

INSTRUCTION MANUAL  
for  
MODEL 1110 DB  
Citizens Band  
Stacked "Duo-Beam"  
(546)

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SECTION I

GENERAL DESCRIPTION

1-1 GENERAL DESCRIPTION

The Hy-Gain Model 1110 DB is a uniquely designed twin driven antenna system that multiplies the effective input power of any efficient 5 watt CB transceiver to 120 watts. The antenna system consists of two 5 element beams stacked and fed with a phasing harness to obtain maximum gain and directivity. The Model 1110 DB is light enough to be rotated with a heavy duty TV rotator, however, it is recommended that a high quality CB or Ham rotator be used.

1-2 CONSTRUCTION

The Model 1110 DB uses taper swaged seamless aluminum tubing for maximum mechanical strength and durability. Extra heavy wall and multiple thickness tubing is used at points of maximum stress. A triangular tension crossboom support is employed for additional strength and reliability. The full circumference compression clamps used at tubing joints will not vibrate loose in the wind. All hardware is iridite treated to prevent rust and corrosion. The Model 1110 DB is built to give years of trouble free service.

1-3 THEORY OF OPERATION

The Model 1110 DB consists of two antenna bays, each with a Reflector, Driven Element, and three Directors. The antenna bays are optimum spaced and fed with a preassembled phasing harness. This enables the signals from the antennas to reinforce each other. The result is a tremendous gain in effective radiated power and maximum front-to-back ratio.

In order to achieve this tremendous amount of gain, Hy-Gain engineers found it necessary to have two settings on the antenna, one favoring the low end of the band and the other favoring the high end. With either setting the entire CB frequency range is covered but two or three channels on one end may have a VSWR slightly above 2 to 1. See VSWR chart Figure 9. Both settings are resonant near the center of the band. Exercise extreme care when adjusting element lengths to obtain maximum performance from this antenna. If the antenna is assembled properly and care is taken when adjusting element lengths you will realize optimum results from the antenna system.

1-4 SPECIFICATIONS:

ELECTRICAL:

Effective Input Power.....	120 watts
Front-to-Back Ratio.....	26db
SWR (at resonance).....	Less than 1.4:1
Coaxial Feedline.....	52 ohm
Lightning Protection.....	DC Grounded

**MECHANICAL:**

Antenna Boom Length.....	18'
Cross Boom Length.....	24'
Longest Element.....	18' 9 3/4"
Boom Diameter.....	2" to 1 1/4"
Cross Boom Diameter.....	2"
Turning Radius.....	15' 6"
Mast Required.....	1 5/8"
Maximum Wind Survival.....	80 MPH
Net Weight.....	59 lbs

**RECOMMENDED ROTATORS:**

CDR Model AR-22 (low-wind areas only); CDR Model TR-44; CDR Model Ham-M; or comparable models from other manufacturers.

**1-5 FEEDLINE.**

The input impedance to the antenna is 52 ohms. It is strongly recommended that you use RG-8/U coaxial cable as a feedline. This will enable you to obtain all the performance designed into the Model 1110 DB. Due to the use of a phasing harness, the input to the antenna is balanced. Since coaxial cable is unbalanced, an RF choke must be constructed from feedline as shown in Figures 1 and 5 or a Hy-Gain CB Balun, Model BN-27, can be used in place of the RF choke. The balun will allow your Duo-Beam to operate with a much greater efficiency than is possible with a "home-made" choke. The BN-27 is available at your local Hy-Gain dealer.

**1-6 WHAT TO EXPECT FROM YOUR DUC-BEAM**

Once you install your Duo-Beam, you will not doubt be comparing it with your previous antenna or just plain observing its performance. In either case you will be transmitting or receiving signals with the MAXIMUM efficiency possible because the Duo-Beam is the most powerful antenna ever produced for Citizens Band radio communications. This superior performance is accomplished in two ways -- through increased directivity and increased gain.

**DIRECTIVITY**

Through the use of advanced design techniques, the Duo-Beam concentrates the transmission of signal energy in one main direction and in the receive function is much more sensitive to signals in that same direction. What this means to you is clearly shown in Figure A. Since CB stations are usually liberally scattered in all directions it is easy to see that the Duo-Beam with its narrow pattern can be rotated or oriented to maximize transmission to, and reception of, any one station or group of stations with which we wish to communicate. Obviously, this greatly reduces interference from other stations on the same channel. In



## ASSEMBLY and INSTALLATION

## 2-1 MOUNTING CONSIDERATIONS.

When installing the Model 1110 DB there are several items to be taken into consideration. One is the fact that close proximity of metallic objects can seriously deteriorate the performance of any antenna. For best results, it is recommended that the antenna be mounted AT LEAST 20' away from power lines, TV antennas or any existing metallic objects. The recommended installation is shown in Figure 8. This is a roof mounted tower. If the tower requires guy wires, they MUST be broken up with strain insulators every three feet. An alternate mounting method, using a guyed mast, is shown in Figure 9. If this method of installation is used, the mast material must be 1 5/8" HEAVY WALLED material. 1 1/4" Plumbers pipe has a 1 5/8" O.D. and is highly recommended for mast material. Mount the antenna a maximum of 1 foot above the rotator and guy the mast directly below the rotator. Use three guy wires equally spaced and be certain to break them up every three feet with strain insulators. Install the guy wires so there is a minimum of 2' clearance between the guys and the lower tip of the antenna elements. This minimum of 2' clearance and the use of strain insulators applies to all installation methods using guy wires.

## 2-2 ASSEMBLY OF THE CROSS SUPPORT BOOM.

( ) Select the special boom-to-mast bracket (drilled for insulator) and install the 10-24 x 1" flathead screw as shown in Figure 2. This screw will be used for attaching the phasing harness insulator in a later step as shown in Figure 5.

( ) LOOSELY assemble a regular boom-to-mast bracket and the special boom-to-mast bracket using ten 1/4-20 by 3/4" screws as shown in Figure 2.

( ) Select the two cross support center sections (2 x 61 3/4") and slip the unswaged ends into the assembled boom-to-mast bracket. Fasten loosely using 5/16-18 x 3" screws. Do not tighten the screws at this time. The bracket must be loose for later when installing on your mast.

( ) Select the two cross support end assemblies (2' x 77" with 1 5/8" tube assembly on end) and install as shown in Figure 2. Fasten securely using the 1/4-20 x 2 1/2" screws.

( ) Install a cross support cable clamp (2" I.D.) and strap on each end of the cross support boom approximately 7' 6" from the center of the boom-to-mast bracket. Refer to Figure 2.

( ) Select the 20' cable and cut it into two 10' lengths. Install the cable on the cross support using a thimble and two cable clamps as shown in Figure 2.

( ) Install a turnbuckle on the free end of each cable. Adjust the cable as necessary so it measures approximately 8' from the cross support cable clamp to the free end of the fully extended turn buckle. Tighten the cable clamps securely then clip off all excess cable. Now tape the support cable somewhere close to the boom-to-mast bracket. In this way it will be readily accessible when the antenna is mounted on your mast.

## 2-3 ASSEMBLY OF THE ANTENNA BOOM.

### NOTE

The following instructions will tell you how to completely assemble one antenna bay. It is recommended that you assemble one antenna bay completely and then repeat the entire procedure to assemble the second antenna bay. After the two antenna bays are assembled they will be mounted onto the cross support boom and the phasing harness will be installed. In this way the antenna will be in three major groups, the cross support boom and the two antenna bays. This will allow you to assemble the antenna at some convenient location and then move it in three pieces to your mounting site. The antenna can then be completely assembled just before hoisting it into position.

( ) Select two boom-to-mast brackets and loosely assemble using ten 1/4-20 x 3/4" screws as shown in Figure 3.

( ) Select the center antenna boom sections (2 x 48" and 2 x 72") and slip the drilled end of each into the boom-to-mast bracket just assembled. Align the holes and fasten loosely using two 5/16-18 x 3" screws. Do not tighten the screws at this time. The bracket must be loose for installing on the cross support boom. The short portion of the boom is the Reflector end and the long portion is the Director end.

( ) Install a 1 1/4 x 48" boom section on each end of the 2" boom using the reducer clamps as shown in Figure 3. Slip the 1 1/4" boom into the small end of the reducer clamp up to but not past the end of the 2" boom.

( ) Place a 1 1/4" caplug on each end of the boom.

#### 2-4 ASSEMBLY OF THE REFLECTOR.

( ) Loosely assemble a set of number 2 element-to-boom brackets on the Reflector end (short end) of the antenna boom as shown in Figures 3 and 4. Do not forget the 1/4-20 by 1/2" taper point anchor screw as shown in Figure 4.

( ) Select the Reflector first section (7/8 x 44") and slip the unswaged end into the bracket assembled on the boom. Tighten the screws to hold the element securely but do not tighten the taper point anchor screws at this time.

( ) Adjust the element until the bracket is just touching the 1 1/4" caplug. Check to make certain that the element will lie in a vertical plane when the antenna bay is installed on the cross support boom. Now tighten the taper point anchor screw securely.

( ) Assemble a 3/4" compression clamp as shown in Figure 6 and slip it over the swaged portion of the 7/8" tubing. Position it about 1" from the end.

#### NOTE

Figure 6 shows the compression clamps in full size to aid in identification. Simply lay the part over its corresponding drawing for proper identification.

( ) Select the Reflector second section (5/8 x 24") and slip the unswaged end into the 7/8" tube. Adjust the 5/8" tube until the center of the mark is at the edge of the 7/8" tube. Now tighten the compression clamp securely.

( ) Assemble a 1/2" compression clamp as shown in Figure 6. Slip the assembled compression clamp over the 5/8" tubing and position it about 1" from the end.

#### NOTE

The 1/2" compression clamp does not require a lockwasher.

( ) Select the Reflector end section (7/16 x 60" marked at 52 5/32") and slip the marked end into the 5/8" tubing.

#### CAUTION

At this time you must decide whether you wish to favor the high end of the band or the low end. Refer to the typical VSWR curve shown in Figure 7. If you select setting #1 your antenna will favor the low end of the band. If you select setting #2 your antenna will favor the high end of the band. Regardless of which setting you select, the antenna will operate satisfactorily over the entire CB frequency range. However, if you select setting #1 your VSWR may go slightly above 2 to 1 on the upper two channels and if you select setting #2 your VSWR may go slightly above 2 to 1 on the lower two channels. This will not affect the efficiency of the antenna. Be certain to adjust ALL elements for setting #1 or ALL elements for setting #2.

( ) If you have selected setting #1, slip the 7/16" tube into the 5/8" tube until the center of the mark is at the edge of the 5/8" tube. Check the overall dimension of the Reflector as shown in Figure 3. It should measure 112 7/8" from the center of the boom to the tip of the element. If it does not, adjust as necessary to reach this dimension then tighten the compression clamps securely.

( ) If you have selected setting #2, adjust the 7/16" tube as necessary so the element measures 112 17/32" from the center of the boom to the tip of the element. Now tighten the compression clamp securely.

#### CAUTION

If you find it necessary to change the tubing length after you have tightened a compression clamp you must first loosen the compression clamp and slide it out of the way. Then with a drill and a sharp bit, drill out the indentation caused by the clamp. The tubing can then be moved and the compression clamp reinstalled.

( ) Place a 7/16" caplug without hole on the top Reflector element and a 7/16" caplug with hole on the bottom Reflector element.

2-5 ASSEMBLY OF THE DRIVEN ELEMENT AND BETA MATCH.

( ) LOOSELY assemble a set of number 5 element-to-boom brackets on the boom 60" from the Reflector bracket. Refer to Figures 3 and 4. Do not forget the 1/4-20 x 1/2" taper point anchor screw.

( ) Select the Driven Element first section (5/8 x 48") and a set of Driven Element insulators. Slip an insulator over the unswaged end of the 5/8" tube then slip the insulated end of the tube into the bracket assembled on the boom. Tighten the screws to hold the element securely but DO NOT tighten the taper point anchor screws at this time.

( ) Carefully recheck the 60" measurement from the center of the Reflector bracket to the center of the Driven Element bracket and make certain the Driven Element lies in the same plane as the Reflector. Now tighten the taper point anchor screws SECURELY.

( ) Assemble a 1/2" compression clamp and slip it over the swaged end of the 5/8" tube. Position it about 1" from the end.

( ) Select the Driven Element end section (7/16 x 60" marked at 57 1/2") and slip the marked end into the 5/8" tubing.

( ) If you have selected setting #1, slip the 7/16" tube into the 5/8" tube until the center of the mark is at the edge of the 5/8" tubing. Check the element length. It should measure 106 3/4" from the center of the boom to the tip of the element. If it does not, adjust as necessary then tighten the compression clamps securely.

( ) For setting #2, adjust the 7/16" tube until the Driven Element measures 106 7/16" from the center of the boom to the tip of the element then tighten the compression clamp securely.

( ) Place a 7/16" caplug without hole on the top Driven Element and a 7/16" caplug with hole on the bottom Driven Element.

( ) Assemble the Beta Match as shown in Figure 3.

( ) Adjust the Beta clamp to the 3 1/4" measurement as shown in Figure 3 then tighten all screws securely.

## 2-6 ASSEMBLY OF THE DIRECTORS.

( ) Assemble Director #1 on the boom in the same manner as the previous elements. Assemble the Director exactly 46 1/2" from the center of the Driven Element to the center of Director #1. Refer to Figure 4 for element-to-boom bracket details and to Figure 3 for tubing descriptions and dimensions.

( ) Assemble Director #2 on the boom in the same manner as the previous elements. Assemble the Director exactly 50" from the center of Director #1 to the center of Director #2. Refer to Figure 4 for element-to-boom bracket details and to Figure 3 for tubing descriptions and dimensions.

( ) Assemble Director #3 on the boom in the same manner as the previous elements. Assemble the Director exactly 56" from the center of Director #2 to the center of Director #3. Refer to Figure 4 for element-to-boom bracket details and to Figure 3 for tubing descriptions and dimensions.

( ) Repeat the entire procedure to assemble the second antenna bay. Make certain you use the same setting, either #1 or #2, for both antenna bays.

## 2-7 PHASING HARNESS INSTALLATION.

( ) Support the antenna cross support boom approximately 10 feet off the ground using a 10 foot step ladder or some similar support.

( ) Install one antenna bay on each end of the cross support boom and fasten securely using the 5/16-18 x 2 1/2" screws. Make certain each antenna is pointed in the same direction then tighten ALL screws securely.

### CAUTION

Do not allow the antenna to rest on the elements. The elements are not designed to withstand the weight of the antenna.

( ) Install a 1 5/8" caplug on each end of the cross support boom.

( ) Install the three hole phasing line insulator on the center boom-to-mast bracket as shown in Figure 5.



( ) Install the phasing harness assemblies between the center boom-to-mast bracket and the Driven Element as shown in Figure 5. Note that the solder lug on the braid at one end of the phasing harness has a large hole. This end connects to the Driven Element bracket using the taper point anchor screws. The other end of the phasing harness is attached to the feedpoint insulator.

#### CAUTION

Make certain the top Driven Element is connected to the top phasing harness center conductor. Attach the other end of the top phasing harness center conductor to the upper hole in the feedpoint insulator. The center conductor on the bottom phasing line attaches to the bottom Driven Element and to the lower hole in the feedpoint insulator. Install both phasing lines in this manner. Refer to Figure 5.

( ) Securely tape the phasing line to the boom using weather proof tape.

( ) Wind an RF choke and attach to the phasing lines as shown in Figure 5. This choke should consist of 12 turns of RG-8/U coaxial cable wound in a circle with an 8" inside diameter. Attach the center conductor of the choke to the center conductor of the top phasing line. Attach the braid of the RF choke to the center conductor of the bottom of the phasing line. This is very important for proper operation of the antenna. The other end of the RF choke attaches to the transceiver.

( ) Securely tape all exposed portions of the coaxial braid to prevent it from shorting out on the antenna. Weather proof all coaxial connections using Pli-O-Bond, Neoprene, or some similar substance. This will prevent water from entering and possibly ruining your coaxial cable.

#### 2-8 MOUNTING THE ANTENNA.

( ) The antenna is now ready to be mounted on a 1 5/8" OD mast. Figures 8 and 9 show typical methods of installation. If your installation requires guy wires do not forget to break them up with strain insulators every three feet. Also make certain the guy wires are installed in such a manner that they will not interfere with the elements.

( ) Mount the antenna on a 1 5/8" mast. Allow approximately 3' of the mast to extend above the boom-to-mast bracket. This will be used to attach the boom support cable.

- ( ) At a point approximately 3' above boom to mast bracket, install the 1 5/8" I.D. boom support clamps.
- ( ) With the turnbuckles fully extended, attach the turnbuckles to the boom support clamp using the links provided as shown in Figure 2.
- ( ) Adjust the turnbuckles as necessary to support the antenna with no droop. If necessary, the 1 5/8" I.D. boom support clamps can be moved to insure proper support. Tighten all screws securely.
- ( ) Drill a hole in your mast corresponding to the remaining hole in the boom-to-mast bracket. Pin the bracket to the mast using the 5/16-18 x 2 1/2" screw provided.
- ( ) Securely tape the RF choke to the boom-to-mast bracket and to the mast. When installing your feedline between the RF choke and your transceiver be certain to leave enough slack in the feedline to allow the antenna to rotate 360 degrees.
- ( ) The antenna is now ready for use.

#### 2-9 LIGHTNING PROTECTION.

- ( ) For proper lightning protection and to insure noise free operation your antenna supporting structure must be properly grounded. To do this, drive a 1/2" x 8' copper clad steel ground rod into the ground as close as possible to the base of your antenna supporting structure. Attach the ground rod to the supporting structure using #8 or larger copper or aluminum wire.
- ( ) For total lightning protection of your equipment it is recommended that you obtain a Hy-Gain Lightning arrester Model LA-1. The LA-1 is available at your local Hy-Gain dealer.



## SECTION 3

## PARTS LIST

## 1110 DB Parts List

Part No.	Description	Qty
171570	Antenna Boom, 2 x 48	2
171413	Antenna Boom, 2 x 72	2
171566	Cross Support, Center Section, 2 x 61 3/4", Swg	2
112912	Directors and D.E. FIRST SECTION, 5/8 x 48" Swg	16
112539	Antenna Boom, End Section, 1 1/4 x 48"	4
873913	Cross Support, End Assembly, 2 x 77" w/1 5/8" Tube	2
171572	Reflector 2nd SECTION, 5/8 x 24" Marked	4
171584	D-2 End Section, 7/16 x 60" Marked at 51 13/16"	4
171576	D-3 End Section, 7/16 x 60" Marked at 54 1/2"	4
171575	D.E. End Section, 7/16 x 60" Marked at 57 1/2"	4
171574	D-1 End Section, 7/16 x 60" Marked at 58 5/16"	4
171573	Reflector End Section, 7/16 x 60" Marked at 52 5/32"	4
171580	Beta Rod, 1/4" formed	4
872480	Phasing Harness Assembly	2
164645	Bracket, Boom-to-Mast	5
171418	Bracket, Boom-to-Mast Special Drilled	1
115422	Reflector First Section, 7/8 x 44" Swg	4
161422	Bracket #11, 1 1/4" Boom to 5/8" Element, D-3	4
165141	Bracket #2, 1 1/4" Boom to 7/8" Element, Reflector	4
161409	Bracket #12, 2" Boom to 5/8" Element, D-1 and D-2	8
163766	Bracket #5, 2" Boom to Element, D.E.	4
461057	Insulator, Driven Element	4
691081	Cable, Boom Support, ft.	20
803905	Instruction Manual	1
161411	Clamp, Reducer, 2" to 1 1/4"	8
872447	Parts Package "A"	1
872448	Parts Package "B"	1
872449	Parts Package "C"	1
872450	Parts Package "D"	1
Parts Package "A" (872447) contains the following:		
171329	Tube Clamp, 5/8"	4
165123	Compression Clamp, 1/2"	20
165361	Compression clamp, 3/4"	4
163371	Beta Clamp	4
455644	Caplug, 7/16"	10

455632	Caplug, 1 1/4"	4
451185	Caplug, 1 5/8"	2
465410	Insulator, 3-hole	1
475639	Caplug, 7/16" with hole	10

Parts Package "B" (872448) contains the following:

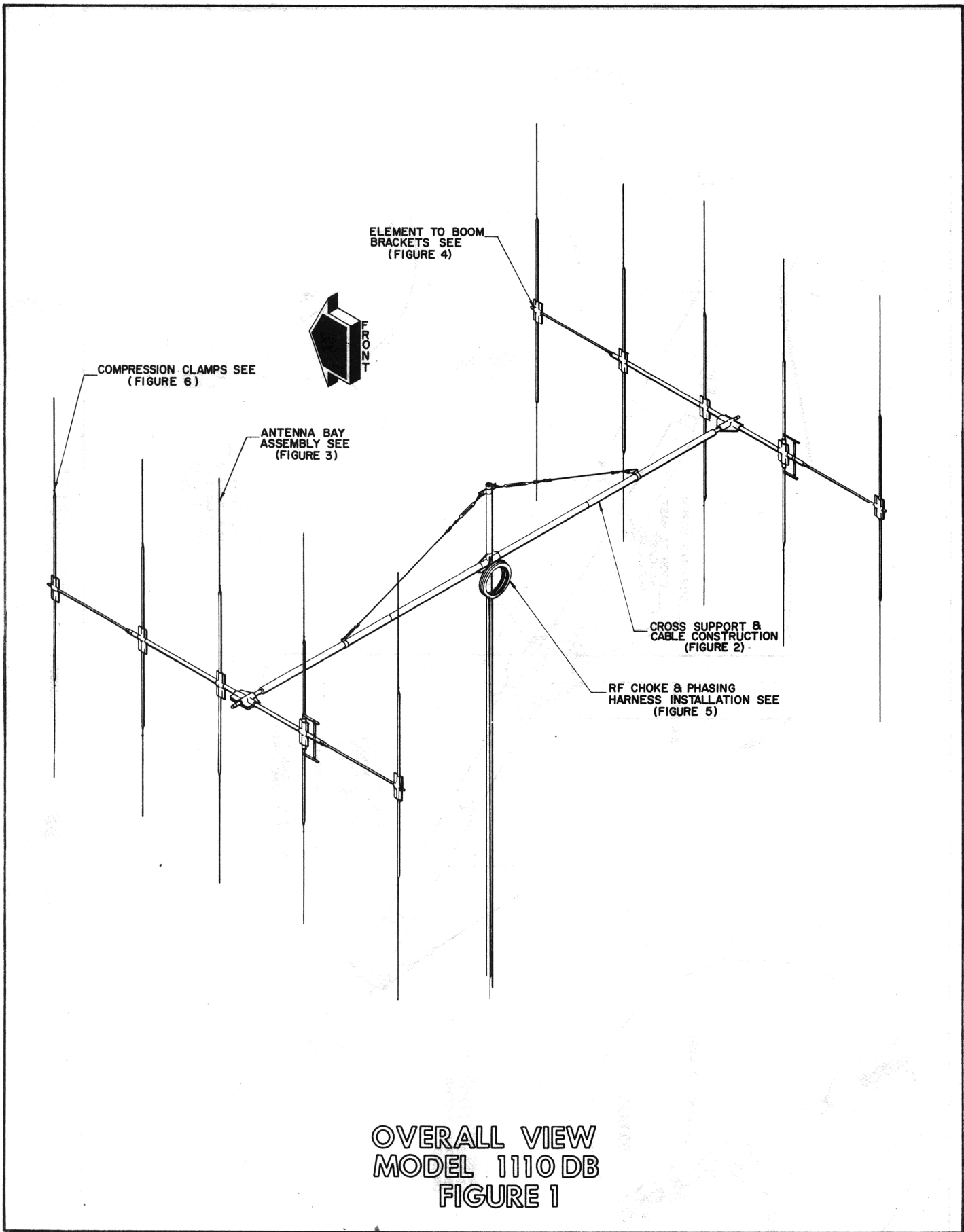
388861	Clamp, Boom Support, 2" I.D.	2
381253	Strap, Boom Support,	2
381100	Clamp, Boom Support, 1 5/8" I.D.	2
351243	Turnbuckle	2
356598	Thimble	4
351244	Link	2
359929	Cable Clamp C	8

Parts Package "C" (872449) contains the following:

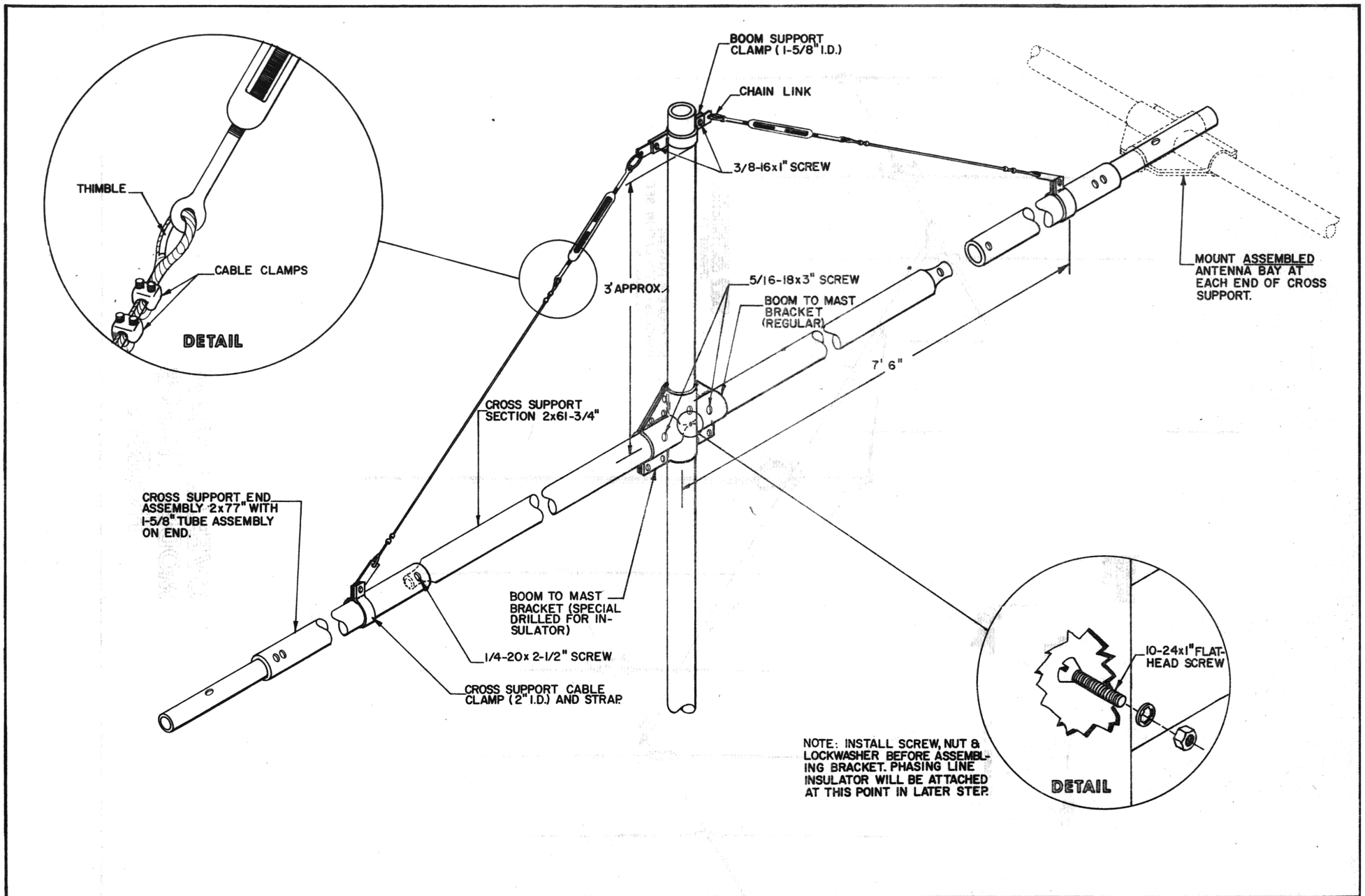
555362	Nut, 10-24 Square	28
567125	Lockwasher, #10	58
505671	Screw, 10-24 x 5/16" RH	20
505821	Screw, 10-24 x 7/16" RH	4
506485	Screw, 10-24 x 1/2" RH	32
506290	Screw, 1/4-20 x 2 1/2"	2
506235	Screw, 5/16-18 x 3" HH	6
556945	Nut, 5/16-18" Hex	9
567075	Lockwasher, 5/16"	9
509320	Screw, 3/8-16 x 1"	2
556930	Nut, 3/8-16"	2
567095	Lockwasher, 3/8"	2
501093	Screw, 10-24 x 1" Flat Head	1
556970	Nut, 10-24 Hex	50
548684	Screw, 1/4-20 x 1/2" Tpr Pt.	16
558685	Nut, 1/4-20 Square	16
506460	Screw, 10-24 x 3/4" RH	16
506455	Screw, 10-24 x 1" RH	2
506389	Screw, 1/4-20 x 1"	2
509173	Screw, 5/16-18 x 2 1/2"	3

Parts Package "D" (872450) contains the following:

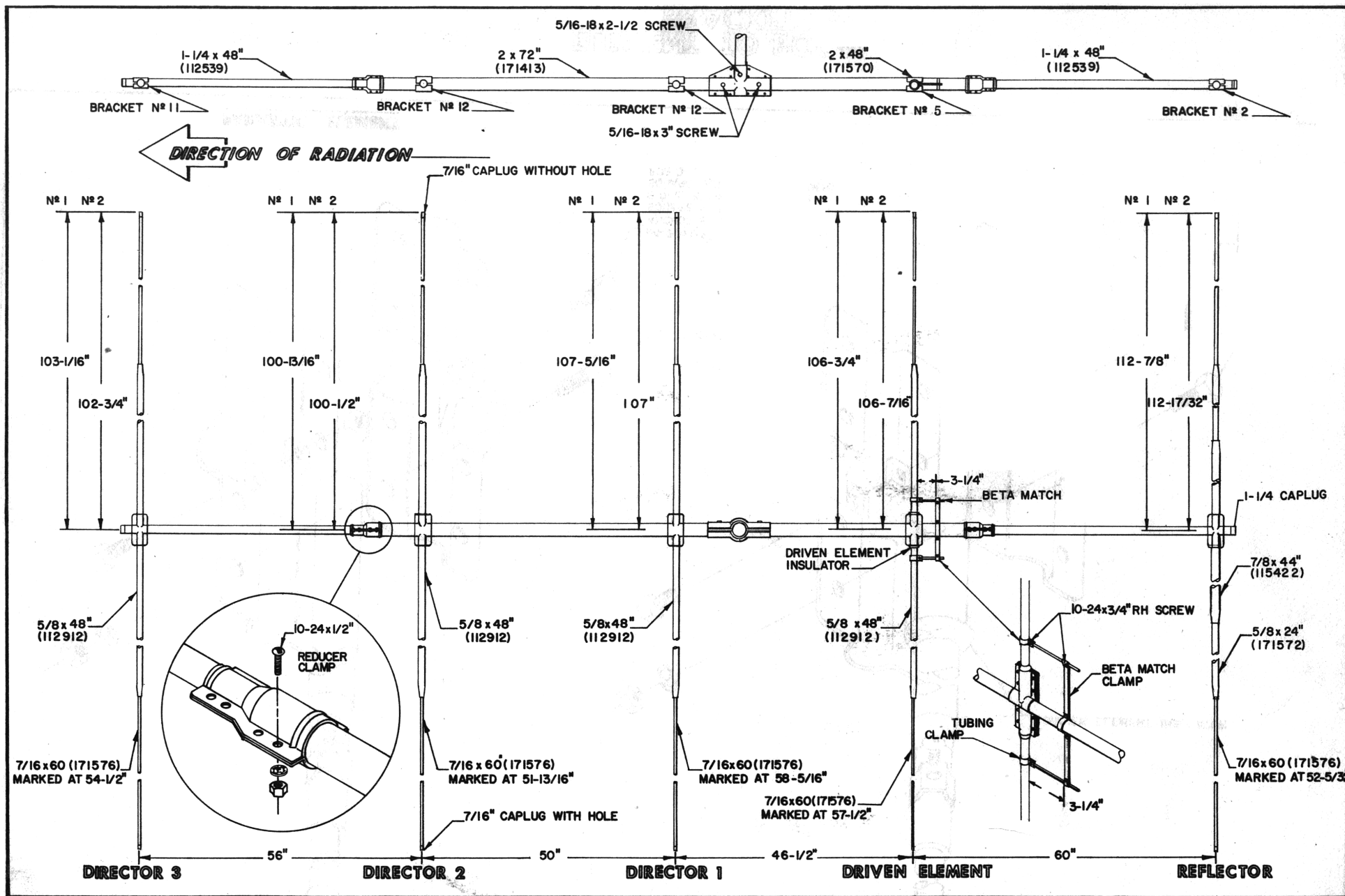
506325	Screw, 1/4-20 x 3/4" HH	110
556960	Nut, 1/4-20 Hex	114
567110	Lockwasher, 1/4"	114



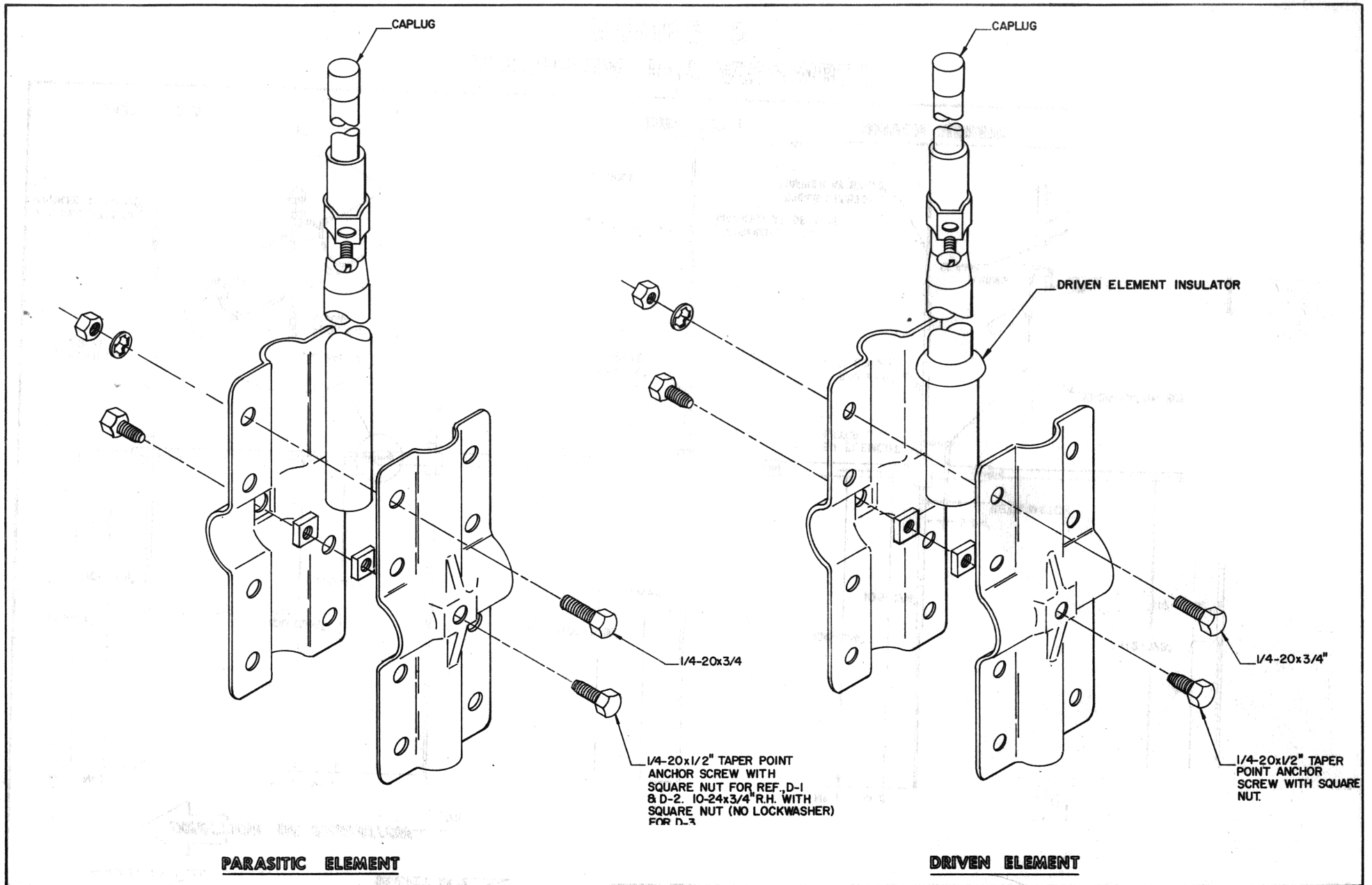
OVERALL VIEW  
MODEL 1110 DB  
FIGURE 1



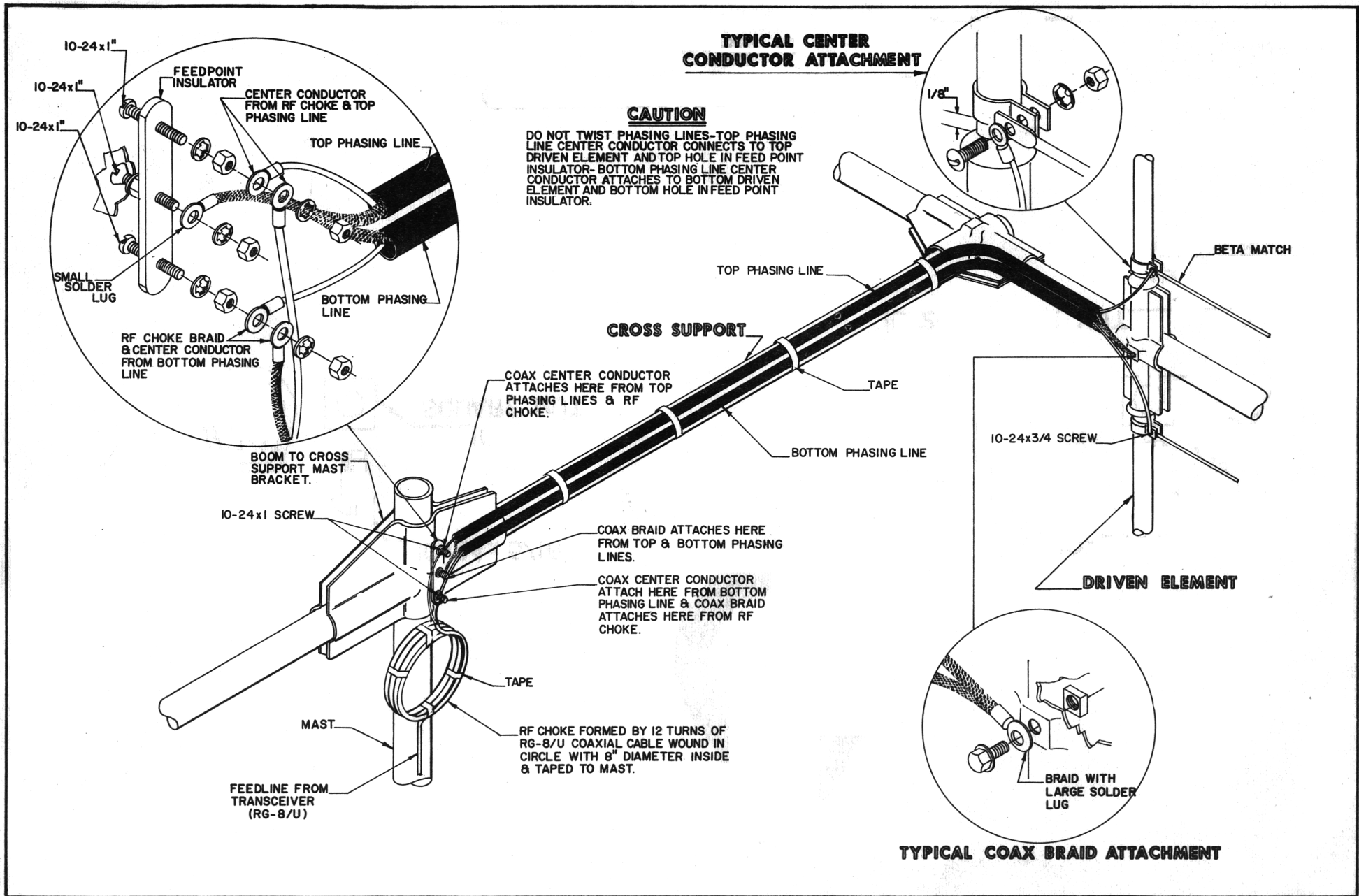
CROSS SUPPORT ASSEMBLY  
FIGURE 2



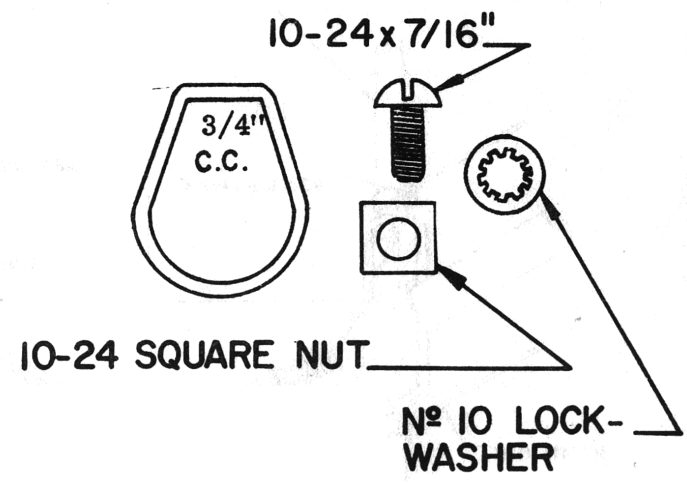
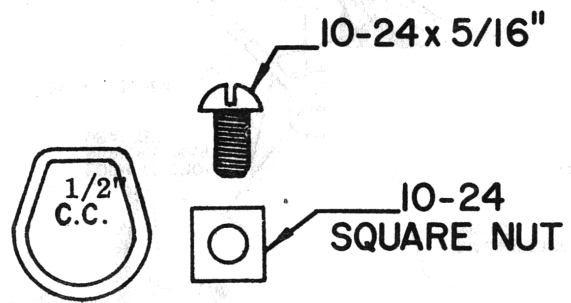
**ANTENNA BAY ASSEMBLY**  
**FIGURE 3**



ELEMENT TO BOOM  
BRACKETS  
FIGURE - 4

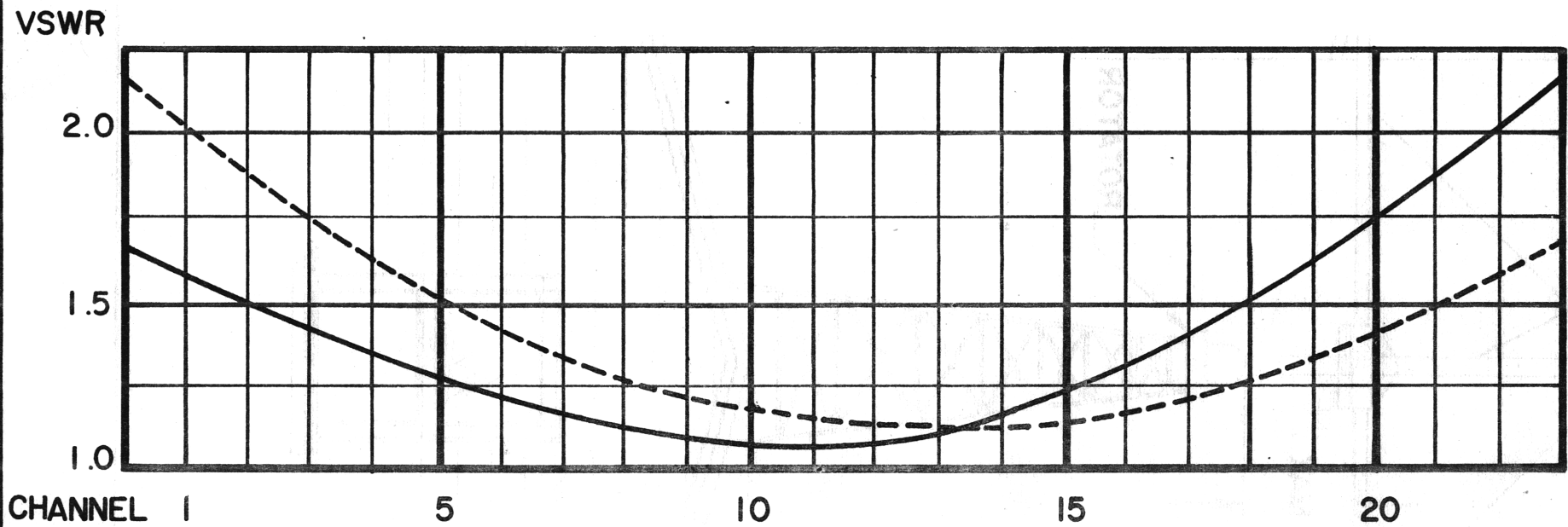


PHASING LINE INSTALLATION  
FIGURE 5



**COMPRESSION CLAMPS**  
**FIGURE 6**



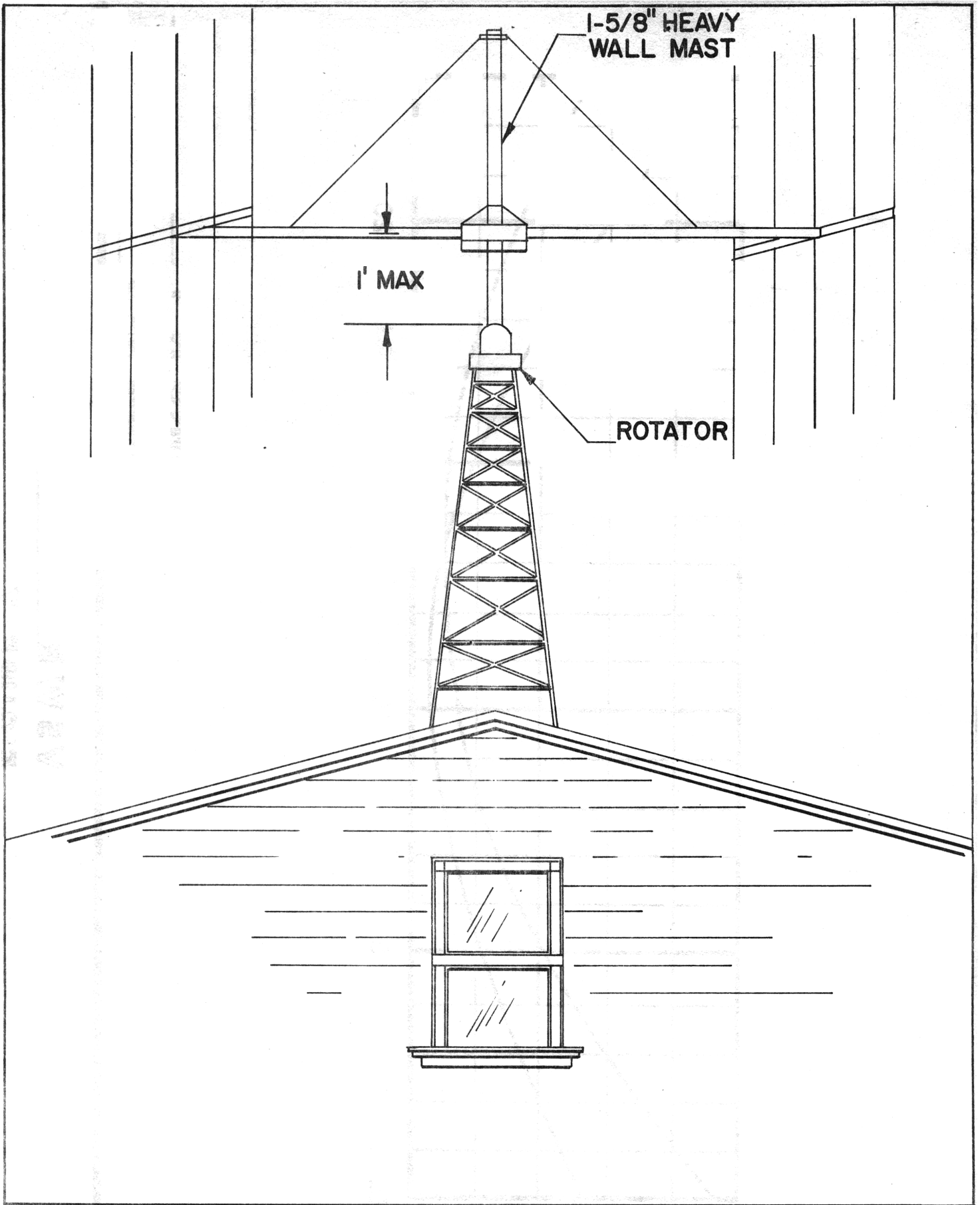


SETTING N° 1 \_\_\_\_\_

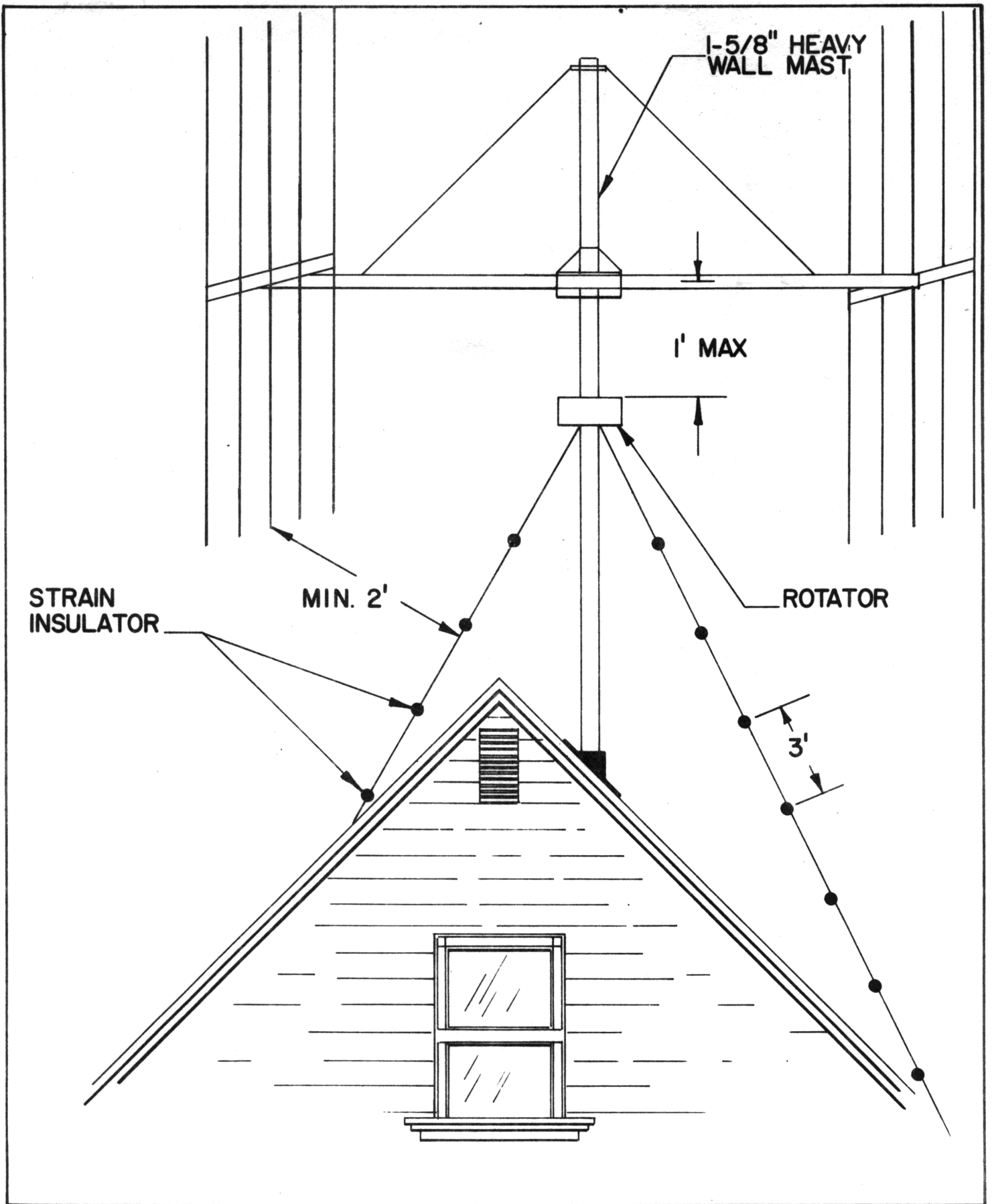
SETTING N° 2 \_\_\_\_\_

VSWR \_\_\_\_\_

FIGURE 7



**FIGURE 8**  
**ROOF-TOP TOWER**  
**INSTALLATION**



**FIGURE 9**  
**ROOF-TOP MAST**  
**INSTALLATION**

**WARRANTY REGISTRATION!**  
FILL OUT AND MAIL IMMEDIATELY!

ON ALL CLAIMS & CORRESPONDENCE REFER TO THIS NUMBER.

DATE PURCHASED

**5335546026**

SERIAL NUMBER

OWNER'S NAME AND ADDRESS

CALL LETTERS

MODEL NO.

PURCHASED FROM

TYPE OF INSTALLATION:..... TOWER..... GROUND..... ROOF..... HEIGHT ABOVE GROUND..... FT.

Where did you first hear of Hy-Gain Products? Friend....., Distributor....., Magazine?.....?

Have you ever seen Hy-gain Advertising?.....

**PACKAGING**       GOOD    FAIR    POOR

Where? .....

**MANUAL**       GOOD    FAIR    POOR

Did you ever reply to a Hy-gain Ad?.....

**ASSEMBLY**       EASY    DIFFICULT

Did you receive what you requested?.....

**EVALUATION**       GOOD    FAIR    POOR

REMARKS: .....

PLACE  
STAMP  
HERE

# HY-GAIN ELECTRONICS CORP.

N. E. HIGHWAY 6 AT STEVENS CREEK

LINCOLN, NEBRASKA 68501

RETAIN THIS FOR YOUR RECORDS, RETURN OTHER PORTION TO MANUFACTURER.

**IMPORTANT:** PLEASE FILL OUT THIS REGISTRATION CARD TO VALIDATE YOUR WARRANTY AND INSURE PROMPT HANDLING OF ANY PROBLEMS THAT MAY ARISE.

LINCOLN, NEBRASKA 68501  
N.E. HIGHWAY 6 AT STEVENS CREEK

**HY-GAIN ELECTRONICS CORPORATION**

DATE PURCHASED

ALL PRODUCTS ARE WARRANTED AGAINST DEFECTS IN MATERIAL AND/OR WORKMANSHIP FOR A PERIOD OF 90 DAYS FROM DATE OF PURCHASE. IN EVENT OF WARRANTY CLAIM, PLEASE CONTACT US DIRECT—ATTN. CUSTOMER SERVICE MANAGER, EXPLAINING FULLY THE NATURE OF THE PROBLEM. IF NECESSARY, AUTHORIZATION AND SHIPPING INSTRUCTIONS WILL BE SENT BY OUR CUSTOMER SERVICE MANAGER.

L I N C O L N , N E B R A S K A

**hy-gain ELECTRONICS CORPORATION**

On all claims and correspondence refer to this serial number . . .  
5335546026

*Warranty*