas that are still under warranty. (See separate sheet for Telex warranty.)

All requests, inquiries or warranty claims should be made to:

PARTS LIST

Item No	Part No.	Description	Qty
68	160012	Capacity-Hat Clamp	8
69	170493	Beta Tube, aluminum, 3/4" x 38 3/4", drilled.....	2
70	170494	Tube, aluminum, 7/16" x 15"	8
71	170495	Tube, aluminum, 7/16" x 62", DE-5	2
72	190109	Tube, aluminum, 7/8" x 18", swaged, DE-4	2
73	190606	Tube, aluminum, 1" x 6"	2
74	190608	Tube, aluminum, 1" x 18", DE-3A	2
75	190609	Tube, aluminum, 1" x 23", DE-3B.....	2
76	381100	Mast Guy Trap.....	2
77	690364	Rope, polyethylene, 5/32", 14 feet	2
78	878303	Trap, 20-meter.....	2
	878304	Parts Pack, QK-710, Clamps	1
79	163378	Extension Strap	4
80	170496	Strap, boom-to-beta.....	1
81	177888	Clamp, beta support	2
82	358757	Tubing Clamp, #10, stainless steel	8
83	878307	Pigtail Assembly, 5 1/2"	2
103	351700	Rope Thimble, 5/32".....	2
	878305	Parts Pack, QK-710, Insulators	1
84	450401	Caplug, 1", black.....	2
85	455644	Caplug, 7/16", black	10
86	465595	Insulator, beta support, bottom	2
87	465600	Insulator, beta support, top	2
	878306	Parts Pack, QK-710, stainless steel hardware	1
88	500152	Bolt, 3/8"-16 x 2", hex head	2
89	500154	Bolt, tap; 5/16"-18 x 3 1/2", hex head	1
90	500157	Bolt, # 10-24 x 2", hex head.....	4
91	500160	Bolt, #10-24 x 5/8", hex head	34
92	504069	Bolt, #10-24 x 1", hex head	4
94	505266	Bolt, 1/4"-20 x 3/4", hex head	4
95	551367	Nut, 1/4"-20, square	6
96	554071	Nut, #10-24, hex	42
97	555694	Nut, 3/8"-16, hex.....	2
98	555747	Nut, 5/16"-18, hex	1
99	562961	Lockwasher, 1/4" internal	6
100	564792	Lockwasher, 5/16", split	1
101	565696	Lockwasher, 3/8", internal	2
102	565697	Lockwasher, #10, internal.....	42

NOTE: The 5/16"-18 x 3 1/2" bolt, lockwasher bracket to the mast. See Figure 2, page 4, of the

Converting American Measurements to Metric

Use this scale to identify lengths of bolts, diameters of tubes, etc.. The American inch (1") and foot (1) can be converted to centimeters in this way.

$$1 \text{ inch (1")} = 2.54 \text{ cm}$$

$$1 \text{ foot (1)} = 30.48 \text{ cm}$$

Example:

U.S.A.



FRACTION AND METRIC EQUIVALENTS
FOR ONE INCH

Fractional Inch	Millimeters	Fractional Inch	Millimeters
1/16	1.588	9/16	14.288
1/8	3.175	5/8	15.875
3/16	4.700	11/16	17.463
1/4	6.350	3/4	19.050
5/16	7.937	13/16	20.638
3/8	9.525	7/8	22.225
7/16	11.112	15/16	23.813
1/2	12.700	1	25.400

VSWR RECORD

Type of VSWR Meter _____

Frequency	Date _____	Date _____	Date _____
	VSWR	VSWR	VSWR
7.00	_____	_____	_____
7.10	_____	_____	_____
7.20	_____	_____	_____
7.30	_____	_____	_____
10.10	_____	_____	_____
10.15	_____	_____	_____
14.00	_____	_____	_____
14.10	_____	_____	_____
14.20	_____	_____	_____
14.30	_____	_____	_____
14.35	_____	_____	_____
21.00	_____	_____	_____
21.10	_____	_____	_____
21.20	_____	_____	_____
21.30	_____	_____	_____
21.40	_____	_____	_____
21.45	_____	_____	_____
28.00	_____	_____	_____
28.25	_____	_____	_____
28.50	_____	_____	_____
28.75	_____	_____	_____
29.00	_____	_____	_____
29.25	_____	_____	_____
29.50	_____	_____	_____
29.70	_____	_____	_____

Height of Antenna: _____