

INSTRUCTIONS

HORNET MODEL TB-600

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.

TOOLS NEEDED FOR INSTALLATION:

2 small wrenches (to fit 1/4" - 20
hex bolts and nuts)

6' "Pull-out" rule

Small hammer or mallet

Screwdriver or cold chisel (to use as
wedge)

Large pair of pliers

Small file

Soldering iron and solder

Roll of plastic electrical tape

SWR bridge (helpful but not essential)

MAST: Mast-to-boom fitting is machined to fit 1 1/2" o.d. mast. 1 1/4" E.M.T. measures 1 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 illustrations. After beam is completely assembled as per step-by-step procedure below, check for correct operation as per 'low-level' check below. If possible, raise beam to a height of 6' to 10' for these checks. A step-ladder makes a good 'tripod' for this purpose.

1. Select the driven element fitting, four cast-aluminum straps, eight $1/4'' - 20 \times 3/4''$ bolts and two driven element halves (with terminals and insulation bushings on ends). Install elements in fitting using straps and $3/4''$ bolts. Terminals should face 'out' and will be approximately 1'' apart, if insulation bushings are mounted evenly under straps.

2. Select two boom halves and boom-to-mast fitting ("T" casting). Slip driven element (assembled in step # 1) on longer boom half to a position approximately 6" from undrilled end. Flat side of fitting should face undrilled end. Join the two boom halves using boom-to-mast fitting, placing the undrilled ends of boom halves in the fitting. Place four $1/4'' - 20 \times 1''$ bolts through the skirt edges of this fitting using a lock-washer and nut on each. DO NOT TIGHTEN. NOTE: When installing the fittings on the boom it is good practice 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.

3. Slip $1 \ 1/2''$ o.d. mast through boom-to-mast fitting, leaving at least 24" extending out of the top.

4. Slide a $1 \ 1/2''$ strap on each boom half. (to be used later in installing overhead brace assembly).

5. Select two element-to-boom fittings and mount one on the outside end of each boom half. These fittings should be mounted with 'flat' side facing IN towards center of boom. Align pre-drilled holes in fittings and boom ends. Secure with $1/4'' - 20 \times 1 \ 1/4''$ bolts, lockwasher and nut in 'ear' of fitting, and with $1/4'' - 20 \times 1''$ bolt and nut through side of fitting. NOTE: Do not overtighten bolt in 'ear' of fitting to avoid breaking.

6. Select two center element sections ($1'' \times 12'$). Mount one in each fitting you have installed as per step #5. Use two $1/4'' - 20 \times 1 \ 3/4''$ bolts to secure each element to element fitting. Place the bolts through holes in fitting then through matching holes in element. Use a flat washer, a lock-washer, then a hex nut. Tighten firmly but not tight enough to crush element.

✓ 7. With mast section in true vertical plane, CAREFULLY align 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 to the horizontal plane. Secure with two 1/4" - 20 x 1 1/4" bolts, lockwashers and 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 straps four 1/4" - 20 x 1 1/4" 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 desired support. Tighten all bolts in overhead brace assembly.

✓ 10. Select six 1" aluminum straps and place one on the end of each element, using 1/4" - 20 x 1" bolts and one nut only on each strap.

✓ 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" (Refer to dimension sheet) and tighten strap. NOTE: All straps should be turned down, i.e., bolt on bottom of element for a neat uniform appearance. Tighten straps firmly, testing element section to be sure it is 'locked'. After straps have been tightened, bend the ends of the straps 'back' against the bolt head and nut using a large pair of pliers. This sets the strap and makes it hold firmly.

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

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

✓ 14. Select six 7/8" aluminum straps and place one on end of each frequency-divider section, using six 1/4" - 20 x 1" bolts and nuts.

15. Select shortest pair of wire-tipped element ends and install in director. Set dimension "I" and tighten strap. Place wire-tips in vertical plane.

16. Install a pair of wire-tipped element ends in the reflector. Set dimension "C" and tighten strap. Place wire-tips in vertical plane.

17. Install the remaining pair of element ends in the driven-element. Set dimension "F" and tighten strap. Place wire tips in vertical plane.

TRANSMISSION LINE: Use ONLY RG8/U - 52 ohm coax to feed the TB-600. To attach coax, use solder lugs to connect center conductor and shield of coax to provided bolt terminals. Attach lugs to coax cable as closely as possible, i.e., do not unwind too much shield, as this extra length will add to the effective length of the driven element, and will lower the resonant frequency of the antenna. Carefully tape the end of the coax around the solder lugs to prevent water from entering the transmission line. Tape coax to boom and mast to keep its weight off of the terminal connection. The length of transmission line is not critical, use any convenient length.

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 Fig. #3 (A) or (B). Use (B) for links with fewer turns.

'LOW-LEVEL' CHECK: Before installing antenna on tower, it is wise to check it, under low power, for correct operation. The procedure described below is intended to check resonant frequency of the antenna only. In low position, the antenna will exhibit an apparent high SWR due to power reflected back to antenna from ground and surrounding objects. To minimize this effect, use as low power as possible in tests. SWR will recede to low value when antenna is raised to satisfactory height above ground.

To determine resonant frequencies use ONLY the SWR indicator method described below. A grid-dip meter is NOT ACCURATE in this function due to ambiguity of dips, 'pulling' and small scale. Be ABSOLUTELY SURE that the SWR indicator you use is ACCURATE, DESIGNED for 52 ohms, and CALIBRATED against a non-reactive 52 ohm load.

When the antenna is assembled as per dimensions shown in Fig. 1, resonance, as checked on the ground (six or seven feet high), should be slightly lower than the specified mid-band frequencies (see Operating Characteristics). When placed higher above ground and buildings, and away from surrounding structures, resonant frequencies should be very close to those specified.

1. To make frequency checks or adjustments on the triband beam, always start with the highest frequency band. Tune transmitter to 28.75 mc. While observing SWR meter shift frequency slightly higher, then lower to determine point of resonance. The point at which minimum reflected power is indicated by SWR meter is the resonant frequency.

2. If resonant frequency is to be lowered, increase dimension "E". If resonant frequency is to be raised, shorten dimension "E". IMPORTANT: Make small changes (1/2" or less). Make equal changes on both ends of driven element. Before making adjustment, BE SURE THAT THE INITIAL DIMENSION IS CORRECT.

3. Tune transmitter to 21.35 and repeat step 1. If resonant frequency needs to be changed it is done by changing the position of the tuning piston on the 15 meter end of the frequency-divider. Before any change is made in the adjustment of the 15 meter frequency-divider, it should be considered very carefully and the exact amount of change needed should be carefully noted. If the change is to be only slight (25 to 50 kc) adjust ONLY the TRAPS ON THE DRIVEN ELEMENT. If a greater change is necessary, make equal changes of the tuning piston in all the 15 meter traps. See Fig. A below for details of adjustment. Use care in making changes. A 1/16" move of the tuning piston makes a noticeable change in resonant frequency. IMPORTANT: Slide the capacitance piston "IN" to raise the frequency. Slide the piston "OUT" to lower the frequency. Mark factory setting with a pencil, and make changes relative to that mark.

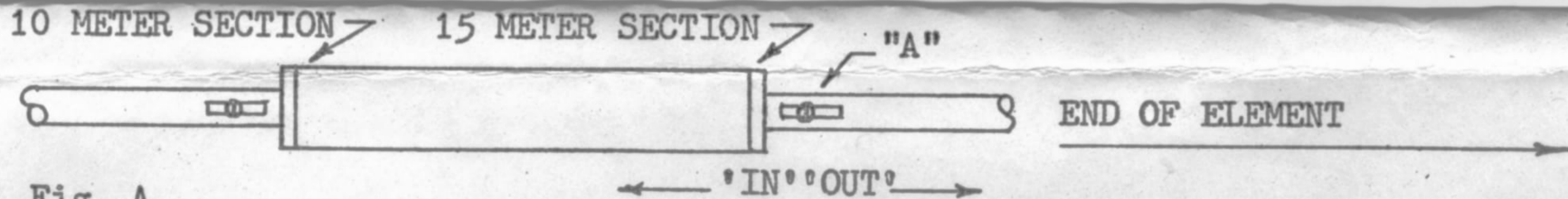


Fig. A

4. Tune transmitter to 14.25 mc and repeat step 1. To lower resonant frequency lengthen dimension "F". To raise resonant frequency, shorten dimension "F". IMPORTANT: Make small changes (1/2" or less). Make equal changes on both ends of driven element. Before making adjustment, BE SURE THAT THE INITIAL DIMENSION IS CORRECT.

SWR: The terminal impedance of this antenna is so near 52 ohms on each band that a very satisfactory SWR is obtained, using a single 52 ohm coaxial transmission line. This is true only if the antenna is installed at a reasonable height above ground and buildings, and is not surrounded by trees, powerlines, large structures, etc.

OPERATING CHARACTERISTICS

RESONANCE:

10 meters - - 28.75
 15 meters - - 21.350
 20 meters - - 14.250

FORWARD GAIN:

10 meters - - 8.2 db
 15 meters - - 7.5 db
 20 meters - - 7.0 db

FRONT TO BACK RATIO:

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

SWR AT RESONANCE:

10 meters - - 1.10
 15 meters - - Unity
 20 meters - - 1.1

HORNET ANTENNA PRODUCTS COMPANY, P. O. BOX 808, DUNCAN, OKLAHOMA

6

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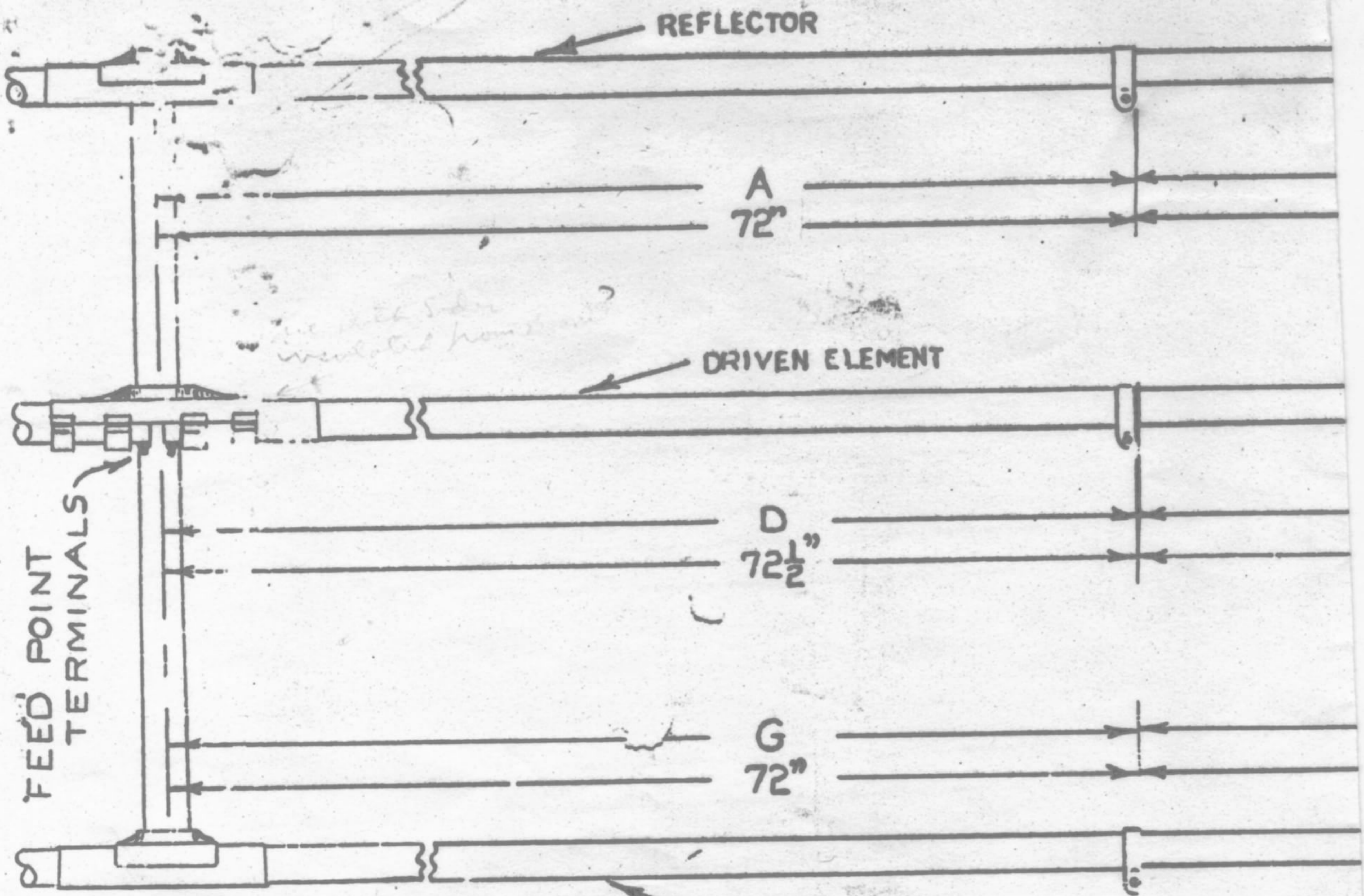
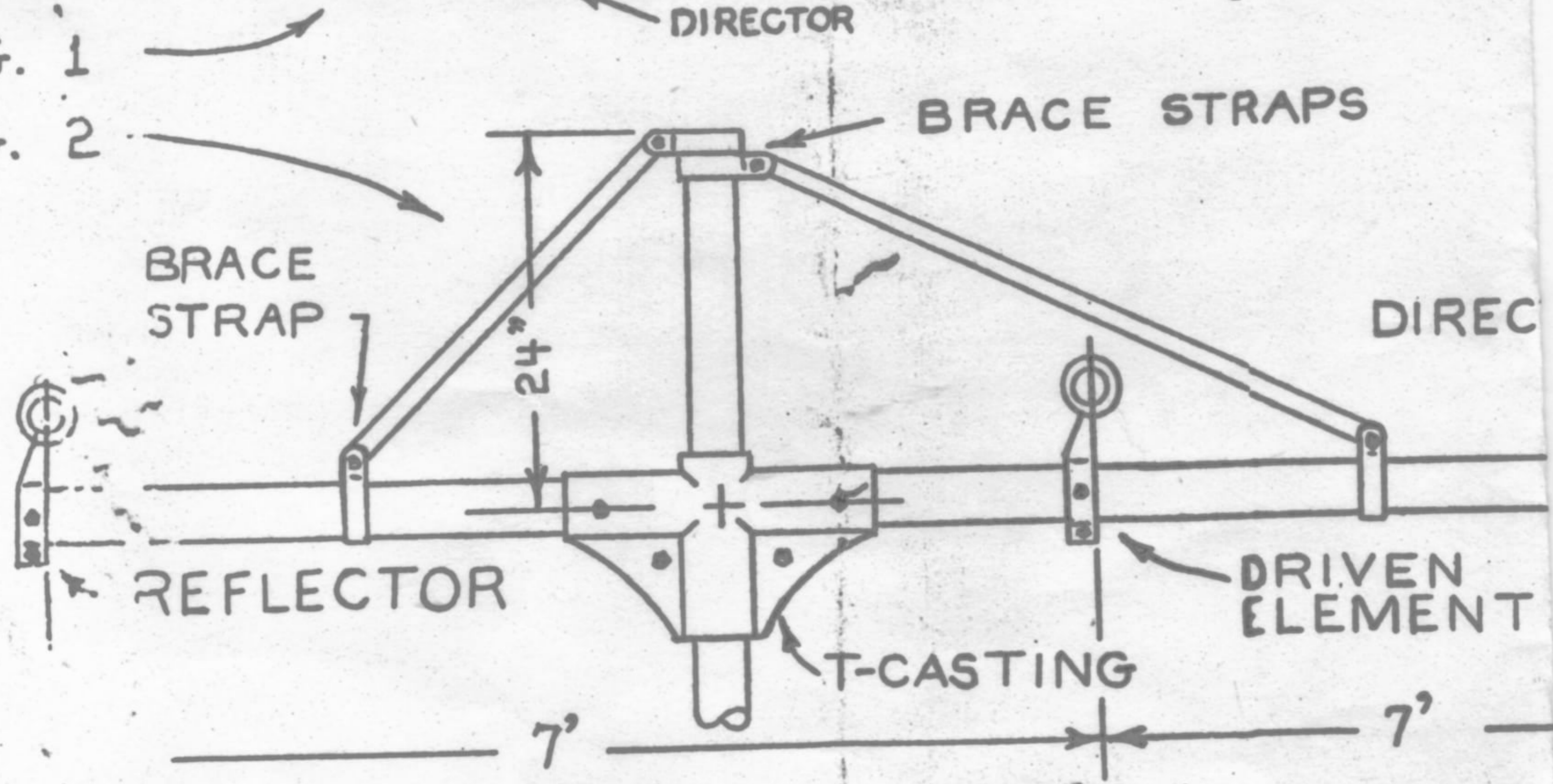


FIG. 1

FIG. 2



7A

PRINT BOTH WAVES AND TAPE TOGETHER.

TB-600
~~FB-500~~

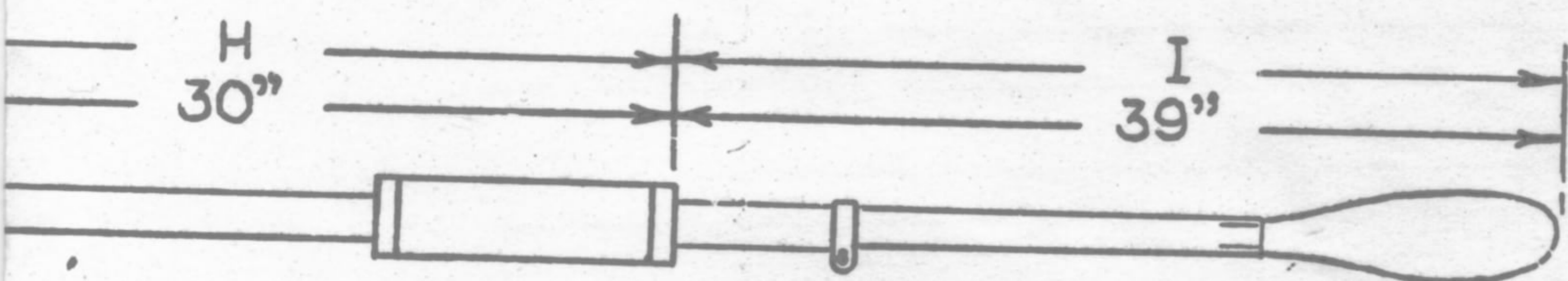
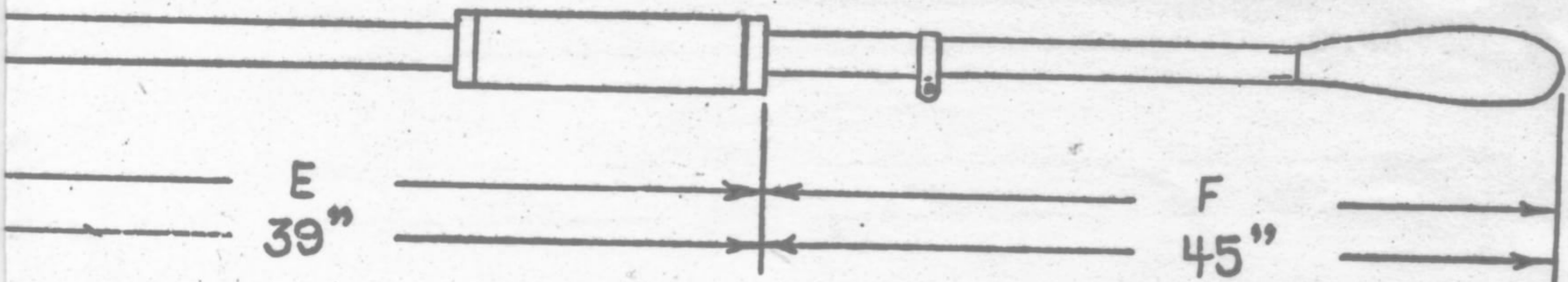
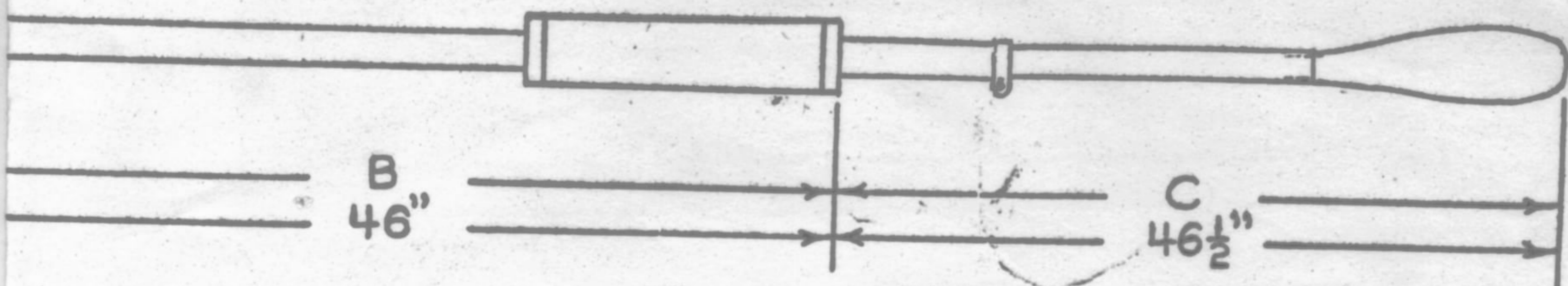
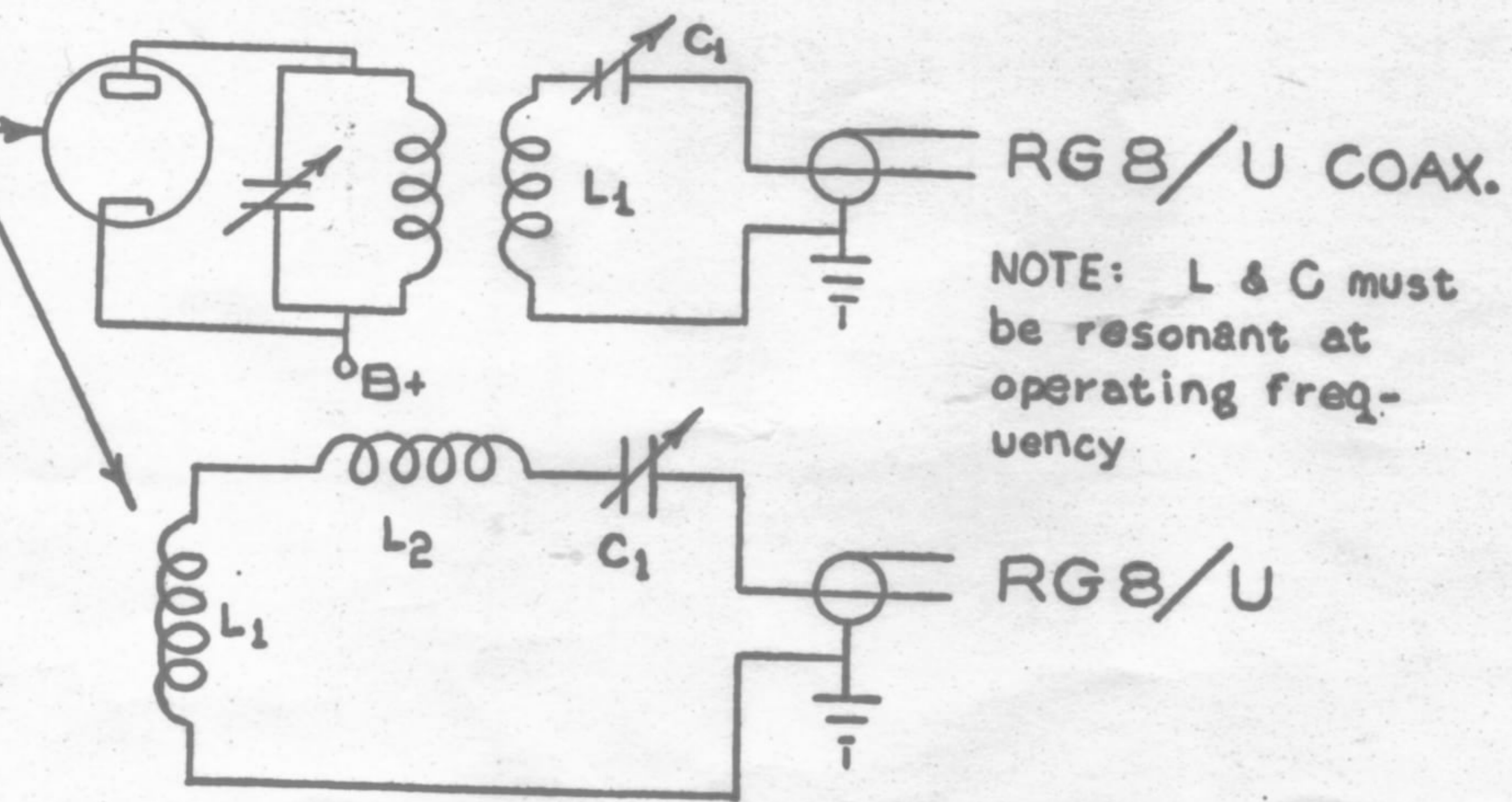
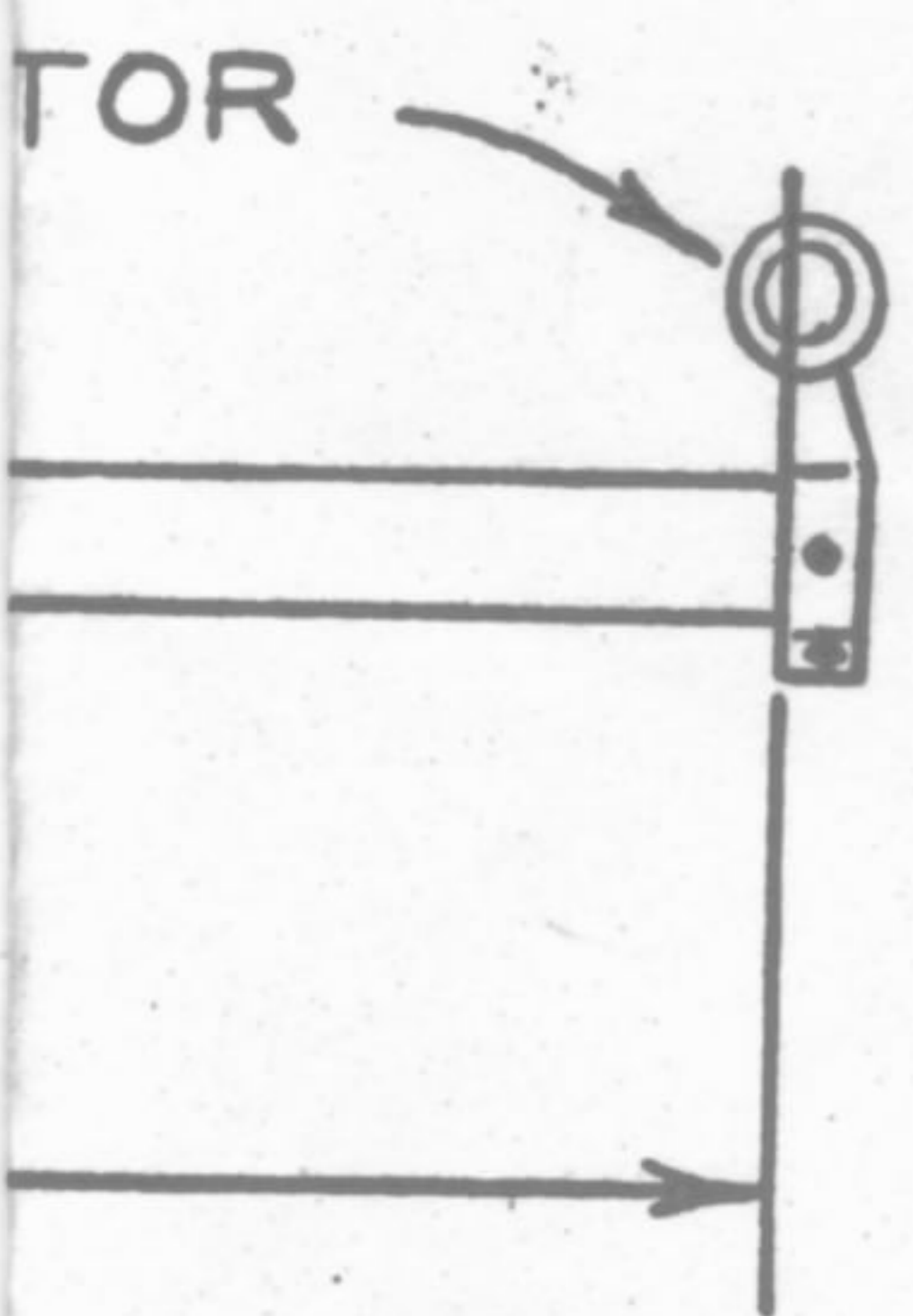


FIG. 3-A
 FIG. 3-B



NOTE: L & C must be resonant at operating frequency

TB-600

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