



M2 Antenna Systems, Inc.

Model No: KT34(A) TO KT34M2 UPGRADE KIT



SPECIFICATIONS:

MODEL NUMBER	KT34M2
FREQ. RANGE	14.0 - 14.35 MHz
	21.0 - 21.45 MHz
	28.0 - 29.0 MHz
GAIN (Free Space).....	SEE CHARTS
FRONT TO BACK	SEE CHARTS
FEED IMPEDANCE / CONNECTOR.....	50Ω / SO-239
VSWR	<1.5:1
KIT WEIGHT / UPS SHIPPING WEIGHT	6 lbs. / 1 Box

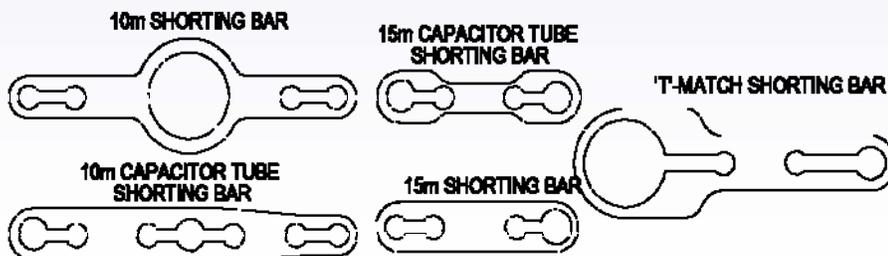
10m		
f, MHz	G, dBi	F/B, dB
28.0	7.3	18
28.2	7.3	23
28.4	7.4	25
28.6	7.5	24
29.2	7.6	20

15m		
f, MHz	G, dBi	F/B, dB
21.0	6.9	19
21.1	6.9	22
21.2	7.0	24
21.3	7.0	24
21.45	7.1	23

20m		
f, MHz	G, dBi	F/B, dB
14.0	6.5	17
14.1	6.6	24
14.2	6.7	21
14.35	6.8	23

FEATURES:

The M² KT34(A)-KT34M2 UPGRADE KIT provides all the parts to bring up your old KT34(A) to current '34M2 specifications and keep it that way. Over the years it has become evident that the original sheet metal straps loosen with time and the connections becomes intermittent and / or lossy. The new close tolerance, CNC machined shorting BARS produce solid, low loss connections for years. The machined bars also add mechanical stiffness to the element. In addition, all new hardware has been supplied as well as new UV stabilized Capacitor Caps and tubes needed for the new 'T' match. Why not upgrade today and see what M² can do for you.



OVERVIEW INSTRUCTIONS FOR KT34(A) TO KT34M2

1. To do this conversion properly, requires complete disassembly and cleaning of the element tip sections of the four multiband elements. The environment your KT34 has been in will determine how extensive the cleaning process may be. Certainly all oxidation in the areas of connections must be cleaned to shiny metal. Usually the most effective for removing oxidation are the green or brown colored scrub or pot scouring pads. Brillo pads and steel wool are other options. Sandpaper or a file may be required in some stubborn cases.
 2. Prior to cleaning everything, look over the parts in the kit. The sheet metal shorting straps parts need not be cleaned.
 3. As you will see from the main ASSEMBLY MANUAL, each element has its own assembly and dimension page, with only its specific dimensions on that page. This method should produce a VSWR curve like KLM predicted. This is a result of converting to close tolerance, rugged machined, shorting straps and bars. Each joint now is stronger with extremely low resistance.
 4. You will remove all the 3/8" tube pieces that have the 90 degree bend. These bent sections will be cut off and THE STRAIGHT SECTION will do the same job as before. The bend has been replaced by one end of a machined bar. Your part may be less than 30" but should be long enough to make all the 10M dimensions.
 5. Some later version KT34A's had 1/2" diameter 20M tips that are too short for the upgrade dimensions. Our kit includes two 3/4 x 12" swaged tubes to replace the 3/4 x 5" tube in your original kit. Installing these new, longer section will allow you to easily make the required 20M tip dimension.
 6. We have provided a complete set of new 8-32 hardware for the re-assembly. Yours may be in great shape but we couldn't be sure you won't snap a few screws off during disassembly.
 7. We have no KT34A manuals dated later than 6-19-85. Changes may have been made to the materials and tubing sizes that we are not aware of. If you have a later version manual, we would appreciate if you could send it to us so we can make a copy and make sure our kit covers any changes after 6-19-02. We will return the manual to you after we copy it.
 8. We are here to help. If you are confused or just feel you need clarification, if we made a "mistake" or left something out of the text or drawings, call or better yet FAX us, but do us a favor first. Read everything carefully and make sure you didn't just miss something. NOTE: THE KT34 UPGRADE DIMENSION SHEET HAS SLIGHTLY DIFFERENT DIMENSIONS THAN THE KT43M2. THE DIFFERENCES ACCOUNTS FOR THE SLIGHTLY DIFFERENT PARTS AND CENTER INSULATORS THAN THE M2 PARTS IN THE NEW ANTENNA. The only calls we received originally were those telling us "it's up and working great"! BOY, DO WE LIKE THAT!
- GOOD LUCK AND WATCH FOR MIKE K6MYC ON 10, 15 OR 20M USING HIS KT36XA FROM HIS NEW QTH.

KT34(A) TO KT34M2 UP GRADE INSTRUCTIONS

If your old KT34(A) is fully assembled, first remove the 8 tip sections from the 1" x 72 inner element sections. Nothing changes on the inner sections except in the 'T' match section. Most of your work will be done on the tips.

Once you have removed the tip sections, begin disassembly of each tip section. Removal of aluminum oxidation will probably be necessary to even disassemble the parts. Use steel wool, sand paper, or PREFERABLY "pot scrubber" type pads. A flat, smooth file may even be necessary in some cases where oxidation is heavy.

Remove and discard all the SHEET METAL shorting straps. Remove all capacitor caps and discard.

Clean the 3/4" diameter CAPACITOR tubes carefully inside and out. Acetone, isopropyl alcohol and or water may be needed to dissolve contaminants. If your old antenna never worked quite right on 15 meters and was resonant low in the band, you may have 16" long capacitor tubes with the wrong wall thickness. The correct wall thickness is .049 inch (same as the short 10 meter tubes). If yours measure .058 inch, you should call us immediately so we can sell you the correct tubes. If your 3/4" CAPACITOR tubes have small holes in the side at one end, you should seal these holes with RTV silicon sealant.

Clean the 3/8" diameter tube OUTSIDE carefully and check each tube for two small 1/8" holes on just one side a few inches apart. If your tubes have these holes you have the latest version for venting the capacitors. No modification is necessary. If your tubes have no holes, using a hand drill or a drill press, it will be necessary to drill these two small holes ON ONE SIDE ONLY and mark the hole orientation near the end of the tube. These holes must be UP when the element is completely assembled and mounted. You will read more about this in the standard assembly manual. After drilling, touch the hole with a smooth file to knock off any burr or high point.

The original 3/8 x 30" tubes with the 90 degree bend will be replaced with straight tube sections that you will cut from the original bent piece. Cut the bent ends off so you loose no straight length. Deburr the ends. You will need 8 pieces.

The 3/4 diameter element sections that were hose clamped to the inner 1" sections can still be attached the same way. If you want to be sure that the 1" to 3/4" junction will hold in all climates, use a .173 (#17) drill bit or equivalent and drill one or two holes through the joint and secure with 8-32 hardware. We drill our holes back 1/2" and 1-1/2" from the joint.

Another part from your old KLM is slightly different from the M² KT34(A). The original short 3/4" section swaged to accept the 1/2" element tip was shorter than the current unit and was slit so a hose clamp could be used to hold the 1/2" piece in place. This hose clamp method can still be used but if you want to be sure it will hold in all climates, then it would be good idea to drill a .173 hole through the joint and use an 8-32 screw and lock nut for sure. We drill our holes at 1/2" and 1-1/2" back from the joint. The slight length difference between the old and the new 3/4" swaged pieces will have no effect on element tuning. Just set the '15M' and '20M' dimensions accurately as shown.

KT34(A) TO KT34M2 UP GRADE INSTRUCTIONS

We have provided the parts to replace your old 'T' match including new machined shorting bars. Remove your old 'T' match assembly. Clean the 1" element section from the center out at least 24" or to where the new shorting bars attach (at the ends of the 1/2" matching tubes). Your original #12 AWG wire leads can still be used to connect the balun to the 'T' match rods. Alternately you can use 1/2" strap material from your old straps to fabricate "strap leads" to do the connection as we do in the new KT36XA. Nothing is very critical in this area except that you create good, solid, low loss connections.

We recommend you remove the shorting strap across each center insulator and clean the connection on the strap and on the element butt thoroughly. Apply zinc oxide paste and re-assemble. THESE ARE CRITICAL JOINTS!!!! All the current in the element flows through these jumpers.

U-bolts, Boom to Mast plates, turnbuckles, even new boom sections are available as optional items from M². Finding what you can locally however should save you time and shipping costs.

Carefully designed and manufactured by:

M² ANTENNA SYSTEMS INC.

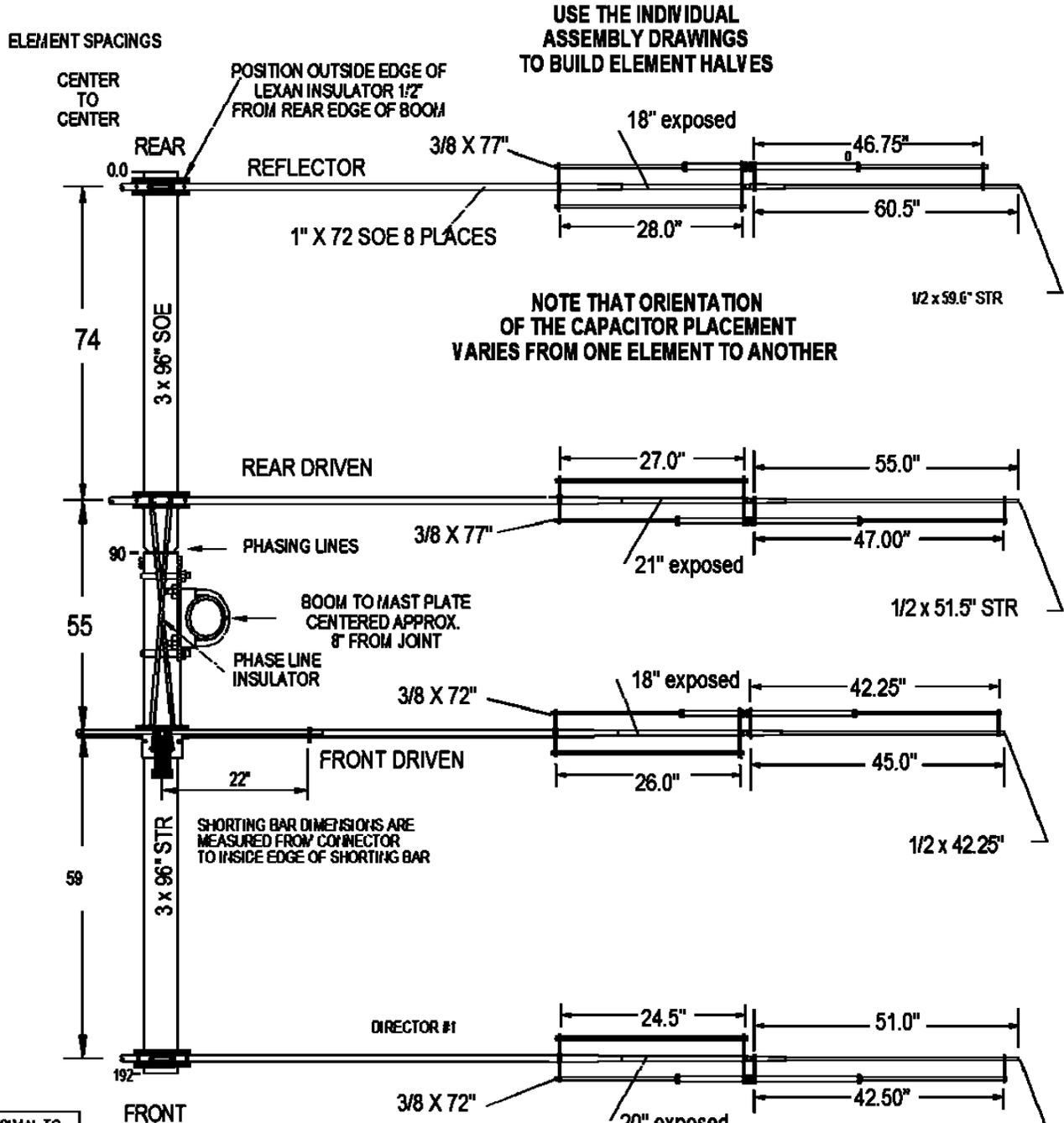
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KT34(A) TO KT34M2 DIMENSION SHEET



DECIMAL TO FRACTION CONVERSION

362 = 1 16"
125 = 1 8"
188 = 3 16"
250 = 1 4"
313 = 5 16"
375 = 3 8"
437 = 7 16"
50 = 1 2"
562 = 9 16"
625 = 5 8"
688 = 11 16"
75 = 3 4"
813 = 13 16"
875 = 7 8"
937 = 15 16"
10 = 1"

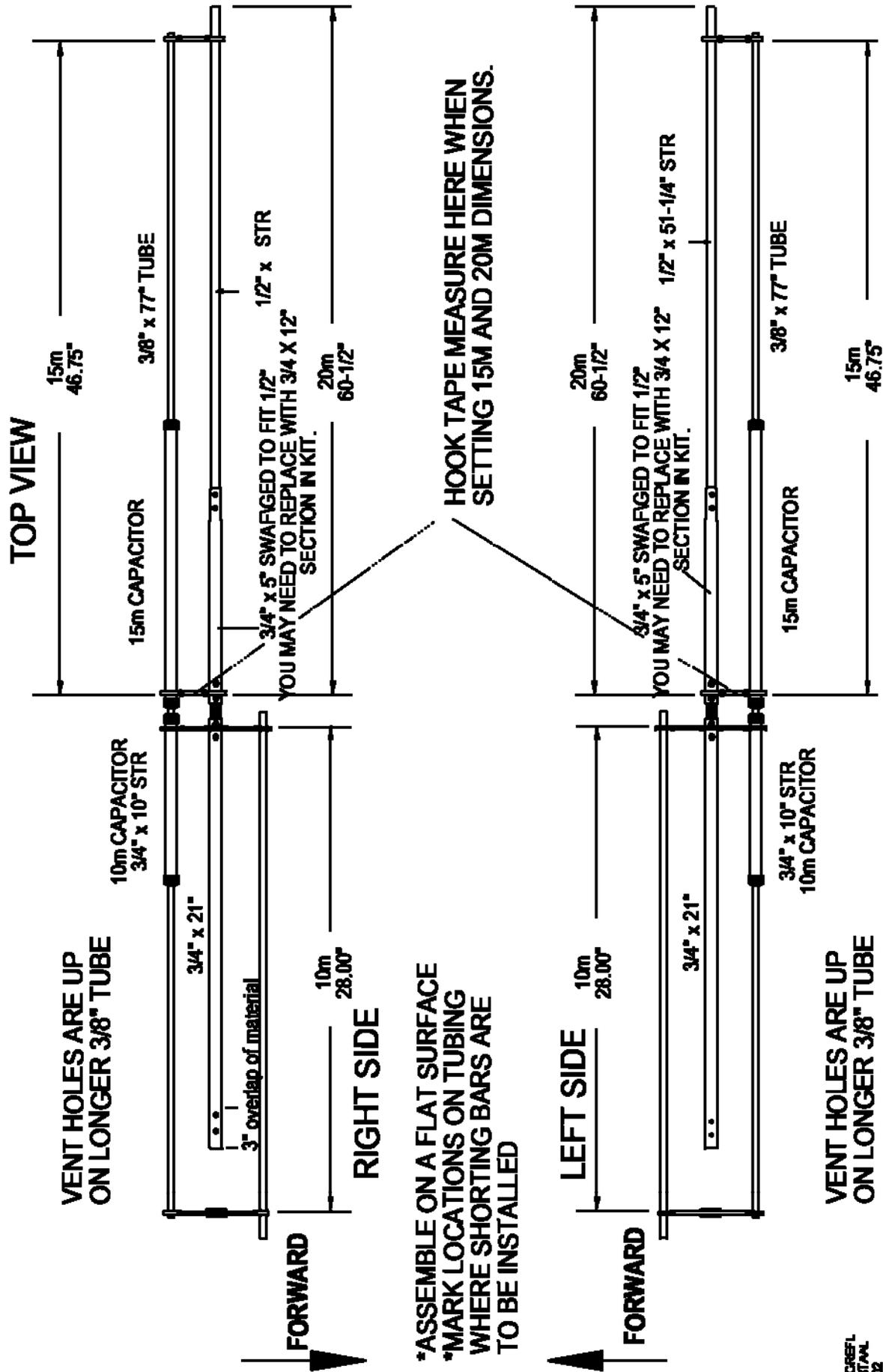
OTHER HALF SECTIONS REMOVED FOR CLARITY

TO PREVENT GALLING OF THE STAINLESS STEEL HARDWARE, APPLY A LIGHT COATING OF PENETROX TO THE THREADS OF ALL BOLTS AND SCREWS

TERMS:
 STR: STRAIGHT PIECE OF TUBING
 SOE: SWAGED ONE END
 SBE: SWAGED BOTH ENDS
 SWAGE: A PHYSICAL REDUCTION MADE IN ONE DIAMETER OF TUBING IN ORDER TO FIT INTO ANOTHER.

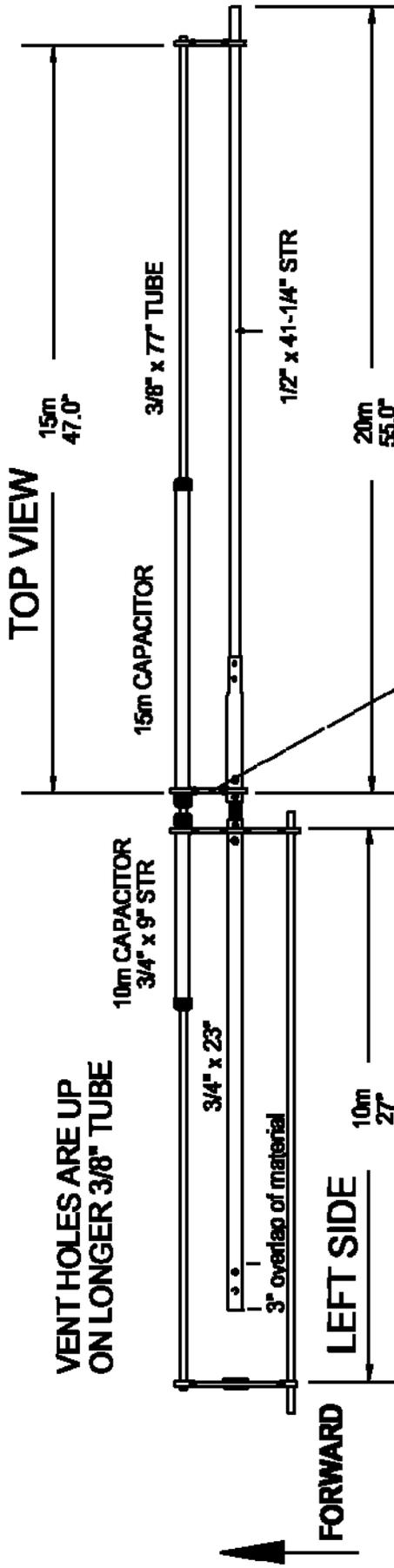
UPGRADE REFLECTOR ELEMENT DIMENSIONS

DIMENSIONS ARE FOR KT34M2 UPGRADE KTS ONLY. 10M, 15, AND 20M DIMENSIONS ARE CORRECT FOR YOUR KIT BUT YOUR TUBES MAY DIFFER SLIGHTLY.



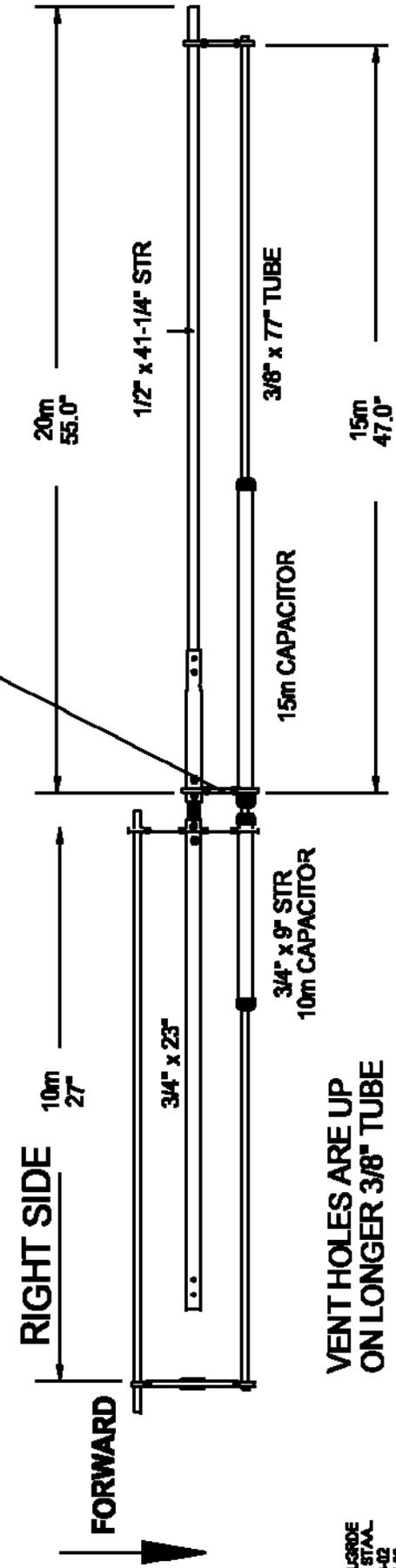
UPGRADE REAR DRIVEN ELEMENT DIMENSIONS

DIMENSIONS ARE FOR KT34M2 UPGRADE KTS ONLY. 10M, 15, AND 20M DIMENSIONS ARE CORRECT FOR YOUR KIT BUT YOUR TUBES MAY DIFFER SLIGHTLY.



*ASSEMBLE ON A FLAT SURFACE
 *MARK LOCATIONS ON TUBING WHERE SHORTING BARS ARE TO BE INSTALLED

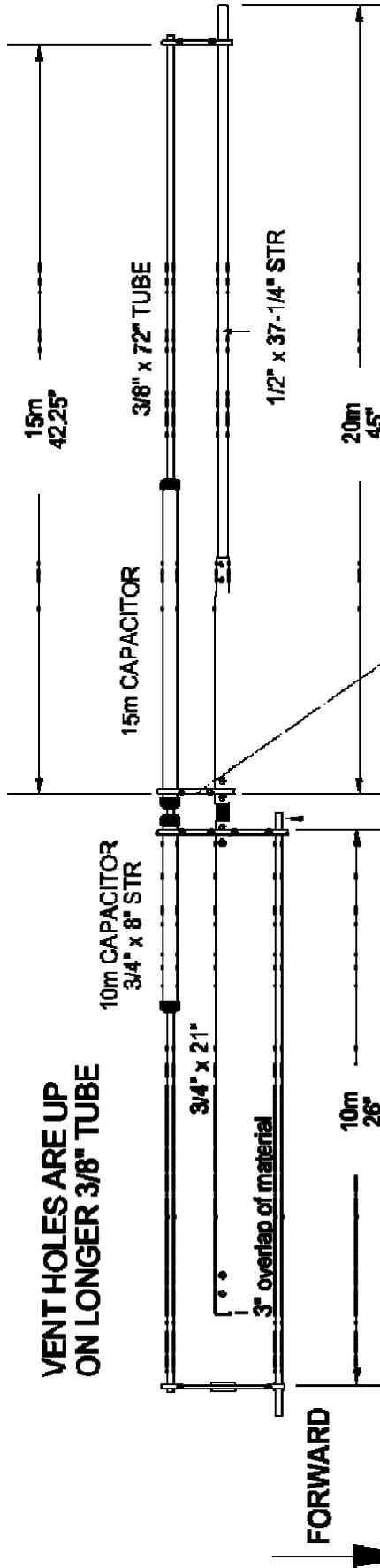
HOOK TAPE MEASURE HERE WHEN SETTING 15M AND 20M DIMENSIONS.



UPGRADE FRONT DRIVEN ELEMENT DIMENSIONS

DIMENSIONS ARE FOR KT34M2 UPGRADE KTS ONLY. 10M, 15, AND 20M DIMENSIONS ARE CORRECT FOR YOUR KIT BUT YOUR TUBES MAY DIFFER SLIGHTLY.

TOP VIEW



VENT HOLES ARE UP ON LONGER 3/8\" TUBE

FORWARD

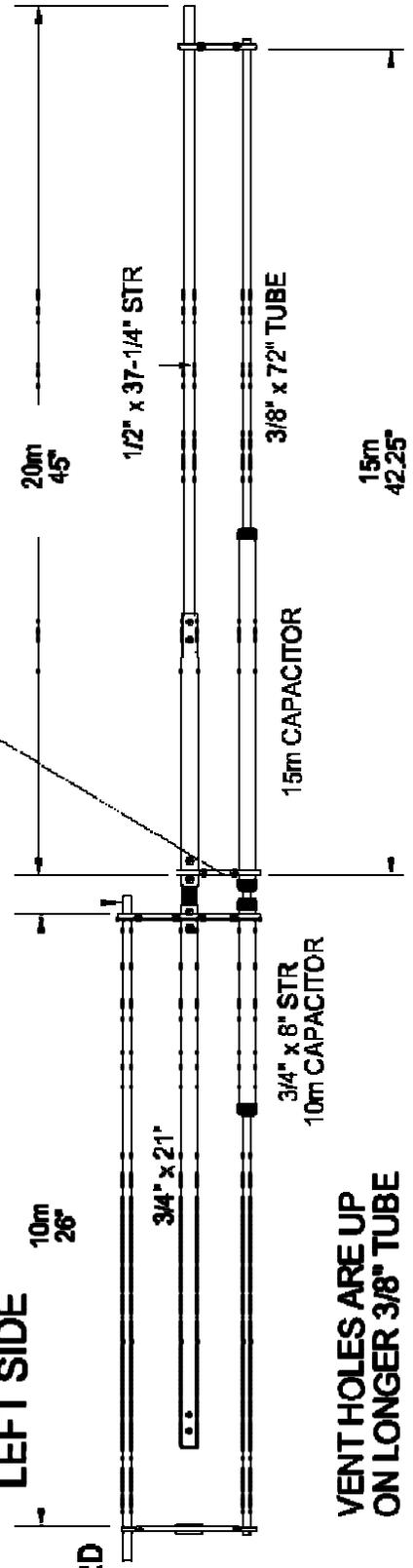
RIGHT SIDE

*ASSEMBLE ON A FLAT SURFACE
*MARK LOCATIONS ON TUBING WHERE SHORTING BARS ARE TO BE INSTALLED

HOOK TAPE MEASURE HERE WHEN SETTING 15M AND 20M DIMENSIONS.

LEFT SIDE

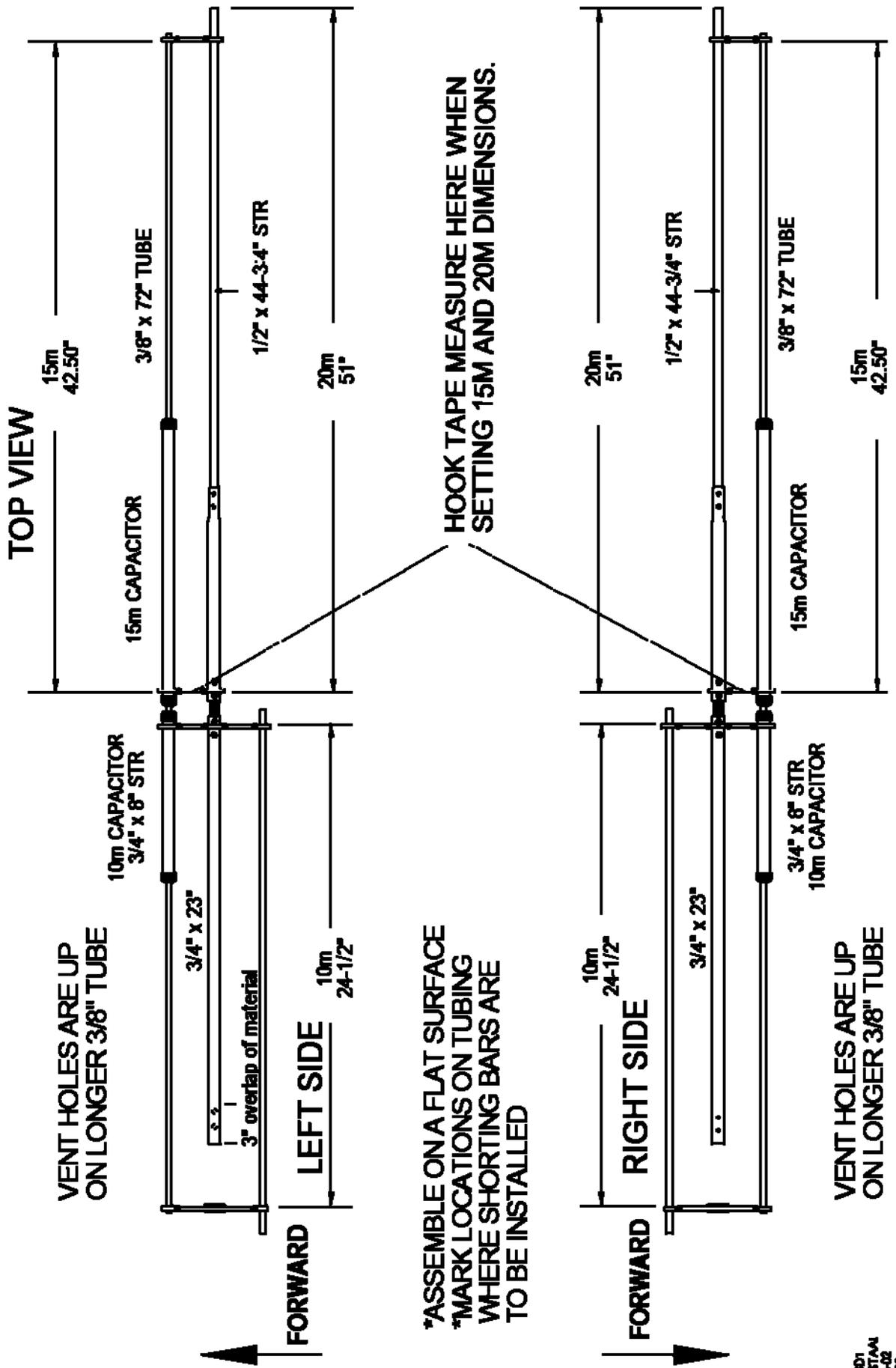
FORWARD



VENT HOLES ARE UP ON LONGER 3/8\" TUBE

UPGRADE DIRECTOR ELEMENT DIMENSIONS

DIMENSIONS ARE FOR KT34M2 UPGRADE KTS ONLY. 10M, 15, AND 20M DIMENSIONS ARE CORRECT FOR YOUR KIT BUT YOUR TUBES MAY DIFFER SLIGHTLY.



KT34(A) TO KT34M2 UP GRADE PARTS & HARDWARE

DESCRIPTION	QTY
Tube, 3/4 X .049 x 12" swaged both ends for Reflector as required.....	2
Matching Tube, 1/2" x .049" x 23.5"	2
Match Insulator, 3/8" x 10"	1
Capacitor Cap.....	32
Shorting Bar, 15M.....	8
Shorting Bar, 15M capacitor tube	8
Shorting Bar, 10M capacitor tube	8
Shorting Bar, 10M.....	8
"T" Match Shorting Bar, 1/4" x 1-1/4" x 3-13/16"	2
Shorting Bar Insulator, Delrin 1-1/2" Dia.	8
Screw, 8-32 x 1-1/2" S.S.....	2
Screw, 8-32 x 1-1/4" S.S.....	40
Screw, 8-32 x 1" S.S.....	60
Nut, 8-32 Locking S.S.....	100
Zinc oxide paste Cup	1
Upgrade Assembly Manual.....	1
KT34M2 REFERENCE Manual	1

Note: This UPGRADE KIT does not include:

1. New style element to boom clamps. These are available as an option.
2. Linear loading 5/8" fiberglass rod insulators. Yours may have sun damage but are not effected structurally. Avoid rubbing the exposed fibers with your fingers. Black 3M or equivalent electricians tape over the sun damaged area will protect you and can be left on the part to protect it from further deterioration.
3. A new 4:1 broad band ferrite balun. Yours is probably OK. We can provide a new and higher power 4:1 balun as an option.
4. Any other parts that are not basically required to convert a KT34(A) to a KT34M2

Carefully manufactured by
M² ANTENNA SYSTEMS, INC.

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COMMON ANSWERS TO COMMON QUESTIONS

QUES: When measuring tube or shorting bar position, “where do I measure from, inside to inside or outside to outside?”

ANSWER: Refer to your individual element dimension sheet. It is much easier to determine which side of the tube or shorting bar to reference. Note: M2 has used two inner shorting bars as points to hook your tape measure onto for ease of measuring, so generally hook your tape measure on to a inner shorting bar and measure to the inner edge of the outer shorting bar or to the end of a tube.

QUES: Is the gap between the capacitor caps critical?

ANSWER: No, the gap can be 1/8” -1/2”. The reason for the gap is to prevent water from sitting in a location where water could over time “wick” into the capacitor tubes. Water in the capacitor tube can change the capacitance which can change the tuning of the antenna.

QUES: If I end up with some unacceptable VSWR on one or more bands can I adjust it out with the “T” match?

ANSWER: No, In fact this is not a true “T” match. We found in the early stage of the original design that only a small amount of VSWR improvement occurred when we adjust the “T” match. Just set it to the dimension sheet and forget it. Other factors are causing your VSWR problems. Recheck your dimensions

QUES: I have a good, but not perfect VSWR, Will it help to replace the balun?

ANSWER: Probably not. If your balun is broken inside your match will be poor (up to 4:1) on all bands. Save your money, recheck your dimensions.

QUES: How can I be sure I have the capacitor caps on the tube all the way?

ANSWER: The capacitor caps overlap the tubes by 3/8” (.375) so when both caps are fully engaged with the tube the dimension from the inside of each cap should be 3/4”(.750) less than the capacitor tube being measured.