

INSTRUCTIONS

HORNET MODEL TB 750 THREE ELEMENT - THREE BAND ANTENNA FOR 10 - 15 - 20 METERS

UNPACKING: Your Hornet tribander has been carefully packed as per packing slip. Remove parts and check off in provided column marked 'Check List' on Parts List. In case of shortage, check missing parts and return packing slip to Hornet Antenna Products Company, Dept. C., P. O. Box 808, Duncan, Oklahoma.

MAST: Mast-to-boom fitting is machined to fit $1\frac{1}{2}$ " o.d. mast. $1\frac{1}{4}$ " E. M. T. measures $1\frac{1}{2}$ " o.d. and is readily available at wiring supply shops and from electrical contractors.

INITIAL ASSEMBLY: Assembly of the beam in low-level position (on saw-horses, crates, etc.) is recommended. Become familiar with assembly of the beam to aid in final installation. **BE VERY CAREFUL TO SET ALL LENGTHS EXACTLY** to the measurements specified in the accompanying illustration.

_____ 1. Select the following items needed in this step:

- 1 - DE-4A fitting
- 2 - DE-5A Aluminum straps
- 2 - DE-4B Aluminum straps
- 1 - Driven element half with jack and insulator bushings
- 1 - Driven element half 1" x 72" slotted on one end

Install element with jack, in driven element fitting DE-4A. Secure with 2 DE-5A straps using $1/4$ " - 20 x $3/4$ " bolts. (The DE-4A fitting has a coax connector and plug assembly that will mate with the jack in the element).

Install the unslotted end of the remaining element half in the DE-4A fitting using 2 DE-4B straps and $1/4$ " - 20 x $3/4$ " bolts. Note that this section is not insulated from the boom.

_____ 2. Select mast-to-boom fitting ('T' fitting) and insert $1\frac{1}{2}$ " mast in fitting. If mast is in position at top of tower, refer to MOUNTING for alternate suggestion.

_____ 3. Slip driven element (assembled in step #1) onto longer boom half to a position approximately 6" from undrilled end. Flat side of fitting should face drilled end. Join the two boom halves in boom-to-mast fitting, placing the undrilled ends of boom halves in the fitting. Place four $1/4$ " - 20 x 1" bolts through the skirt edges of this fitting using a lockwasher and nut on each. **DO NOT TIGHTEN.** NOTE: When installing the fittings on the boom, you may wish to use a large screwdriver or chisel to act as a 'wedge' for spreading the fittings slightly. NOT TOO MUCH. Just enough to slide them on the boom easily.

_____ 4. Slide a $1\frac{1}{2}$ " aluminum 'boom-brace' clamp on each boom half (to be used later in installing overhead brace assembly).

_____ 5. Select two element-to-boom fittings (E-500) and mount one on the outside end of each boom half. These fittings should be mounted with 'flat' side facing IN towards mast-to-boom fitting. Align pre-drilled holes in fittings and boom ends. Secure with $1/4$ " - 20 x $1\frac{1}{4}$ " bolts, lockwasher and nut in 'ear' of fitting, and with $1/4$ " - 20 x 1" bolt and nut through side of fitting. NOTE: Do not over-tighten bolt in 'ear' of fitting to avoid breaking.

_____ 6. Select two $1\frac{1}{4}$ " - 1" element centers. Mount one in each element mount fitting with $1/4$ " - 20 x $1\frac{3}{4}$ " bolts. Place one flat washer on each of bolts, and insert through holes in element. Place element in flange, inserting extending bolts in holes in flange. Place lockwasher and nut on each bolt as it extends through boss on back of flange. **TIGHTEN FIRMLY BUT BE CAREFUL NOT TO CRUSH TUBING.**

7. If mast has been installed in step #2, place in true vertical plane, and CAREFULLY align parasitic elements (installed in step #6) to the horizontal plane. Lock boom halves by tightening bolts in skirt of boom-to-mast fitting. Tighten only until mast and boom halves are 'locked'. Further tightening may break fitting.

8. Position driven element midway between reflector and director and carefully align with the parasitic elements to the horizontal plane. Secure with two 1/4" - 20 x 1 1/4" bolts, two lockwashers and two nuts in 'ear' of fitting. Do not over-tighten, as fitting may be broken. Tighten setscrew provided in hub of fitting.

9. Select two overhead braces, remaining two 1 1/2" aluminum clamps, four 1/4" - 20 x 1" bolts, and four 1/4" - 20 hex nuts. Referring to Fig. #2, install braces as shown, with brace rods secured to mast, extend brace rods outward on boom to gain boom support. Tighten all bolts in overhead brace assembly. See MOUNTING for alternate suggestions.

10. Select six 1" plastic clamps and place one on the end of each element, using 10/32 screws and nuts. Do not tighten.

11. Select the longest pair of frequency-dividers. Install them in the reflector. (Reflector is on shortest boom half). Unslotted end goes into element. Set dimension "B" (Fig. #1) and tighten clamp. The screws locking the tuning sleeves in the frequency-divider sections and the ears of all element clamps should face downward for a neat uniform appearance. Since moisture cannot enter the frequency-divider sections through tuning piston slots, it is not necessary to tape or otherwise seal.

12. Select shortest pair of frequency-divider sections and install in director as per step #11. Set dimension "H" and tighten clamps.

13. Select remaining pair of frequency-divider sections and install in driven element as per step #11. Set dimension "E" and tighten clamps.

14. Select six 7/8" plastic clamps and place one on end of each frequency divider section, using six 10/32 screws and nuts. Do not tighten.

15. Select a pair of element ends and install in director. Set dimension "I" and tighten clamp.

16. Install a pair of element ends in the reflector. Set dimension "C" and tighten clamps.

17. Install a pair of element ends in the driven element. Set dimension "F" and tighten clamps.

MOUNTING: Because every antenna installation presents its own inherent problems, specific instructions will not be applicable in every case. In planning your installation, however, the following suggested methods should prove useful.

(a) The beam has been completely assembled on the ground and given low-level checks. Check entire beam for secure assembly. Pull beam to top of tower with strong rope and secure. Note: If mast has previously been installed on tower, raise beam to top of tower and slip mast-to-boom fitting over mast. Brace rods should be installed as described in step #9 and spread along boom halves to gain boom support. See Fig. #2.

(b) Remove boom halves with elements attached from mast-to-boom fitting. Mount mast-to-boom fitting on mast at top of tower or pole. Mount brace rods on clamps 24" above mast-to-boom fitting. Pull halves of beam to top of mast, one at a time, and slip ends of the boom into the mast-to-boom fitting. Place all elements in a horizontal plane by rotating boom halves. Secure bolt in flange of mast-to-boom fitting. Attach brace rod clamps as described in step #9 and spread

(c) Installing on a tilt-over tower. Tilt tower over until you have a distance of 9' from ground to where $1\frac{1}{2}$ " mast extends out of tower. Mount mast-to-boom fitting and brace rods as in example (b) above, using a small stepladder to reach the center. Mount one of the boom sections with elements attached and secure brace rod to boom. Rotate beam 180 degrees and repeat with remaining boom and element assembly. Once again 'boom-brace' clamps may be extended along boom to gain support.

TRANSMISSION LINE: Use only RG 8/U - 52 ohm coaxial transmission line. If power level does not exceed 100 watts RG 58/U coaxial cable may be used.

LOADING: If your transmitter has a Pi network in the final, you should not experience any trouble in loading. Transmitters using link-coupling to the output may require one of the methods shown in Figs. #3A and #3B. Use Fig. #3B for links with fewer turns. L & C should resonate at operating frequency.

OPERATION: Experience at the Hornet Antenna Test Facility has shown that very little can be gained by additional tuning of the antenna. If the antenna is installed at least 40' high and reasonably clear of trees, power-lines and other objects, good performance can be expected.

OPERATING CHARACTERISTICS

RESONANCE:

10 meters - - 28.750
15 meters - - 21.350
20 meters - - 14.250

FRONT TO BACK RATIO:

10 meters)
15 meters) 15 - 18 db
20 meters)

FORWARD GAIN:

10 meters - - 6.5 db* (See note below)
15 meters - - 6.0 db* (See note below)
20 meters - - 5.5 db* (See note below)

SWR AT RESONANCE:

10 meters)
15 meters) 1.2 or less
20 meters)

NOTE: It is not possible to measure gain or front to back ratio of antennas below 30 mc with any great degree of accuracy. Many factors such as ground reflection and proximity of surrounding objects cause data collected at one time not to be reproduceable at another time.

With due consideration of the above, recent measurements made at the Hornet Antenna Test Facility indicate that a 3 element Yagi antenna with .35 wavelength total boom length has a gain of 7.3 db approx., as measured over a 1/2 wave dipole. In our opinion this is a more realistic figure than those commonly used for an antenna of this kind.

Gain and front to back measurements as indicated for the Model TB 750 are in accordance with this concept.

MUCH MORE IMPORTANT THAN PUBLISHED GAIN FIGURES is 'on-the-air' proof of antenna superiority. Thousands of enthusiastic users of Hornet antennas will attest to this fact.

HORNET ANTENNA PRODUCTS COMPANY, P. O. Box 808, Duncan, Oklahoma

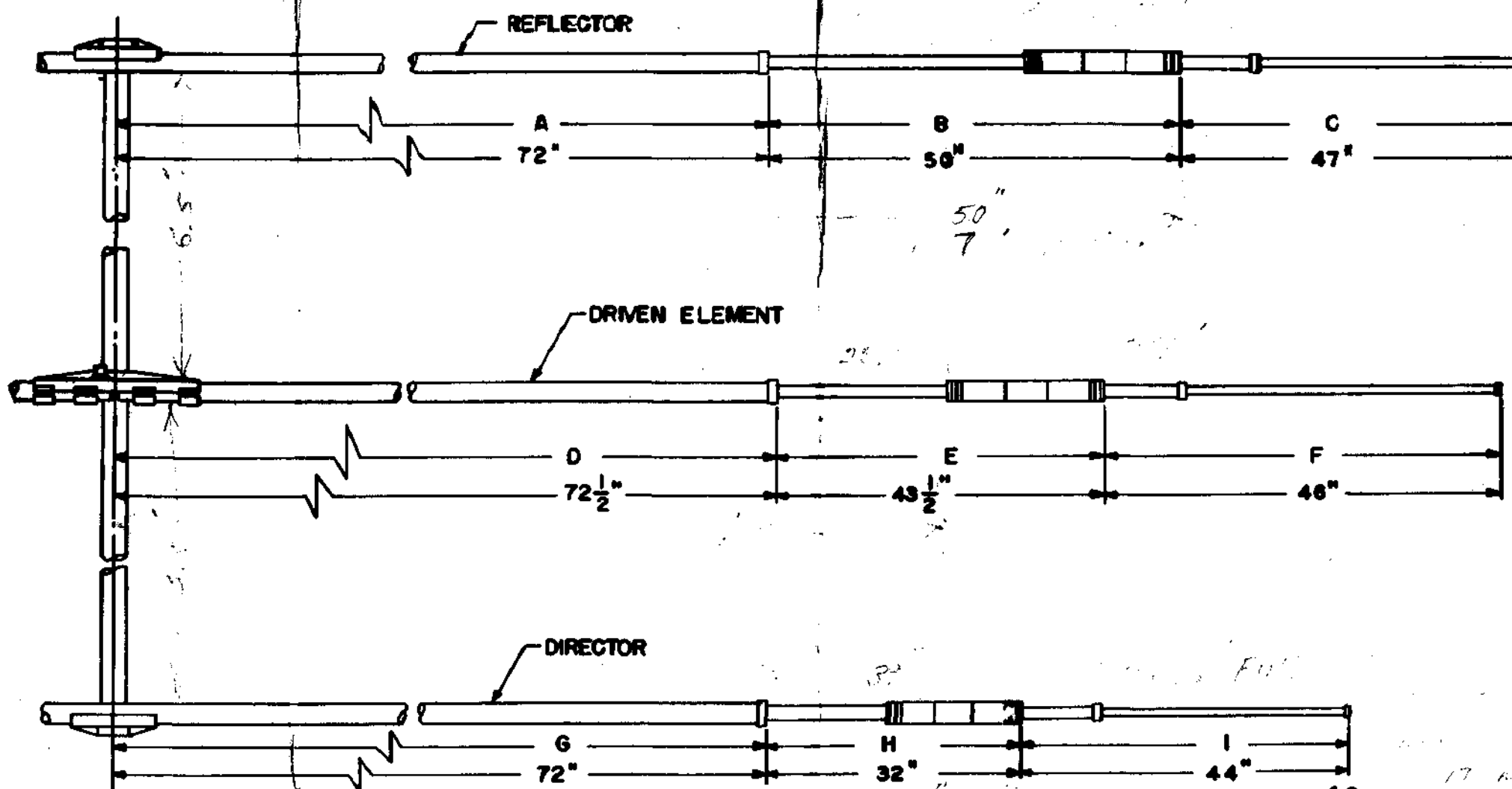


FIG. 1

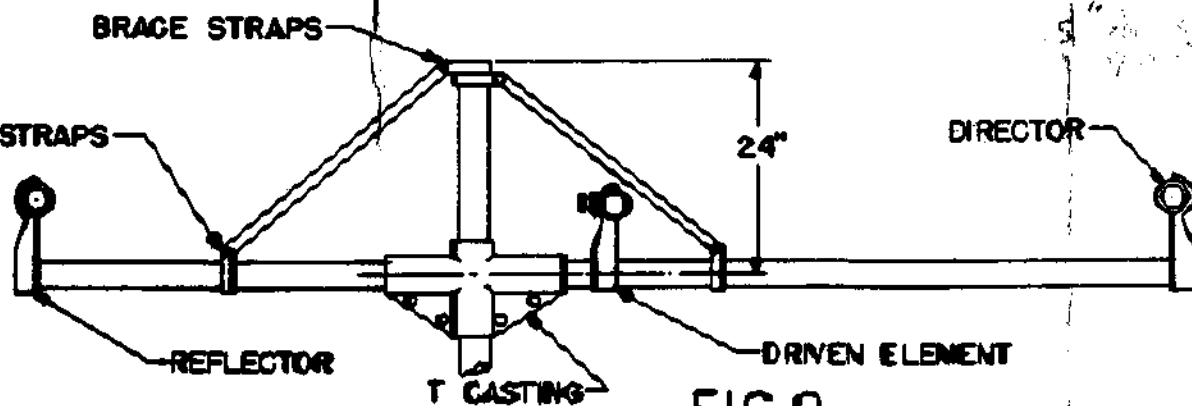


FIG. 2

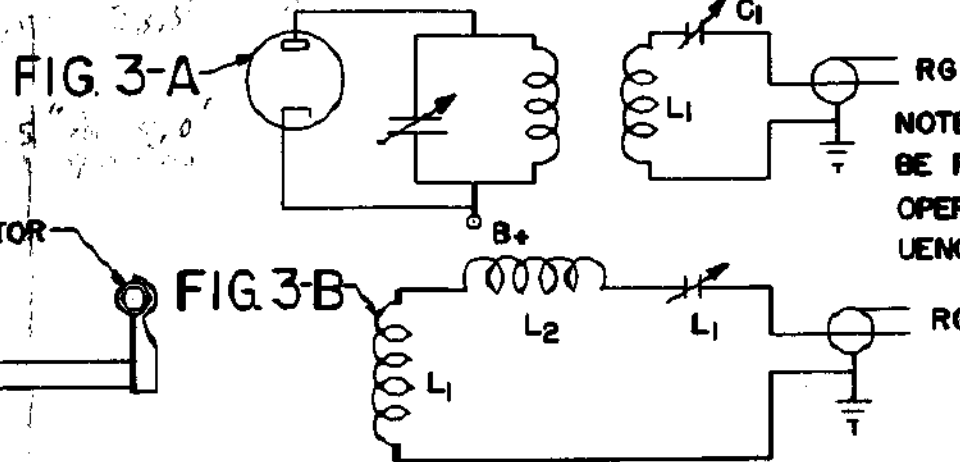


FIG. 3-A

FIG. 3-B