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## VB-64DX 6-Meter 4 Elements Beam

# INSTRUCTION MANUAL

### WARNING

### General Description

Model 64DX is a four element, six meter beam optimum spaced for maximum forward gain. The beta match system allows the best possible match to coaxial cable with the broadest possible pass band. This antenna now includes stainless steel hardware for all electrical and most mechanical connections, and a boom-to-mast bracket that will fit masts up to 2 1/16 inches in diameter.

When installing your system, take extreme care to avoid accidental contact with power lines and other overhead obstructions by any ladder or other installation equipment. Failure to exercise this care could result in serious or fatal injury.

### Specifications

#### *Electrical*

Gain .....	10.35 dBi (8.2 dBd)
Front-to-Back Ratio .....	20-25 dB
Maximum Power Input to Antenna.....	500 W AVG., 1 kW PEP
VSWR (at resonance) .....	less than 1.5:1
Impedance .....	50 ohms
Frequency Range .....	50-54 MHz
Electrical Boom Length .....	0.61 wavelength
Stacking Distance (H Plane) .....	0.64 wavelength (12' 6")

#### *Mechanical*

Longest Element.....	9' 11" (3.2 m)
Boom Length .....	12' (3.6 m)
Turning Radius .....	8' (2.4 m)
Net Weight.....	10 lbs. (4.5 kg)
Maximum Wind Survival .....	100 mph (161 kmph)
Mast Diameter.....	1 5/8" to 2 1/16" O.D. (41 mm to 52 mm)
Boom Diameter.....	1 1/4" O.D. (32 mm)
Surface Area 1.1 sq. ft.....	(0.102 sq. m)
Wind Load at 80 mph .....	28.1 lbs (12.7 kg)

## Preparation For

For OVERSEAS CUSTOMERS: If you use the Metric System, See the American-to-Metric conversion table in the rear of this manual. Most illustrations in this manual will provide both American and Metric dimensions.

Tools: The following tools are required for easy assembly of the 64DX beam:

Qty	Tool Type
1	Tape measure, 12 ft.
1	Nut driver, 1/2 inch
1	Nut driver, 7/16 inch
1	Nut driver, 5/16 inch

Standard wrenches or adjustable wrenches may also be used in place of the nut drivers.

When unpacking your antenna, check inside of all tubing for small parts and elements. To conserve space, these smaller articles are sometimes put inside larger pieces. Check all parts against the parts list in the rear of this manual to ensure no parts are missing.

## Feedline and SWR

Model 64DX can be matched to 50 ohm coax using the balun supplied. Without the balun, the input impedance is 200 ohms. The SWR can be 1.1:1 with proper installation and necessary care taken in assembly.

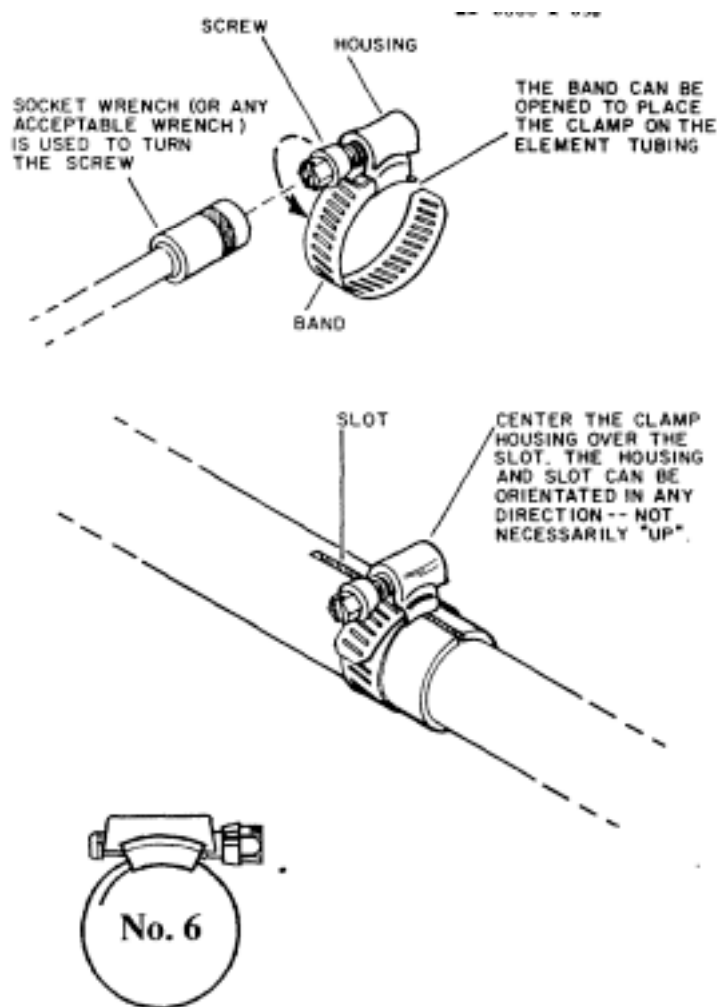
NOTE: If resonance is affected by environmental surroundings, shorten the Driven Element to raise the frequency and lengthen the Driven Element to lower the frequency. Shorten the Driven Element in 1/4 inch increments until desired results are obtained.

## Installation of Tubing Clamps

Select the proper size tubing clamp as shown in the chart in Figure 1. When installing the clamp, place the clamp near the tube end with the top of the clamp over the slot in the tube as shown.

After adjustment of the tubing lengths, tighten the clamp with a 5/16 inch nut driver, socket, or open end wrench until the tubing will not twist or telescope.

Do not overtighten the tubing clamps.



Part No.	Description	Fits Tubing Sizes
358756	Clamp, Size #6 all stainless steel 5/16" hex head screw	1/2 and 3/4"

Figure 1 Tubing clamp Assembly

## Assembly Instructions

Select the boom-to-mast clamp (Item No. 10), the boom-to-mast bracket (Item No. 9) and four (4) 1/4" - 20 x 3/4" bolts (Item No. 19), four (4) internal lockwashers (Item No. 20) and four (4) 1/4" hex nuts (Item No. 21).

Place the boom-to-mast bracket body (item No. 9) on the boom-to-mast clamp (Item No. 10), align the holes and place the bolts in the four (4) outer holes as shown in Figure 2).

Refer to Figure 3. Select the three (3) pairs of boom-to-element brackets (Item No. 2) and one pair of boom-to-driven element brackets (Item No. 1). Place a 1/4"-20x3/8" bolt (Item No. 18) with a square nut in the large brackets (Figure 3, Detail B) and a #10-24 x 1/2" bolt (Item No. 13) with a square nut in each center hole (Figure 3, Detail A) of the small brackets. Do Not tighten at this time. These will now be called the anchor bolts.

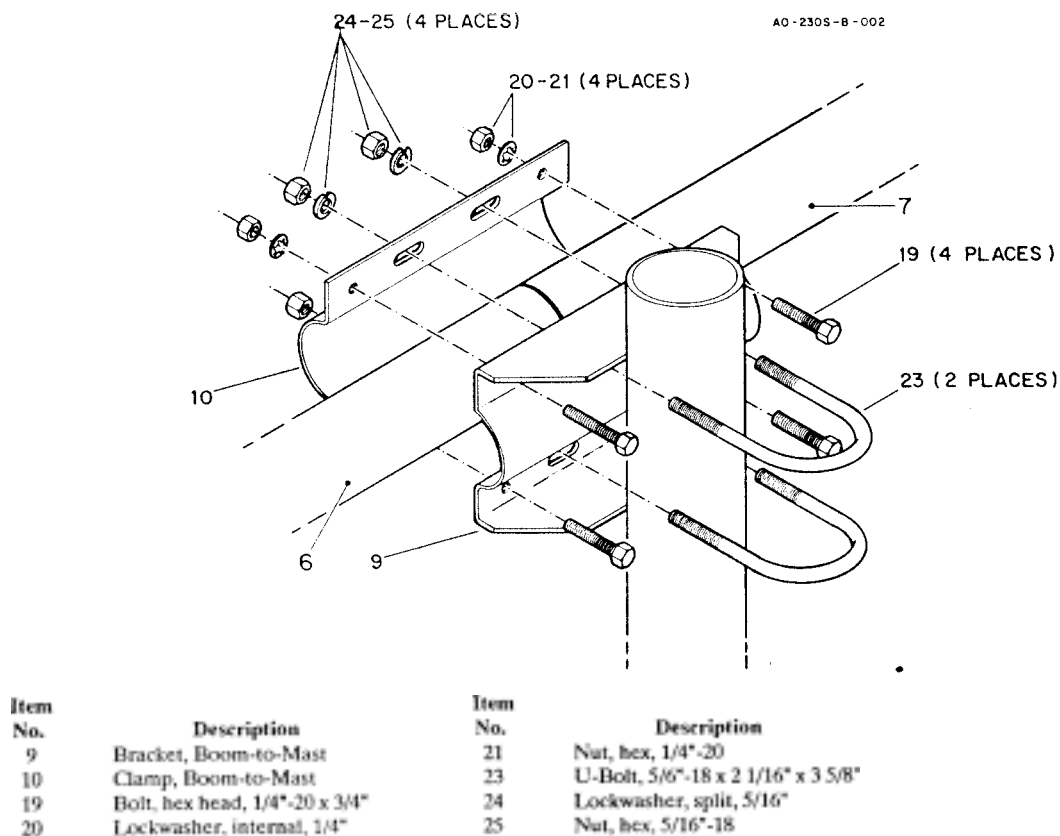
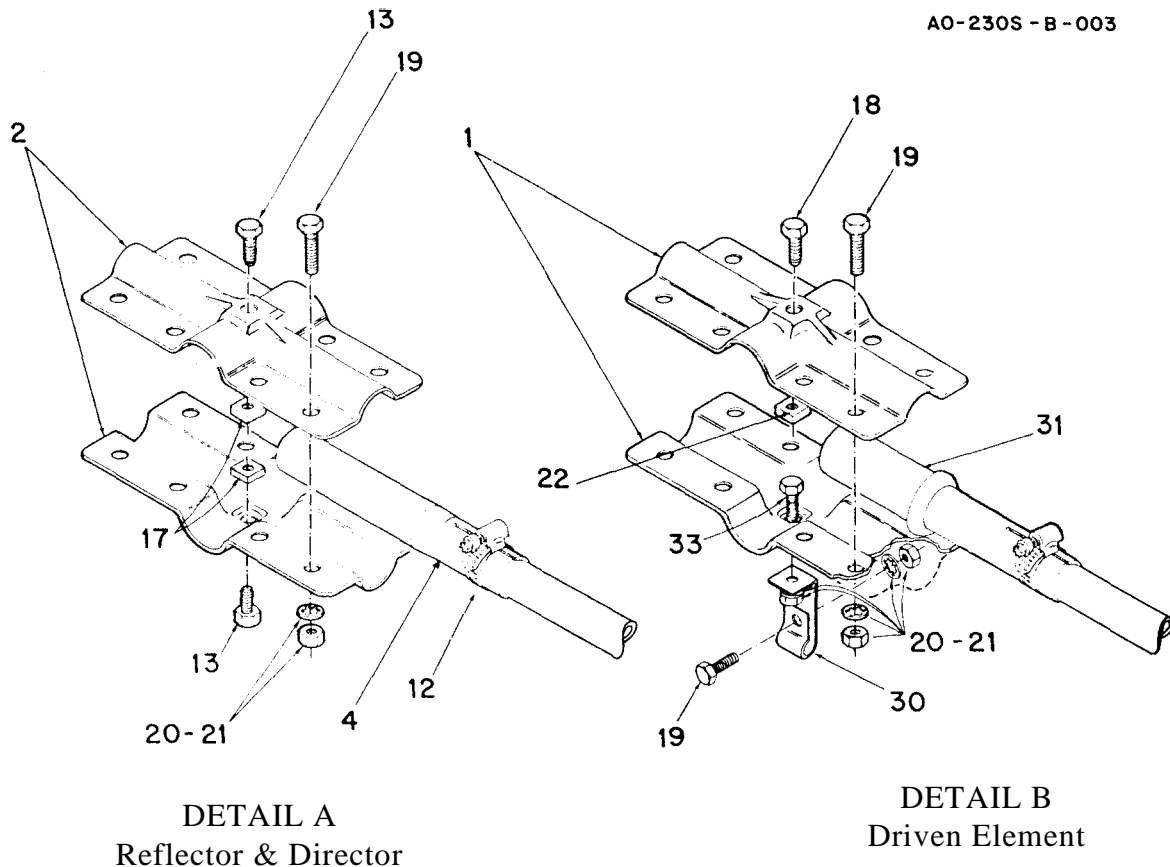


Figure 2 Boom-to-Mast Bracket

Select the two sections of boom (Item Nos. 6 & 7) and insert them into the boom-to-mast bracket until they meet at the center. Tighten the bolts.

Install the U-bolts and associated hardware as shown in Figure 2.

NOTE: See Figure 3, Detail B. Be sure to insert the bolt (Item No. 33) in the bottom half of the bracket from the "inside-out" to attach the beta support clamp.



Item No.	Description	Item No.	Description
1	Bracket, Driven Element-To-Boom, No 1.	19	Bolt, Hex Head, 1/3"-20 x 3/4"
2	Bracket, Element-To-Boom (small), No. 11	20	Lockwasher, internal, 1/4"
4	Tube, 5/8" x 7 1/2" 21 Nut, hex, 1/4"-20	22	Nut, square, 1/4"-20
12	Clamp, #6 Tubing	30	Clamp, Beta Support, 6 Meter
13	Bolt, Hex Head, #10-24 x 1/2"	31	Insulator, 5/8" to 1 1/4"
17	Nut, Square, #10-24	33	Bolt, Hex Head, 1/4"-20x1/2"
18	Bolt, Hex Head, 1/4"-20x3/8"		

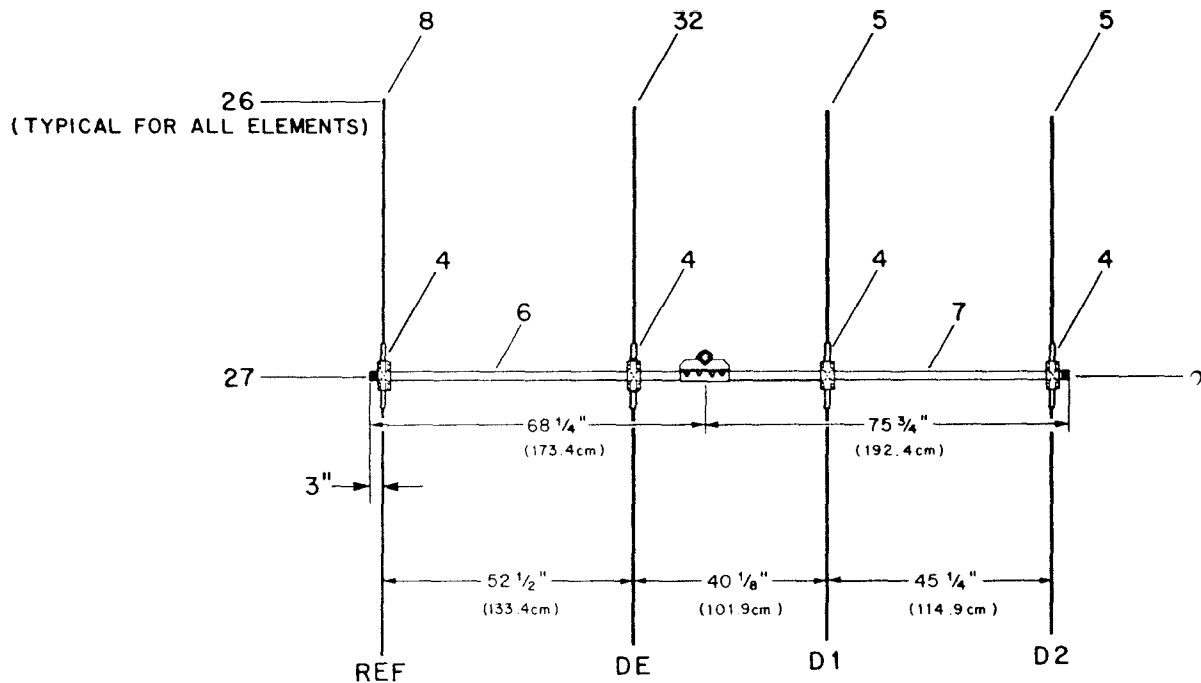
Figure 3  
Element-to-Boom Bracket

Refer to Figure 4. Place one small pair of brackets on one end of the boom (the end that measures approximately 68 1/4 inches from the center of the boom-to-mast bracket). This will be the reflector element-to-boom bracket. Tighten the brackets loosely using 1/4"-20x3/4" bolts (Item No. 19). Insert the 5/8"x7 1/2" tubing (Item No. 4) into each side of the bracket and tighten all bolts securely. This includes the center anchor bolts (Item Nos. 13, 18 & 19) on both sides of the element-to-boom brackets.

Place a #6 tubing clamp (Item No. 12) over the five eighths inch (5/8") tubing (Item No. 4). Insert the 7/16" x 53" tubing (Item No. 8) into the five eighths inch (5/8") -tubing. Refer to the chart (Figure 7) for the correct setting and tighten the tubing clamp.

Select the driven element-to-boom bracket (Item No. 1) and install in the same manner as described in the preceding two paragraphs. Insert the 5/8" x 7 1/2" tubes (Item No. 4) into the driven element insulators (Item No. 31). Insert the insulators into the bracket (Item No. 1).

SETTING DIMENSIONS ARE MEASURED FROM  
CENTER OF BOOM TO END OF ELEMENT

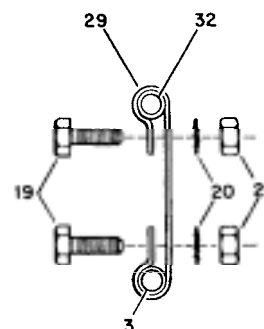
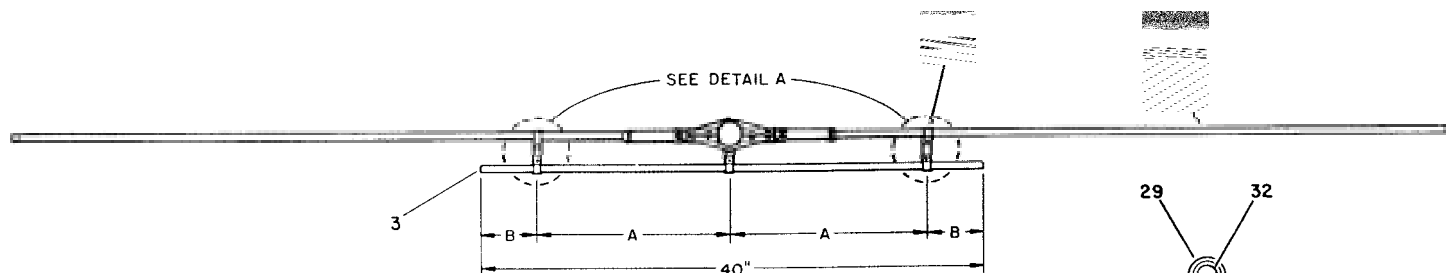


Item No.	Description
4	Tube, 5/8" x 7 1/2"
5	Tube, D1 and D2, 7/16" x 49"
8	Tube, Reflector, 7/16" x 53"
26	Caplug, 7/16" (with hole)
27	Caplug, 1 1/4"
32	Tube, Driven Element, 7/16" x 52"

	REF	DE	D1	D2
Setting #1 (50-51 MHz)	59" (1499 mm)	56 3/4" (1441 mm)	55" (1397 mm)	54" (1372 mm)
Setting #2 (50.5-53 MHz)	56 3/4" (1441 mm)	54 1/2" (1384 mm)	52 7/8" (1343 mm)	51 7/8" (1318 mm)
Setting #3 (51-54 MHz)	55 1/2" (1410 mm)	53 3/16" (1351 mm)	51 5/8" (1311 mm)	50 7/8" (1292 mm)

FREQUENCY SETTING CHART

Figure 4 Element Assembly and Antenna  
Dimensions



Item No.	Description
3	Beta Tube, 7/16" x 40"
19	Bolt, hex head, 1/4"-20 x 3/4"
20	Lockwasher, internal, 1/4"
21	Nut, hex, 1/4"-20
29	Clamp, Beta, 6 Meter
32	Tube, Driven Element, 7/16" x 52"

**DETAIL A**  
**Beta Clamp Assembly**

	DIM. A	DIM. B
Setting #1 (50-51 MHz)	15 1/2" (394 mm)	4 1/2" (108 mm)
Setting #2 (50.5-53 MHz)	15" (381 mm)	5" (127 mm)
Setting #3 (51-54 MHz)	15" (381 mm)	5" (127 mm)
Beta Match Setting		

(See Figure 7 for VSWR  
Curves) Figure 5 Beta Match  
Assembly

Place a #6 tubing clamp (Item No. 12) over the five eighths inch (5/8") tubing. Insert the 7/16" x 52" tubes (Item No. 32) into the five eighths inch (5/8") tubing. Refer to the chart (Figure 7) for the correct setting. After setting the tubes to the correct lengths, tighten the tubing clamps.

Assemble Directors 1 and 2 in the same manner as the reflector. Refer to Figure 4 and VSWR curves (Figure 7) for the correct

Attach the beta match as shown in Figure 5. Refer to the chart for the dimensions desired. Attach the balun assembly to your antenna as shown in Figure 6.

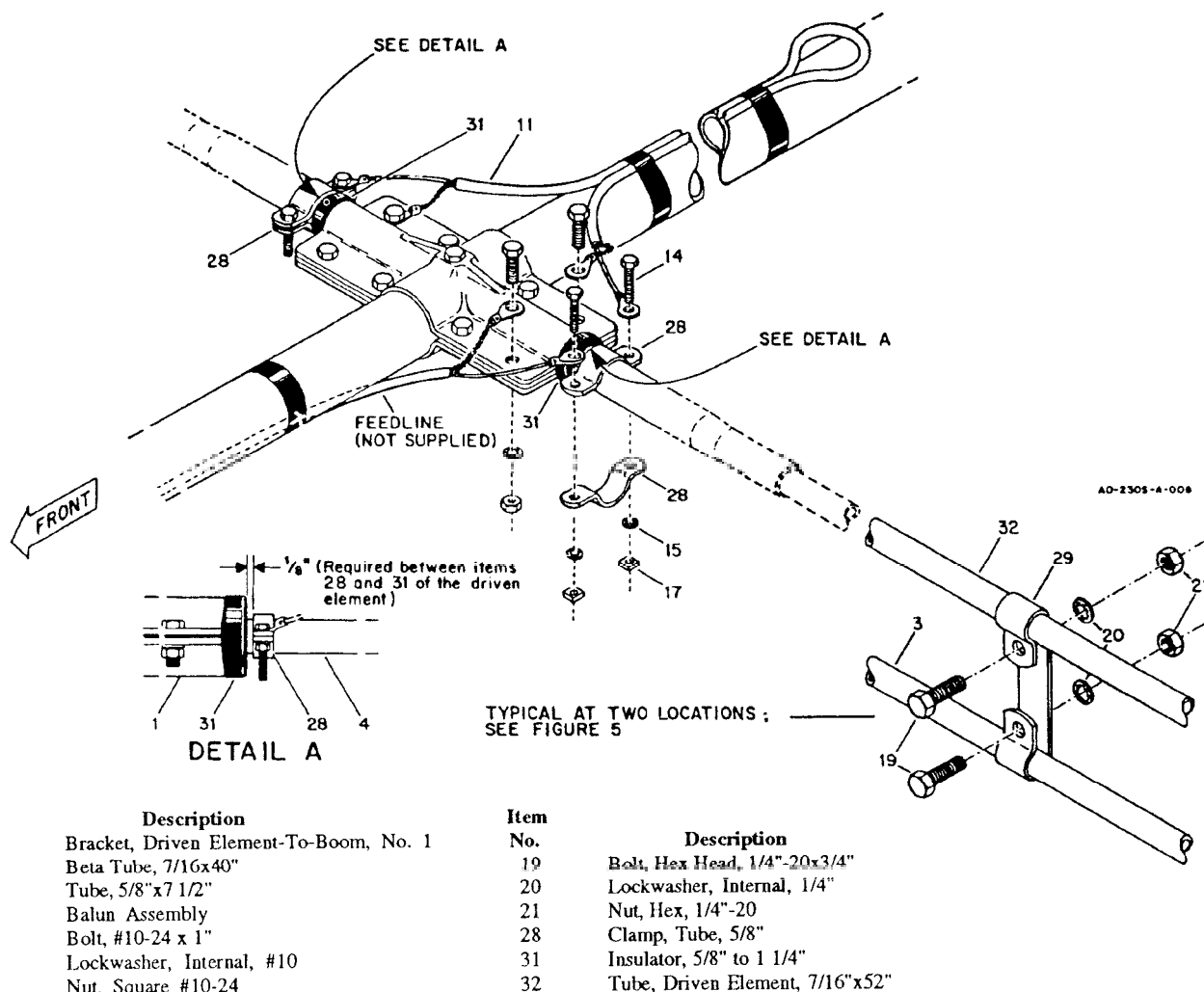


Figure 6 Balun and Feedline Connections

NOTE: For operation at power levels above 500 watts, construct a balun using RG-213/u coaxial cable. The cable cut-off length is 80 1/4". The shield length should be 78" with 1 1/8" of center conductor and dielectric exposed at each end.

Recheck all mechanical connections for tightness and seal with Coax-Seal® or some similar substance.

CAUTION:

**Protect exposed cable dielectric from U.V. with black tape or heat shrink.**

Coax-Seal® is a registered trademark of Universal Electronics, Inc.

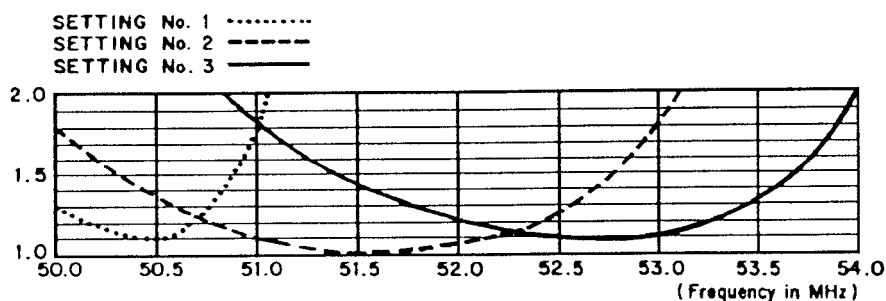


Figure 7  
VSWR Curves

## Rope Dampening Installation

Select the rope and cut it into eight equal lengths of two feet. Slip a length of rope into the end of each element. With about a 1/2" of rope extending from the element end separate the fibers and fold them back over the element (refer to Figure 8). Now slip a 7/16" caplug over the element and rope. The rope inside the element will prevent vibrations caused by low wind velocities.

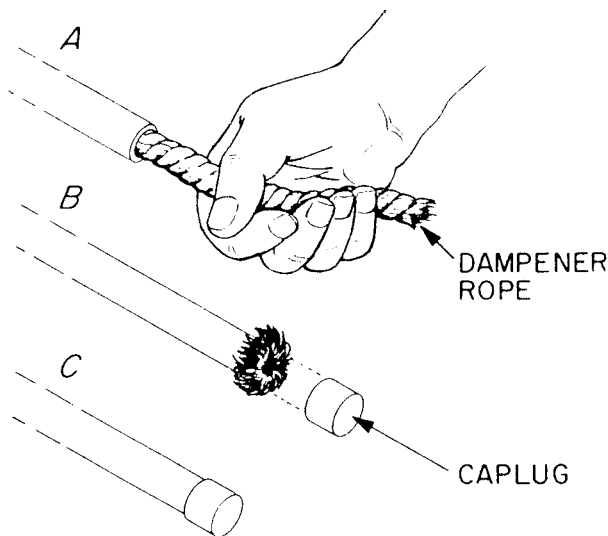


Figure 8 Rope  
Dampening

## Installation:

Attach your feedline to the driven element and the balun assembly, Tighten securely and tape the coax to the boom for strain relief.

The driven element and feedline may be positioned on either the bottom or top of the boom; however, when stacking 2 or more antennas, the feedline side of each balun should be on the same side for all antennas in the array.

Recommended feedline for the 64DX antenna is a low-loss cable such as Belden 8214 or 9913.

### WARNING:

Do Not allow any part of the antenna to touch power lines. This could cause severe burns and/or fatal injuries.

When mounting the 64DX beam above or below any other antennas, allow at least 5 feet for minimum interaction.

The recommended stacking distances for the 64DX antenna is 1.1 wavelengths (260 inches/6.6 m) in the E-plane and 0.64 wavelength (150 inches/3.8 m) in the H-plane.

## Service Information

If you encounter technical problems and need assistance, you should contact the Telex/HyGain Customer Service Department in Lincoln, Nebraska.

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, warranty claims, and to order replacement parts contact:

Hy-Gain  
308 Industrial Park Road  
Starkville, Mississippi 39759 USA

Phone: 662-323-9538  
FAX: 662-323-6551

## Announcin

Hy-Gain also makes similar antennas for 144 MHz and 432 MHz for SSB/CW DX. Product 232S, Model 215DX features 15 elements on a 28 foot boom for 144-146 MHz. Products 231S, model 70-31 DX features 31 elements on a 24 foot boom for 432-438 MHz.



## Parts List

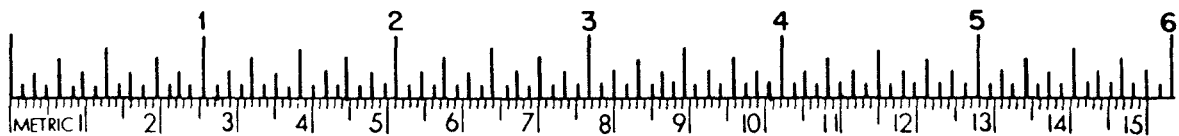
Item No.	Part No.	Description	Qty
1	165138	Bracket, Driven Element-To-Boom, No. 1 .....	2
2	161422	Bracket, Element-To-Boom (small), No. 11 .....	6
3	175637	Beta Tube, 7/16" x 40" .....	1
4	190002	Tube, 5/8" x 7 1/2" .....	8
5	172929	Tube, D1 & D2, 7/16" x 49" .....	4
6	175648	Tube, Boom, No. 1, 1 1/4" x 68 1/4" .....	1
7	175649	Tube, Boom, No. 2, 1 1/4" x 75 3/4" .....	1
8	172928	Tube, Reflector, 7/16" x 53" .....	2
9	385142-1	Bracket, Boom-To-Mast .....	1
10	385144-1	Clamp, Boom-To-Mast .....	1
11	871740	Balun Assembly .....	1
	872015-1	Parts Pack 230S-1, Stainless Steel .....	1
12	358756	Clamp, #6 tubing .....	8
13	500158	Bolt, Hex Head, # 10-24 x 1/2" .....	7
14	504069	Bolt, Hex Head, # 10-24 x 1" .....	4
15	565697	Lockwasher, Internal, #10 .....	5
16	554071	Nut, Hex, #10-24 .....	5
17	555693	Nut, Square, #10-24 .....	7
18	500156	Bolt, Hex Head, 1/4"-20 x 3/8" .....	1
19	505266	Bolt, Hex Head, 1/4"-20 x 3/4" .....	44
20	562961	Lockwasher, Internal, 1/4" .....	44
21	554099	Nut, Hex, 1/4"-20 .....	44
22	551367	Nut, Square, 1/4"-20 .....	1
23	540067	U-Bolt, 5/16"-18 x 2 1/16" x 3 5/8" .....	2
24	564792	Lockwasher, Split, 5/16" .....	4
25	555747	Nut, Hex, 5/16"-18 .....	4
26	475639	Caplug, 7/16" (with hole).....	8
27	455630	Caplug, 1 1/4" .....	2
28	162803	Clamp, Tube, 5/8" .....	4
29	165641	Clamp, Beta, 6 Meter .....	2
30	165643	Clamp, Beta Support, 6 Meter .....	1
31	461057	Insulator, 5/8" to 1 1/4" .....	2
32	175165	Tube, Driven Element, 7/16" x 52" .....	2
33	506708	Bolt, Hex Head, 1/4"-20 x 1/2" .....	1

# 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 inch (1") = 2.54 cm  
1 foot (1') = 30.48 cm

Example: 42" x 2.54 = 106.7



FRACTION AND METRIC EQUIVALENTS FOR ONE INCH			
Fractional		Fractional	
Inch	Millimeters	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

## **hy-gain®** LIMITED WARRANTY

**Hy-Gain** Warrants to the original owner of this product, if manufactured by **Hy-Gain** and purchased from an authorized dealer or directly from **Hy-Gain** to be free from defects in material and workmanship for a period of 12 months for rotator products and 24 months for antenna products from date of purchase provided the following terms of this warranty are satisfied.

1. The purchaser must retain the dated proof-of-purchase (bill of sale, canceled check, credit card or money order receipt, etc.) describing the product to establish the validity of the warranty claim and submit the original or machine reproduction of such proof of-purchase to **Hy-Gain** at the time of warranty service. **Hy-Gain** shall have the discretion to deny warranty without dated proof-of-purchase. Any evidence of alteration, erasure, or forgery shall be cause to void any and all warranty terms immediately.
2. **Hy-Gain** agrees to repair or replace at **Hy-Gain's** option without charge to the original owner any defective product under warranty, provided the product is returned postage prepaid to **Hy-Gain** with a personal check, cashiers check, or money order for \$8.00 covering postage and handling.
3. Under no circumstances is **Hy-Gain** liable for consequential damages to person or property by the use of any **Hy-Gain** products.
4. Out-of-warranty Service: **Hy-Gain** will repair any out-of-warranty product provided the unit is shipped prepaid. All repaired units will be shipped COD to the owner. Repair charges will be added to the COD fee unless other arrangements are made.
5. This warranty is given in lieu of any other warranty expressed or implied.
6. **Hy-Gain** reserves the right to make changes or improvements in design or manufacture without incurring any obligation to install such changes upon any of the products previously manufactured.
7. All **Hy-Gain** products to be serviced in-warranty or out-of-warranty should be addressed to **hy-gain, 308 Industrial Park Road, Mississippi 39759, USA** and must be accompanied by a letter describing the problem in detail along with a copy of your dated proof-of-purchase.
8. This warranty gives you specific rights, and you may also have other rights which vary from state to state.