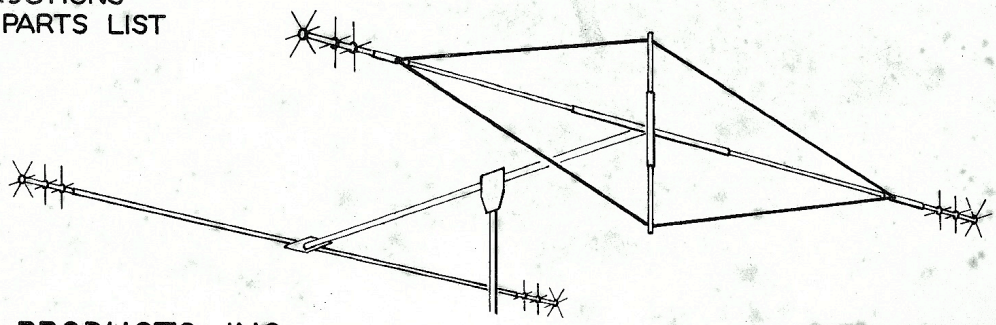
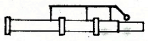
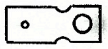
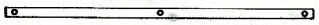
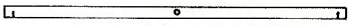
INSTRUCTIONS
AND PARTS LIST



MINI-PRODUCTS INC.

MODEL HQ-1

HYBRID-QUAD ANTENNA

 LOADING COIL (4)	 CROSS ARM BRACKET (1)
 SPOKE PACKAGE (1)	VERTICAL SLEEVE (1)
 HARDWARE PACKAGE (1)	 VERTICAL INSUATOR (1)
 DRIVEN ELEMENT (2)	 HORIZONTAL SLEEVE (1)
INSULATING DOWEL (1)	HORIZONTAL INSULATOR (2)
 BOOM WITH INSULATING BOARD (1)	 COIL MOUNT SLEEVE (2)
 MAST MOUNTING PLATE (1)	REFLECTOR DIAGONAL (4)

ASSEMBLY INSTRUCTIONS FOR HQ-1

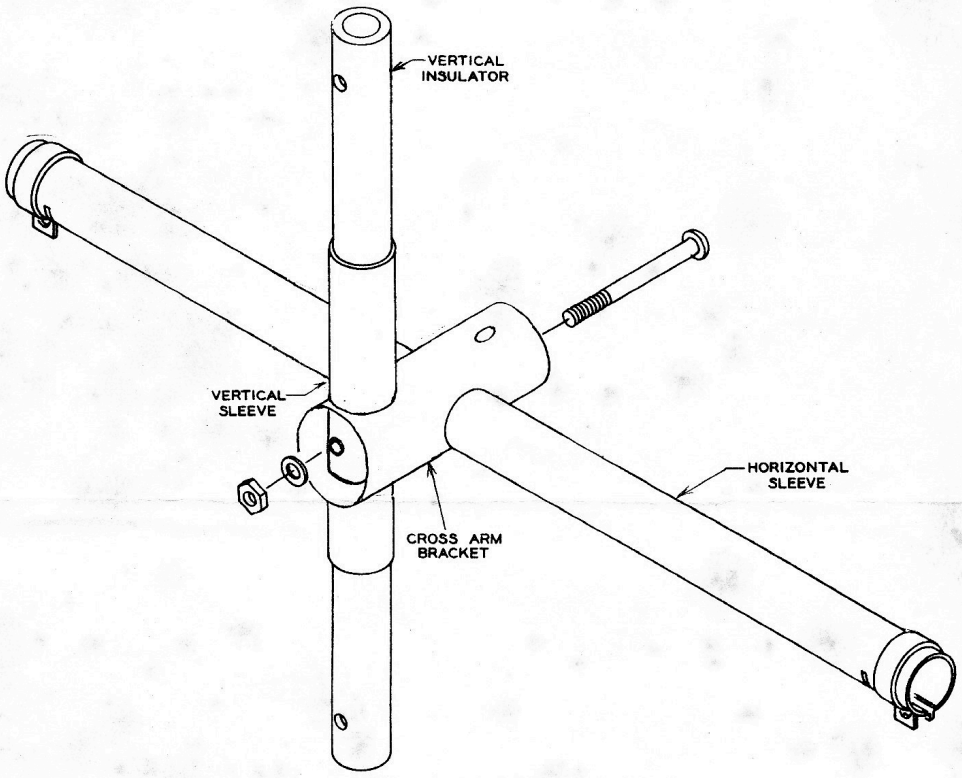
Please read these instructions over before attempting to assemble your antenna.

Page one shows the component parts and their description. These components will be referred to by description in the following instructions.

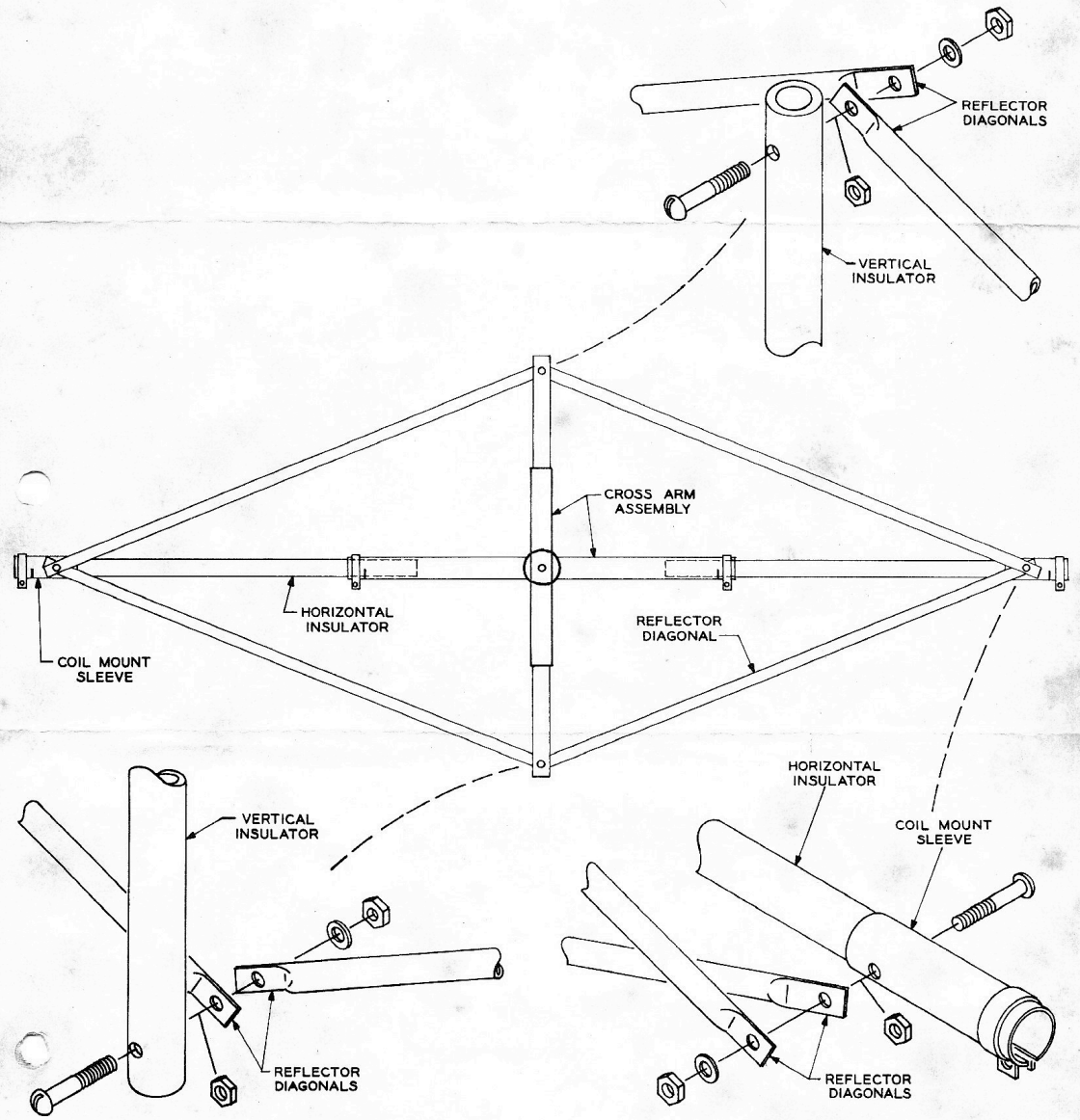
1. Choose a cleared area to proceed with assembly such as a garage floor, patio, etc.

2. Remove loading coils and spoke package; set them aside while performing the hardware assembly. The coils are the last steps performed in these instructions.

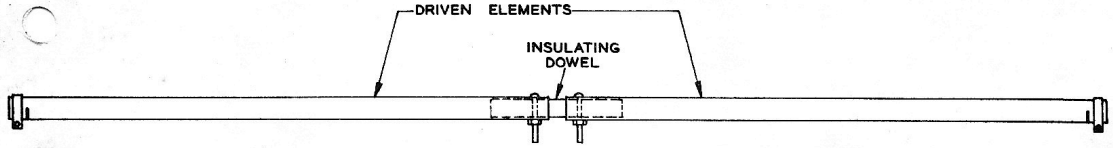
3. Cross Arm Assembly. Assemble horizontal sleeve, vertical sleeve and vertical insulator to cross arm bracket; align holes, insert 2 1/2" long screw; secure with washer and nut. Attach clamps to horizontal sleeve. Refer to picture below.



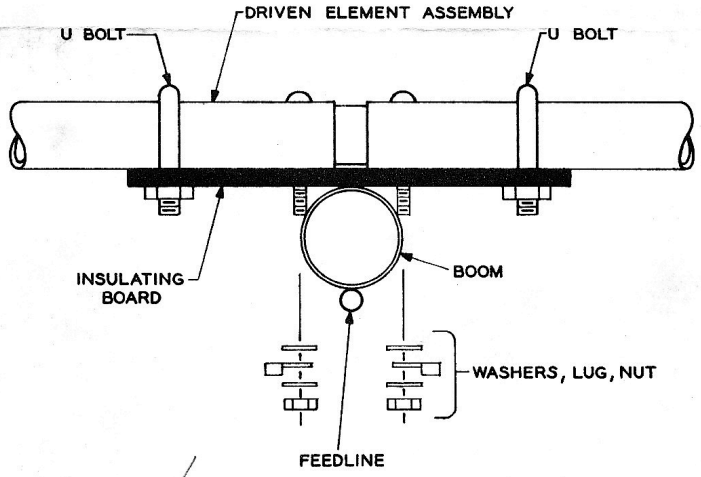
4. Reflector Element. Insert horizontal insulators in ends of horizontal sleeve. Do not tighten clamps yet. Assemble 1 1/2" screw and nut to the vertical ends of cross frame and tighten securely. Assemble coil mount sleeves to ends of horizontal insulators. Insert 1 1/2" screws through the holes provided and fasten securely with nut. Place four 1/2" diam. aluminum diagonals over the protruding 1 1/2" screw ends. Put on washers and nuts but do not tighten. Align by sliding insulator in or out of horizontal sleeve. Tighten down all connections including clamps on horizontal sleeve. Refer to drawings below.



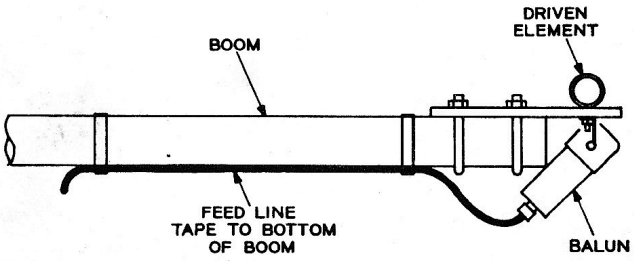
5. Driven Element. Assemble driven elements and insulating dowel with 1 3/4" long bolts and nuts as shown in picture below. This is a heavy current point, nuts must be pulled down tight to ensure good contact.



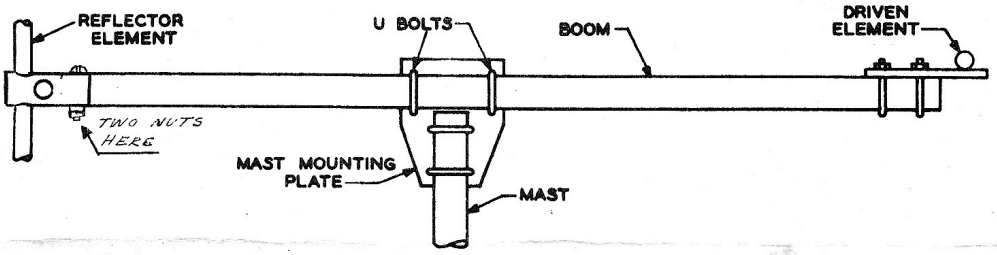
6. Attach driven element to insulating board on side opposite boom; secure with "U" bolts, nuts and washers. Counter bored holes in board provide clearance for driven element nuts. Assemble washer, lugs and nuts to driven element screws protruding through board. Refer to picture below.



7. Feedline Assembly (RG8/U). Feedline attachment may be performed after the antenna is completely assembled, but it is more convenient if attached at this point of assembly. Crimp and solder the leads of the transmission line to the two solder lugs on driven element screw. Check to make certain there is no possibility that either the braid or the center conductor will short out to the boom. Tape feedline to underside of boom as shown in picture for step 6.
Note: The HQ-1 will work fine with direct feed, however, to eliminate skewing and for best front to back a 1:1 50 ohm balun is recommended. If a balun is used it should be located close to the antenna terminals as shown and connecting leads made as short as possible.



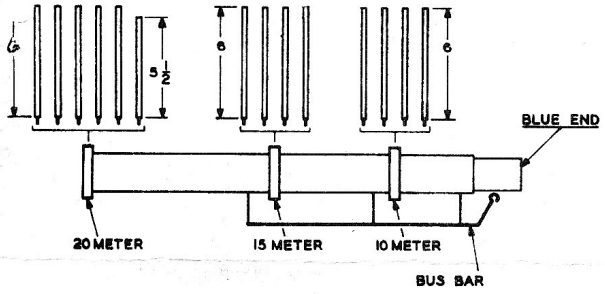
8. Assemble reflector element to boom and align with driven element. Fasten aluminum cross arm bracket to boom with the 2" inch long #10 screw and nuts provided. Place two nuts as shown below to insure reliability. The first nut should be tightened securely before the second nut is tightened down. Mast mounting plate should be assembled approximately mid way between reflector and driven element as shown.



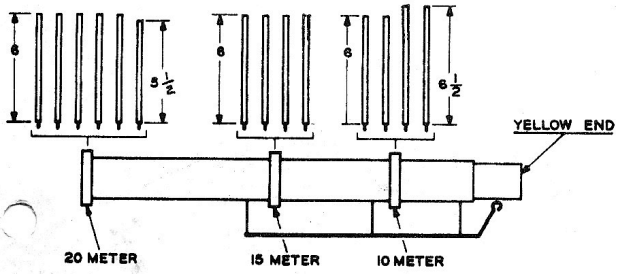
THIS COMPLETES THE HARDWARE ASSEMBLY OF YOUR ANTENNA

9. Coil Assembly and Frequency Adjustments for 10, 15 and 20 Meters.
The drawing below shows one reflector coil and one driven coil. Also shown is the spoke distribution and the various rings which affect operating frequencies for 10, 15 and 20 meters sections.

DRIVEN COIL



REFLECTOR COIL



NOTE:

1. Spoke length is measured from the shoulder above the threads to tip of spoke.

2. Radial position of longer or shorter spokes in the rings is not critical.

3. Avoid bending bus bars; straighten if necessary.

The Model HQ-1 is factory resonated near the low frequency end of each band. Antenna as received from factory and using spokes as supplied resonates at approx. 50 KHz of the following frequencies: 10 Meter Band - 28.6 MHz
15 Meter Band - 21.2 MHz
20 Meter Band - 14.150 MHz

For those who wish to operate higher into the phone band or into the single side side band portion, the frequency of the 10, 15 and 20 meter bands may be independently increased by changing the length of one spoke in each coil on any or all bands which you wish to change. The table below indicates the amount of frequency change in each band by removing 1/2" of spoke length from one spoke from each coil for that particular band.
Adjustment of one band does not affect the resonant frequency of other bands as is sometimes the case with other multi-band antennas.

Bands	Effect of removing 1/2" from one spoke for each coil
10 Meters	Increases 250 KHz
15 Meters	Increases 150 KHz
20 Meters	Increases 100 KHz

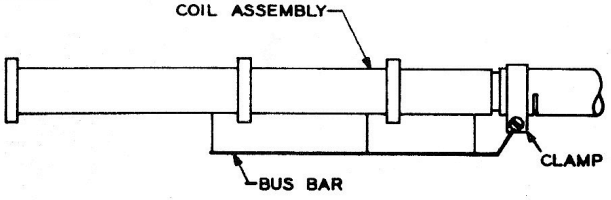
The values for removal of 1/2" spoke length shown in the table are to be considered typical. The relationship is basically linear ie., if 1/4" is removed the frequency increase is about one half the value shown in the table and if 1" is removed the frequency increase is twice the value shown in the table.

Example: You wish to raise the frequency of the 20 meter section by 100 KHz. Choose one spoke from each 20 meter ring, remove 1/2" from each spoke, return the shortened spokes to the 20 meter rings, one shortened spoke per ring.

Note: Remember, the adjustment is made on one spoke from each coil for that band you wish to change. All shortened spokes should be rounded of to prevent corona. The position of the shortened spoke in its respective ring is not critical.

10. Spoke Installation. Insert the spokes into their respective rings to finger tightness followed by an additional 1/8 or so turn with pliers to ensure good electrical contact. Failure to tighten spokes properly will result in irregular antenna operation.

11. Assemble reflector coils (yellow color end) to reflector element and driven coils (blue color end) to driven element. Eye of coil bus bar is secured to clamps on ends of elements.



CONGRATULATIONS! YOU'RE FINISHED.

Six Meter Band. The 50 to 54 MHz six meter band is resonated at the more popular low end of the band. The SWR on six meters is approximately 2.5 to 1.0 across the entire band, but the antenna has good gain and extremely good front to back on this band. Since most baluns are lossy at this frequency a balun is not recommended.

GENERAL NOTES

The general information below is somewhat random in nature and has been included in this special section. As additional suggestions and comments of this nature become available, we will be happy to pass them along to you so that you get the ultimate in operating pleasure from your Model HQ-1 two element four band hybrid antenna. Your comments are welcomed and are solicited.

1. If it is desired to decrease the resonant frequency of your antenna, it is only necessary to lengthen spokes. Spokes may be lengthened by soldering a short length of No. 12 or 14 Ga. copper wire to their tips and then trimming to required length. Longer spokes are available from the factory at 80¢ each, post paid.

2. The Model HQ-1 is intended for mounting with an 1½ OD mast (not included). A standard TV type rotor is normally adequate for rotation.

3. We hope you never break off one of the tuning spokes but it can happen. One easy way to remove it is to file it flat with the surface of the coil ring and saw a slot across the center. Simply insert a screw driver into this slot and remove the broken stub.

4. Replacement or spare parts are available if required. Address requests for information to:

   MINI-PRODUCTS, INC.
   1001 West 18th Street
   Erie, Pennsylvania 16502

   ATT. Customer Service Department

- -NOTE- -

When operating the HQ-1, the input power to the final must be limited to 1200 watts P.E.P. During tune-up and when operating in the key down or CW mode, dc input must be limited to 500 watts and 40% duty cycle.

FOR LIGHTNING PROTECTION, THE MAST SUPPORTING THE ANTENNA SHOULD BE CONNECTED TO EARTH GROUND WITH A LOW RESISTANCE HEAVY GUAGE (#10 or #12) COPPER WIRE.

OR--THE OUTSIDE SHIELD OF THE COAXIAL FEEDLINE SHOULD BE CONNECTED TO EARTH GROUND WITH A LOW RESISTANCE COPPER WIRE ON THE OUTSIDE NEAR THE POINT WHERE IT ENTERS THE BUILDING.
