

KLM KT-34 BANDPASS TRIBANDER

01275

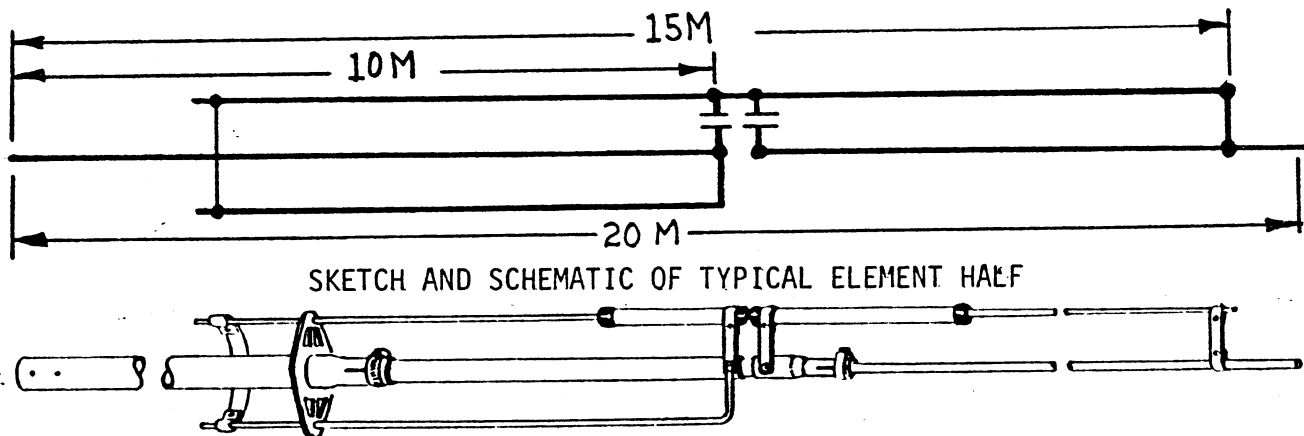
The KT-34 Tribander is innovative in concept, unique in its practical design, consistent in superior performance.

All four of the elements work on each band. Ten meters is a full-sized element using a trap formed with a small amount of linear loading (also used to shorten 20 meter section) and an air capacitor. Fifteen meters uses a tuned decoupling stub with another air capacitor and is also a full-size element. Twenty meters is approximately 75% of full size and defined by the element extending beyond the 15 meter decoupling jumper. Twenty and fifteen meters tune with total independence.

Two driven elements (log cell) with all three resonances are employed to achieve a broadband driven structure which allows almost constant flat VSWR and performance across each of the three bands. Basic feed impedance is 200 ohms balanced and is transformed to 50 ohms unbalanced with the 4KW PEP KLM balun (supplied).

Power handling capability is excellent with no lossy coils or capacitors. Consequently efficiency is high (a conventional tribander may be rated at 8db gain but if it's only 50% efficient, the effective gain is really 5db).

Normal operation (14.-14.350), (21.0-21.450), and (28.-29.50 MHz) requires no adjustments other than the original assembly dimensions given later in the text.



SKETCH AND SCHEMATIC OF TYPICAL ELEMENT HALF

KT-34A SPECIFICATIONS

Frequency of Operation:

20M = 14.0 - 14.35 MHz

15M = 21.0 - 21.45 MHz

10M = 28.0 - 29.75 MHz

Elements: 4 on each band**Max element length:** 24 feet**Gain:** 7dB over a dipole reference**F/B:** 20M-25dB, 15M-22dB, 10M-20dB**F/S:** 30dB or better**Feed Impedance:** 200 ohms balanced/50 ohms
with 4:1 balun supplied**Power Rating:** 4KW P.E.P.**Wind Area:** 6 sq. ft.**Wind Survival:** 100 M.P.H.**Turning Radius:** 15 ft.**Weight:** 45 lbs.**Boom Length/Dia.:** 16 ft./3" O.D.**Mounting:** 2" mast

H.F. ANTENNA ASSEMBLY GUIDE:

BEFORE YOU BEGIN

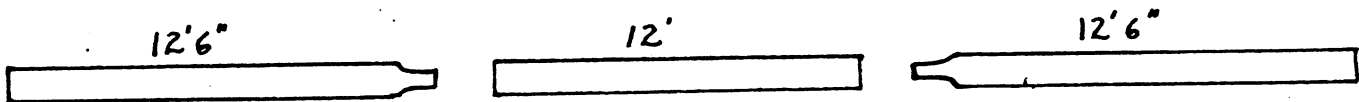
1. Select an assembly area large enough to comfortably accommodate overall antenna dimensions. A shallow box is handy for holding and sorting the smaller hardware, as is a marking pen for identifying components.
2. Some simple tools are required: A tape measure, screwdriver, and a set of spin-tite, and socket or end wrenches. Common nut sizes are:

3/8"	10-32 Hdwe	1/2"	5/16-18 Hdwe
7/16"	1/2-20 Hdwe	9/16	3/8-16 Hdwe

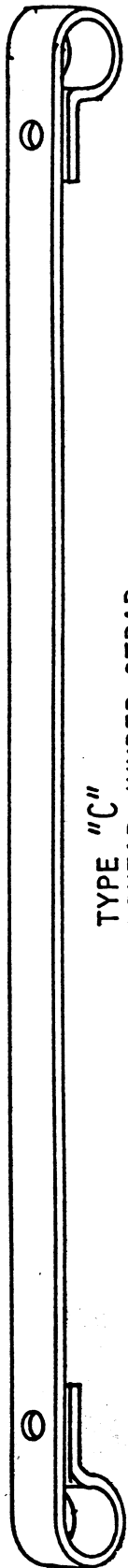
To avoid damage to antenna components, be aware that most hardware need only be moderately hand tightened with screwdriver or spintite to be secure. When using tools with mechanical leverage such as socket or end wrenches, care must be taken not to over-torque nuts and damage components.
3. Thoroughly unpack shipping box and check components and hardware against the Parts List. If there is a difference, look for a "Factory Update/Change" sheet accompanying the assembly instructions prior to contacting KLM.
4. For easiest and fastest assembly, take a few moments before starting to familiarize yourself with the assembly guide and the antenna components.

BOOM ASSEMBLY

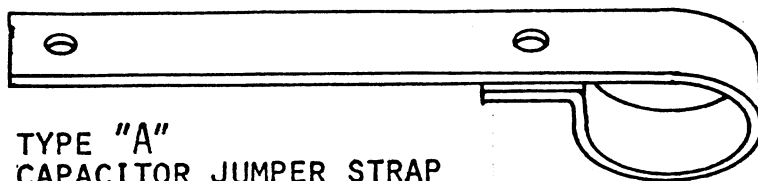
1. Lay out 3" O.D. boom sections on the ground as shown in the sketch below:



2. To assemble, insert the swaged (necked down) end of the boom sections into the appropriate straight boom section and align the bolt holes. Each joint is cross-bolted with two 1/2-20 x 3 1/2" bolts, lockwashers, and nuts. Torque nuts up to 10 ft./lbs.
3. Place the assembled boom on two sawhorses or boxes about 1/3 the length from each end. Slide a 3" I.D. cast-aluminum ring clamp onto each end. Position roughly 3 ft from the rear and 5 ft from the front. If clamps do not slide easily spread them open slightly with two nuts inside split on a 5/16" or 3/8" bolt.



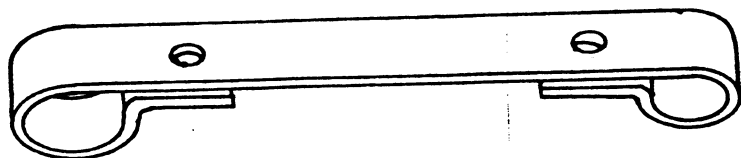
TYPE "C"
LINEAR JUMPER STRAP



TYPE "A"
CAPACITOR JUMPER STRAP

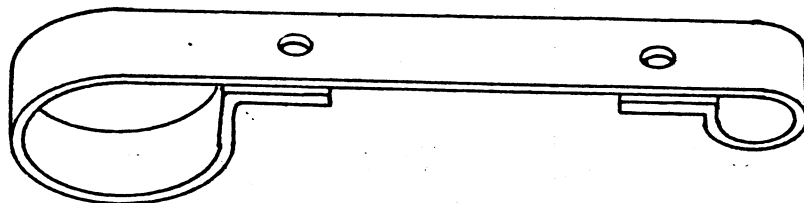


LINEAR
REINFORCING
INSERT "PEANUT"

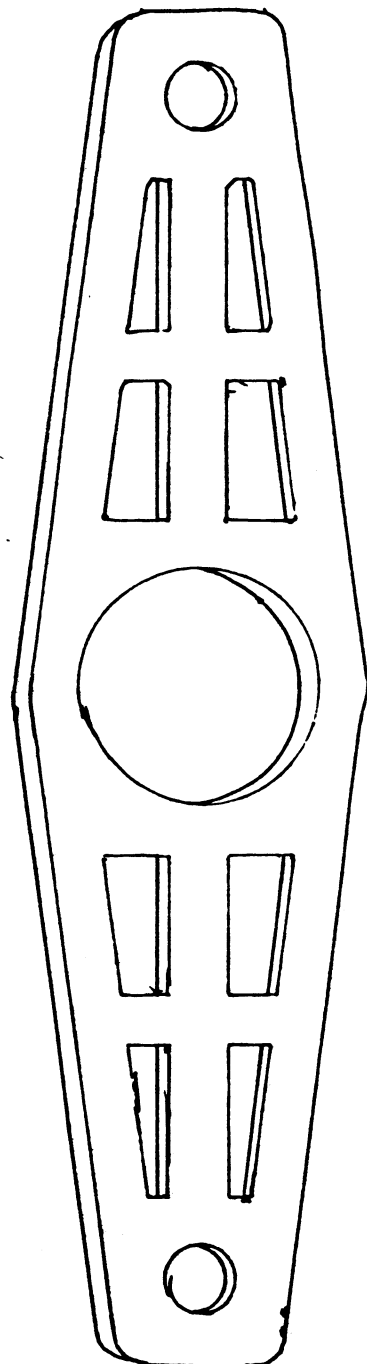


TYPE "B"
15 METER SHORTING STRAP

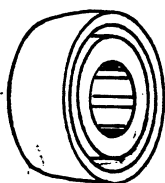
LINEAR
INSULATOR



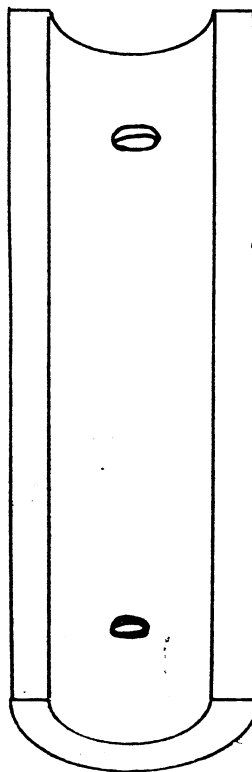
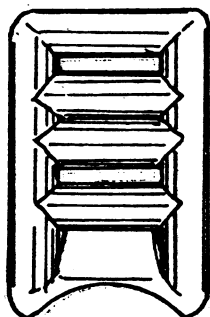
TYPE "D"
MATCH STRAP



CAPACITOR
CAPS



PHASING STRAP
STANDOFF



INSULATOR
REDUCTION
SECTION

I. BEFORE YOU BEGIN.....

1. Select an area large enough to accommodate boom and element lengths. A long workbench is helpful for assembling the element halves. Two sawhorses or large boxes are useful for holding the boom at a comfortable working height. A shallow box is handy for holding and sorting the small hardware. You will need a tape measure, screwdriver, spintites and socket or end wrenches. Common nut sizes used are:

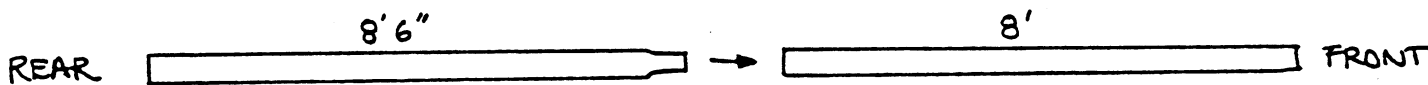
11/32"	8-32 hdwe	7/16"	1/2-20/28 hdwe
3/8"	10-32" hdwe	1/2"	5/16-18 hdwe

Please remember, most small nuts and screws can be considered tightened securely when moderately hand tightened with screwdriver or spintites. When using tools with additional leverage on any hardware large or small, care must be taken not to overtightened and damage components.

2. A conductive zinc or copper paste is supplied with this antenna kit. Apply it lightly between all aluminum-to-aluminum and aluminum-to-copper joints. This includes element overlaps, straps, balun leads, etc. This paste should be used under each nut and lockwasher where they touch any part of the round aluminum elements. Use of this paste ensures long lasting electrical connections and ease in mechanical assembly.
3. Thoroughly unpack the shipping box and check all hardware and components against the Parts List. In the event a difference is apparent, please check for a "Factory Update/Change" sheet accompanying these instructions prior to contacting your dealer or the KLM factory.
4. It is helpful to separate and group the larger components so that they are convenient to locate during the assembly process.
5. Correct assembly and dimensional adjustments are very important to successful operation of the KLM Tribander. A number of illustrations are provided to acquaint you with specific parts and assembly procedures. We suggest you read through the assembly instructions and familiarize yourself with the hardware BEFORE you actually begin construction.

II. BOOM ASSEMBLY

1. Insert the swaged (necked down) end of the 3"O.D. x 8'6" rear boom section into the drilled end of the 8' forward boom section. Rotate sections as needed to align bolt holes and secure with two 1/2-20 x 3 1/2" bolts, lockwashers, and nuts.

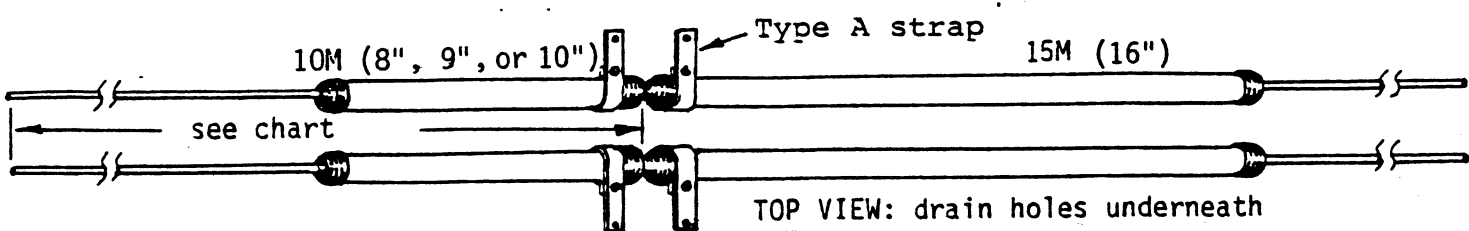


III. CAPACITY BANK ASSEMBLY

NOTE: A short block of wood with a 7/16 to 1/2" hole, clamped in a bench vice is handy for use during installation of the plastic (polyethylene) capacitor caps.

The instructions make a special effort to show how to keep the position and orientation of element components consistent and symmetrical (among elements and element halves) during assembly. It is also helpful to refer often to the pictorials and the "Overview". You should identify various element sections with a felt pen as they are completed. This will speed assembly later.

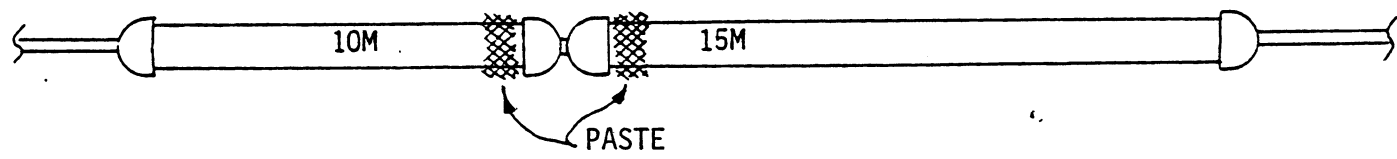
The sketch below shows a typical pair of 3/8"O.D. linear loading sections with 3/4"O.D. capacitor tubes in place. Note the type "A" straps are installed on one section to form a mirror image of the other. This assures proper orientation when the complete element is assembled.



ELEMENT	3/8"O.D.	10M CAPACITOR	CENTER CAPS @	15M CAPACITOR
Director D1	2 ea. 72"	8"	27½"	16"
Front Driven	2 ea. 72"	8"	28"	16"
Rear Driven	2 ea. 77"	9"	28"	16"
Reflector	2 ea. 77"	10"	28½"	16"

1. Slide two capacitor caps, back to back, onto all the 3/8"O.D. x 72" and 77" tubing. Center the caps on the 3/8" tube according to the chart above. Lightly rounding tubing ends with fine sandpaper may ease initial installation. For positioning the caps, pushing the 3/8" tubing through a 1/2" hole in a 2 x 4 that is securely clamped to a bench or cabinet may help.
2. Prepare the 3/4"O.D. capacitor tubes for installation. Push a wad of cloth or foam through the inside of all tubes to remove aluminum chips, dust, moisture, etc. Capacitor sections: 3/4"O.D. x 8", 9", 10", and 16".
3. Slide a type "A" capacitor jumper strap onto each capacitor tube. Insert the 8-32 x ½" screws, lockwashers, and nuts but do not tighten at this time.

Apply paste to all the capacitor tubes in the areas shown on the sketch below. Then slide the jumper straps toward the ends until they are ¼" from the end.



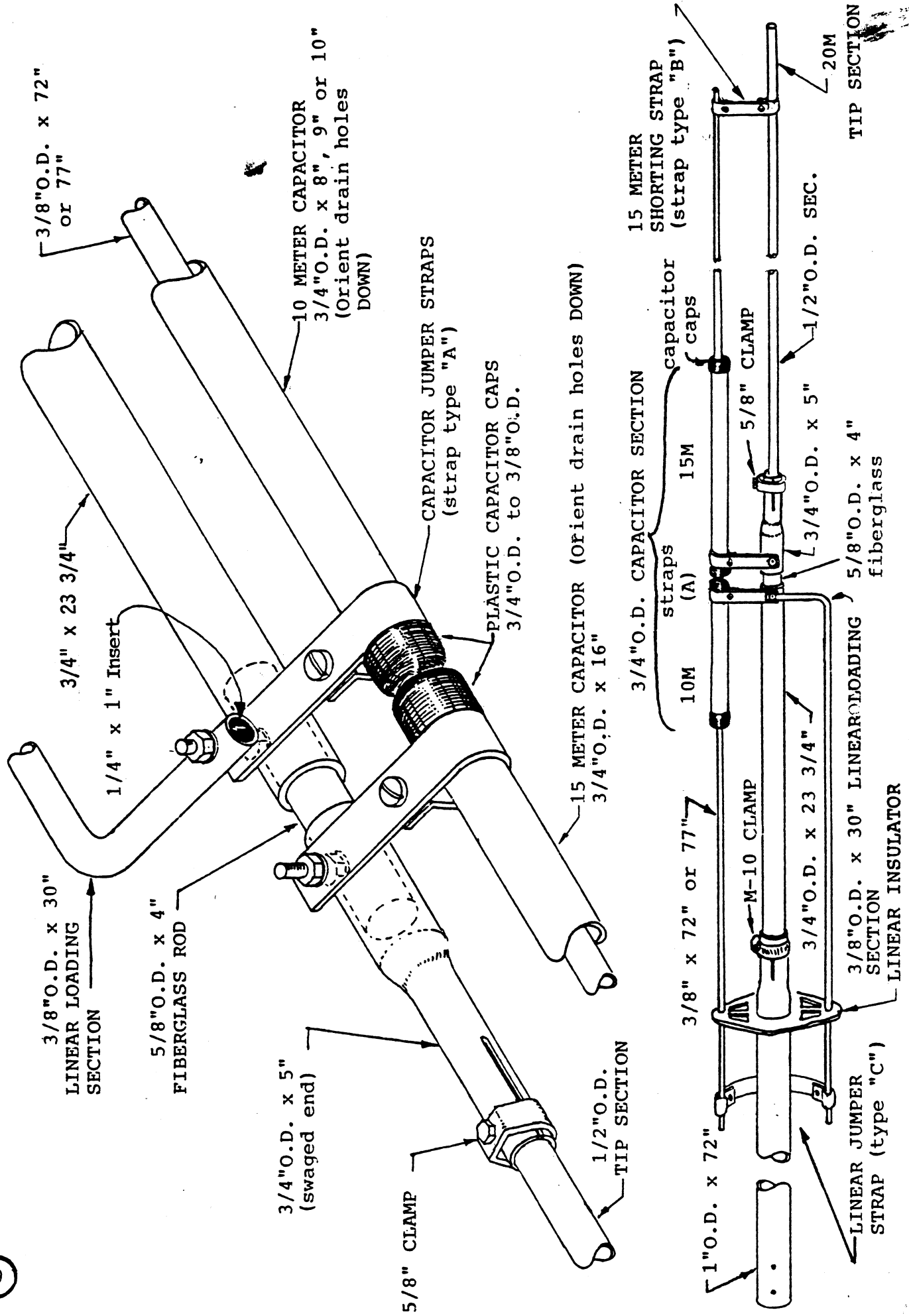
4. Slide a 3/4" x 16" capacitor tube onto the longer half of all the 3/8" x 72" and 77" sections and work the tubes solidly into the capacitor caps. Push another capacitor cap onto the opposite end of the 3/4" x 16" tube.
- The shorter half of both 72" sections receive an 8" capacitor tube. The remaining pair of 77" sections receive 9" or 10" capacitor tubes. See chart above.
5. After each capacitor tube is installed, push on the second capacitor cap and work it solidly into the tube. Orient the type "A" straps per sketch with long tab coming off the top side and the drain holes underneath. DO NOT TIGHTEN YET.

This completes the Capacity Bank Assembly.

ASSEMBLY PICTORIAL

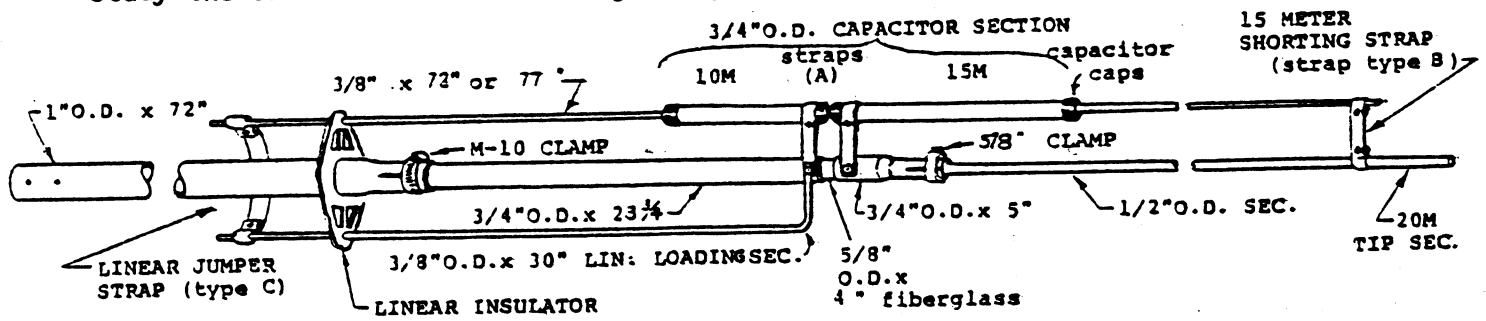
TYPICAL ELEMENT-HALF & DETAIL

9



IV. ELEMENT TIP ASSEMBLY (Reflector, Rear Driven, Front Driven, D1)

Study the sketch below before beginning.

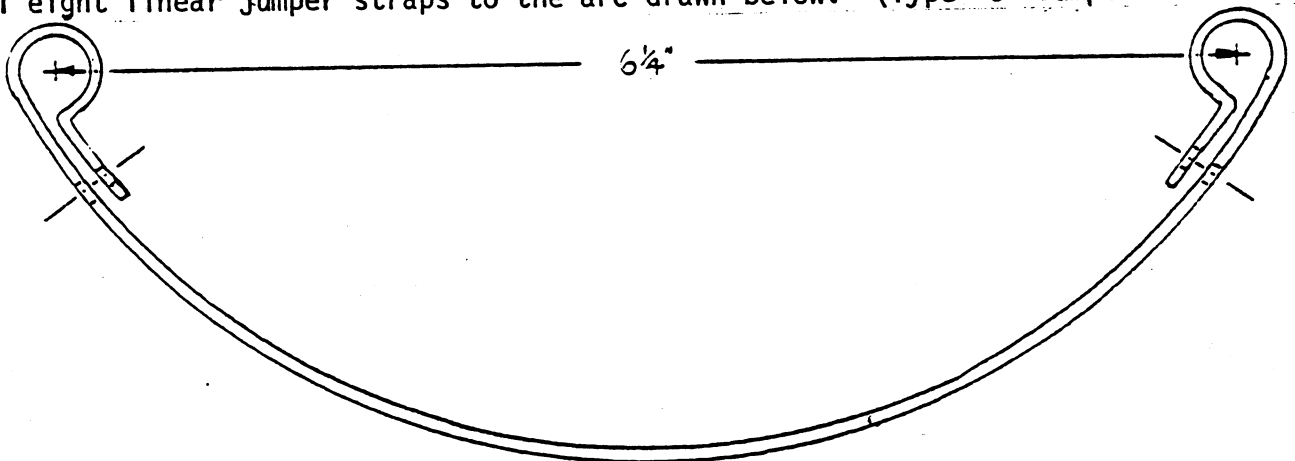


NOTE: A bench vice is handy for holding the 3/4" x 23 3/4" main part during this assembly.

1. Assemble the 23 3/4" & 5" swaged 3/4"O.D. sections to the end of the 4" x 5/8"O.D. fiberglass rod. Align holes and secure with 8-32 x 1 3/4" screws, nuts, and lockwashers. Tighten until the tubing flattens onto the rod and the assembly becomes rigid.

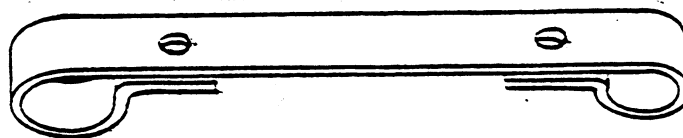
Repeat for all eight sections.

2. Bend all eight linear jumper straps to the arc drawn below. (Type "C" Jumper Strap).



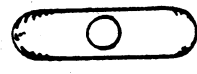
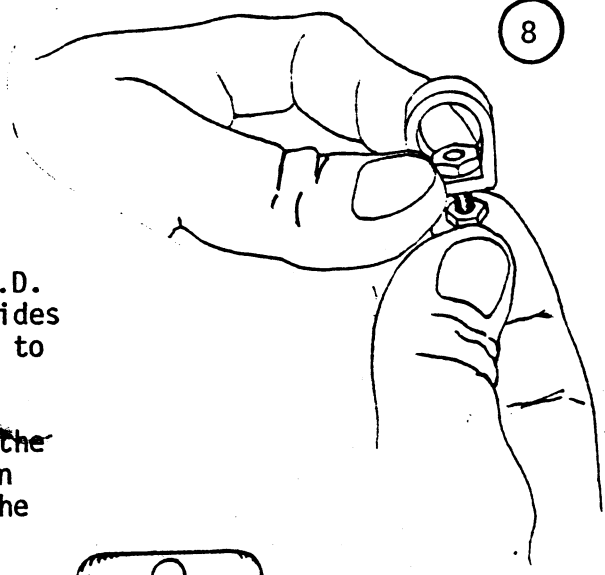
Add the 8-32 x 1/2" screws, nuts, and lockwashers. Finger tighten only at this time.

3. Prepare the type "B" shorting strap by adding the 8-32 x 1/2" screws, nuts, and lockwashers. Finger tighten only at this time.



TYPE "B"
15 METER SHORTING STRAP

4. Prepare eight 5/8" compression clamps as shown. Dab a bit of paste on the end and threads of the 10-32 x 3/8" hexhead screw. Position the 10-32 nut in the clamp and thread together.
5. Beginning with Director D1 capacitor bank (3/8" O.D. x 72"), spread a small amount of paste on both sides of each type "A" strap fingers where they attach to the studs. Next place fingers onto the studs. Separate two 10 and 15M capacitor tubes 1/16" to 1/8" as required for the "A" strap holes to fit the stud. The 15M strap attaches to the screw stud on the 3/4" O.D. x 5" section and the 10M strap to the stud on the 20" length.

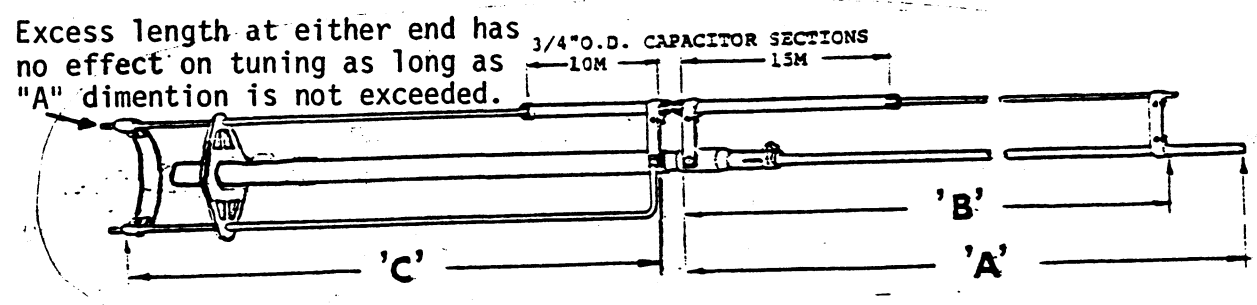


LINEAR REINFORCING INSERT (PEANUT)

6. Insert a peanut into the drilled end of the 3/8" linear loading section ("L" shaped part).
7. Place the drilled end onto the screw stud OVER the 10M capacitor strap. Secure both studs with 8-32 lockwashers and nuts.

The studs and straps are on the "top" of the element so orient the drain holes in the capacitors DOWN by rotating the capacitor section as needed. Then tighten the screws securing the straps to the capacitors.
8. Slide a diamond-shaped linear insulator about 6" onto the shorter half (10M side) of the 3/8" O.D. tubes.
9. Using a small swab, apply paste inside the loops of the type "B" and "C" jumpers and to about 2" of the 1/2" O.D. x 51" tip. Install the 1/2" tip, "B" and "C" jumpers, and adjust to the dimensions below by hooking a tape measure on the type "A" capacitor straps and pulling toward "A" and "B" or "C". Measure to the outer edge of the "B" and "C" straps. Tighten all hardware on this assembly. Mark it appropriately (D1), wipe of excessive paste, and repeat for the other half.
10. Repeat Step 9 for the Front Driven, Rear Driven, and Reflector element parts marking them accordingly.

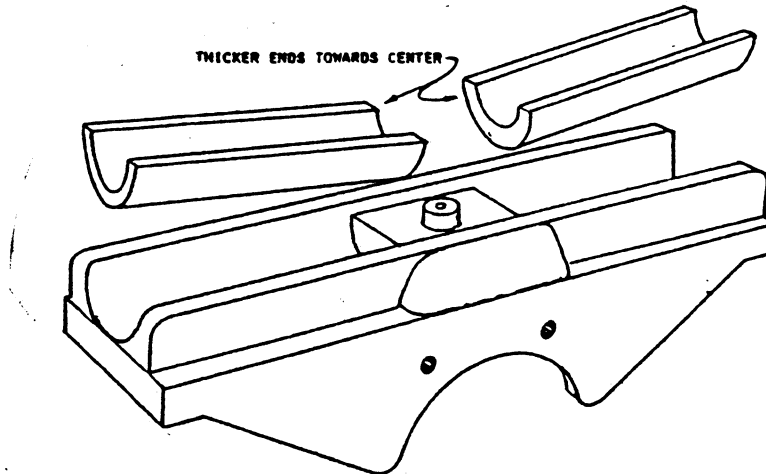
	1/2" O.D. TUBE REQUIRED	A	B	C
DIRECTOR D1	49 1/2"	51"	43 1/2"	24 1/2"
FRONT DRIVEN	42 1/4"	45"	43"	26"
REAR DRIVEN	51 1/2"	55"	47 3/4"	27"
REFLECTOR	59"	60 1/2"	47 1/2"	28"



Element tip caps are not supplied or recommended due to potential moisture build-up inside the tips when caps are used.

V. MOUNTING ELEMENT SECTIONS TO INSULATORS

1. The KLM Lexan insulator has been designed to accommodate up to $1\frac{1}{2}$ " O.D. elements. Antennas using smaller O.D. elements are supplied with half-round reduction sections. These are placed in the two element channels on top of the insulator with the thicker ends toward center as shown in the drawing below. Prepare all insulators.

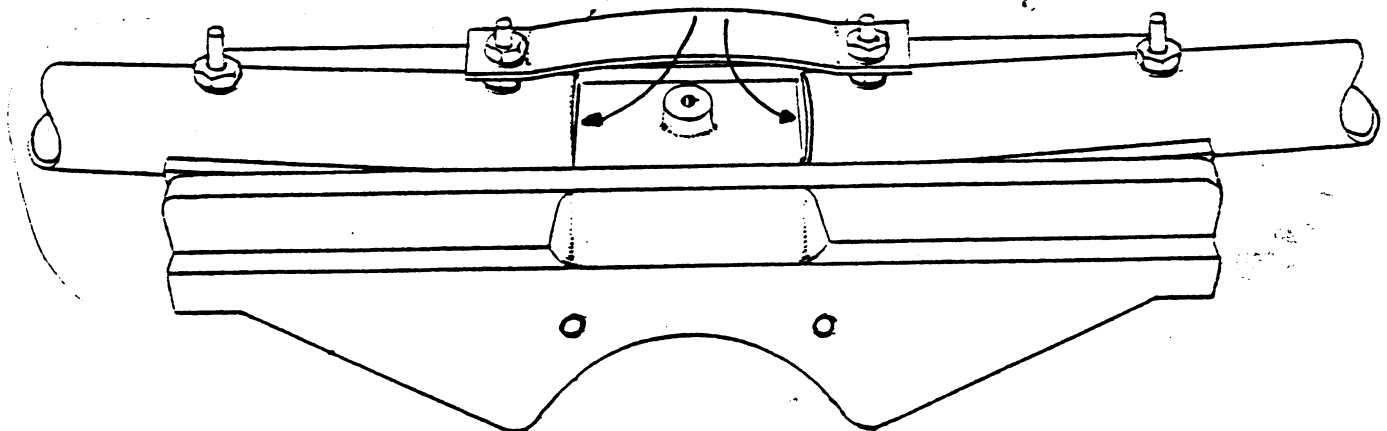


2. Mount the 1" O.D. x 72" element half pairs to the insulators (check that the $\frac{7}{8}$ " O.D. butt reinforcing inserts are in place with holes aligned).

NOTE: The element butt holes are drilled at a slight angle to compensate for the upward camber of the insulator cradle. Element should be rotated 180 degrees until the mounting screws pass easily through the insulator and element. The 10-32 x $2\frac{1}{2}$ " screws are inserted from the bottom of the insulator. Apply paste to the element around the screw hole and secure with lockwashers and nuts above the element butt (the studs formed by the two inside screws are used later for strap connections). Tighten the nuts securely to be sure the element sections are well seated in the insulator. Note that upon installation, the sections tilt up slightly to compensate for element droop.

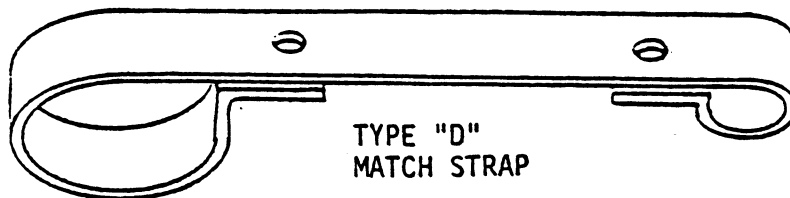
3. Apply paste and place a $\frac{1}{2}$ " x $3\frac{3}{4}$ " jumper strap across the inner element studs for the Reflector and D1. Secure with additional 10-32 nuts and lockwashers. For convenience, DO NOT install the completed element tip assemblies yet.

7/8" BUTT INSERTS



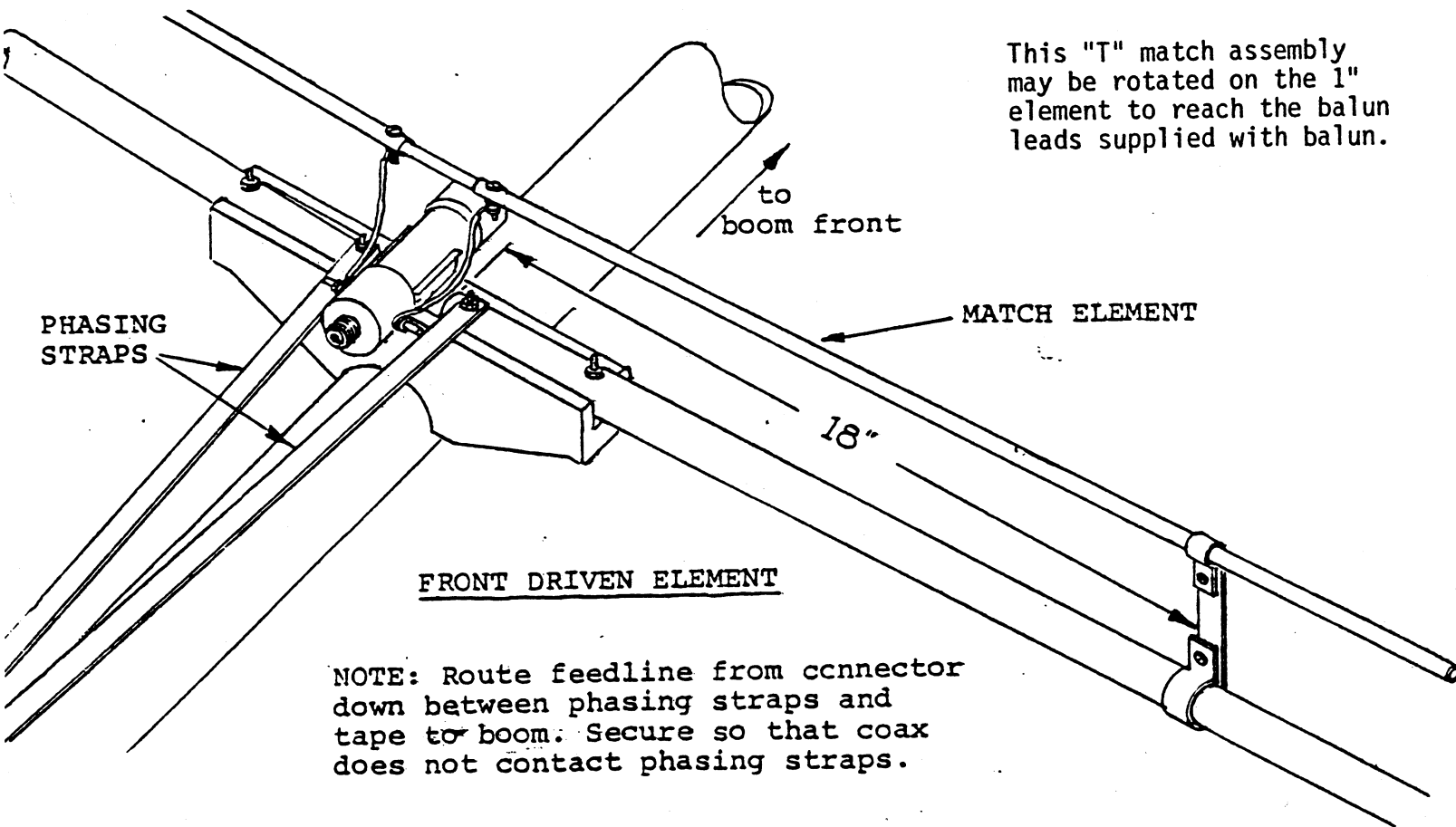
VI. FRONT DRIVEN ELEMENT "T" MATCH ASSEMBLY

1. Locate the two type "D" match straps and install the $\frac{1}{2}$ " x 8-32 screws, lockwashers, and nuts loosely.



2. Select one of two remaining element insulator assemblies without center jumpers and slide a type "D" on each side locating them 18" each side of the element butts (apply paste under the straps and tighten in place per sketch below).

MATCH ASSEMBLY - FRONT DRIVEN ELEMENT



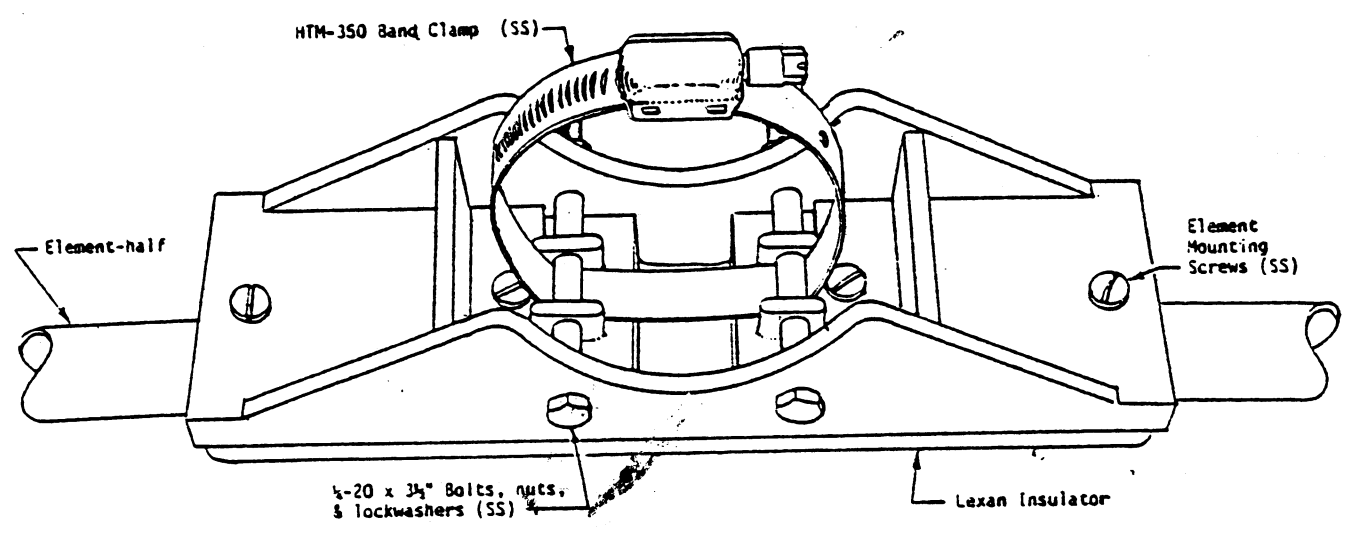
This "T" match assembly may be rotated on the 1" element to reach the balun leads supplied with balun.

3. Now slide the preassembled 3/8" O.D. match assembly tubing first into one side; Then into the other. Apply paste to the appropriate areas under the strap. Center the assembly over the element insulator and tighten the type "D" screws around the 3/8" tubes.
4. Insert a #6 sheet metal screw through the end hole in the balun clip and mount the balun clip to the circular boss in the center of the element insulator.
5. Snap the 3-60-4:1 4KW PEP balun into place. Apply paste and attach the #12 AWG copper leads between the balun and the "T" match using #8 flatwashers, lockwashers, and nuts on the "T" match studs. Keep the lead as short as possible without distorting this assembly.

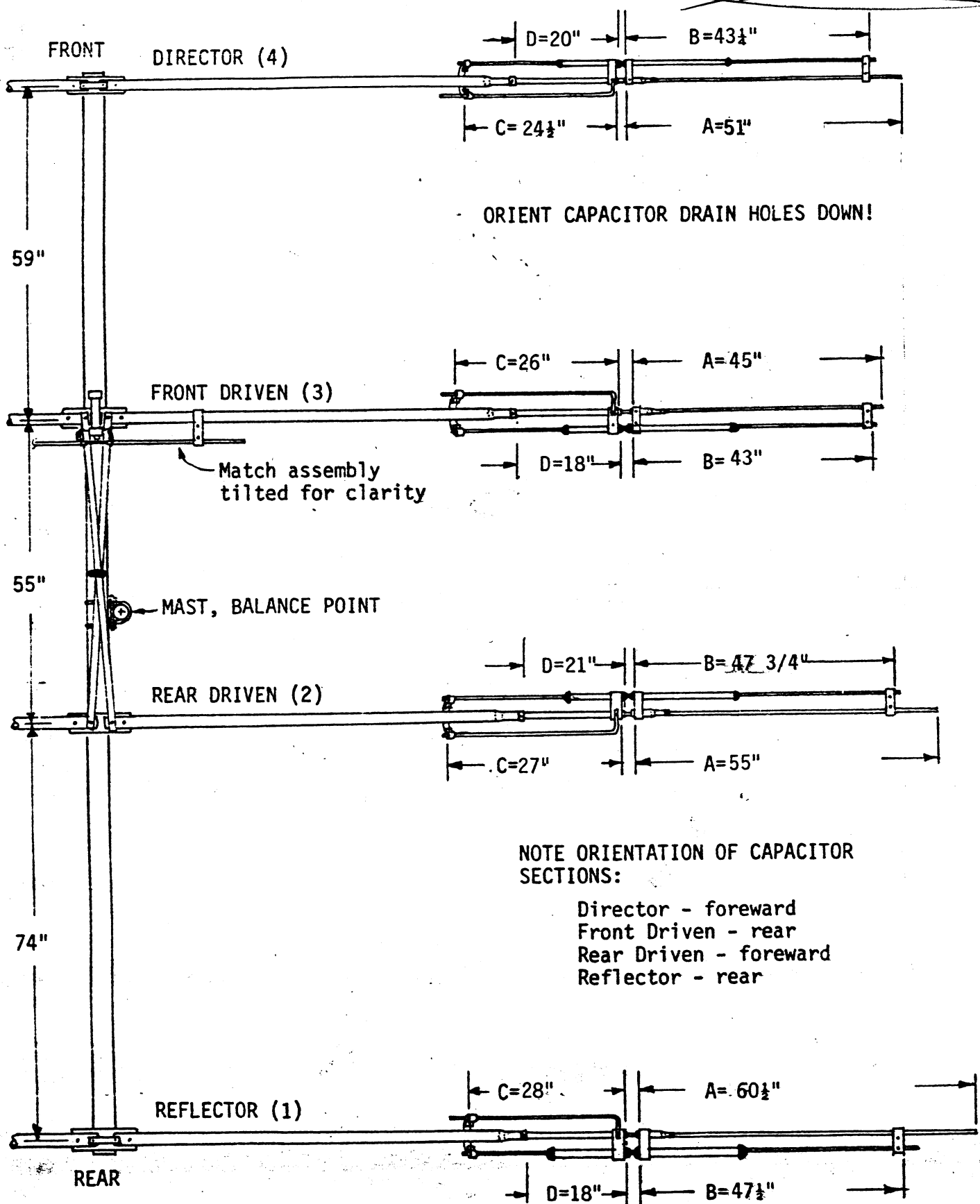
NOTE: The only thing critical about this assembly is that paste is applied to all joints as this assembly carries the full power of your transmitter.

VII. INSTALLATION OF ELEMENT MOUNTING CLAMPS

1. The large HTM-350 band clamps are bolted into the underside of the Lexan insulators with 1/2-20 x 3 1/2" bolts, lockwashers, and nuts (stainless steel) as shown in the drawing below. Install in all the insulators. DO NOT over-tighten the 1/2-20 bolts (100 in lbs. maximum torque).



ORIGINAL
ORIGINAL DIMENSIONS



ORIENT CAPACITOR DRAIN HOLES DOWN!

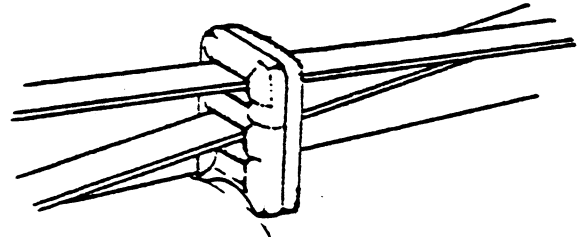
Match assembly tilted for clarity

NOTE ORIENTATION OF CAPACITOR SECTIONS:

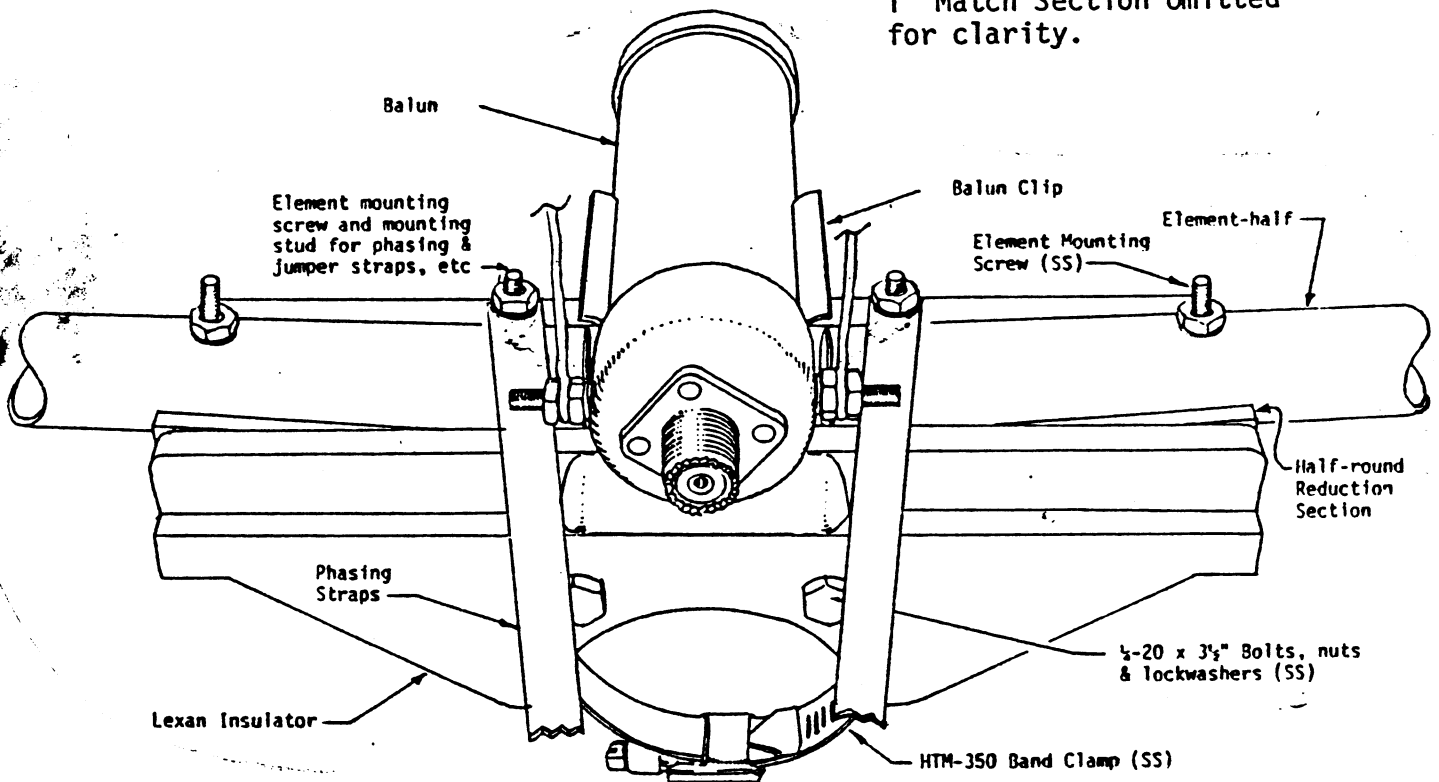
- Director - forward
- Front Driven - rear
- Rear Driven - forward
- Reflector - rear

NOTE: The completed element tips are NOT installed as yet.

1. Rotate boom until splice bolts are diagonal, heads up. Center element #1 (Reflector) insulator 3" from the boom end and tighten the band clamp.
2. Mount element #2 (Rear Driven) 74" from #1 (center-to-center). Align element with reflector and tighten clamp.
3. Loosely mount element #3 (Front Driven) 55" forward of #2 (Rear Driven).
4. Slide 55½" phasing straps through two standoffs until they are centered. Apply paste around the strap holes and install straps between elements #2 and #3. Place ends onto inner set of element mounting screw studs (over existing nuts). Slide element #3 forward to fit straps. Be sure straps cross at center and connect to element halves on opposite side of the boom. Secure with #10 lockwashers & nuts.
5. Tension the phasing straps by tapping element #3 away from #2 until straps are taut. (Hold boom straight for this operation.) Align #3 element sections with the others and tighten clamp.



"T" Match Section omitted for clarity.

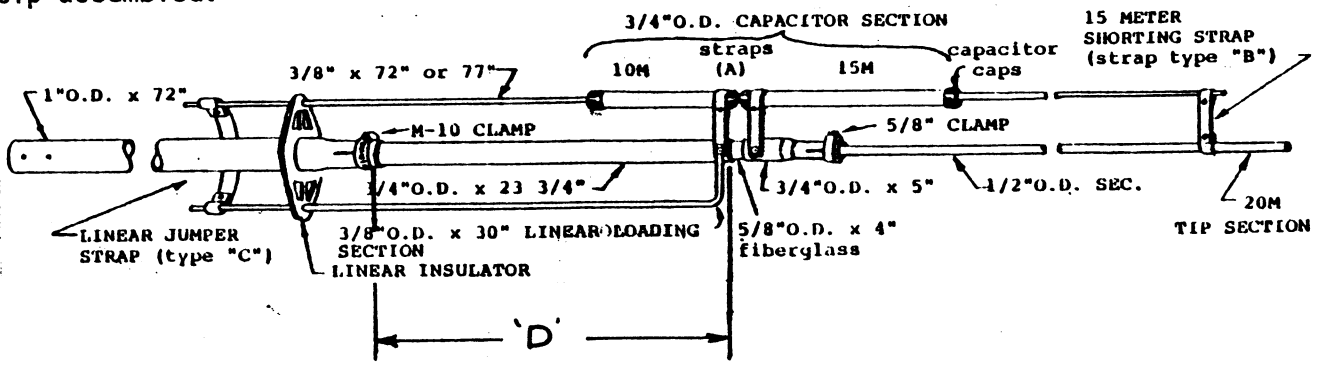


6. Place Director D1 59" forward of the Front Driven Element. Align and secure.
7. Once elements are all correctly aligned, the HTM-350 clamps may be additionally secured. Drill a small hole into boom (#38 drill) through existing hole in HTM-350 band clamp. Tighten a #6 x 3/8" sheetmetal screw into hole.

This operation is recommended especially if you live in an area with extreme weather conditions or if it is likely that the elements will snag on guy wires, trees, or other obstacles during installation of the antenna.

IX. ELEMENT TIP MOUNTING (Refer to the Complete Half Antenna Sketch)

NOTE: At this point, your particular assembly area may dictate whether you mount the element tips now or get the antenna to the next installation step prior to installing the tips. If your installation permits, you may even be able to mount the existing boom and partial element assembly on the tower before adding the tip assembled.



1. Select an element tip pair previously marked 'Reflector'. Apply paste to about 2" of the 3/4"O.D. element butt and slide on an M10 or M8 stainless band clamp. Refer to the "D" dimension and the capacitor bank location with respect to the other elements on the complete half antenna drawing. Also note that the studs on the element tip should be up and the capacitor vent holes down.
2. Insert the 3/4"O.D. tube into the 1" x 72" swaged element to the proper "D" dimension and tighten the band clamp.
3. Repeat for the other half tip.
4. Repeat the above steps for the Rear Driven, Front Driven, and D1 element tips.

	<u>Dimension "D"</u>
D1	20"
FD	18"
RD	21"
REF.	18"

X. ATTACHING THE BOOM-TO-MAST PLATE

1. Raise the antenna off its supports and determine the balance point on the boom. This will be in the area of the central boom splice.
2. Center the 9" x 9" boom-to-mast plate at the balance point and secure with two 3" U-bolts. Plate may be mounted on either side of the boom.
3. Two 2" U-bolts are supplied for securing antenna to mast.

XI. INSPECTION

1. Upon completion of assembly, have another individual recheck antenna against critical dimensions shown on Dimension Sheet.
2. If possible, allow antenna to temp. cycle overnight. Then check and re-tighten all connections. This will ensure long lasting mechanical and electrical integrity.
3. Check once again to make sure all the capacitor caps are pressed firmly onto the 3/8"O.D. capacitor sections and that the drain holes are "down".

XII. PRE-INSTALLATION CHECK-OUT

1. Since the permanent installation of any antenna requires a great deal of time and effort, we would like to suggest the following tests be made on the KT-34A prior to final installation.
2. Attach your good quality 50 ohm feedline to the balun and place the KT-34A on a temporary support 10 to 25 feet above ground. Use a non-metal roof, tall ladder, short tower, etc.
3. Using your exciter and a good quality SWR bridge, take SWR readings every 100 KHz on each band. Start and end at or beyond the band edges. Naturally, some SWR will be present and the general shift, because of the low height, will indicate the antenna is resonant slightly low in frequency. For the most accurate SWR readings, keep the system simple, i.e., exciter - SWR bridge - antenna. Eliminate scopes, antenna switches, filters, etc., for your initial readings. This simple system should be used for your post-installation SWR check also.

Gross problems such as 50-100% power reflected on all portions of each band indicate a problem in the feedline or balun. Disconnect the feedline at both ends and check for center pin-to-pin continuity and connector shell-to-shell continuity. There should be no continuity between center pin and shell. The balun should show continuity from center pin-to-shell and to each of the balanced terminals.

4. Another rough check of general performance even with the antenna at the low temporary height is to listen to the signals on 10, 15, and 20. If possible, compare it with another antenna on those bands. Signals on 10 and 15 meters particularly should be lively. Twenty meters may be subdued somewhat by the temporary test height conditions. Again, you're looking for anything grossly different than what you would expect.

If any gross problem appears to be present, a continuity check of each element should be made. Check for continuity across each joint. This continuity check will almost invariably expose the problem and we consider it a most valuable time spent to ensure long trouble-free operation.

XIII. INSTALLATION HINTS AND KINKS

1. Good quality coax feedline of the proper impedance is a major factor in achieving good VSWR across each ham band. KLM recommends the following cables.

1. RG-213 AU
2. Times FM-8 Foam Coax
3. Belden 8214 Foam Coax

Other brands of foam "RG-8 type" coax are typically not 50 ohm (more like 60-70 ohm) and should be avoided.

2. Large objects and other antennas, 40 or 80 meter dipoles for instance, can also affect the VSWR of a tribander. To check for detrimental effects, temporarily lower or remove the dipole or at least rotate it 90° out of line with the tribander elements. If the VSWR is reduced, one of the antennas should be relocated to avoid adversely affecting the performance of the Tribander.

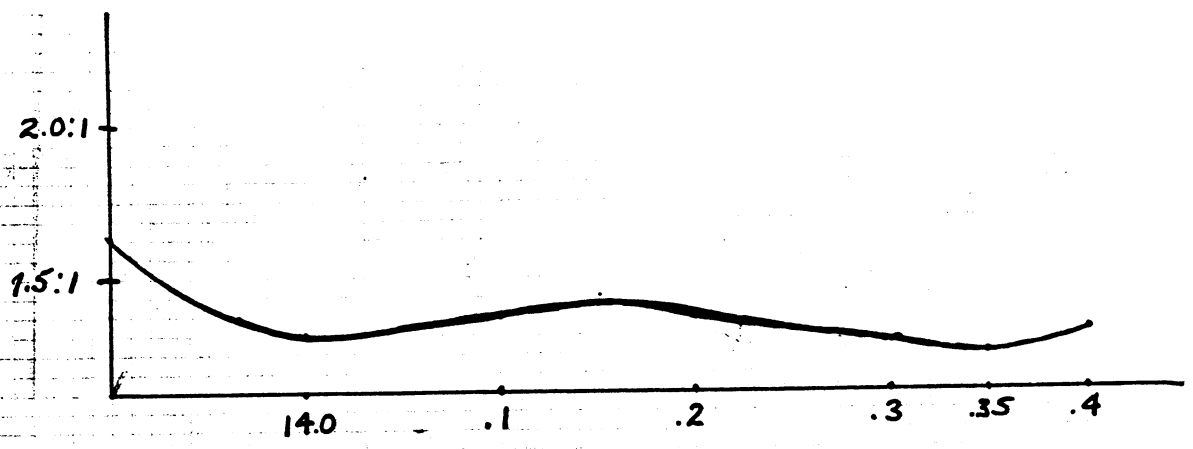
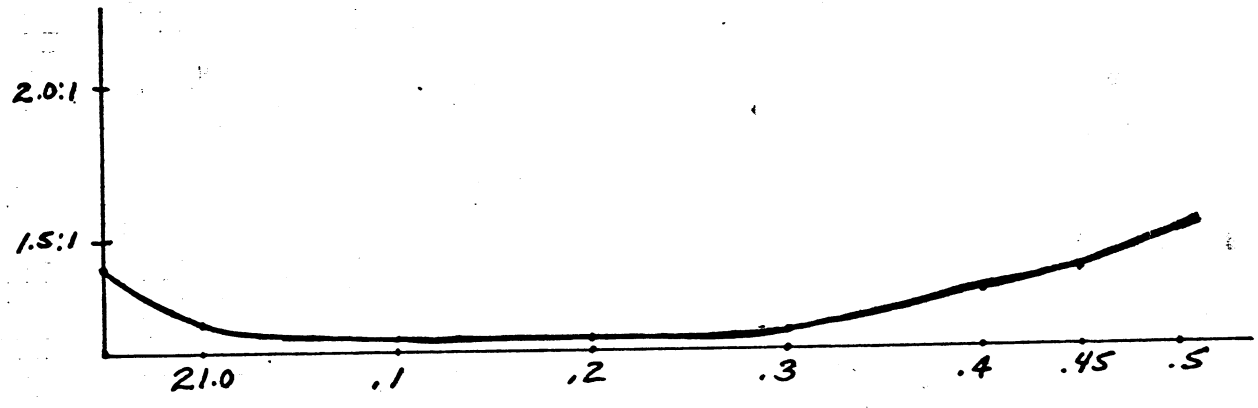
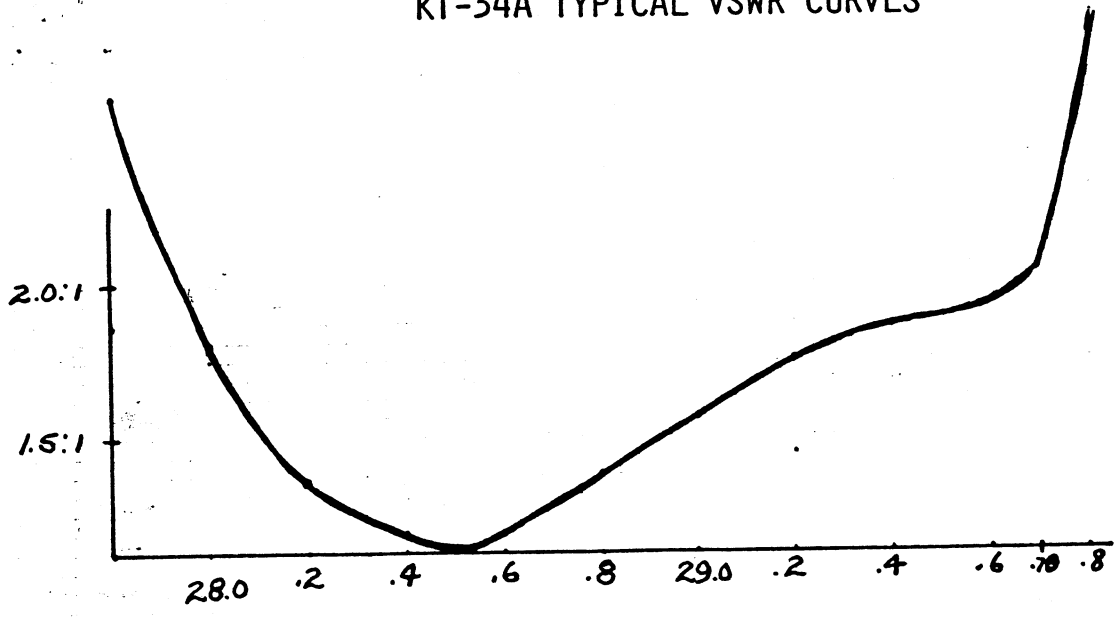
The KLM 40 meter dipole (7.2-1) can be used with the Tribander and will work well. But, the dipole must be mounted above or below the Tribander and in line with its boom (90° out from elements).

3. Mounting height: Generally, the comment "the higher - the better" is true. Excellent performance can be realized, however, from 30 feet on up. Ten (10) meters will be affected least by increased heights over 30 feet and 20 meters will be improved the most.

Overall, antenna efficiency is reduced at low heights because surrounding objects (buildings, trees, metal fences, etc.) absorb RF from the antenna before that energy can become a sky-wave. Whenever possible, mount the antenna high and in the clear.

4. See Page 17 for typical SWR curves for each band. Your curves may vary somewhat due to instrument accuracy, height above ground, surrounding objects, etc. But, you should be able to recognize key corner points and ripple.

KT-34A TYPICAL VSWR CURVES



PARTS LIST

KT-34A BANDPASS TRIBANDER

HARDWARE PACKAGE #1

1 x 3 3/4" Jumper Strap 2
 1/2-20 x 3 1/2" Bolts, s.s. 10
 10-32 x 2 1/2" Screws 16
 Standoffs, phasing straps 2
 1/2 x 1" Linear Inserts (Peanuts) 8

HARDWARE PACKAGE #2

8-32 x 1/2" Screws 56
 8-32 x 1 3/4" Screws 16
 #6 x 3/8" Sheetmetal Screws 7
 10-32 x 3/8" Hexhead Screws 8

HARDWARE PACKAGE #3

#8 Flatwashers 2 4
 #8 Lockwashers 94 100
 8-32 Nuts 94 106

HARDWARE PACKAGE #4

#10 Flatwashers 2 4
 #10 Lockwashers 26 42
 10-32 Nuts 34 40

HARDWARE PACKAGE #5

20 Nuts & Lockwashers 10 ea. 12
 3/8-16 Nuts & Lockwashers 4 ea. 5
 5/16-18 Nuts & Lockwashers 4 ea. 5

IN HARDWARE BOX

M-10 (or M-8) Band Clamps 8
 5/8" Compression Clamps 8
 Capacitor Caps 32
 10-32 Nuts 8
 Capacitor Strap (Type A) 16
 15M Strap (Type B) 8
 Linear Jumper Strap (Type C) 8
 Match Strap (Type D) 2
 Linear Insulators 1" 8
 Reducing Sections 1 1/2" to 1" 8
 3/4"O.D. x 5" Swaged Section 8
 4" Fiberglass Rod (5/8"O.D.) 8
 HTM-350 Band Clamps 4
 Anti-Sieze Paste 1
 2" U-bolts & Cradles 2 ea.
 3" U-bolts & Cradles 2 ea.
 Boom Caps (Factory Option) 2
 Balun & Clip 3-60-4:1 1 ea.
 Insulators 1 1/2" x 3" 4
 Instructions 1

IN SHIPPING BOX

Boom: 3"O.D. x 8'6" Swaged (Rear) 1
 x 8' (Front) 1

Elements:

1"O.D. x 72" Swaged with 7/8" insert 8
 3/4"O.D. Section x 23 3/4" 8

3/4"O.D. Capacitor Sections:

x 8" 4
 x 9" 2
 x 10" 2
 x 16" 8

1/2"O.D. x 49 1/2" 2
 x 42 1/2" 2
 x 51 1/2" 2
 x 59.0" 2

3/8"O.D. x 72" 4
 x 77" 4
 x 30" with bend 8

Match Section (Factory Assembled):

3/8"O.D. x 24" 2
 1/2"O.D. x 4" Fiberglass Rod 1
 8-32 x 1 1/2" Screws, Nuts, & Lockwashers 2 ea.

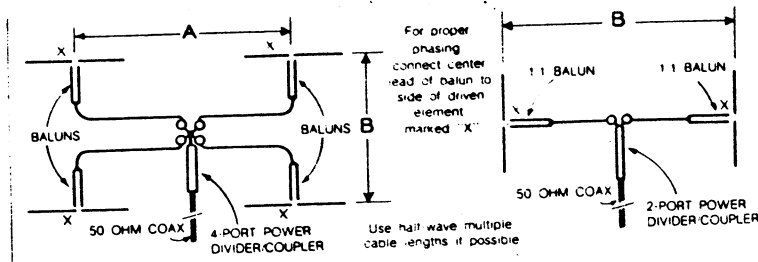
Boom-to-Mast Plate 8" x 9" or larger 1
 Phasing Straps 1/2" x 55 1/2" 2

W

Baluns

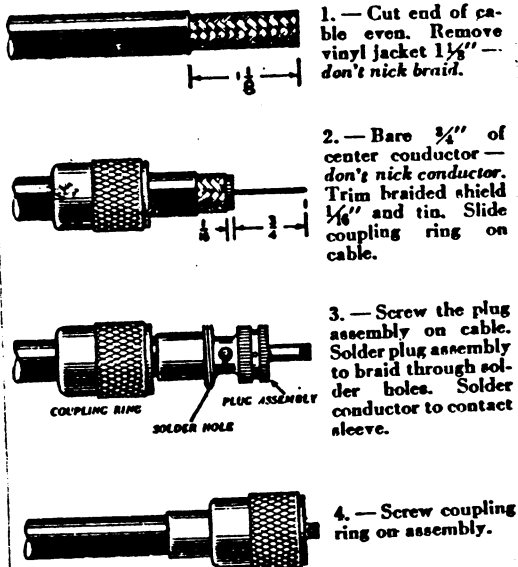
Your KLM balun has been fully tested, both electrically and physically, before leaving the factory. To maximize the performance and efficiency of your balun, please note the following recommendations.

1. Keep the lead lengths from balun to feedpoints as short as possible. Un-necessary length can upset VSWR, bandwidth, etc. Solder lugs are a good idea too.
2. Be sure studs on HF balun are at least 3/8" from other antenna hardware.
3. When stacking two or more antennas, use balun stud identified with red dot (HF) or center lead (VHF and UHF) as key for proper phasing (see sketch below).

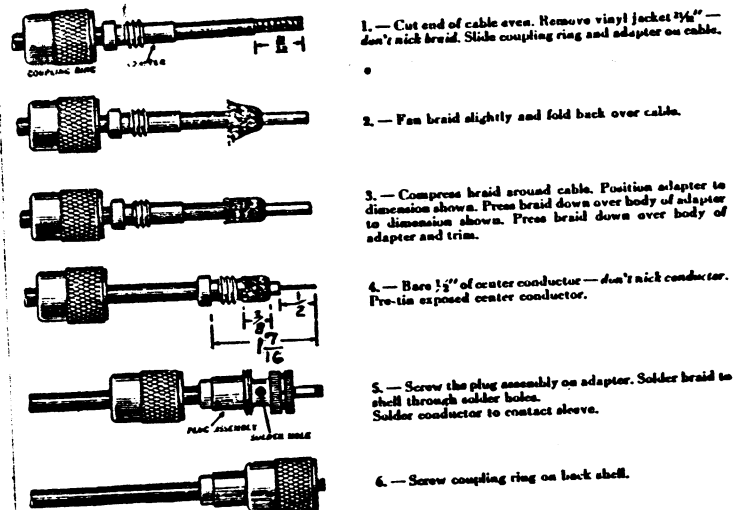


4. KLM HF/VHF BALUNS ARE NORMALLY SUPPLIED WITH SO-239 TYPE CONNECTORS. USE ONLY PL-259 CONNECTORS WITH THEM. ASSEMBLY OF PL-259 CONNECTORS (FOR TWO TYPES OF COAX) ARE SHOWN BELOW.

83-1SP (PL-259) Plug



83-1SP (PL-259) Plug with Adapters



IMPORTANT NOTE: IF YOUR BALUN IS SUPPLIED WITH TYPE "N" CONNECTORS (HF/VHF, OPTION - UHF STANDARD), PLEASE READ ON

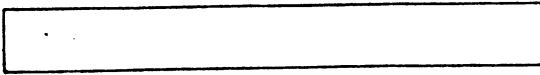
Type "N" connectors are noted for their low loss and good weather seal characteristics, but they must be carefully mated and only to other clean and carefully assembled type "N" connectors.

KLM's 90 day materials and workmanship warranty does not cover type "N" center pins bent or broken during installation or field use, so please read the following application notes carefully. (See back page)

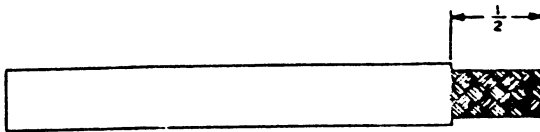
1. Use only type "N" connectors with your balun. Do not use PL-259 (S0239) type connectors. They will ruin it.

2. Carefully mate Type "N" connectors straight on. Jamming them together at angles will damage or break the center pins.

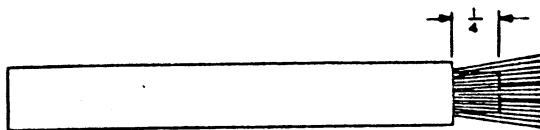
3. Carefully assemble your own type "N" connectors. See below for step-by-step details.



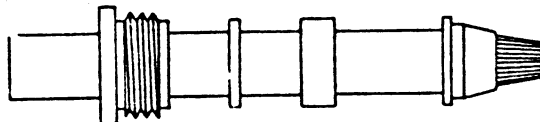
CUT END OF CABLE EVEN.



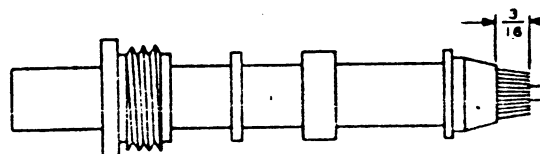
REMOVE VINYL JACKET $\frac{1}{2}$ INCH — DON'T NICK BRAID.



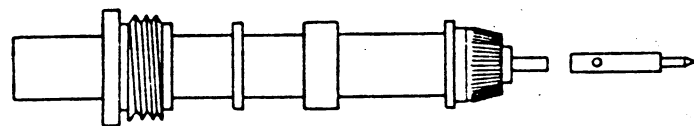
COMB OUT COPPER BRAID AS SHOWN. BARE $\frac{1}{4}$ INCH OF CENTER CONDUCTOR — DON'T NICK CONDUCTOR.



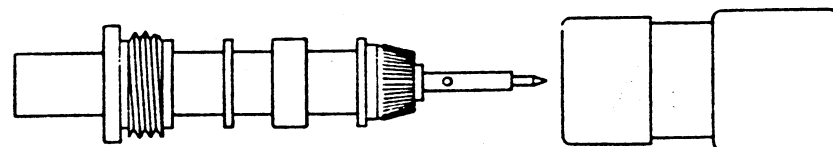
TAPER BRAID AS SHOWN. SLIDE NUT, WASHER AND GASKET ON VINYL JACKET. SLIDE CLAMP ON BRAID.



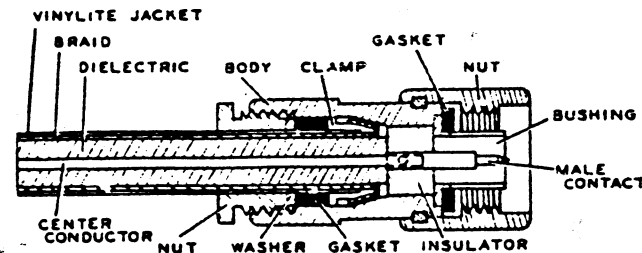
WITH CLAMP IN PLACE, TRIM BRAID AS SHOWN.



FOLD COPPER BRAID BACK ON CLAMP. TIN CENTER CONDUCTOR, USING MINIMUM AMOUNT OF HEAT.



HOLDING CONTACT WITH PLIERS, SOFT SOLDER CONTACT TO CENTER CONDUCTOR. IT IS *IMPERATIVE* THAT BACK END OF CONTACT BE FLUSH WITH POLYETHYLENE DIELECTRIC. DO NOT USE EXCESS SOLDER. WIPE CLEAN—SEE THAT END OF CABLE INSULATOR IS CLEAN AND FREE OF SOLDER, ROSIN AND FOREIGN MATERIAL.



SLIDE BODY INTO PLACE CAREFULLY SO THAT CENTER CONDUCTOR ENTERS HOLE IN INSULATOR. FACE OF CABLE DIELECTRIC MUST FIT FLUSH AGAINST INSULATOR. PROPERLY TIGHTEN BODY AND NUT WITH WRENCHES.

NOTES: 1. THIS ASSEMBLY PROCEDURE APPLIES TO TYPE N PLUGS. THE PROCEDURE FOR JACKS IS THE SAME EXCEPT FOR THE USE OF A FEMALE CONTACT AND A JACK BODY.