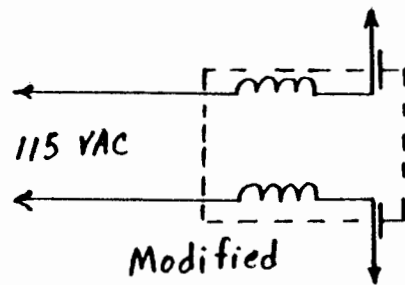
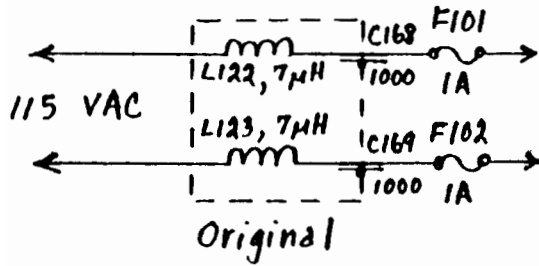


# AC Power Input Filter

URM-25D Notes

Dallas Lankford, 11-88, rev. 1-94



Moving C168 and C169 from the ends to the sides of the filter box will help reduce breakage. I have seen this mod on some 25D's.

Often one or both of C168 and C169 (the AC power input filter feedthrough capacitors, 1000pF, 500V) are broken. Even if you are careful when removing the 25D from its case, you can still break one of these feedthrus.

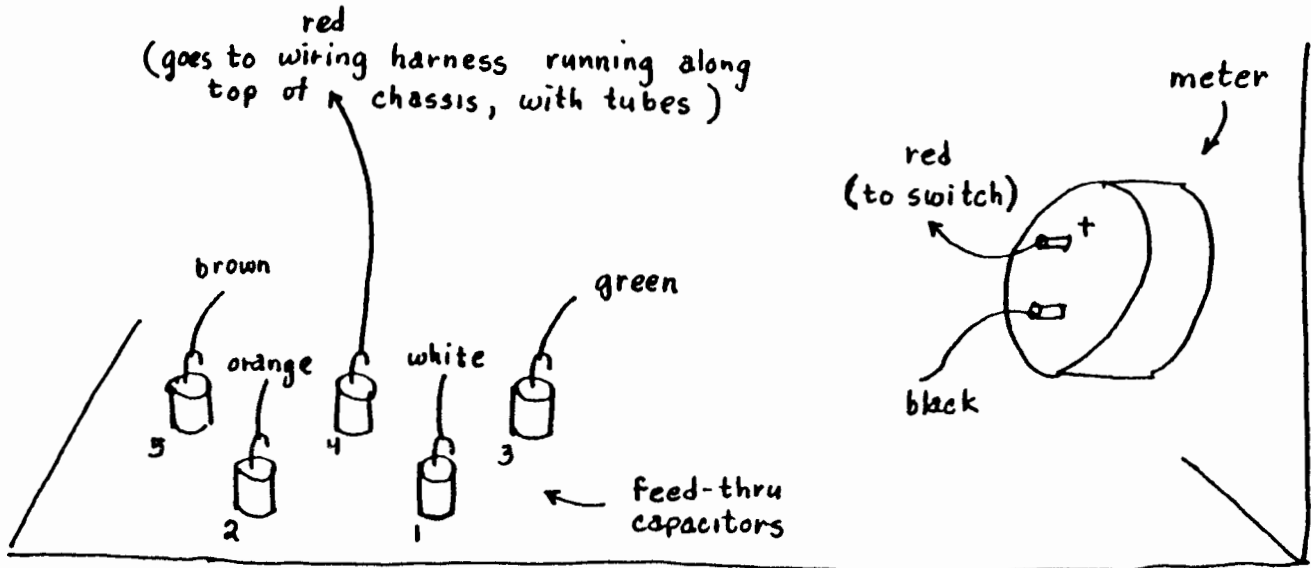
Tusonix 357-000-X540-102M, previously available from Newark, is an exact replacement. If you plan to keep your 25D, you should buy several for your spare parts inventory.

Often L122 and L123 will be "fried," and partly melted down. I don't know what causes this (maybe shorted or leaky C168 and/or C169), but it is common with 25D's I have seen. The 25D parts list specifies: "single winding; single layer wound; 7.0μH; ±10%; 0.95 ohms; two axial wire leads." The closest I could come to these specs with a higher current rating is the Miller 4622 choke, 10μH, 1.5 amp, iron core. I have experienced no problems with this substitute. If you want to get closer to 7μH, remove 5 of the 32 turns of the Miller 4622. In some 25D's I have seen Ohmite Z-50 chokes used as replacements. The Ohmite Z-50 is a 7.0μH, 1 Amp choke, and it is available from RF Parts (619)-744-0700 for about \$3.25 each. RF Parts has a \$20 minimum order.

## Unsoldering And Soldering

Use Chem-Wik Lite 0.100 desoldering braid and a soldering iron with 45 watt, 900°F tip. Use good desoldering practices: remove all old solder and all remains of old leads. Use good soldering practices: crimp all leads before soldering, and do not dribble solder onto solder joints. Use 60/40 rosin core solder.

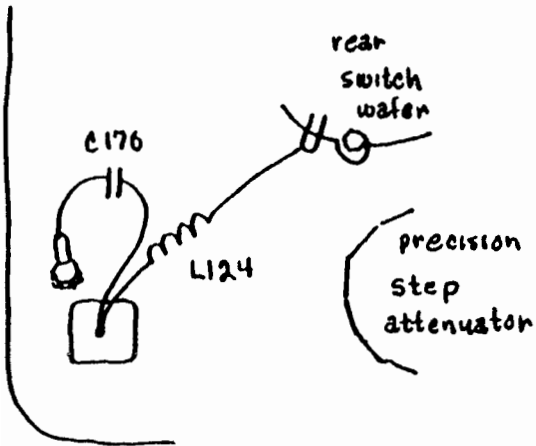
# Removal Of Modulation (Audio) Subchassis



(1) Remove L124; unsolder at switch and at BNC connector.

(2) Unsolder red and black wires to meter. Note which meter terminal is marked +. If not marked, mark it.

(3) Unsolder wires to feed-thru capacitors, in order indicated by numbers (minimizes chances of burning insulation with hot soldering iron tip).



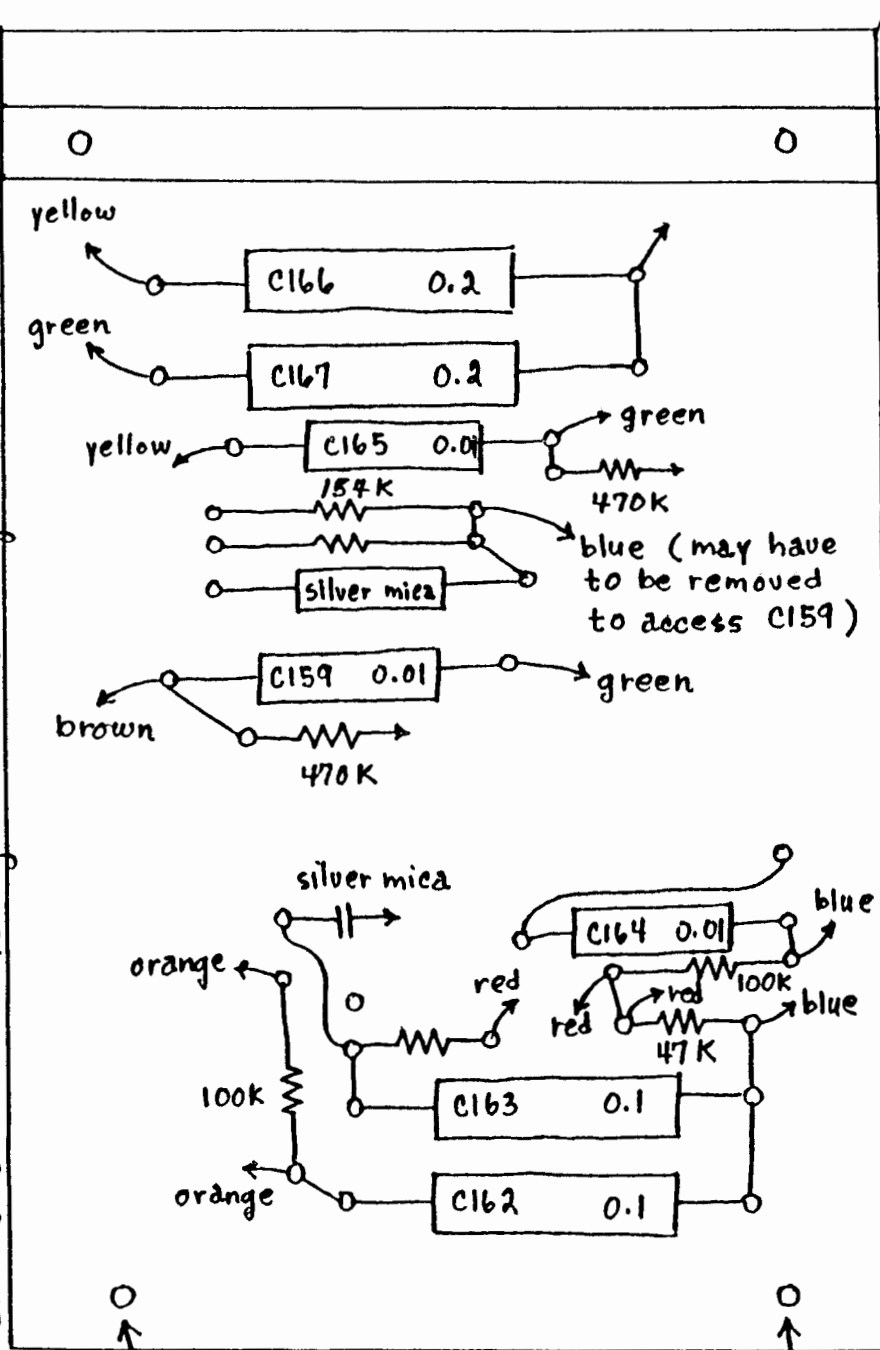
NOTE: When reinstalling the modulation subchassis, reconnect the numbered wires in the reverse order, i.e., 5 first, 4 second, etc. Before removing the 5 wires, verify that their colors are as indicated on the diagram above. If not, record their colors.

(4) Unbolt and remove modulation subchassis, after removing the three knobs which restrict its removal, and disconnecting BNC connector on side of black cast alloy box.

# Modulation (Audio) Subchassis Overhaul

## URM-25D Notes Dallas Hankford, 11-88

If a stranded, insulated wire is attached to the top of a lug, and the old capacitor lead is attached to the bottom of that lug, then you should remove the stranded, insulated wire and reinstall it at the bottom of the lug after removing the old capacitor lead.



metal support bar

NOTE: Leave the metal support bar on this end attached to the bakelite board. Remove the screws from both ends which attach the bar to the "top" and "bottom" metal plates.

Remove both screws which attach the bakelite board to the other bar.

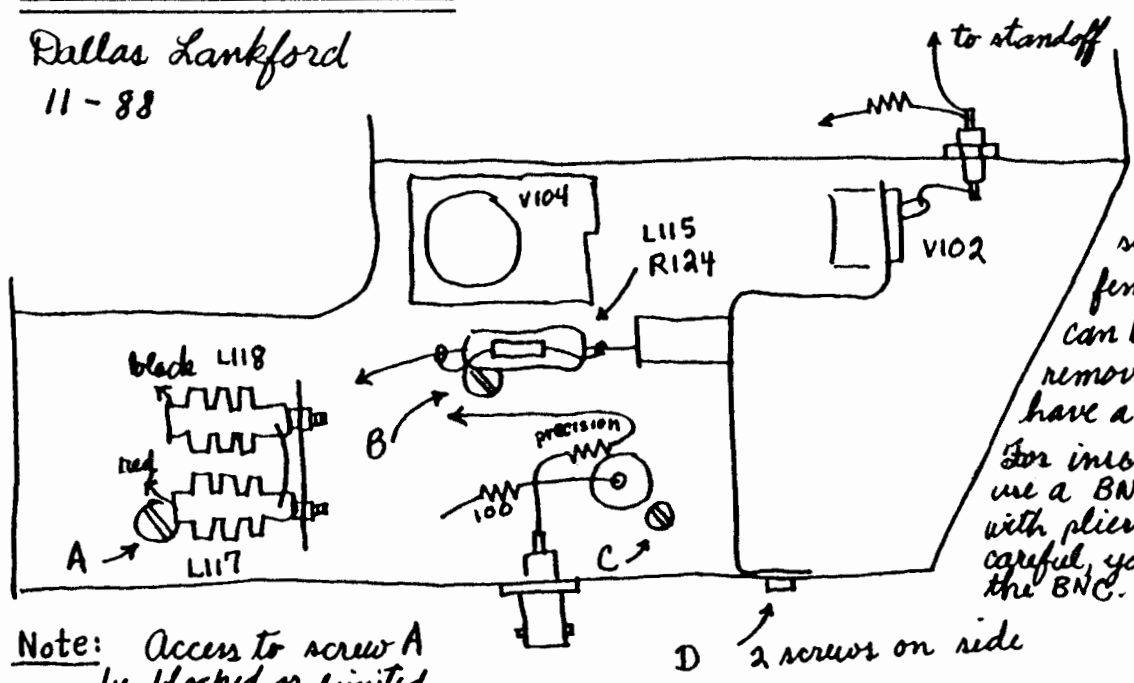
Remove the remaining three screws from the "top" metal plate (which contains the tubes) which attach it to the bars.

After the above steps have been done, the metal plates can be "opened up" ("folded away from") the bakelite board. Replacement of C159, C162, C163, C164, C165, C166, and C167 can then be done.

# Buffer Amplifier Subchassis Overhaul

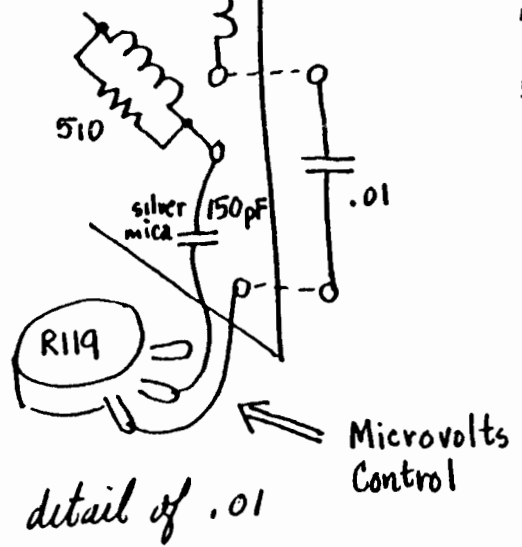
## URM-25D Notes

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Note: The screw-in BNC female connector can be deformed during removal. It is best to have a replacement. For insertion/tightening, use a BNC male to grip with pliers. If you are careful, you will not deform the BNC.

Note: Access to screw A may be blocked or limited by a capacitor lead. Bend or move the lead out of the way as much as possible. A long blade screwdriver will probably be required. Screws B, C, and D may have to be loosened before screw A can be loosened completely.



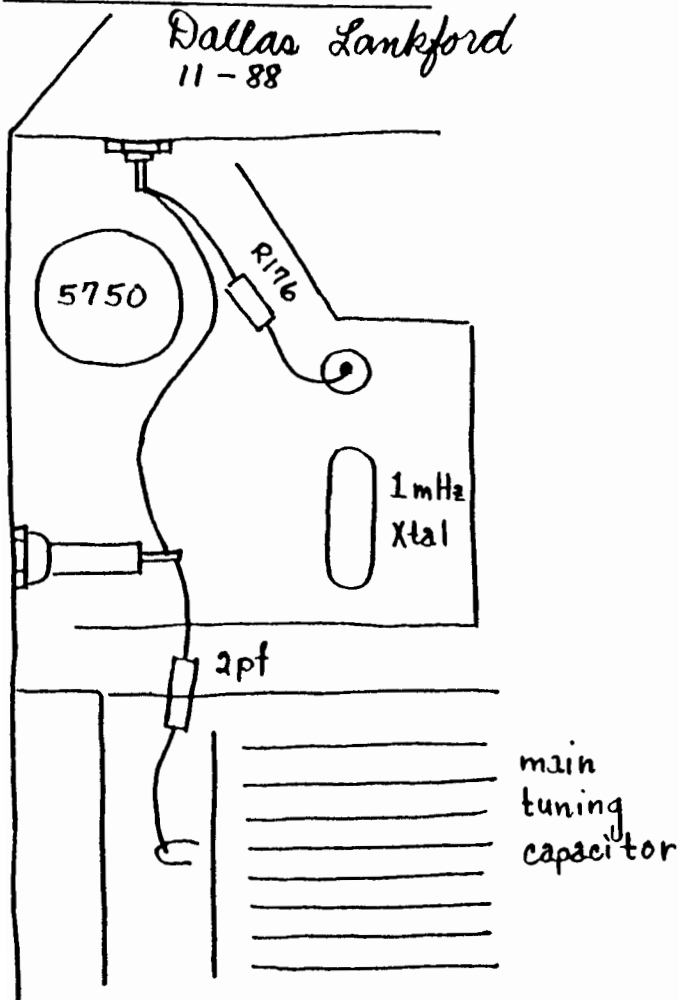
- To remove buffer amplifier subchassis, remove MICROVOLTS and MULT knobs:
1. unsolder wire from pin 1 of V102 to feedthrough,
  2. unsolder resistor and wire to standoff on other side of feedthrough
  3. unbolt and remove feedthrough
  4. unsolder precision resistor to BNC lug on side and remove female BNC connector; see note above
  5. unsolder 100 ohm resistor to BNC lug on bottom
  6. unbolt L117 and L118 from mounting bracket and remove both from mounting bracket in order to access screw A
  7. remove (D) 2 side screws, and unscrew until free, but do not remove (A), (B), and (C). To access screw (B) you may have to push L115/R124 towards V104 subchassis
  8. the buffer amplifier can now be "Chinese puzzled" out of the compartment.
  9. the .01 paper cap can now be unsoldered, removed, and replaced by a .01, 1KV on the other side of the bakelite chassis.

Note: I replaced the .01 paper with a .01, 2KV. Because of space limitations in the original position, I installed the .01, 2KV

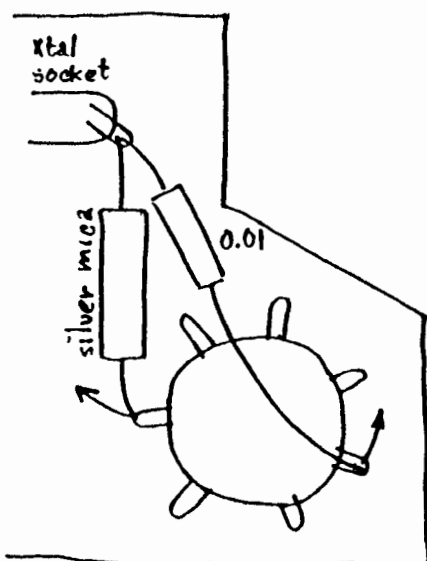
# Calibration Oscillator Subchassis Overhaul

## URM-25D Notes

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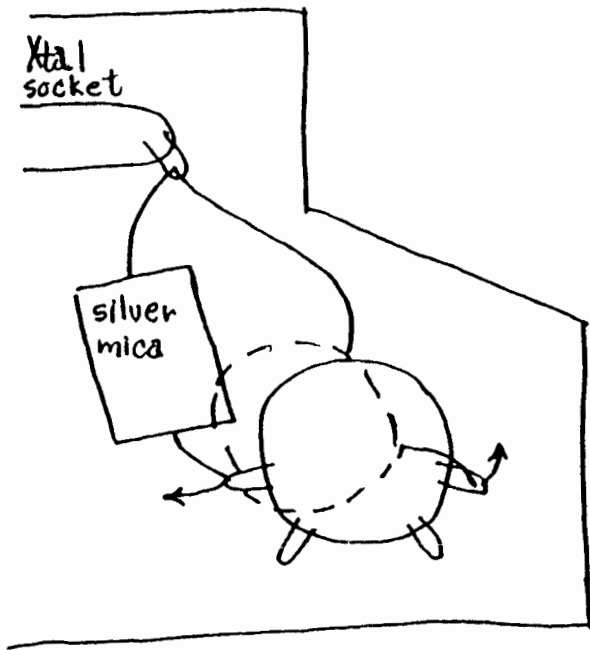


- (1) Unsolder R176 at both ends and remove it.
- (2) Unsolder the 2pf ceramic capacitor at the standoff insulator and gently bend it out of the way (so that the subchassis can be lifted straight up).
- (3) Remove and discard the black insulated solid wire. (It is easier to replace it than to try to reuse it.)
- (4) Unbolt the subchassis after removing the 5750 tube and unscrewing and removing the standoff insulator. The two screws which secure the subchassis are behind the power line filter, so the front panel screws which secure the power line filter will have to be removed, and the front and rear cover of the power line filter will have to be removed.
- (5) Lift the subchassis up and turn it over. It cannot be completely removed because of attached stranded insulated wires.
- (6) Unsolder and remove the 0.01 capacitor.
- (7) Gently bend the silver mica capacitor away from vertical until it is parallel to the subchassis bottom, just above the trimmer.



(8) Install a 0.01, 1KV disc ceramic capacitor parallel to the subchassis bottom, above the tube socket bottom, in about the position indicated by the dashed circle, just above the silver mica capacitor corner.

NOTE: Unless the silver mica capacitor is repositioned as described in Step 7, there will not be enough space to install the 0.01 disc ceramic capacitor. Be careful bending the lead which is soldered to the tube socket pin. The tube socket pin is easily broken.



"After"

### Buffer Amplifier Subchassis Overhaul Addendum 1-94

In two of the four 25D's I have rebuilt, the MICROVOLTS control, R119, 5000 ohm, 1/4 watt, linear, has been "scratchy." Even if the control is not scratchy, it may be well worn, and far out of specs. I have replaced these successfully with RV4 type 5000 ohm, 2 watt, linear pots (Allen Bradley type J, Ohmite). Unfortunately, the only RV4 type pot currently manufactured (in Mexico) is made by Clarostat, and the Clarostat RV4 is not nearly as good quality as the 1950's and 1960's vintage pots. A possible replacement is Clarostat model 380 C1, which are supposed to be better quality than current RV4's. The 2" shaft will have to be cut to size using the original R119 to measure shaft length. Clarostat Model

### URM - 25D Notes

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break when you unsolder the R119 500 volt silver mica. The nearby large choke will probably have to be unsoldered and repositioned.

380 C1 pots (2" shaft) and model 380 C3 pots (7/8" shafts, same size as RV4) may be available from Allied (800)-433-5700. The 150 pF silver mica leads will probably break when you unsolder the R119 connection, so have a spare 150pF

## URM-25D Calibration (Alignment)

URM-25D Notes Dallas Lankford, 11-88

Except for the 50 mhz trimmer adjustment on band 8, the URM-25D can be calibrated (aligned) using any communications receiver which can be accurately tuned to the following frequencies:

0.500, 0.540, 0.600, 0.950, 1.000, 3.000,  
4.500, 10.000, and 30.000 mhz.

The calibration frequencies below 500 khz are aligned using harmonics, and are denoted by underlining. As usual, the inductors (L101-L108) are adjusted at the low end of the band, and the trimmers are adjusted at the high end of the band.

10-30 khz: 500 = 10 x 50, 600 = 30 x 20

30-95 khz: 600 = 30 x 20, 540 = 90 x 6

95-300 khz: 600 = 100 x 6, 600 = 300 x 2

300-950 khz: 600 = 300 x 2, 950

0.95-3.0 mhz: 1.000, 3.000

3.0-9.5 mhz: 3.000, 9.500

9.5-30.0 mhz: 10.000, 30.000

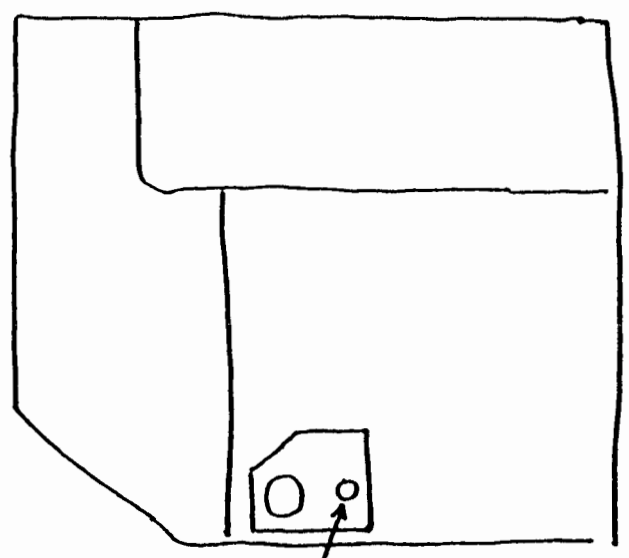
30.0-50.0 mhz: 30.000, —

Use the receiver BFO and adjust trimmers and capacitors for zero beat. I use small and medium size screw drivers for these adjustments which "pull" the frequency. But it is easy to estimate how much to detune so that when the screw driver is removed the -25D is near zero beat.

# AN/URM-25D CALBRATION (Alignment) (continued)

URM-25D Notes

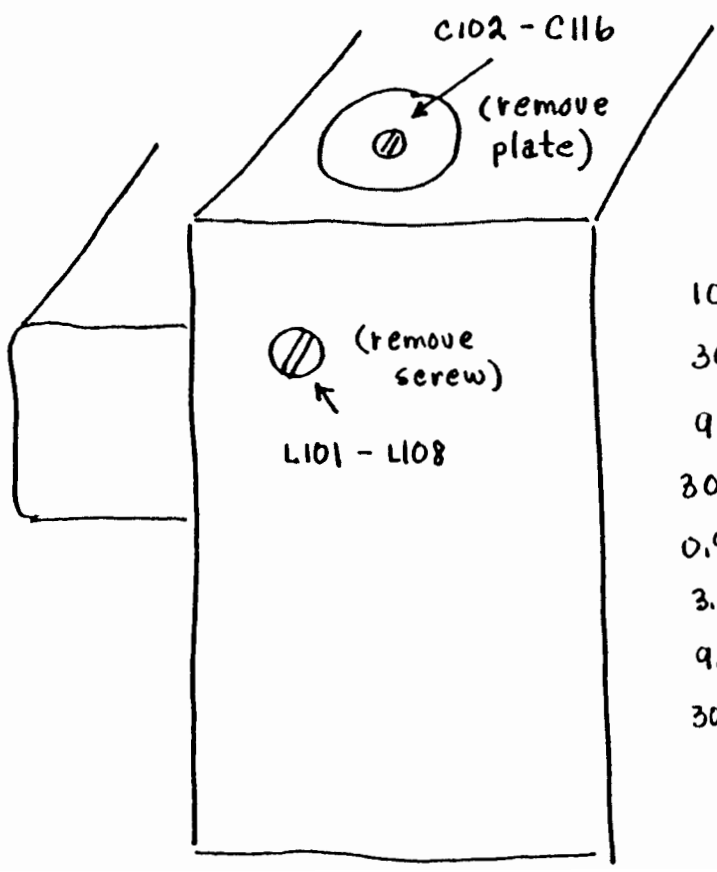
Dallas Lankford, 11-88



view with  
back cover  
removed

C158

1mHz cal.  
zero adjust



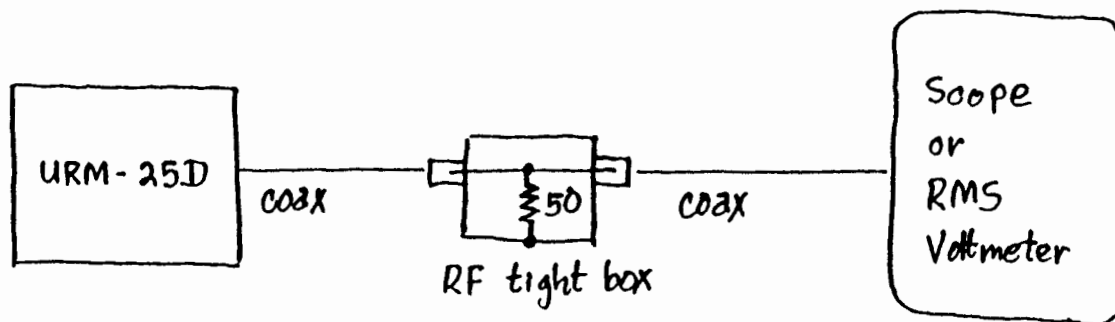
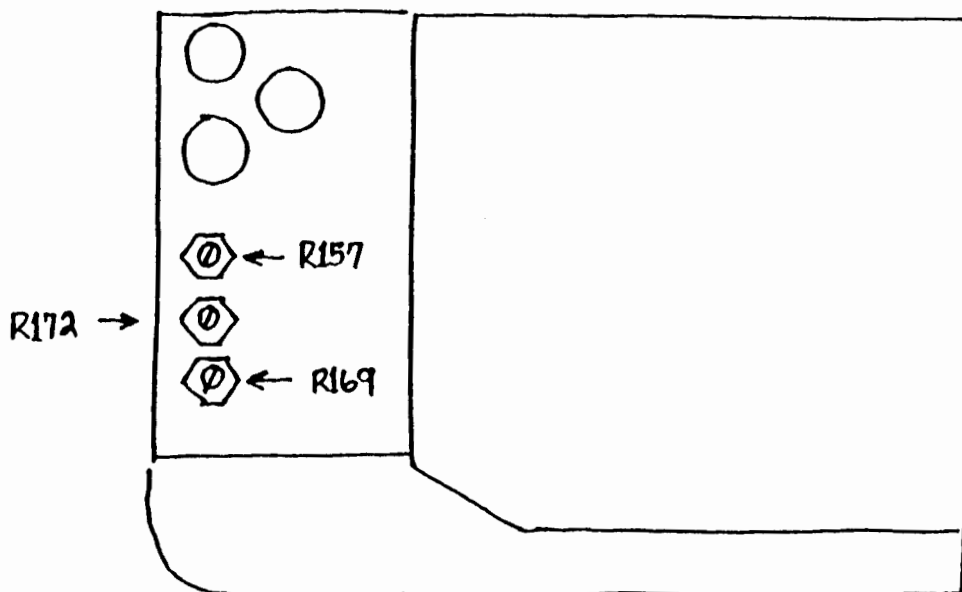
- 10-30 kHz
- 30-95 kHz
- 95-300 kHz
- 300-950 kHz
- 0.95-3.0 mhz
- 3.0-9.5 mhz
- 9.5-30.0 mhz
- 30.0-50.0 mhz



# URM-25D RF Output Calibration

URM-25D Notes

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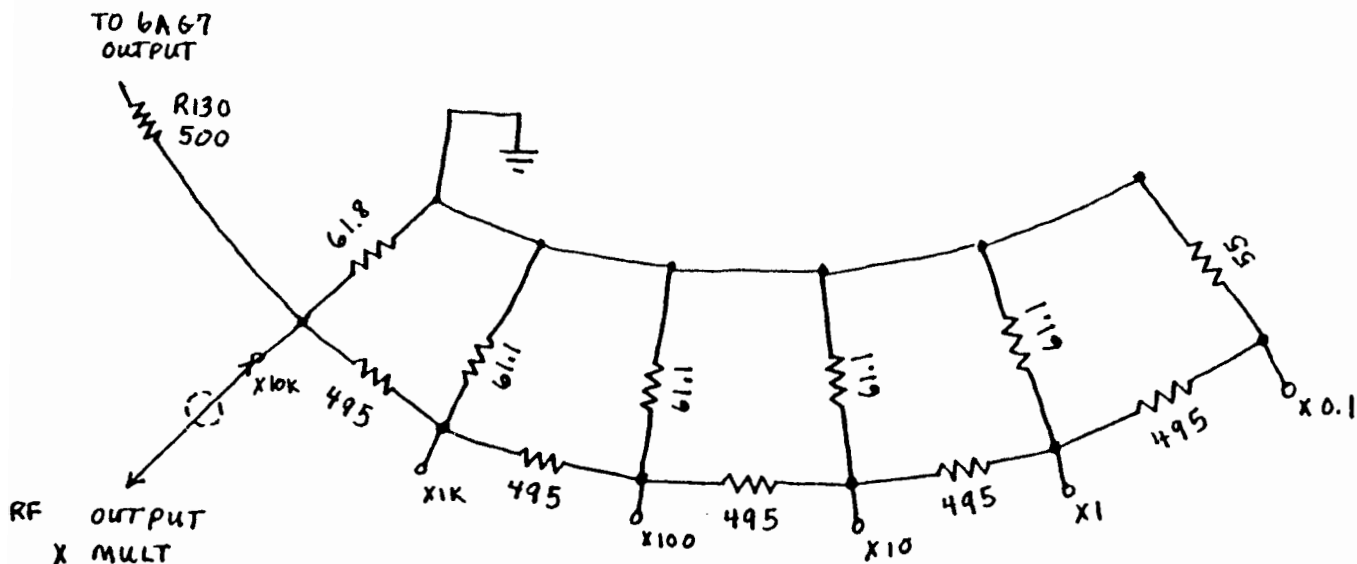


Set zero adjust with MICROVOLTS fully counterclockwise, and SET CARRIER TO 10 fully counterclockwise. With frequency set to 1 MHz, turn MICROVOLTS fully clockwise and adjust SET CARRIER TO 10 for a meter reading of 10 with METER READS set to CW and R.F. MULTIPLIER set to X10K. Adjust R172 for 100 mV RMS (280 mV P-P) output into 50 ohms using test setup shown above.

Spot check output at other frequencies (always with MICROVOLTS fully clockwise and SET CARRIER TO 10 adjusted for meter reading of 10). Output should be 280 V P-P  $\pm 10\%$ , except above 20 MHz; 25D output falls off slowly above 20 MHz to about 220 mV P-P at 30 MHz, or so it seems.

# Step Attenuator

(interior view)



## URM-25D Notes

Dallas Lankford

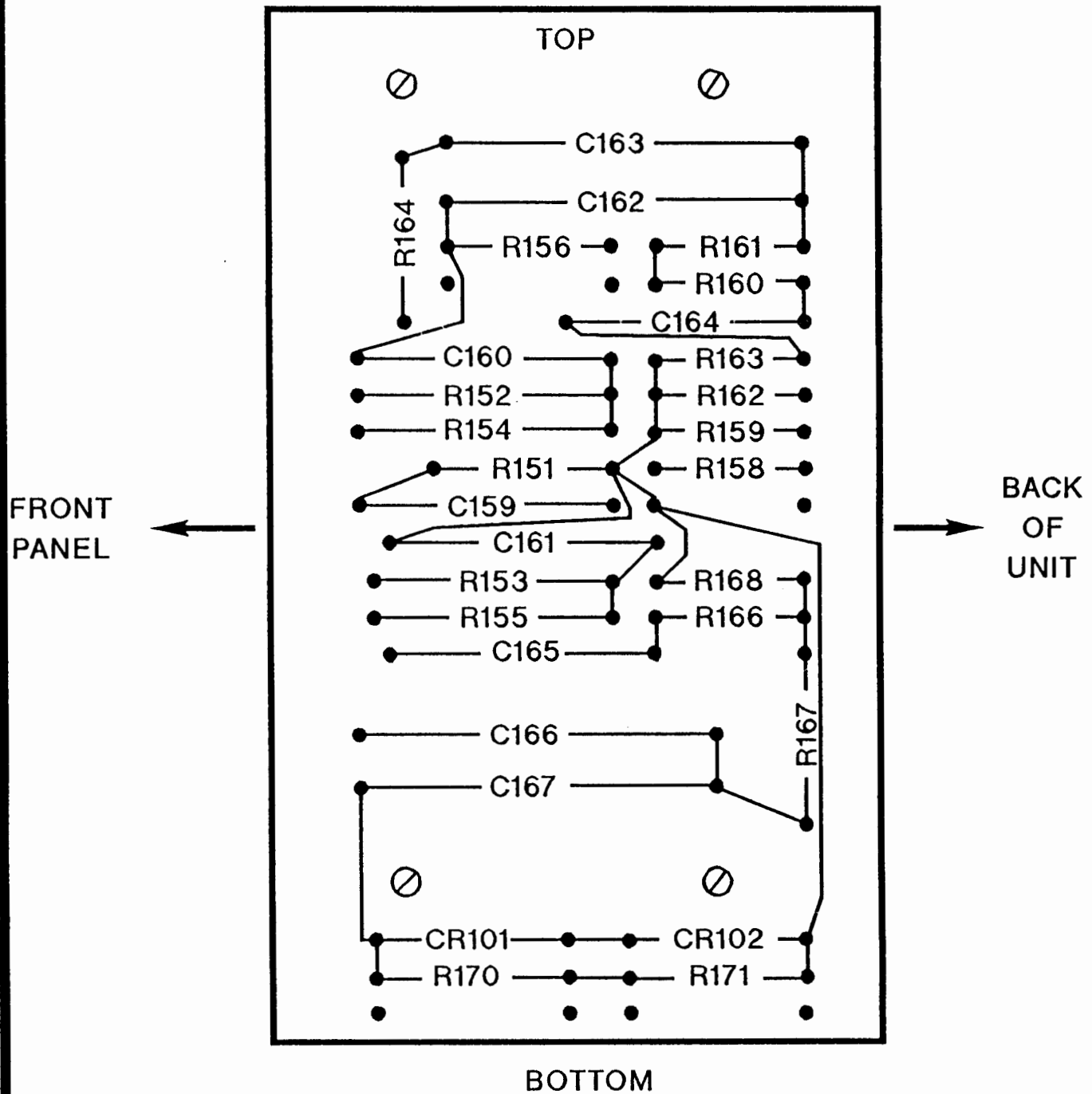
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The above sketch may be useful to those who attempt to rebuild the URM-25D step attenuator.

Addendum 9-93: Even if all of the precision resistors in a 25D step attenuator look original, and look good (no discoloration due to passing large currents because the user stupidly attached the 25D output to an AC or DC source without decoupling through a suitable 0.1  $\mu\text{F}$  capacitor with adequate voltage rating), one or more precision resistors may still be defective. One indication of a defective step attenuator is when the RF output of a 25D cannot be adjusted, via R172, for 100 mV RMS output (280 mV P-P) into 50 ohms resistive as viewed on a high impedance input scope with 25D front panel controls set for 100 K MV.

# AN/URM-25D TERMINAL BOARD

(EYELET SIDE)



# AN/URM-25D TERMINAL BOARD

(COMPONENT SIDE)

