



publications engineering

# SERVICE BULLETIN

COLLINS RADIO COMPANY

Cedar Rapids, Iowa 52406

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EQUIPMENT TYPE KWM-1

BULLETIN NO. 1

DATE

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**SUBJECT A: Improvement in Calibrator Operation**

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**E: "Tweets" in Audio Output Caused by DC Power Supply**

## GENERAL

A number of improvements have been made in design of the KWM-1 since the beginning of manufacture of the equipment. As in common to most new design equipment, field use has turned up certain problems that can not be foreseen in the original design and manufacture of the unit. This bulletin outlines the necessary procedures to correct the problems that have been brought to light in field use.

All KWM-1 Transceivers have not exhibited these problems. Due to the compactness of the equipment it is recommended that only the modifications be incorporated where it is

### SUBJECT A: Improvement in Calibrator Operation

It has been noted that multiple beats are present in Calibrate position of the Emission Switch. The following modification will increase the strength of the correct calibration signal. Units using a type 6AU6 tube for V1 require this modification.

1. Remove bottom cover by removing screws on bottom and rear of unit.

definitely known that the problem does exist in the transceiver. A poorly executed modification can cause other problems in the equipment. MODIFICATION SIMPLY TO BRING THE UNIT UP TO DATE IS NOT RECOMMENDED.

Serial number effectivity is not definitely known on all of the modifications. Serial number effectivities that are known are listed in the separate sections of the bulletin.

In all cases, examination of the equipment will show the existence of the modification in the unit. The procedures outlined in the following sections are recommended when it has been determined that the problem outlined at the beginning of each section exists.

2. Remove choke, L22, connected from XV1 pin 5 to terminal strip and replace with 100K 1/2 watt resistor, R153, (745 1436 00). Use sleeving removed from choke over resistor lead.

3. Remove L1 coil can. (L1 can is located beside XV4 and is second can nearest front of the unit). See figure 6.

4. Remove 1 uuf capacitor, C118, and coax lead from C118 to XV1 pin 5. C118 and coax

lead are connected to insulated terminal mounted on trimmer capacitor. Discard coax and capacitor. See figure 1.

5. Mount a insulated terminal (306 0233 00) over XV5 pin 9 on the side of the chassis approximately 3/4 inch below the lip of the chassis using 4-40 x 3/16 screw (343 0284 00). Mount terminal in one of the existing perforated holes.

6. Mount an insulated terminal (306 0233 00) 1/2 inch toward the front of the chassis in line with the terminal added in step 5 using 4-40 x 3/16 screw (343 0284 00).

7. Install a five inch length of coax cable (425 0926 00) from terminal directly over XV5 pin 9 (installed in step 5) to insulated terminal to which C16 and coax cable to XV4 pin 1 is connected. See figure 1. Ground coax shield to C15 as shown in figure 1. Ground shield at C15 end only.

8. Remove ground from coax lead connected to XV5 pin 3.

9. Ground center shield to XV5 pin 5.

10. Install new 1 uuf capacitor, C209, (916 0070 00) from XV1 pin 5 to insulated terminal installed in step 6 (terminal nearest front panel).

11. Install new 1 uuf capacitor, C118, (916 0070 00) between insulated terminals added on side of chassis (added in steps 5 and 6).

12. Install 47 uh choke, L34, (240 0190 00) from junction of C118 and C209 (terminal added in step 6 ) to partition shield of XV1.

13. Unsolder .001 capacitor and coax from the insulated terminal mounted on "Cal Zero"

capacitor, C117, (insulated terminal on K3 side of capacitor) and remove insulated terminal from capacitor. See figure 2.

14. Place a 4-40 nut (313 0132 00) on screw where insulated terminal was removed in step 13.

15. Drill new hole as indicated in figure 2. Care should be taken not to damage wiring and other components when drilling this hole.

16. Mount insulated terminal (removed in step 13) in hole drilled in step 15 using 4-40 x 3/16 screw (343 0284 00).

17. Connect the .001 capacitor and coax cable onto the insulated terminal. Sufficient slack has been allowed in the coax to permit it to be pulled through the grommet and reach the new terminal location. Ground coax shield on opposite side of XV11 socket shield.

18. Replace V1 tube with type 6BA6 (225 0185 00).

19. Check circuit for correct wiring as shown in Figure 3.

20. Replace L1 shield can.

21. Replace bottom cover if no other modifications are to be performed.

PARTS REQUIRED FOR MODIFICATION:

Modification Kit 541 6175 00

For modification parts, price quotations (minimum order charge is \$15.00), and availability contact Collins Radio Company, Service Parts Department, Cedar Rapids, Iowa 52406. All parts orders must specify the Collins modification kit number, or part numbers, quantity required, and reference this service bulletin.

Qty.	Description	Circuit Symbol	Part Number
1	Resistor, 100K 1/2 w+10%	R153	745 1436 00
2	Capacitor, 1 uuf 500 vdcw	C118, 209	916 0070 00
1	Choke, 47 uh	L34	240 0190 00
1	Tube, 6BA6	V1	255 0185 00
2	Terminal, Insulated		306 0233 00
3	Screw, 4-40 x 3/16		343 0284 00
1	Wire, Coax (ft)		425 0926 00
1	Nut, 4-40 hex		313 0132 00

**SUBJECT B: Spurious Outputs of KWM-1**

A spurious output has been noted on some recent KWM-1's. This is caused by the third harmonic of the Variable Frequency Oscillator beating with the output frequency in the first transmit mixer. The cross over point is 14,286 kc. This spurious output is caused by the output of driver, V2, getting into the first transmit mixer, V6, due to poor grounding of the shield can for L8. It may be eliminated by the addition of five ground clips around the edges of the L8 shield can. In the event that the spurious is less than 40 db below the key down output power this modification should be accomplished.

**PARTS REQUIRED:**

Qty.	Description	Collins Part Number
5	Clips, grounding	220 1323 00

**SUBJECT C: Transient in Speaker when Switching from Receive to Transmit**

In some KWM-1 transceivers a popping noise is evident when changing from receive to transmit. This noise may be greatly reduced by the following modification. Serial number effectivity 861.

1. Remove the 330K 1/2 watt resistor, R124, connected to terminal on terminal strip behind XV12. (See Figure 6). R124 should be removed by cutting from the strip and discarded.
2. Carefully drill a number 29 hole next to tie strip at rear of XV15 as shown in figure 4. Care should be taken not to damage cable harness.
3. Mount insulated terminal (306 0233 00) in hole drilled in step 2 using 4-40 x 3/16 screw (343 0284 00).
4. Connect a new 330K resistor, R124, (745 1457 00) from center terminal of terminal strip behind XV12 to insulated terminal installed in step 3.
5. Connect 330K resistor, R156, (745 1457 00) from insulated terminal installed in step 3 to

**MODIFICATION PROCEDURE:**

1. Remove the L8 shield can. See figure 6.
2. Install five ground clips (220 1323 00) around edge of the can and replace in original location. Make sure that can mounting nuts are tight.

For modification parts, price quotations (minimum order charge is \$15.00), and availability contact Collins Radio Company, Service Parts Department, Cedar Rapids, Iowa 52406. All parts orders must specify the Collins modification kit number, or part numbers, quantity required, and reference this service bulletin.

end terminal of terminal strip (this terminal has 100K 1/2 watt resistor connection from XV15 pin 7).

6. Connect .1 uf capacitor, C204, (931 0299 00) from insulated terminal installed in step 3 to same ground as C138. See figure 6.
7. Check XV15 pin 2 for the presence of a 2.2 mh rf choke connected across the 100K resistor connected to this pin.
8. If the choke is not present, connect a 2.2 mf choke (240 0084 00) across the 100K resistor, R77, connected to pin 2 of XV15.
9. Refer to figure 5 for schematic of completed modification.

**PARTS REQUIRED:**

Modification Kit 544 6176 00

For modification parts, price quotations (minimum order charge is \$15.00), and availability contact Collins Radio Company, Service Parts Department, Cedar Rapids, Iowa 52406. All parts orders must specify the Collins modification kit number, or part numbers, quantity required, and reference this service bulletin .

Modification Kit 544 6176 00 contains:

Qty.	Description	Symbol	Collins Part Number
2	Resistor, 330K 1/2 watt	R124, 156	745 1457 00
1	Capacitor, .1 uf 400 vdcw	C204	931 0299 00
1	Terminal, Insulated		306 0233 00
1	Screw, 4-40 x 3/16		343 0284 00
1	Choke, RF, 2.2 mh	L33	240 0084 00

**SUBJECT D: Hum in Speaker when AF Gain is Advanced in CW Operation**

In earlier models of the KWM-1, some hum could be heard if the AF Gain control was run high when in CW operation. This is actually a low frequency oscillation in the sidetone circuit and may be eliminated by the following modification. Units that have this modification installed will have a four terminal tie strip mounted directly behind the RF and AF gain controls with a 470 K 1/2 watt resistor connected in series with a 220 uuf capacitor mounted on the strip. Figure 6 shows the modified circuit.

1. Remove 6-32 screw on chassis directly behind "AF Gain" control.
2. Mount tie strip (306 2210 00) under screw of step 1.
3. Disconnect one end of 470K 1/2 watt resistor R95, from tie strip behind RF and AF Gain

Modification Kit 544 6177 00 contains:

Qty.	Description	Symbol	Collins Part Number
1	Capacitor, 220 uuf 500 vdcw	C195	912 0519 00
1	Strip, tie		306 2210 00

**SUBJECT E: "Tweets" in Audio Caused by DC Power Supply**

Trouble has been encountered in some of the KWM-1 mobile installations in that harmonics of the transistor oscillators in the 516E-1 DC power supply are getting into the KWM-1 i-f and audio circuits. This results in a series of tweets which have a peculiar warbling effect which varies in frequency as the rf gain control is varied. The trouble may be cured by the addition of two rf chokes in the 516E-1 DC power supply.

controls (the end that connects to the white and red shielded wire) and reconnect to tie strip added in step 2.

4. Connect a 220 uuf capacitor, C195, (912 0519 00) between new tie strip and tie point terminal which formerly connected R95 and white and red shielded wire together. This places 220 uuf in series with R95.
5. Replace bottom cover onto unit.

**PARTS REQUIRED:**

Modification Kit 544 6177 00

For modification parts, price quotations (minimum order charge is \$15.00), and availability contact Collins Radio Company, Service Parts Department, Cedar Rapids, Iowa 52406. All parts orders must specify the Collins modification kit number, or part numbers, quantity required, and reference this service bulletin.

Units in the field that have experienced this difficulty may be modified as outlined in this subject.

Modification to 516E-1 Power Supply.

1. Remove power input cover from cabinet.
2. Remove top cover of cabinet.
3. Remove 4 screws securing capacitor mounting plate and fold it out of cabinet so as to gain access to rear of TB1.

4. Remove white with brown and red tracer wire connected to terminal 4 of TB1. Connect this wire to terminal 17 of terminal strip above TB1 on inside of cabinet.

5. Connect a 120 uh rf choke, L4, (240 0194 00) from terminal 17 of terminal board to terminal 4 of TB1.

6. Remove white with green tracer wire from terminal 6 of TB1 and connect it to terminal 15 of terminal board.

7. Connect a 500 uh rf choke, L5, (240 0073 00) from terminal 15 of terminal board to terminal 6 of TB1.

Modification Kit 544 6178 00 contains:

8. Replace capacitor mounting plate top cover and input power cover using original hardware.

PARTS REQUIRED:

Modification Kit 544 6178 00

For modification parts, price quotations (minimum order charge is \$15.00), and availability contact Collins Radio Company, Service Parts Department, Cedar Rapids, Iowa 52406. All parts orders must specify the Collins modification kit number, or part numbers, quantity required, and reference this service bulletin.

Qty.	Description	Symbol	Collins Part Number
1	Choke, rf, 120 uh	L4	240 0194 00
1	Choke, rf, 500 uh	L5	240 0073 00

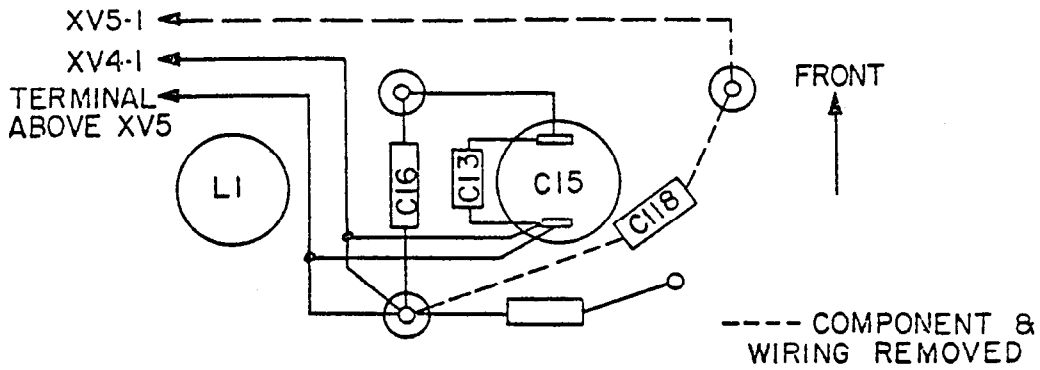


Figure 1. Wiring Location of L1 Shield Can

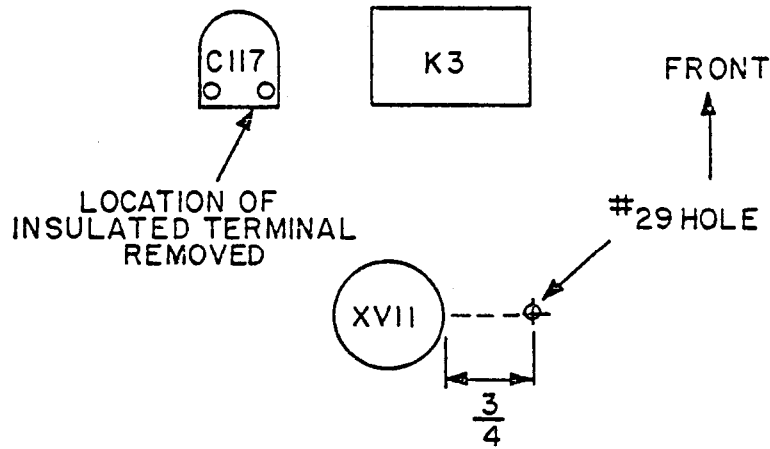


Figure 2. Location of Number 29 Hole for Installation of Insulated Terminal

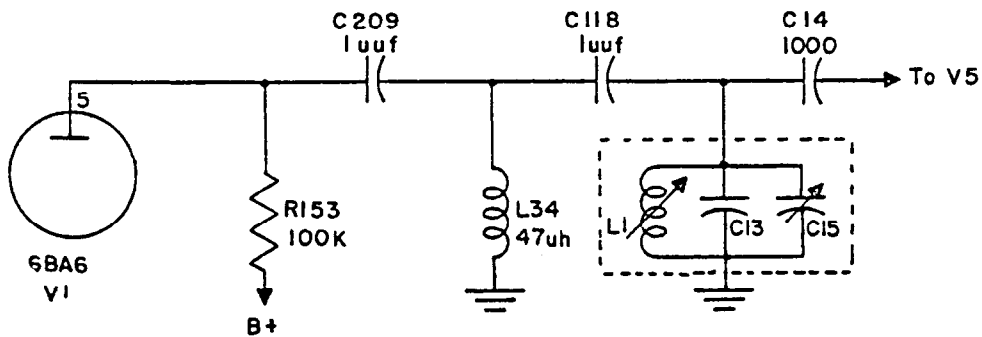


Figure 3. Partial Schematic V1, After Modification

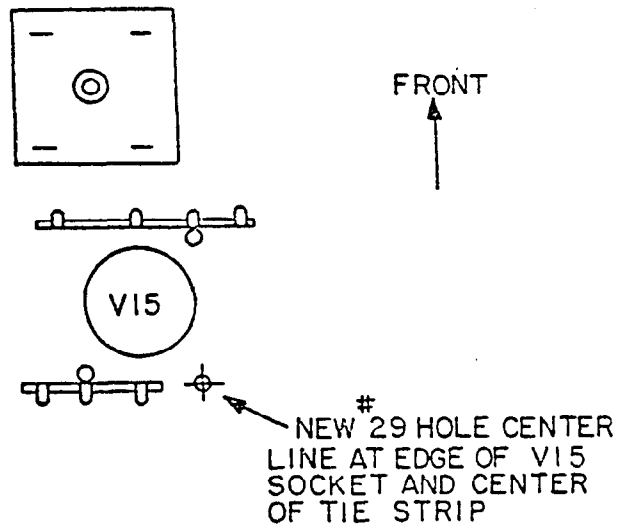


Figure 4. Location of Number 29 Hole for Installation of Insulated Terminal

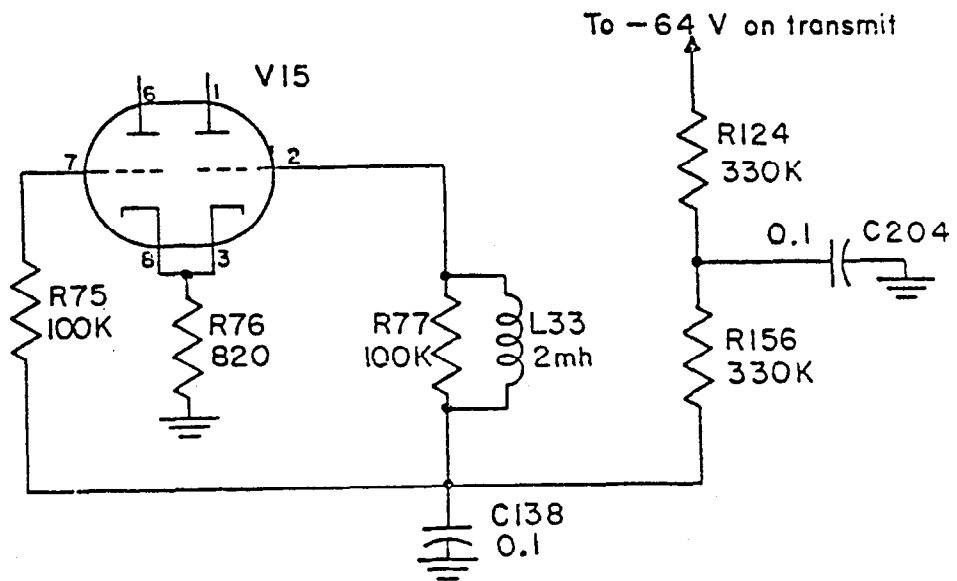


Figure 5. Partial Schematic V15, After Modulation

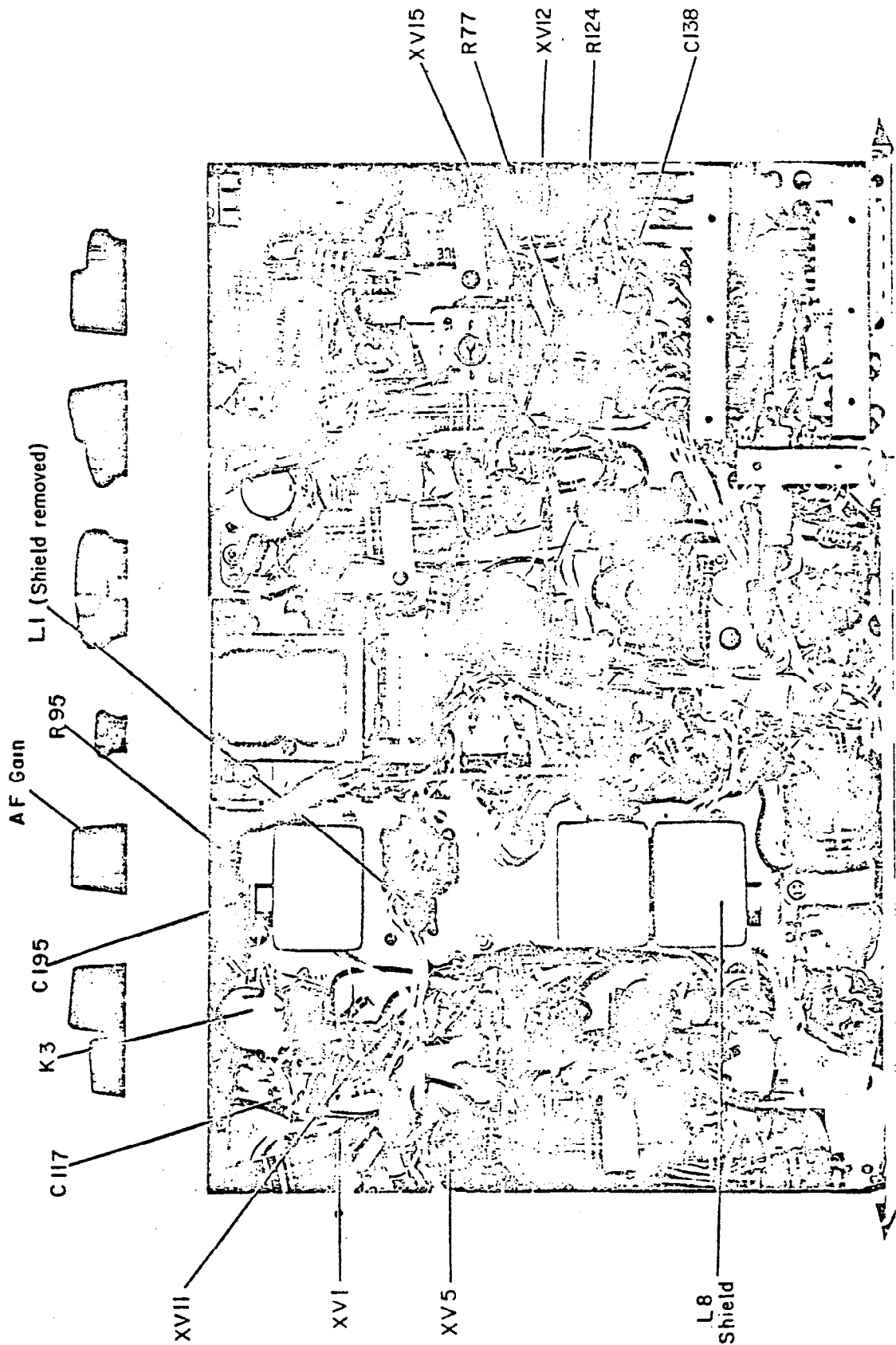


Figure 6. Location of Components, Bottom View



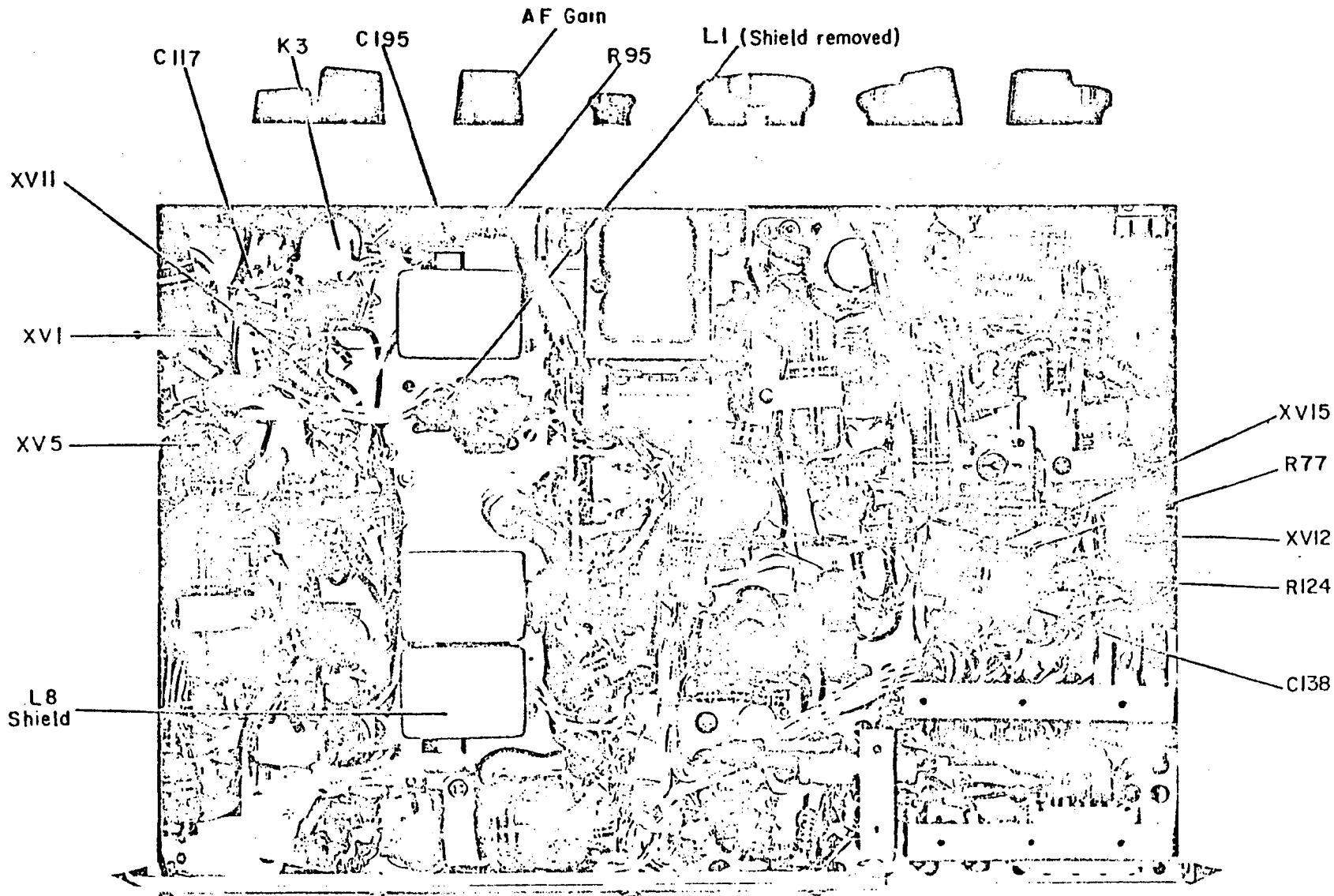


Figure 6. Location of Components, Bottom View