TELEX hy-gain
TELEX COMMUNICATIONS, INC.
8601 NORTHEAST HIGHWAY SIX, LINCOLN, NE 68505 U.S.A.

80207

INSTRUCTION MANUAL

ORDER NO. 208

8 Element, 2-Meter Beam

PN 801318

General Description

This antenna is an eight element optimum spaced, two-meter beam. It features extremely high forward gain, a clean radiation pattern and an excellent front-to-back ratio. The dimensions shown in Figure 2 produce a radiation pattern with low sidelobes and backlobes over the entire two-meter band.

Specifications

Mechanical

Boom length	148¾" (3.778 m)
Longest element	40¼" (1.022 m)
Net weight	4.1 lbs. (1.859 kg)
Turning radius	75⅛" (1.984 m)
Wind survival	80 mph (128.74 kmph)
Mast diameter	1¼" to 1⅝" O.D. (3.17 cm to 4.12 cm)
Boom diameter	1¼" O.D. (3.17 cm)
Wind area	1.26 ft.² (0.117 m²) (vertical)
	1.02 ft.² (0.094 m²) (horizontal)

Electrical

Gain	14.0 dBi, 11.8 dBd
Front-to-back ratio	20 dB
Maximum SWR	2:1
Bandwidth	2 MHz
Maximum power	250 watts continuous, 500 watts P.E.P.
Impedance	52 ohms (with balun)
Half-power beam width	43° (vertical polarization)
	36° (horizontal polarization)
Broadside stacking distance	123" (3.124 m)

(82" minimum [2.082 m minimum])

SWR and Feedline

The 208 antenna has an input impedance of 200 ohms. The supplied balun matches the input to 52 ohms. If you are using transmission line with a characteristic impedance other than 52 ohms or 200 ohms, a matching device must be made. Refer to any current Amateur Handbook for information on constructing a matching device.

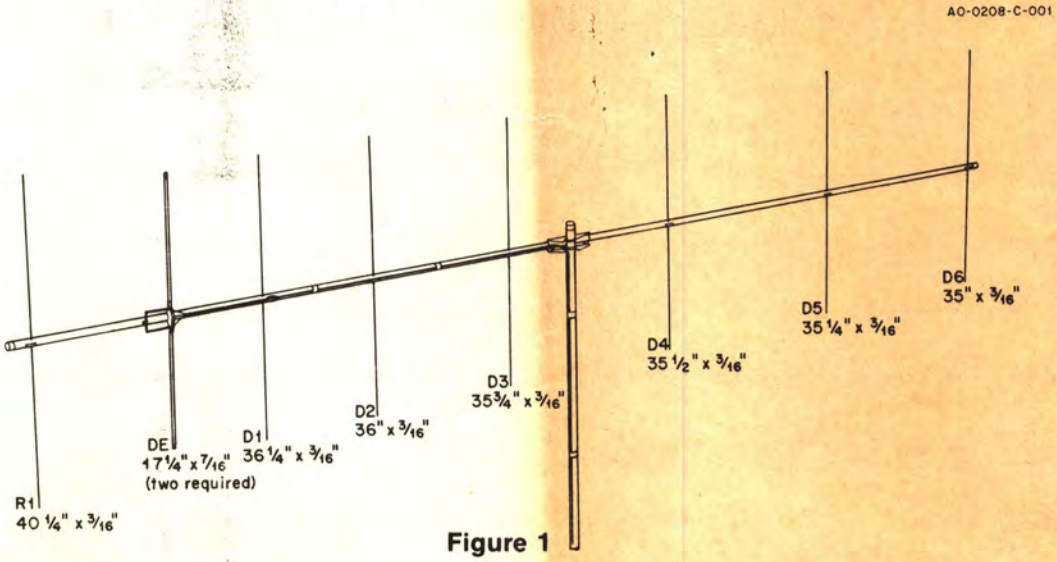


Figure 1

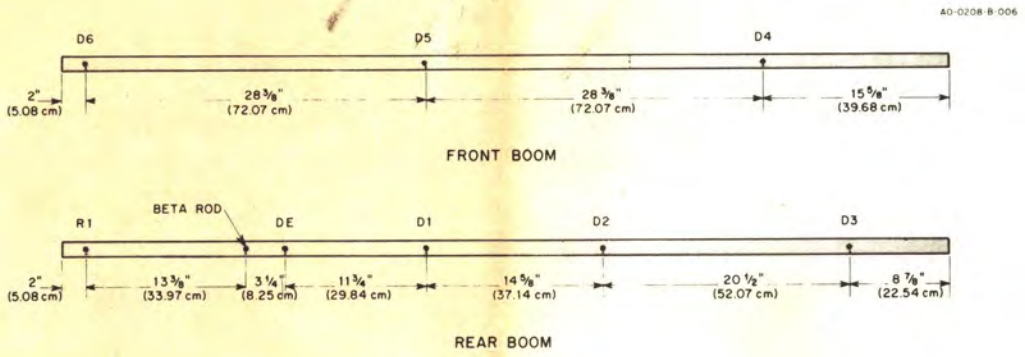


Figure 2

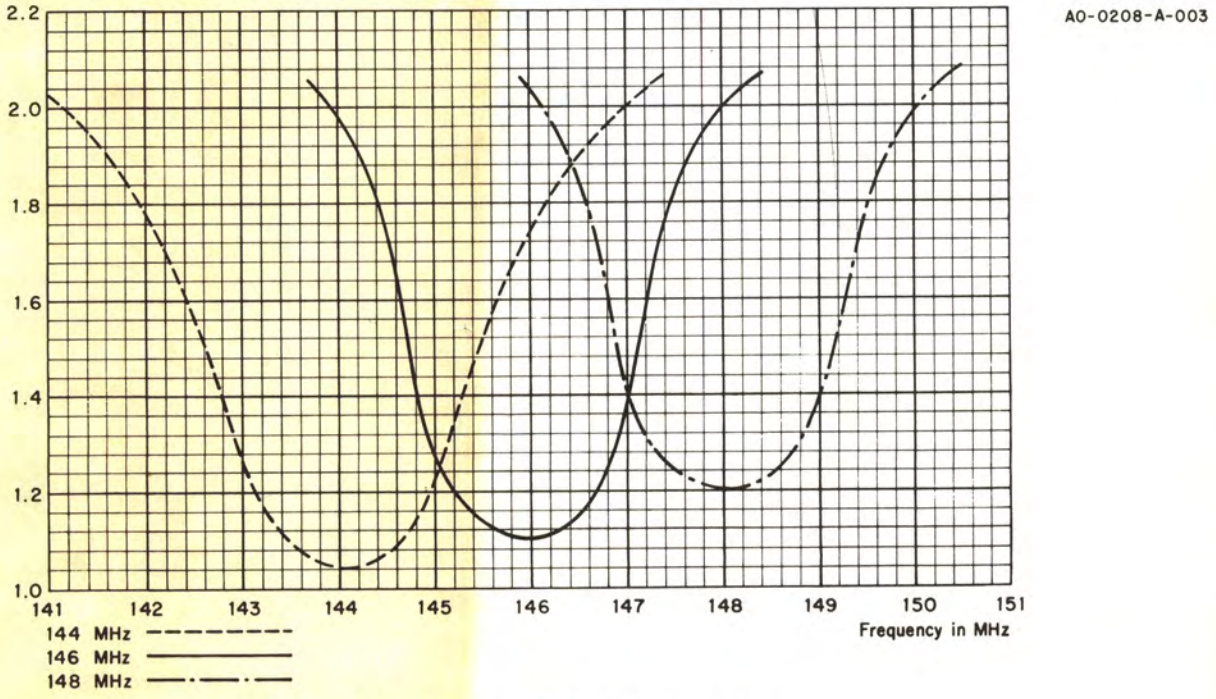
Tuning

This antenna is pre-tuned for optimum performance over the entire 2-meter band. In most cases, maximum front-to-back ratio does not occur at the same frequency where maximum gain is obtained. To obtain the maximum front-to-back ratio, cut the parasitic elements to the lengths shown in the parasitic cutting charts.

SWR can be lowered to 1.1:1 at the desired frequency by carefully trimming the Driven Element. Keep the element symetrical by trimming the same amount from each side. Typical SWR curves are shown in Figure 3 for use as a guide. Each installation is different, so cut for the lowest SWR at your particular location.

Parasitic Cutting Chart

MHz	144	145	146	147	148
R1	40¼ (102.2 cm)	40 (101.6 cm)	39¾ (100.9 cm)	39½ (100.3 cm)	39¼ (99.6 cm)
D1	36¼ (92.0 cm)	36 (91.4 cm)	35¾ (90.8 cm)	35½ (90.1 cm)	35¼ (89.5 cm)
D2	36 (91.4 cm)	35¾ (90.8 cm)	35½ (90.1 cm)	35¼ (89.5 cm)	35 (89.9 cm)
D3	35¾ (90.8 cm)	35½ (90.1 cm)	35¼ (89.5 cm)	35 (88.9 cm)	34¾ (88.2 cm)
D4	35½ (90.1 cm)	35¼ (89.5 cm)	35 (88.9 cm)	34¾ (88.2 cm)	34½ (87.6 cm)
D5	35¼ (89.5 cm)	35 (88.9 cm)	34¾ (88.2 cm)	34½ (87.6 cm)	34¼ (86.9 cm)
D6	35 (88.9 cm)	34¾ (88.2 cm)	34½ (87.6 cm)	34¼ (86.9 cm)	34 (86.3 cm)



VSWR for Horizontal Polarization Only
Figure 3

Stacking

The antenna can be easily stacked for approximately 3 dB more gain each time the number of yagi is doubled. Refer to Figure 4 for stacking and phasing harness cutting information.

The two phasing lines coming from the two antennas to the "T" connector can be any odd multiple of one-quarter wavelength in the 75 ohm transmission line. See Figure 5.

NOTE: When phasing two antennas, the Driven Element halves that are connected directly to the phasing lines should be on the same side of the array.

The feedline impedance is for 52 ohms. (RG-8/u). For detailed information on stacking more than two yagis, please consult any current Amateur Handbook.

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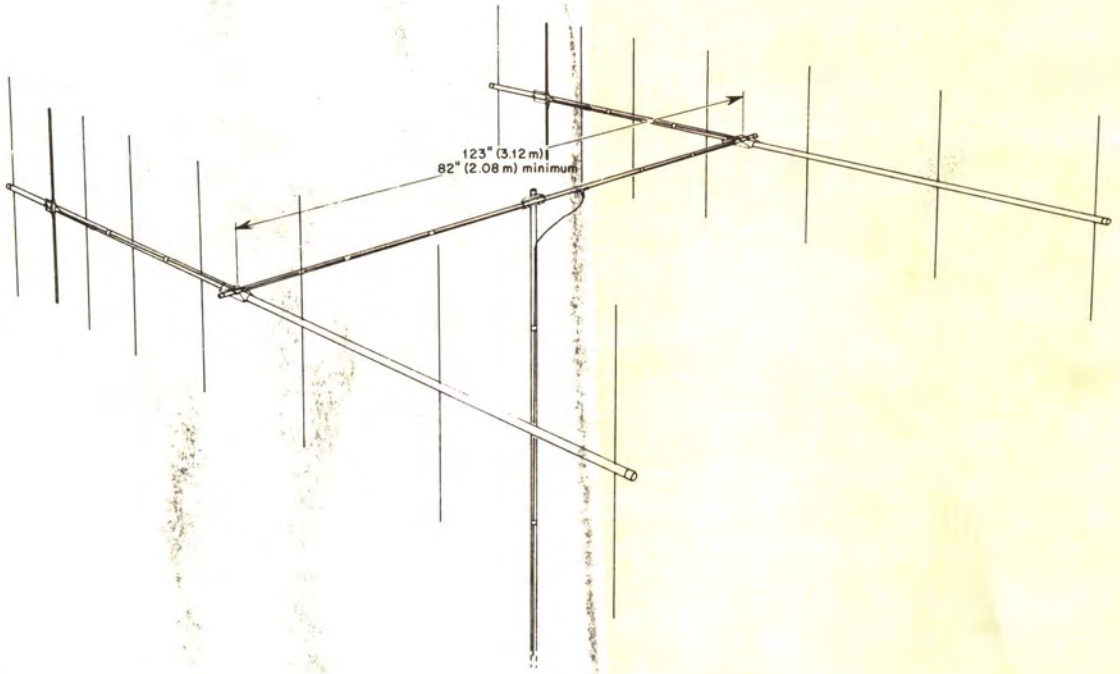

Figure 4

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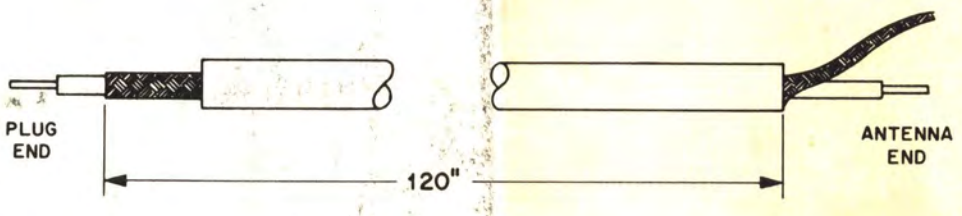


RG-11/U OR ANY 75-OHM COAX

$\frac{5}{4}\lambda = 67"$ $\frac{7}{4}\lambda = 93\frac{1}{2}"$

$\frac{3}{4}\lambda = 40"$ $\frac{9}{4}\lambda = 120"$

Figure 5

Installation

This antenna fits a 1⅝" mast. A 1¼" plumbers pipe is recommended for a sturdy mast.

Mount the antenna in the clear. Surrounding objects—particularly power lines and other objects of considerable mass or length—are detrimental to the performance of the antenna.

WARNING

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

When mounting the 208 with an HF beam antenna on the same mast, the 208 should be on top. If the 208 is to be vertically polarized, separation of the two antennas should be at least 2 feet. If the 208 is to be horizontally polarized, separation should be at least 6 feet.

The mast, if metallic, should **never** be run completely through the plane of the elements. Slightly reduced performance will be noticed if a vertically polarized 208 is mounted at the top of a metallic mast as shown in Figure 1. Horizontally polarized mounting will not be affected. For optimum performance with a vertically polarized 208, a wooden mast should be used and the coax routed past the reflector then dropped to the mast.

The antenna can be mounted either vertically or horizontally for FM or SSB/CW operation respectively. Circular polarization can be obtained by using two yagis. For information about which polarization to use, consult local amateurs who use the frequencies you desire.

Step-by-Step Assembly

Remove the parts from the carton and check them against the parts list and the illustrations.

Select the boom back-up plate, the boom-to-mast bracket and the four ¼"-20 x ¾" screws, ¼" nuts, and lockwashers.

Place the boom-to-mast bracket on the boom as shown in Figure 6. The front and rear boom sections should meet in the middle of the boom-to-mast bracket. Use the ¼"-20 x ¾" screws in the outside holes. Leave the inside holes for the two U-bolts, which will be used later for mounting the mast. Select either the vertical or horizontal mounting position. Adjust the boom accordingly before tightening the screws securely.

Select R1 (40¼" rod). Use a pencil to place a mark at the center of the rod (20⅛" from either end). Place two more marks ⅝" from each side of the center mark.

Place a #10-24 x 1¼" eyebolt into the R1 slot as shown in Detail A. Slide R1 through the holes and the eyebolt until the outer two marks on R1 are visible on each side of the boom. Slip on an aluminum half washer, a lockwasher and a #10 nut. Tighten it just enough to hold the rod securely.

Select the element-to-boom insulator, two sections of the Driven Element (DE) (7/16" x 17-¼" tubing), and beta rod. See Detail B.

NOTE: If 52 ohms coaxial cable is used to feed the antenna, select the supplied balun at this time.

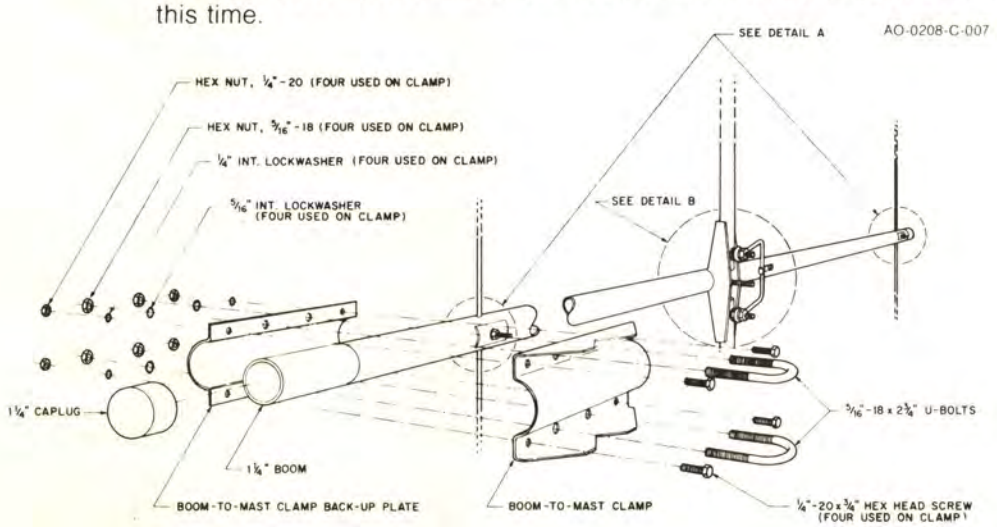
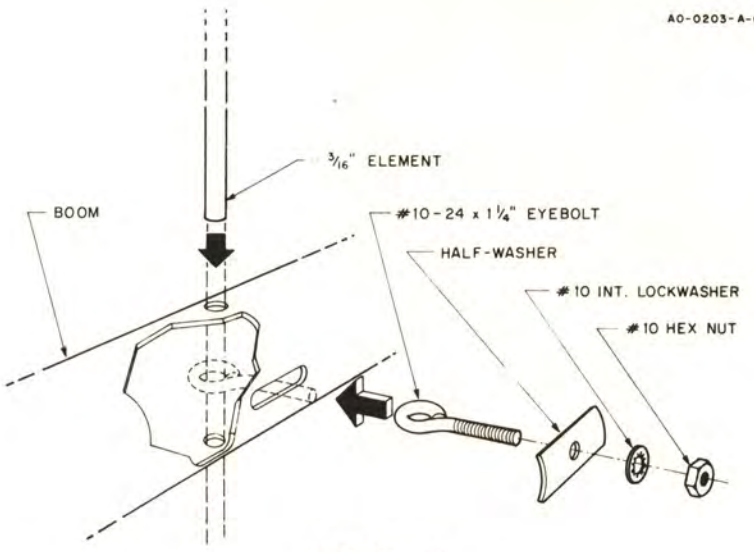


Figure 6

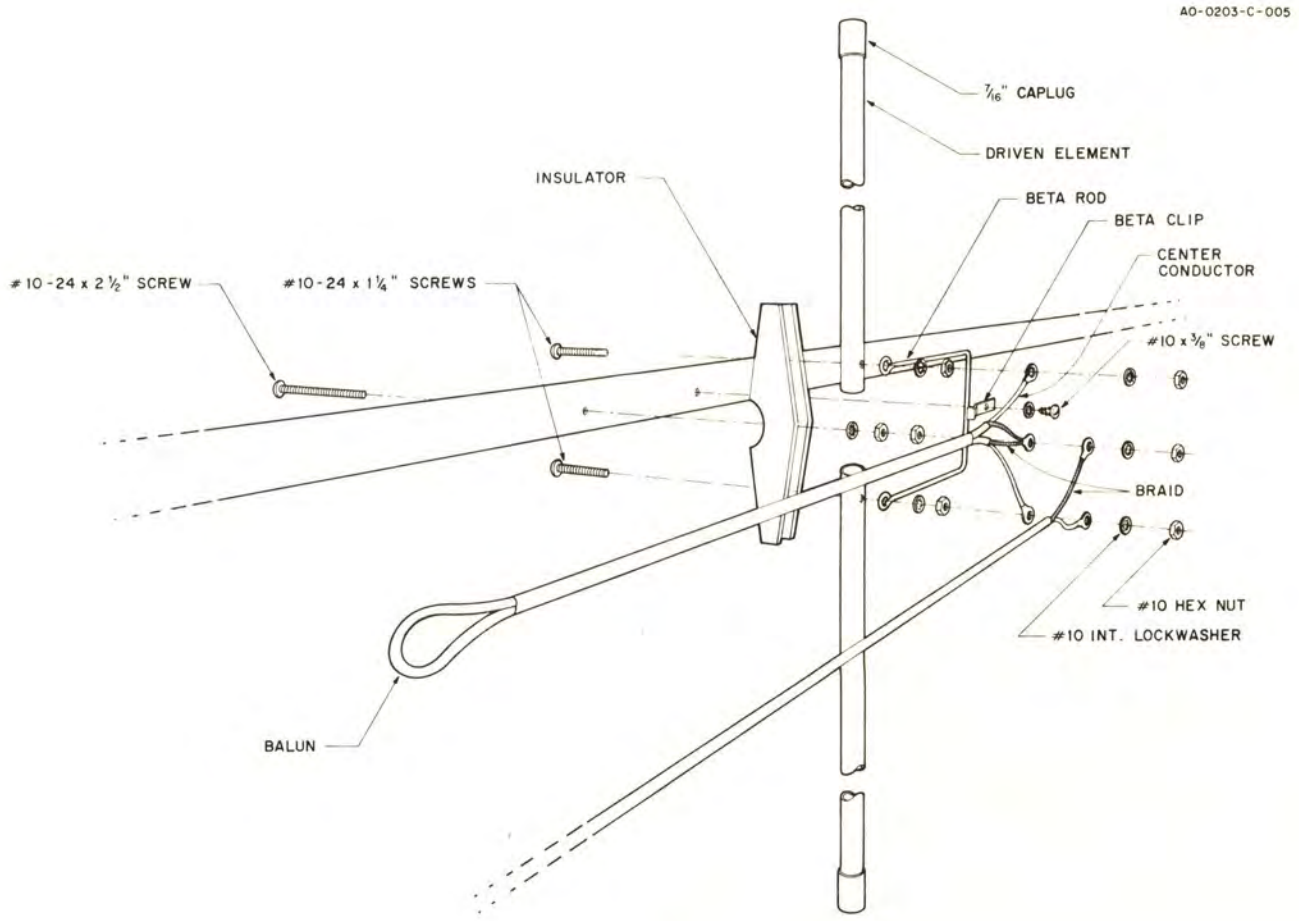


DETAIL A

Use the #10-24 x 2½" screw to fasten the element-to-boom insulator to the boom. Refer to Detail B.

Use the two #10-24 x ¼" screws to assemble the DE as shown in Detail B. Pay particular attention to the connections of the beta rod, balun and feedline.

Waterproof the connection with Neoprene, Krylon or some similar substance.



DETAIL B

Install caplugs on the ends of the booms and the Driven Element.

Use the #10 x 3/8" screw to fasten the beta rod shorting clip over the beta rod, as shown in Detail B.

Select the following rods: D1 (36¼" long), D2 (36" long), D3 (35¾" long), D4 (35½" long), D5 (35¼" long), and D6 (35" long). Mark the center point on each rod, then make two more marks 5/8" on either side of the center mark. Secure the elements to the boom as shown in Figure 1 and Detail A. Be sure they are oriented as shown.

Slip the two U-bolts into the boom-to-mast bracket and fasten it to the mast securely.

Tape the coax feedline and balun to the boom and to the mast. Be sure to insulate any connection from the boom or the mast. This completes your installation.

Parts List

Part No.	Description	Qty
170391	boom, 1¼" x 74⅜", rear	1
170388	boom, 1¼" x 74⅜", front	1
175157	DE, 7/16" x 17¼"	2
160040	3" beta rod	1
385142	clamp, boom-to-mast	1
385144	back-up plate	1
160038	R1, 40¼" x 3/16"	1
160017	D1, 36¼" x 3/16"	1
160018	D2, 36" x 3/16"	1
160019	D3, 35¾" x 3/16"	1
160020	D4, 35½" x 3/16"	1
160022	D5, 35¼" x 3/16"	1
160023	D6, 35" x 3/16"	1
465420	insulator (DE-to-boom)	1
871704	balun assembly	1
879496	parts pack	1
163266	beta clip	1
455630	1¼" caplug	2
475639	7/16"	2
545146	U-bolts, 5/16"	2
506325	screw, ¼" x ¾" hex head	4
506430	screw, #10 x 2½" round head	1
540023	#10 x 1¼", 3/16" eyebolt	7
506450	screw, #10 x 1¼" round head	2
519205	screw, #10 x 3/8" PHS, Type A	1
556945	nut, 5/16", hex	4
556970	nut, #10, hex	14
556960	nut, ¼", hex	4
567075	lockwasher, 5/16", internal	4
567125	lockwasher, #10, internal	15
567110	lockwasher, ¼", internal	5
170376	aluminum half washer	7

FOR OUR OVERSEAS CUSTOMERS: The United States uses the English units of measurement. Please see the information below for assistance in identifying the hardware and components supplied with this product.

Converting English Measurements to Metric

Use this scale to identify lengths of bolts, diameters of tubes, etc. The English 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 cm

→ 1.25 in loss

KLLK RPL

	161.64	166.250	170.150 driven element
R_1	36.50	34.75	33.75
D_1	32.50 ✓	30.75	29.75 cut to best VSWR.
D_2	32.25 ✓	30.50	29.50
D_3	32.00 ✓	30.25	29.25
D_4	31.75 ✓	30.00	29.00
D_5	31.50 ✓	29.75	28.75
D_6	30.25	29.50	28.50

cut to 161.64
3/19/89
BH