

hy-gain®

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DB-1015
Duo-Monoband Beam
7-Element, 10 and 15 Meter

INSTRUCTION MANUAL

General Description

The Hy-Gain DB-1015 is a 7 elements, 2-band beam antenna designed for operation on the 10 and 15 meter amateur bands. The DB-1015 uses Hy-Gain's unique Para-Sleeve driven element, monoband reflectors and directors, and Hy-Gain's rugged boom-to-mast bracket. The DB-1015 will mount on a standard 2" O.D. mast and can be rotated with Hy-Gain's CD-45II or HAM-IV/V rotators. All hardware is stainless steel.

Hy-Gain's Para-Sleeve* driven elements and the monoband parasitics allow 3-element monobander performance on each of the two bands! In additions, the DB-1015 includes assembly dimensions for either 10/15 meters or 12/17 meters. The DB-1015 is designed to survive 115 MPH winds with no ice and 80 MPH winds with .25 inch radial ice! This antenna also features a 4-piece boom and a 49" (1.24M) shipping container - ideal for DXpeditions.

Specifications

Electrical:

Gain (ave.).....	5.2 dBd (7.4 dBi)
Front-to Back Ratio (max.)	25 dB
Maximum power.....	1500 watts continuous duty
VSWR at resonance.....	less than 1.5:1
Input Impedance.....	50 ohms
Matching system.....	Beta (DC ground)

Mechanical:

Boom Length.....	14 ft. (4.3 m)
Boom Diameter.....	2 in. (51 mm)
Longest Element.....	29' 6" (9 m)
Turning Radius.....	16' 3" (5 m)
Accepts Mast.....	1.9 to 2.5 in. (48 to 64 mm)
Net Weight.....	36 lb. (17 kg)
Shipping Weight.....	38.5 lb. (17.5 kg)
Maximum Wind Survival.....	115 mph (185 kph)
Wind Surface Area (max.).....	6.7 sq. ft. (0.6 sq.m.)
Wind Load at 80 MPH.....	172 lb. (78 kg)
Hardware.....	All Stainless Steel
Suitable Rotators.....	Hy-Gain CD-45II, HAM IV or Ham V

*References: U.S. Patent Number 4,604,628. "The Open-Sleeve Antenna", CQ Magazine, Vol. 39, No. 8, August 1983, Pages 13-19. The ARRL Antenna Book, 16th Edition and later, "The Open-Sleeve Antenna", Multiband Antennas Chapter.

Preparation for Assembly

FOR OUR OVERSEAS CUSTOMERS: The United States uses American units of measurement. Please see page 8 of this manual for American-to-Metric conversion. Most illustrations include both American and Metric dimensions.

When unpacking your antenna, check inside of all tubing for smaller tubes. To conserve space and protect parts, these parts are packed this way. Check all parts against the parts list to ensure none are missing.

Choose a large, clear area to assemble your DB-1015 antenna. The area must be at least 14' x 30' (4.3 m x 9 m). You may wish to use a temporary mast to support the boom during assembly.

All tubing supplied with the DB-1015 telescopes together. Make all measurements to the given dimensions, plus or minus no more than 1/8 inch (3 mm).

TOOLS: The following tools are required for easy assembly

Type Tool	Qty
Tape Measure, 12 foot.....	1
Nut Driver, 5/16" (8mm).....	1
Nut Driver, 3/8" (9.5mm).....	1
Nut Driver, 7/16" (11mm).....	1
Nut Driver, 1/2" (12.7 mm).....	1

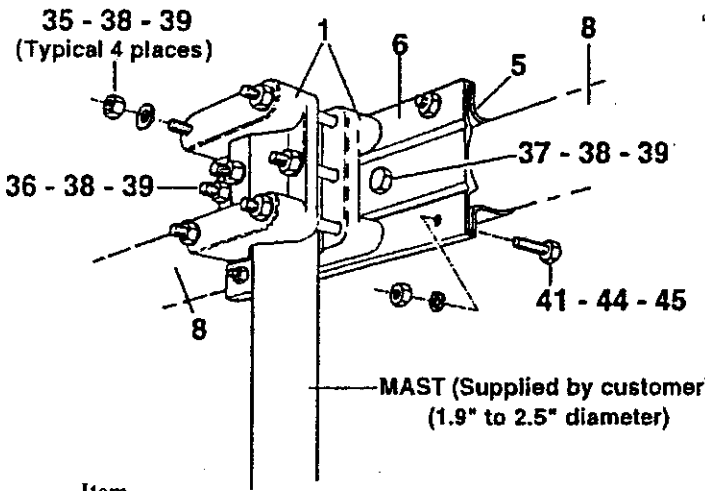
Assembly of the Boom

Select the boom-to-mast clamps (Items 5 and 6). Loosely assemble them on the drilled ends of the two boom sections (Item 8) using the 1/4"-20 x 3/4" bolts, 1/4" nuts and lockwashers (Items 41, 44 and 45). Secure the boom to the bracket using the two 5/16"-18 x 2 3/4" screws, nuts and lockwashers (Items 37, 38 and 39). Tighten these six bolts securely.

Assemble the two cast aluminum brackets (Item 1) on your temporary mast about 4 feet (1 m) above ground. Secure the two brackets together using the two 5/16"-18 x 3" bolts, nuts and lockwashers. Tighten these two bolts evenly until the brackets are snug.

Attach the boom assembly to these two brackets using the four 5/16"-18 x 5" bolts, nuts and lockwashers (Items 35, 38 and 39). Tighten these four bolts just enough to hold the weight of the antenna.

Assemble the remaining two boom sections (Item 7) to the ends of the assembled boom using 1/4"-20 x 2 1/2" screws, nuts, and lockwashers. Tighten securely.



Item No.	Description
1	Mast Bracket, cast aluminum
5	Clamp, Boom-to-bracket
6	Bracket, Casting-to-boom
8	Boom, 2" x 46 1/2" swaged
35	Bolt, 5/16"-18 x 5", hex head, stainless steel
36	Bolt, 5/16"-18 x 3", hex head, stainless steel
37	Bolt, 5/16"-18 x 2 3/4", hex head, stainless steel
38	Nut, 5/16"-18, hex, stainless steel
39	Lockwasher, 5/16", split, stainless steel
41	Bolt, 1/4"-20 x 3/4", hex head, stainless steel
44	Nut, 1/4"-20, hex, stainless steel
45	Lockwasher, 1/4" internal

Figure 1
Boom-to-Mast Bracket

Element-to-Boom Brackets

There are three sizes of element-to-boom brackets supplied. The largest (Item 4) has a 1 1/2" I.D., and is used only on the 15m driven element. The medium-sized brackets (Item 3) have a 1 1/4" I.D., and are used on the 15m reflector and director elements. The smallest brackets (Item 11) have a 7/8" I.D., and are used on the all of the 10m elements.

Assemble the brackets as shown in Figure 2 and position them on the boom as shown in Figure 8. It is easier to assemble the brackets on the boom at the correct location, rather than try to slide them on the boom. If you are going to leave this assembly unattended for more than 15 minutes, we suggest that you tighten the eight (8) bolts on each bracket, so that they do not vibrate off. Do not tighten the two (2) anchor bolts (Item 40) until the elements are installed and aligned.

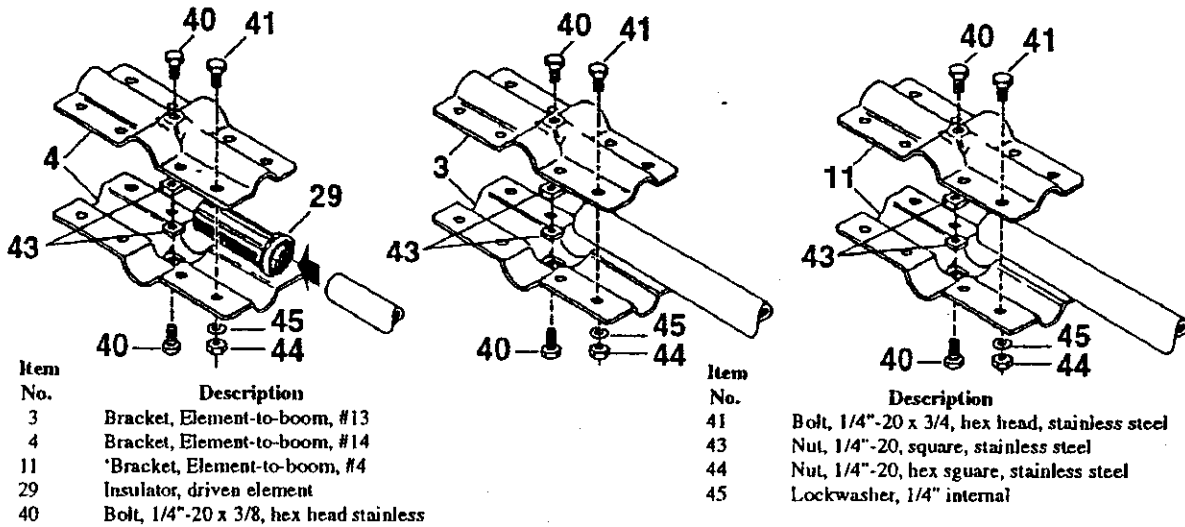
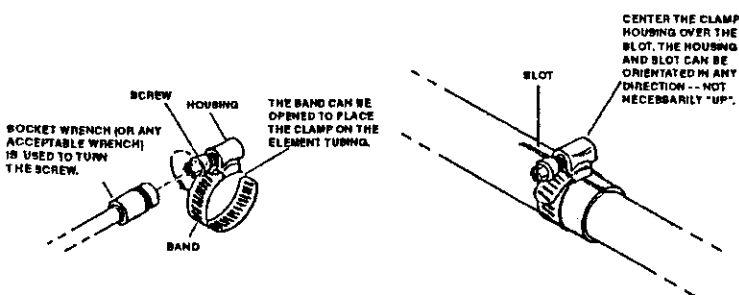


Figure 2
Element-to-Boom Bracket

Tubing Clamp Assembly

Select the proper size tubing clamps as shown in Figure 3. When installing the clamps, 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 (8 mm) nut driver until the tubing will not twist or telescope. DO NOT overtighten!



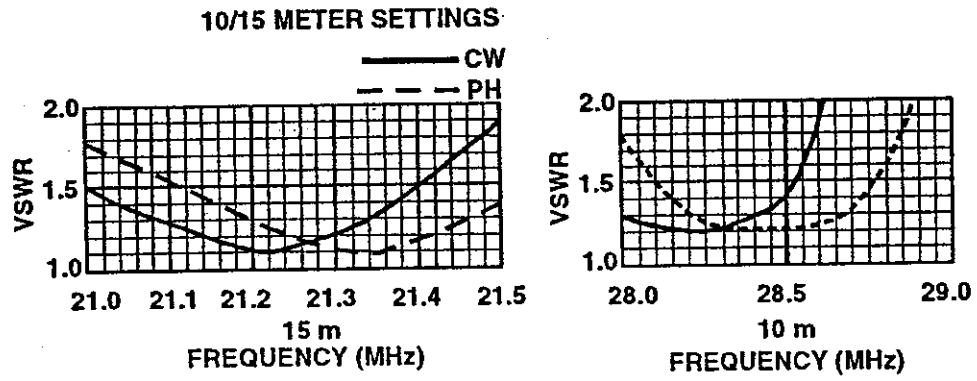
Part No.	Description	Fits Tubing Sizes
358756	Clamp, Size #6 all stainless steel 5/16" hex head screw	1/2" - 7/8"
358757	Clamp, Size #10 all stainless steel 5/16" hex head screw	1 1/8"
358758	Clamp, Size #16 all stainless steel 5/16" hex head screw	1 1/4"

Figure 3
Tubing Clamp Assembly

Settings

The DB-1015 is supplied with 3 settings - 12/17, 10/15 - CW, and 10/15 - Phone. Choose one of these settings to use in assembling this antenna. Typical VSWR curves shown in Figure 4 will help you decide which setting to use.

The VSWR curves are typical for this antenna mounted 70 feet (21.3 m) above ground. Similar curves can be expected for this antenna mounted between 30 feet (9.1 m) and 100 feet (30.5 m) above ground. Do not try to tune this antenna for low VSWR at ground level!



NOTE: 12 and 17 meter settings are not shown as the VSWR is less than 1.5 over each entire band.

Figure 4
VSWR Curves

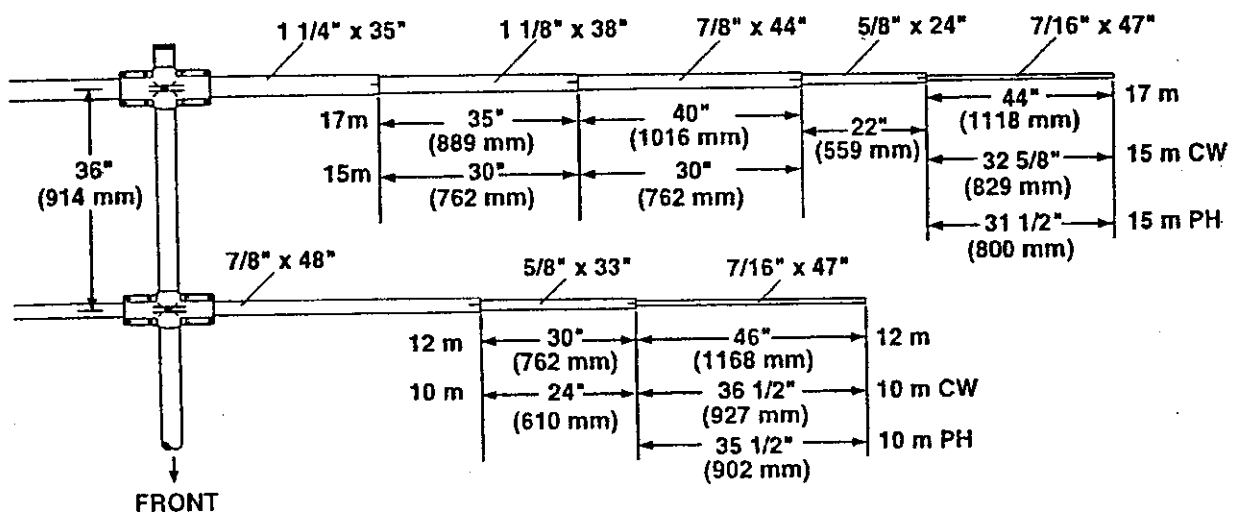


Figure 5
Reflector Assemblies

Element Assembly

Select the remaining tubing parts and tubing clamps. Assemble each element as shown in Figures 5, 6, and 7. Mark each element with an indelible marker. Use "15R" for the 15m reflector sections, "15DE" for the 15m driven element sections, and "15DIR" for the 15m director sections.

Mark the 10m sections in the same manner. Install the driven element insulators (Item 29) and the 1 1/4" tubing clamp assemblies onto the large ends of the 15m driven element sections. See Figure 3 for clamp assembly details.

Penetrox-A® is supplied for use as an anti-oxidant within the element tubing assemblies

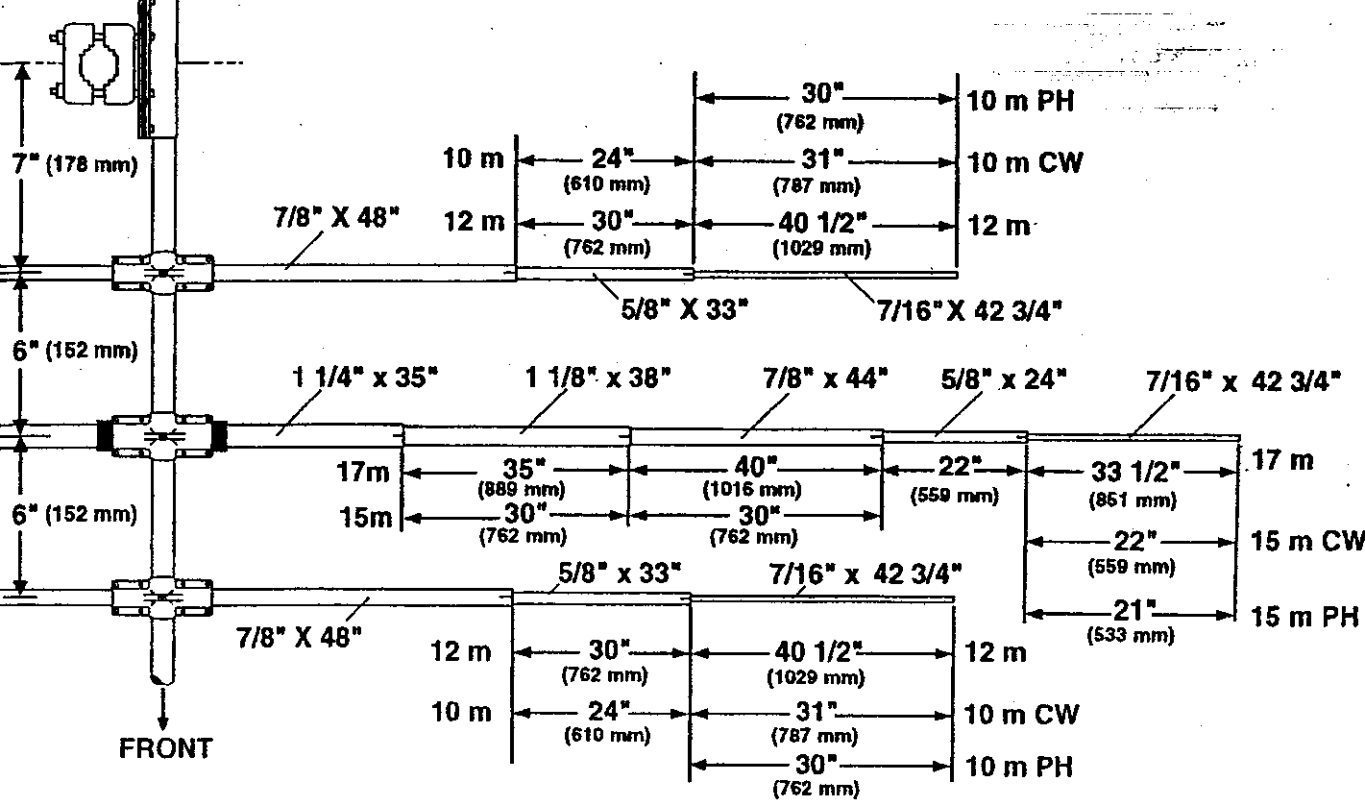


Figure 6
Driven Element Assemblies

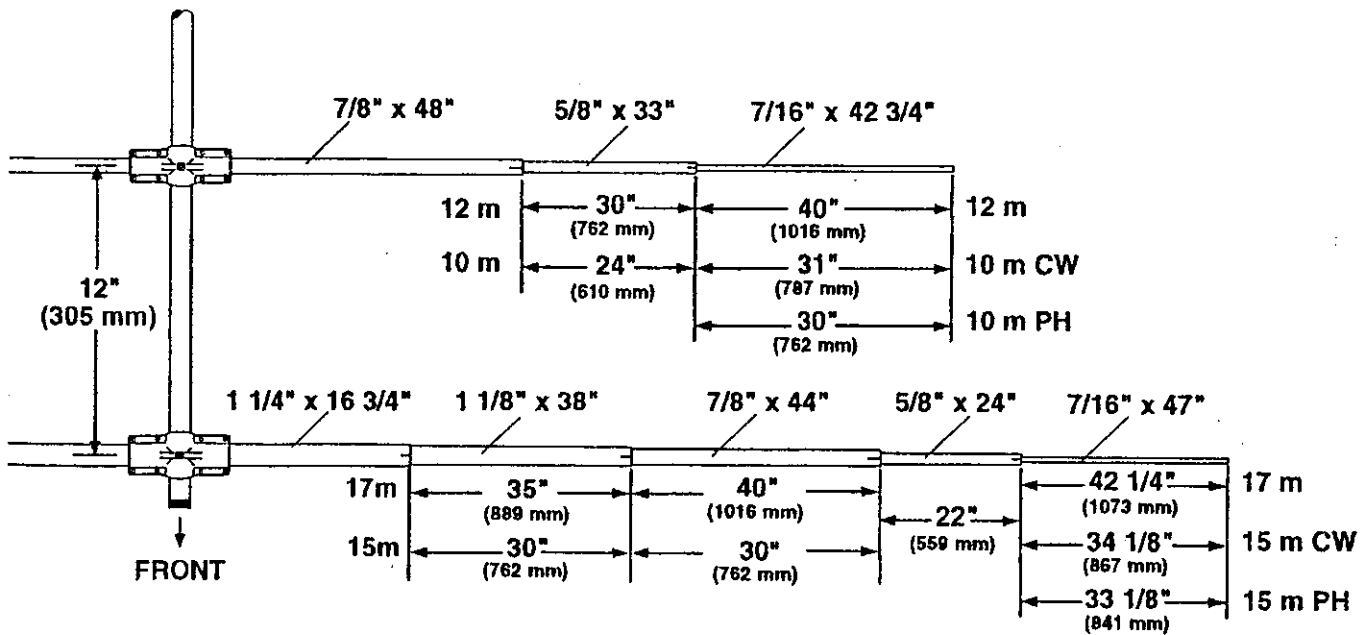


Figure 7
Director Assemblies

Select each completed element assembly and install each into the appropriate element-to-boom bracket. Refer to the Overall View in Figure 8. Tighten the eight (8) 1/4"-20 x 3/4" bolts on each bracket until it is difficult to rotate the bracket on the boom. Make sure the anchor bolts in the center of each bracket are still loose at this point.

Recheck the spacings between the elements and adjust if necessary. Align all elements so that they are parallel to the ground and at a right angle to the temporary mast. When all elements are aligned, securely tighten the eight bolts and two anchor bolts on each element.

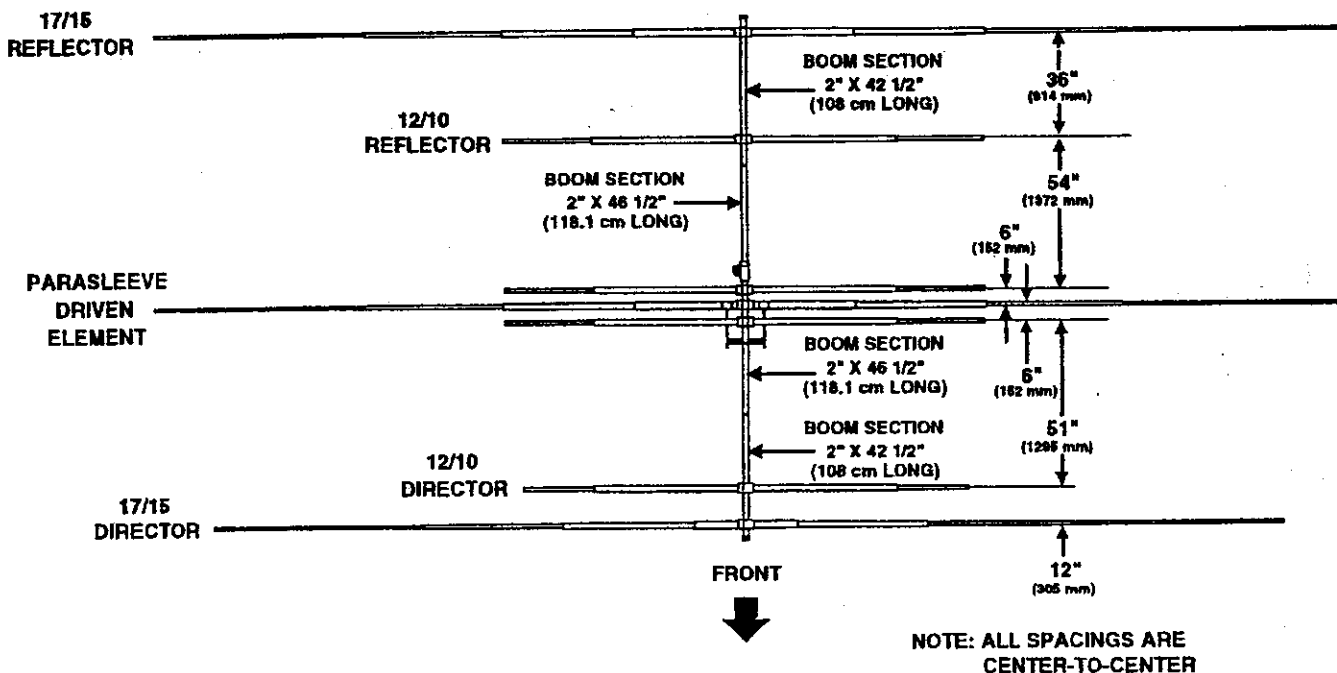
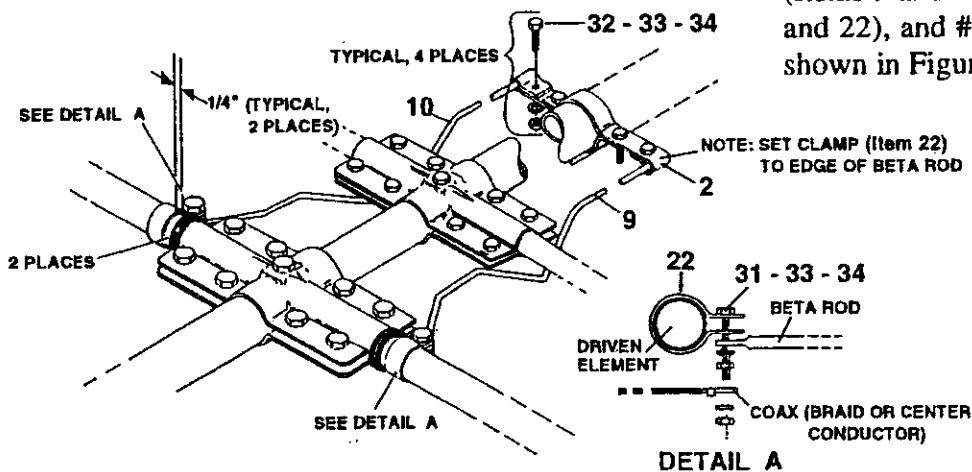


Figure 8
DB-1217 Overall View

Beta Match Assembly

Select the left and right beta match rods (Items 9 and 10), beta match clamps (Items 2 and 22), and #10-24 hardware. Assemble as shown in Figure 9.

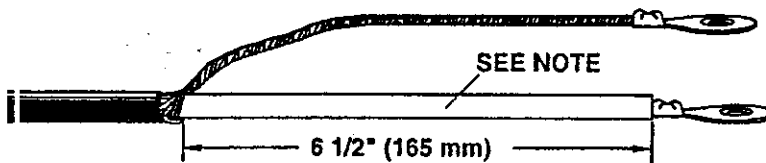
NOTE: DO NOT ALLOW THE BETA RODS TO TOUCH THE ELEMENT - TO - BOOM BRACKETS OR THE 12m ELEMENT



Item No.	Description
2	Clamp, beta shoring
9	Beta rod, 1/4" left
10	Beta rod, 1/4" right
22	Clamp, 1 1/4" tubing
31	Bolt, 1/4"-20 x 3/8", hex head, s.s.
32	Bolt, #10-24 x 1", hex head, s.s.
33	Nut, #10-24, hex, s.s.
34	Lockwasher, #10 internal, s.s.

Figure 9
Beta Match Assembly

NOTE: COVER COAX DIELECTRIC WITH BLACK TAPE OR HEAT SHRINK TUBING TO PREVENT CRACKING FROM U.V. EXPOSURE.



**Figure 10
Coax Stripping**

Balun Choices

The DB-1015 does not include a balun, however it is recommended that a balun or coaxial RF choke be used at the feedpoint. A voltage-balun such as the Hy-Gain BN-86 may be used if antenna tuners and high-power amplifiers will not be used together with this antenna.

A current-type balun such as the Hy-Gain BN-4000 is highly recommended, especially if this antenna will be used off-resonance with antenna tuners and high-power amplifiers. Another alternative is to use a home-made RF choke. This works identical to the current-type balun.

The RF choke may be wound from 12 turns of RG-213/U on a 6 inch diameter form. One end should be stripped as shown in Figure 10. The RF choke **MUST** be mounted at the driven element.

Installation

Double-check all dimensions and tighten all connections before installation.

WARNING!

Installation of this antenna near power lines is dangerous! For your safety, follow the instructions provided with your tower and the instructions in this manual. **NEVER** install this antenna within 20 feet of any power lines!

The cast aluminum boom-to-mast brackets must be removed from the temporary mast and installed on the permanent mast as shown in Figure 1. Attach a gin pole to the tower or mast to assist in lifting the antenna. There must be at least two (2) people available when installing this antenna. **DO NOT** try to install this antenna by yourself!

Attach the lifting rope to the balance point of the antenna. The lifting rope should be fed through the gin pole or other pulley arrangement attached to the tower. The other end should be at ground level, available to the ground crew for lifting.

When the antenna reaches the mast bracket, pin the antenna to the cast brackets with a single 5" bolt. This takes the weight of the antenna off the lifting rope and allows the person at the top of the tower to tilt the antenna up, so that the other three 5" bolts may be installed. Tighten all four of the 5/16"-18 x 5" bolts (Item 35) securely. Check the direction of the antenna for use in calibrating your rotator and reposition if necessary. Tape the coaxial cable to the mast, leaving a loop for rotation. This completes your installation of the DB-1015.

Service Information

If you are encounter technical problem and need assistance, you should contact Hy-Gain Customer Service Department.

Hy-Gain
308 Industrial Park Road
Starkville, Mississippi 39759 USA
Phone: 662-323-9538
FAX: 662-323-6551

Converting American Measurements to Metric

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

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

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

$$\text{Example: } 42" \times 2.54 = 106.7 \text{ cm}$$



Please record the following information for your records

Date of Purchase: _____

Purchased From: _____

Price Paid: _____

Please retain your copy of the Bill-of-Sale for warranty claims

Item No.	Part No.	Description	Qty
1	102734	Mast Bracket, cast aluminum.....	2
2	163371	Clamp, beta shorting.....	2
3	165919	Bracket, Element-to-boom, #13.....	4
4	165920	Bracket, Element-to-boom, #14.....	2
5	172732	Clamp, Boom-to-bracket.....	1
6	172735	Bracket, Casting-to-boom.....	1
7	179892	Tube, 2" x .049 x 42 1/2", drilled.....	2
8	179893	Tube, 2" x .049 x 46 1/2", swaged.....	2
9	170067	Beta rod, 1/4" left.....	1
10	170068	Beta rod, 1/4" right.....	1
11	163764	Bracket, Element-to-boom, #4.....	8
12	190307	Tube, aluminum, 1 1/8" x 38".....	6
13	172922	Tube, aluminum, 7/16" x 47".....	6
14	175512	Tube, aluminum, 7/16" x 42 3/4".....	8
15	190004	Tube, aluminum, 5/8" x 24".....	6
16	190015	Tube, aluminum, 5/8" x 33.....	8
17	190205	Tube, aluminum, 7/8" x 44".....	6
18	190906	Tube, aluminum, 1 1/4 x 16 3/4".....	2
19	191025	Tube, aluminum, 7/8" x 48.....	8
20	878579	Tube Assembly, Driven Element, 1 1/4" x 35".....	4
21	873725	Parts Pack Clamps DB-1015 / DB-1217.....	1
22	171777	Clamp, 1 1/4", tubing.....	2
23	358756	Clamp, #6 tubing.....	28
24	358757	Clamp, #10 tubing.....	6
25	358758	Clamp, #16 tubing.....	6
26	878726	Parts Pack Insulator.....	1
27	455625	Caplug, 2".....	2
28	455644	Caplug, 7/16".....	14
29	465833	Insulator, driven element.....	2
30	878727	Parts Pack Hardware DB-1015 / DB-1217.....	1
31	500159	Bolt, #10-24 x 1 1/2", hex head, stainless steel.....	2
32	504069	Bolt, #10-24 x 1, hex head, stainless steel.....	4
33	554071	Nut, #10-24 hex, stainless steel.....	8
34	565697	Lockwasher, internal, #10, stainless steel.....	10
35	500349	Bolt, 5/16"-18 x 5", hex head, stainless steel.....	4
36	500392	Bolt, 5/16"-18 x 3", hex head, stainless steel.....	2
37	506968	Bolt, 5/16"-18 x 2 3/4", hex head, stainless steel.....	2
38	555747	Nut, 5/16"-18, hex, stainless steel.....	8
39	564792	Lockwasher, 5/16", split, stainless steel.....	12
40	500156	Bolt, 1/4"-20 x 3/8", hex head, stainless steel.....	14
41	505266	Bolt, 1/4"-20 x 3/4", hex head, stainless steel.....	60
42	505734	Bolt, 1/4"-20 x 2 1/2", hex head, stainless steel.....	2
43	551367	Nut, 1/4"-20, square, stainless steel.....	14
44	554099	Nut, 1/4"-20, hex, stainless steel.....	62
45	562961	Lockwasher, 1/4" internal.....	62
46	878697	Penatrox-A®, 1 oz.	1

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, Starkville, 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.