

ASSEMBLY INSTRUCTIONS - RIW MODEL 432-19 ANTENNA

Assembly of your RIW 432-19 will proceed in 3 basic stages:

1. Assembly of elements to boom sections
2. Assembly of connector and balun to boom and driven element
3. Final assembly

CAUTION

PROTECT FROM EYE INJURY - Assembly, handling and installation of this antenna presents possible risk of eye injury. Wear eye protection!

Assembly of elements to boom sections

See figure 1. Boom sections are identified as FWD, CTR and AFT. The elements are identified and coded by position.

Starting with FWD boom section, install element D16 as follows:

- A. See figure 2. Insert a retaining ring into the shallow recess at the end of the spool - RETAINING RING FINGERS MUST POINT TOWARD SPOOL as shown. With one tip of element bearing against a stationary work surface, push retaining ring onto element with spool until ring is even with scribed line on element as shown in figure 3.

NOTE: The exact position of the ring, which effects the centering of the element on the boom, is not critical; + 1/8" variation will not effect antenna performance. If ring is pushed too far it may be removed by continuing to push it along the element until it falls off the end opposite that onto which it was installed. It can not be removed by pushing back towards end from which it was installed.

- B. See figure 4. Slide insulator onto element noting position of insulator shoulder. Insert element thru holes in boom, slide second insulator onto element, again noting shoulder position. With tip of element bearing against work surface as shown in figure, push second retaining ring onto element until it presses firmly against insulator, making sure that insulators are properly seated in boom holes.

Assembly of elements to boom sections (cont.)

Repeat previous steps A and B for remaining elements in all boom sections.

ASSEMBLY HINT: Holding the boom section horizontally and bearing element tip against a slender vertical surface such as a door jamb or column has been found very convenient as it allows clearance for elements already assembled.

Assembly of connector and balun to boom and driven element

- A. See figure 5. Secure the connector assembly to the AFT boom section noting that connector faces forward. Insert ends of balun thru lugs on connector assembly and slide into position shown, securing balun to boom with plastic clamp.
- B. See figure 6. Assemble element clamps and lugs to the driven element. Lugs are to fit between clamp tabs. Secure clamp hardware very tightly. Note that scribe marks have been placed on the element at the specified $10\frac{1}{4}$ " clamp spacing.
- C. See figures 5, 6 and 7. Solder the precut wire matching sections in place as shown. Solder balun leads to wire matching sections, and balun jacket to connector assembly lugs as shown.

Final Assembly

See figure 8. Assemble boom sections together and install mast clamp assembly as shown. Make sure boom assembly hardware is tightened securely.

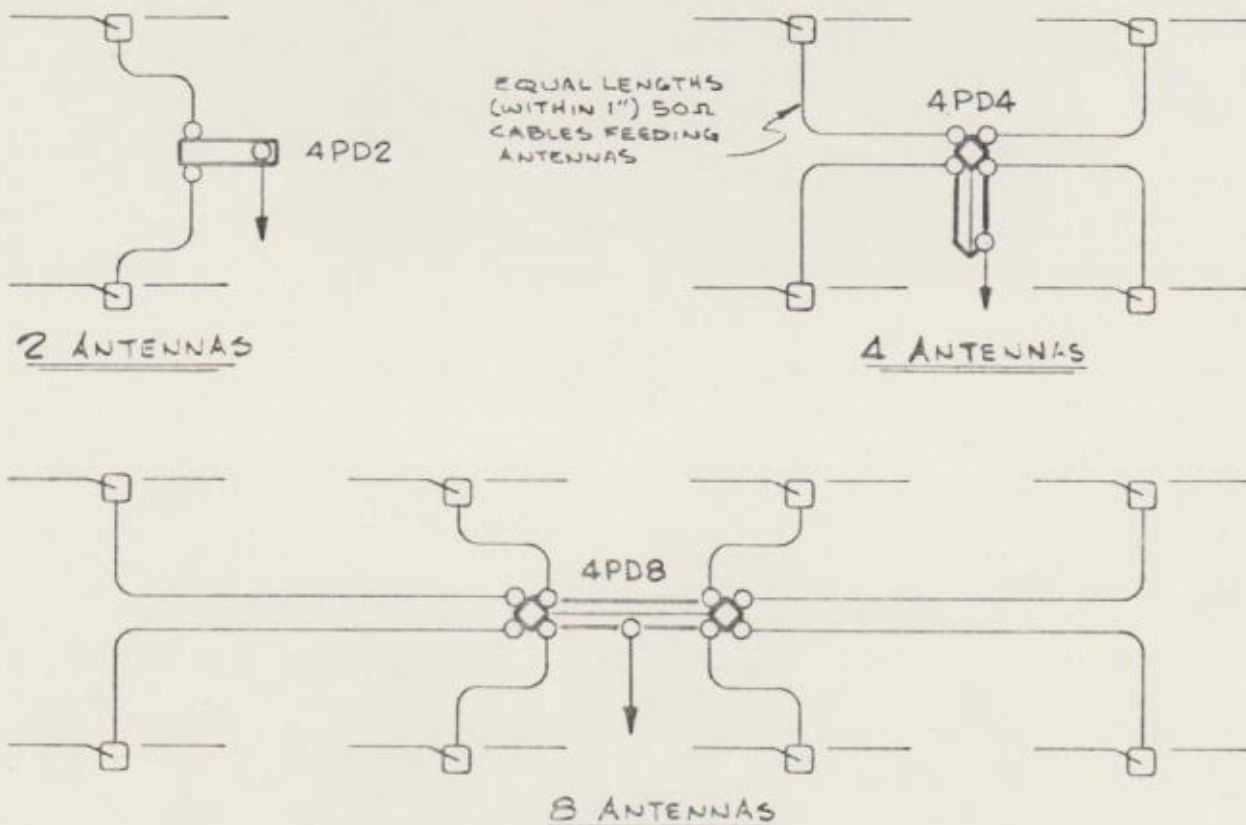
This completes assembly of your 432-19.

NOTE: The 432-19 driven element is ungrounded. It is recommended that the input of your receiver front end have a dc ground return to eliminate static charge build-up.

FEEDING

All antennas of an array must be properly phased. Individual antennas must be correctly oriented within the array, i.e., none mounted upside down with respect to the others (unless compensated by 180° phase shift of signal fed to it). All antennas must be fed in phase requiring feed cables to be matched in length to within 1 inch. However, cable lengths may differ by any multiple of a full wavelength in the particular cable used.* This allows length reduction of cables feeding inboard antennas of large arrays if desired.

RIW's 2, 4 and 8-way Power Dividers (models 4PD2, 4PD4 and 4PD8 respectively) provide the lowest-loss and most trouble-free method of feeding multiple antennas. Typical feed arrangements are shown below.



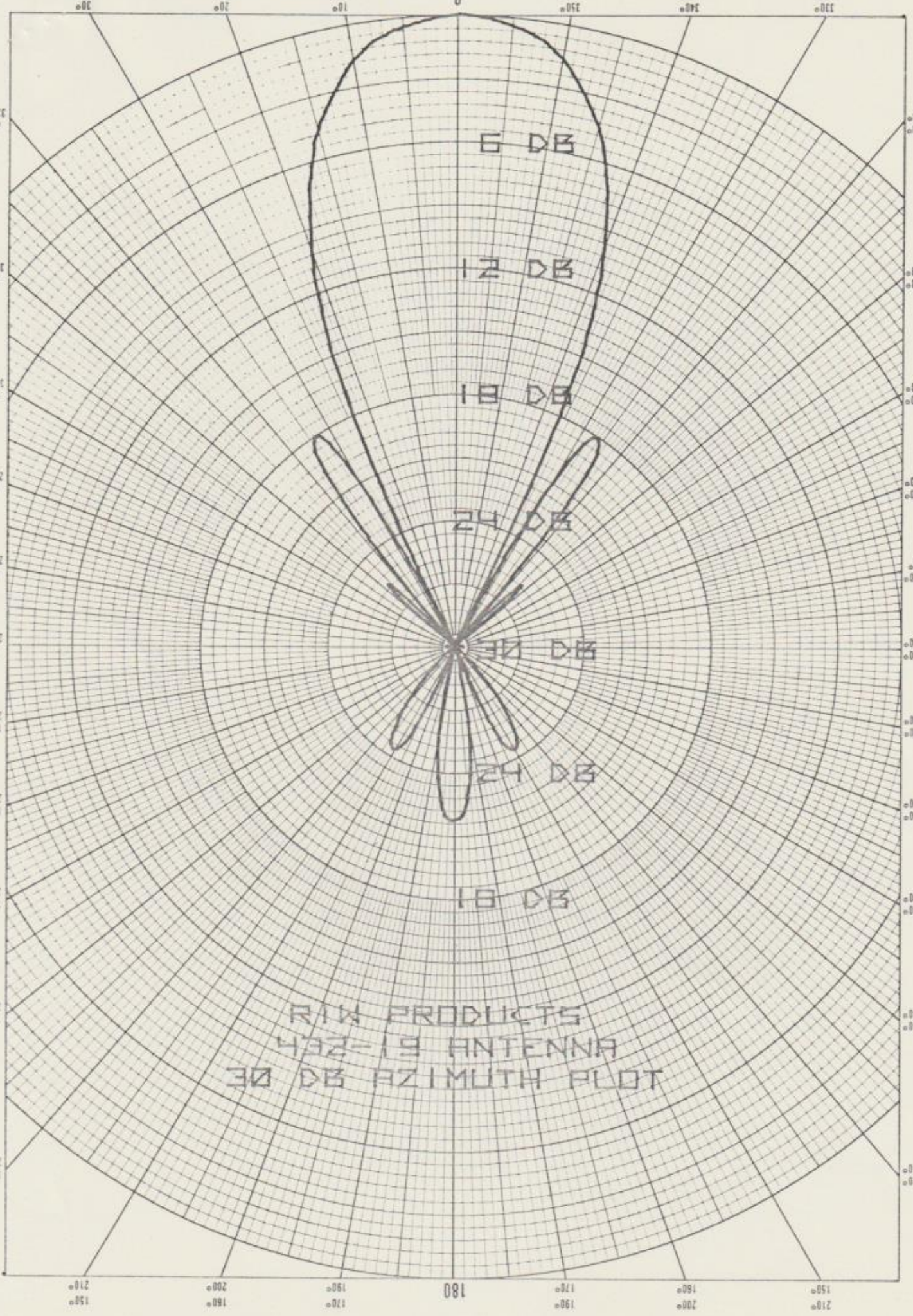
Alt. 8 Ant. feed: 2 4-ways fed by 2-way thru eq. lngth cables

16 Antenna feed: 2 8-ways fed by 2-way thru eq. lngth cables

Alt. 16 Ant. feed: 4 4-ways fed by 4-way thru eq. lngth cables

* Wavelength in Cable (inches) = Wavelength in Air times Cable Velocity Factor

$$= 11803 \times V.F. / \text{freq (MHz)}$$



RTW PRODUCTS
432-19 ANTENNA
30 DB AZIMUTH PLOT

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[NOTE: ELEMENTS HAVE ALSO BEEN CODED AT ENDS FOR IDENTIFICATION AFTER ASSEMBLY]



Figure 1

FWD BOOM

NOTE SMALL HOLE ON THIS END →

CTR BOOM

NOTE POSITION OF MAST CLAMP HOLES. →

NOTE SMALL HOLE ON THIS END →

AFT BOOM

○	D16	Blu-Blu	<input type="checkbox"/>
○	D15	Vio-Vio	<input type="checkbox"/>
○	D14	Vio-Vio	<input type="checkbox"/>
○	D13	Vio-Vio	<input type="checkbox"/>
○	D12	Vio-Vio	<input type="checkbox"/>
○	D11	Vio-Vio	<input type="checkbox"/>
○	D10	Grn-Blu	<input type="checkbox"/>
○	D9	Grn-Grn	<input type="checkbox"/>
○	D8	Grn-Grn	<input type="checkbox"/>
○	D7	Red-Vio	<input type="checkbox"/>
○	D6	Red-Blu	<input type="checkbox"/>
○	D5	Red-Red	<input type="checkbox"/>
○	D4	Red-Grn	<input type="checkbox"/>
○	D3	Red-Red	<input type="checkbox"/>
○	D2	Blk-Vio	<input type="checkbox"/>
○	D1	Blk-Blu	<input type="checkbox"/>
○	DR	Blk-Grn	<input type="checkbox"/>
○	R1	Blk-Red	<input type="checkbox"/>
○	R2	Blk-Blk	<input type="checkbox"/>

IMPORTANT - TO AVOID CONFUSION, IT IS RECOMMENDED THAT ELEMENTS BE CHECKED OFF AS THEY ARE INSTALLED →

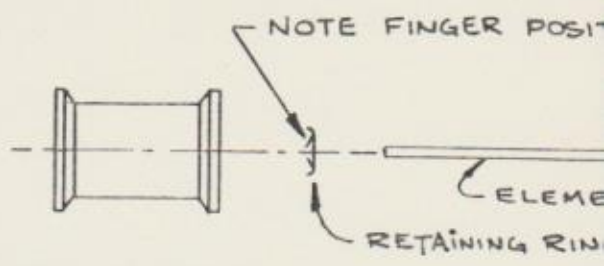


Figure 2

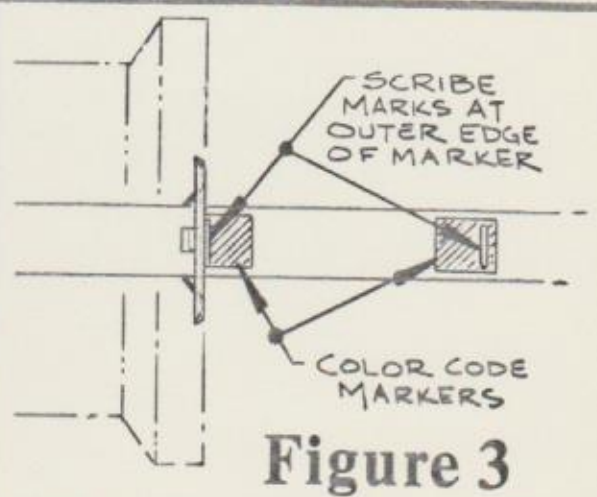


Figure 3

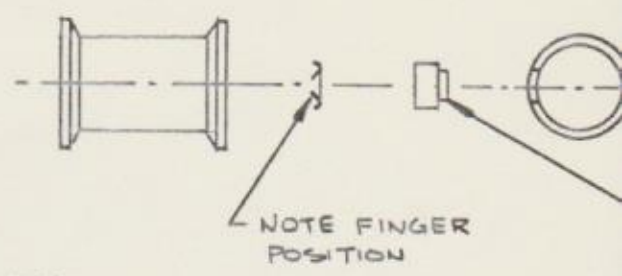


Figure 4

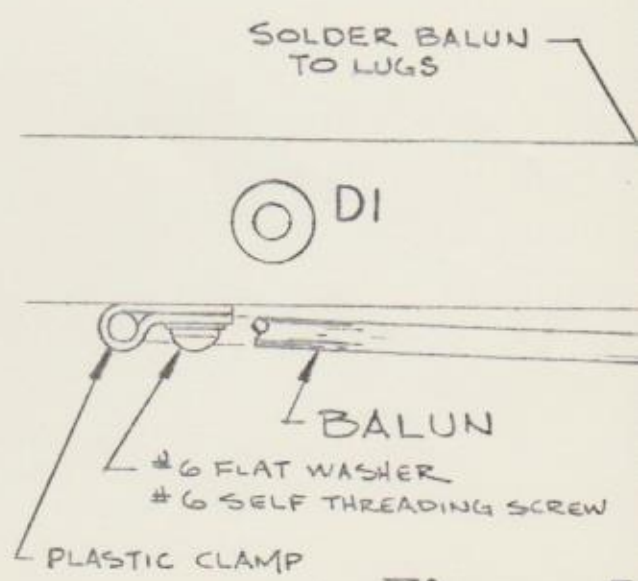


Figure 5

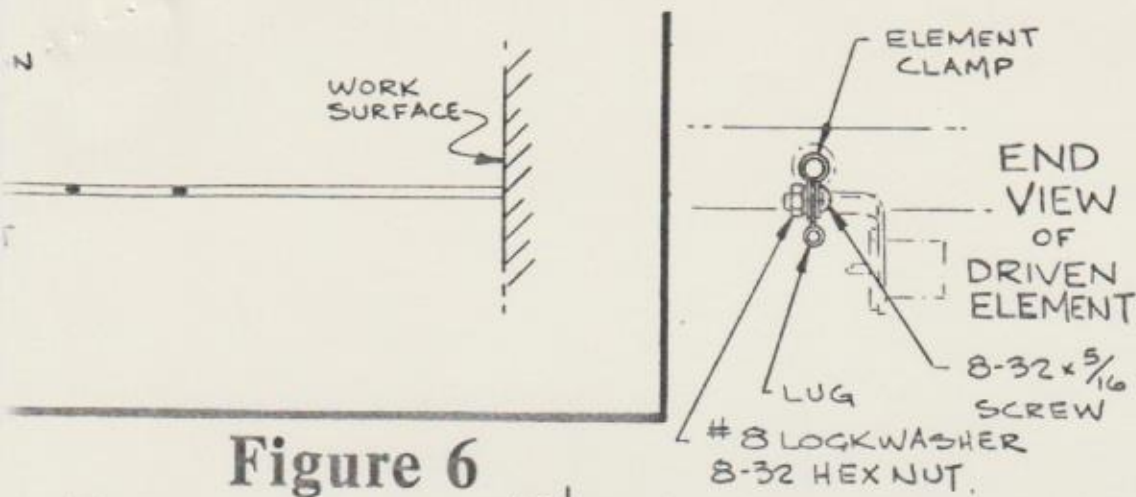


Figure 6

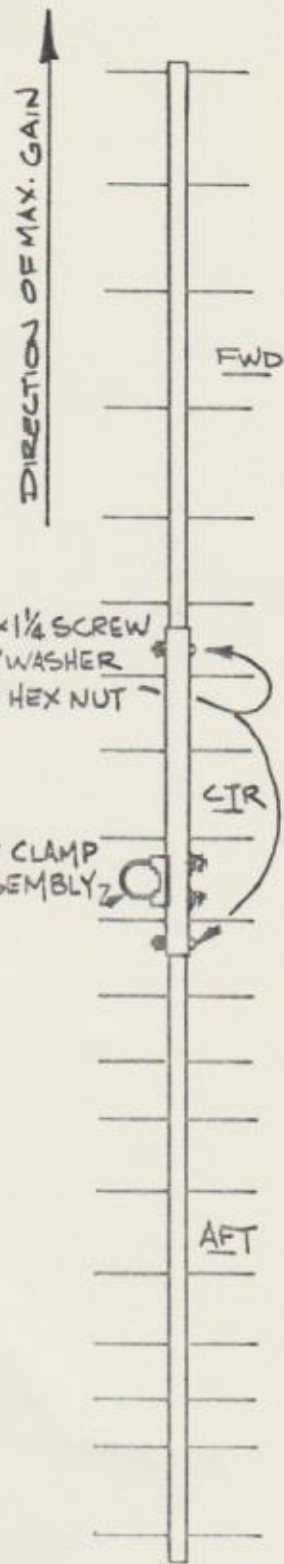
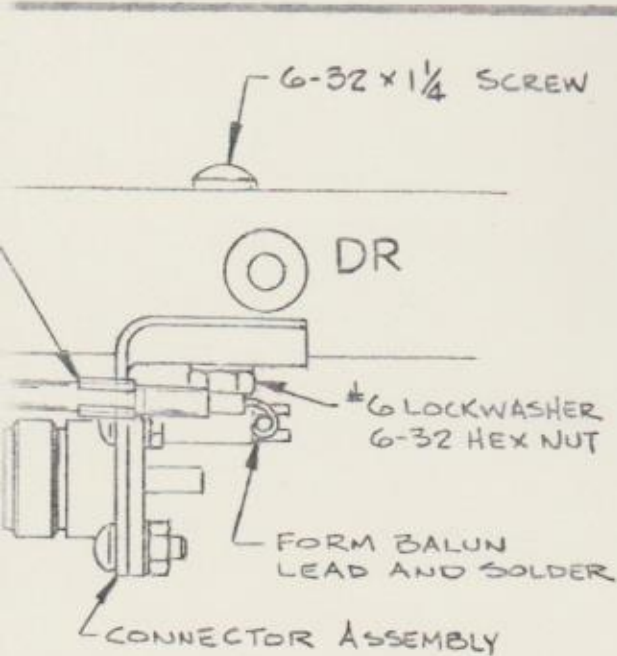
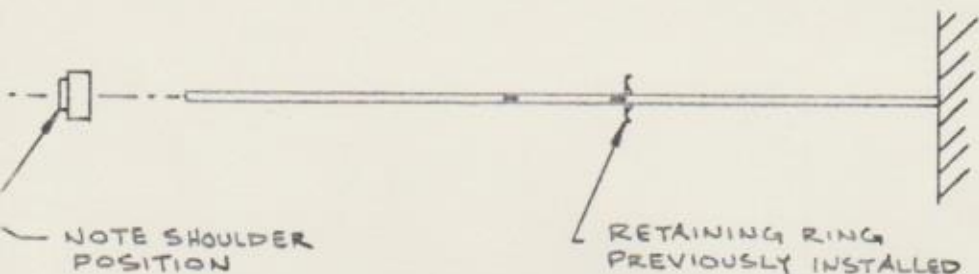
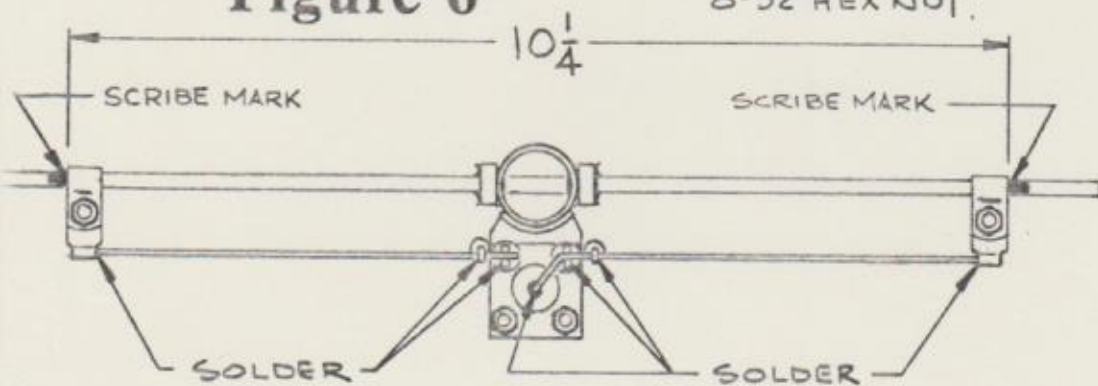
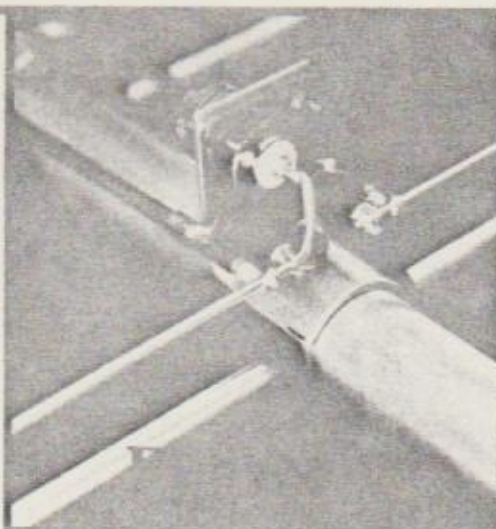


Figure 8



RIW 432-19

RIW 432-19 SPECIFICATIONS

ELECTRICAL

Forward Gain.....	16 dBd*
First Sidelobe.....	-18 dB
Front-to-Back Ratio.....	>20 dB
VSWR.....	<1.2, 432 MHz <1.6, 426 to 438 MHz <2.0, 424 to 442 MHz
Beamwidth (-3dB).....	24 degrees
G/T**.....	3 dB Sun "Y" Factor
Input Impedance.....	50 Ohms, Integral Balun
Connector.....	Type N, Weatherproof
Power Rating.....	1 kW CW, 2 kW P.E.P.

* Referenced to a Standard Dipole

** G/T is an antenna's "Figure of Merit." Now specified for all satellite ground station antennas, G/T is the ratio of antenna gain to it's equivalent noise power (expressed in degrees Kelvin). Better antennas have lower sidelobe/backlobe noise power, thus a higher G/T. This is of significance when detecting threshold level signals with up-pointing antennas as sidelobe/backlobe noise tends to mask the desired signal (this assumes use of front end with adequately low noise figure).

MECHANICAL

Boom Length.....	13 Feet
Turning Radius.....	86 Inches
Weight.....	2.8 Pounds
Wind Resistance at 80 MPH.....	19.8 Pounds
Wind Survival.....	85 MPH 55 MPH, ½" ice loading

Mast Clamp Assembly fits masts to 1½" diameter.

PARTS LIST

<u>ITEM</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>ITEM</u>	<u>QTY</u>	<u>DESCRIPTION</u>
1	1	FWD Boom Section	13	1	Plastic Clamp
2	1	CTR Boom Section	14	1	6-32 x 1¼ Machine Screw
3	1	AFT Boom Section	15	1	#6 x ½ Self Thding Screw
4	1	Connector Assembly	16	1	#6 Lockwasher
5	1	Balun	17	1	#6 Flat Washer
6	1	Elements, set of 19	18	1	6-32 Hex Nut
7	38	Element Insulators	19	2	8-32 x 5/16 Machine Screw
8	38	Retaining Rings	20	2	8-32 x 1¼ Machine Screw
9	2	Element Clamps	21	4	#8 Lockwasher
10	2	Lugs	22	4	8-32 Hex Nut
11	1	Matching Wire, Str.	23	1	Mast Clamp Assembly
12	1	Matching Wire, Formed	24	1	Spool (assembly tool)