

# FT-102

## HF ALL MODE TRANSCEIVER



### PREFACE

The purpose of this manual is to provide a technical supplement to the Instruction Manual supplied with the FT-102 from the factory. Detailed information regarding installation, operation and alignment, as well as the circuit description, has been provided in the Instruction Manual, and is not reprinted here. Therefore, this Technical Supplement is not intended to serve as an independent reference, but to be used in conjunction with the information provided in the Instruction Manual.

Every effort has been made to include all of the modifications and updates that have been developed during production of the FT-102. However, certain custom modifications that are not of general interest have not been included, and Yaesu reserves the right to carry out additional modifications without notifying owners.

So far, the FT-102 has proven to be extremely reliable in the field, with only a few common problems having required modifications. These have all been incorporated into the later production lots, but details of the modifications are included here for those who may need to update earlier models.

We trust that technically-minded owners and service technicians of the FT-102 will find this manual useful as a supplement to the FT-102 Instruction Manual. Although Yaesu can not assume liability for any damages that may occur because of possible errors in this Supplement or the Instruction Manual, we do invite readers to call our attention to errors or inconsistencies that we might have overlooked.

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Pages 17-25 have been deleted from the Supplement, as they describe procedures for band conversions that are not authorized in certain countries. This material is available from Yaesu representatives in those countries where such operation and modification of the FT-102 is legal. Contact you nearest authorized Yaesu dealer for details.

# ERRATA

## FOR THE FT-102 INSTRUCTION MANUAL

These errata apply to early printings of the Instruction Manual, up to the present. Only those of possible technical significance are listed here, although there were a few other minor typographical errors. The following pages 3 and 4 are completely updated replacements for pages 15 and 44, respectively, in all early editions of the FT-102 Instruction Manual.

### Page 30, line 4:

Q2011 should be noted as a type 2SC1815Y transistor.

### Page 30, fifth paragraph:

Only D6004 should be mentioned as a noise detector. Also, the DC squelch control signal from the SQL control is passed to the squelch control section of Q6008, and not to Q6010 and Q6011. D6004, Q6010 and Q6011 have been deleted from the AM/FM Unit.

### Page 35, FT-102 FREQUENCY RELATIONSHIPS

The frequency of the carrier signal input to the Balanced Modulator (at the upper right corner of the diagram) should show LSB as 456.6 kHz and USB as 453.4 kHz. This was reversed in the first printing of the manual.

Also in the same diagram, the small table at the upper left should show the IF as 8.2134 MHz for LSB, and 8.2166 MHz for USB. LSB was not mentioned in the original printing.

### Page 36, line 2:

Q4026 is a fixed crystal oscillator, and not a VCXO.

### Page 38, TOP VIEW:

Later printings of the manual include an indication of the location of PO ADJ potentiometer VR5 in the labelling of this photo. The location of this potentiometer is also indicated in the rear panel photograph on page 10, as the upper lefthand control in the dashed box numbered 12.

### Page 40, Upper left photo:

The title of this photo, RECT. A UNIT, was inadvertently omitted from earlier printings of the manual.

Also on this page, in step 2 of the PO Meter Adjustment, VR7 appeared as the adjustment potentiometer number. This should read VR5, indicating the PO ADJ potentiometer.

### Page 41, Carrier Balance Procedure:

Step 3 should read, "Press the MOX switch." (only).

### Pages 42 and 43, SSB Carrier Point Procedure:

This procedure has been revised from that appearing in early editions of the Instruction Manual, and should read as follows:

#### SSB Carrier Point

1. Set the MODE selector to USB, and connect the frequency counter to TP<sub>4007</sub>.
2. Key the transmitter and adjust potentiometer VR<sub>4003</sub> for 10.5466 MHz on the counter.
3. Now connect the frequency counter to TP<sub>4006</sub>, key the transmitter, and adjust potentiometer VR<sub>4002</sub> for 19.2166 MHz on the counter.
4. Set the MODE selector to LSB and check TP<sub>4007</sub> for 10.5434 MHz and TP<sub>4006</sub> for 19.2134 MHz with the counter during transmission.
5. Connect the audio signal generator to pin 8 of the MIC jack (pin 7 is ground), and connect the oscilloscope to the TP<sub>3005</sub> on AF Unit. Set the AG for 1 kHz @ 2 mV, MIC gain to 9 o'clock, and HEATER off. Key the transmitter and note the amplitude of the scope display. Now change the AG frequency to 300 Hz (2 mV) and adjust VR<sub>3002</sub> for the same amplitude on the scope.

6. Retune the AG to 1 kHz, and switch the HEATER on, 14 MHz band. Tune up the transmitter for 100 watts output, adjusting the signal generator output level to obtain this power output with the MIC GAIN control at the 12 o'clock position.
7. Now adjust the audio generator frequency to 300 Hz while maintaining a constant generator output level. If the ALC indication on METER II does not change during this audio frequency change, check the output power level, which should now be 25 watts. If necessary, adjust VR<sub>4005</sub> for 25 watts output. If the ALC indication changes, repeat step 5 with the MIC GAIN control set lower and the signal generator level correspondingly higher.
8. Return to receive, switch the MODE selector to USB and repeat step 6, adjusting VR<sub>4006</sub>, if necessary, to obtain 25 watts output.

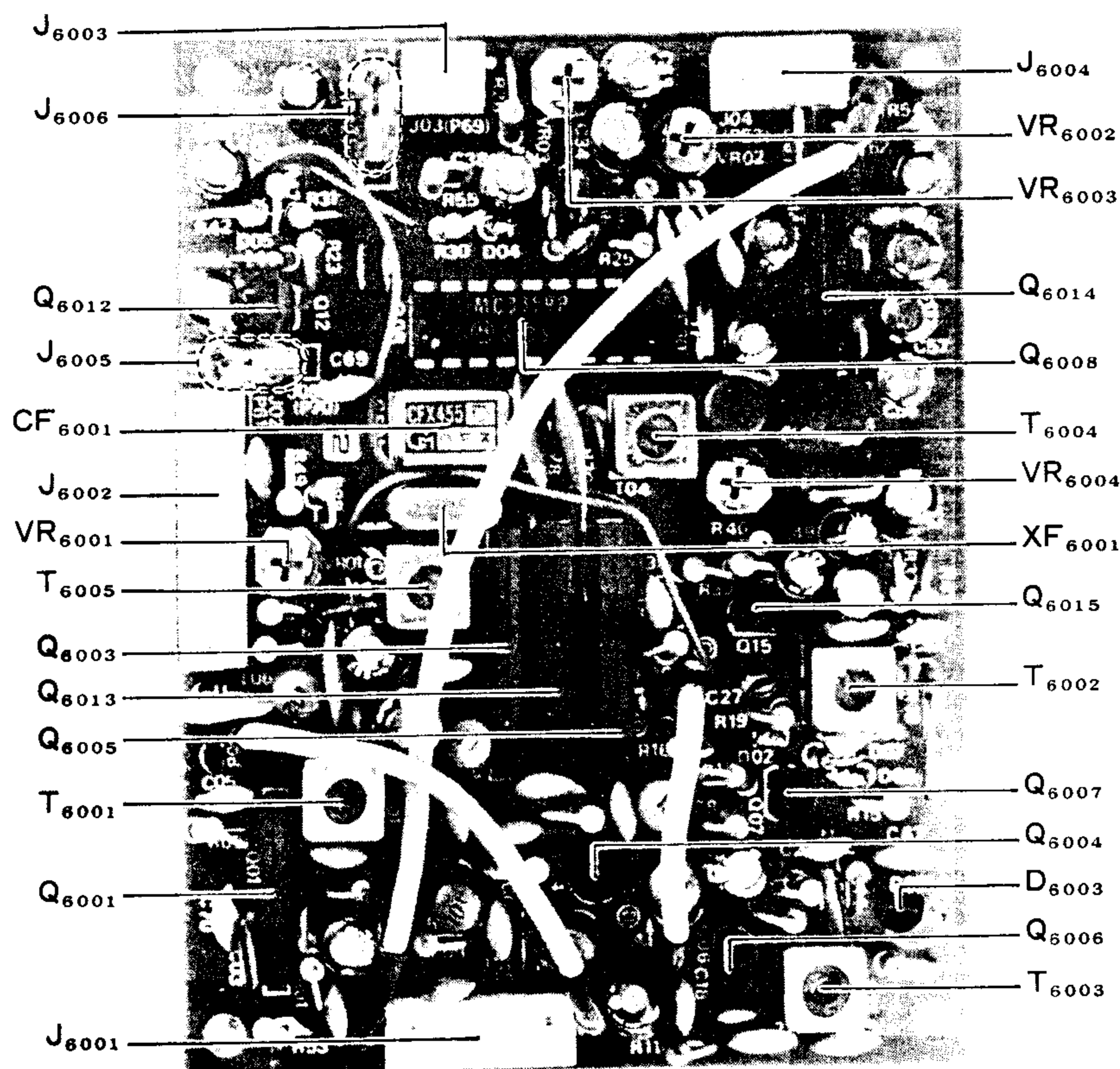
Page 47, AM/FM UNIT (photo):

This photo was replaced from the second printing of the manual with the photo of the updated Unit, shown below. Also, the Varactor Pinout diagram was denoted as D6003 in later printings.

Page 52, AM/FM Unit Installation:

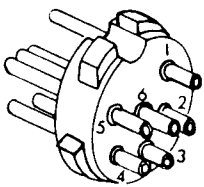
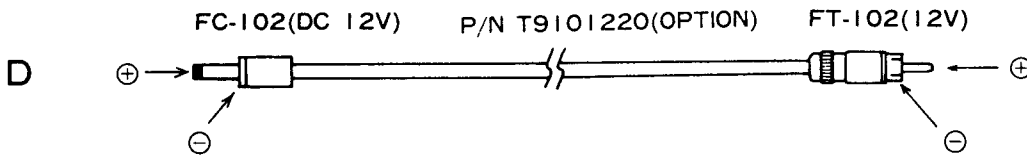
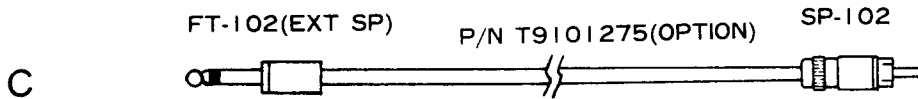
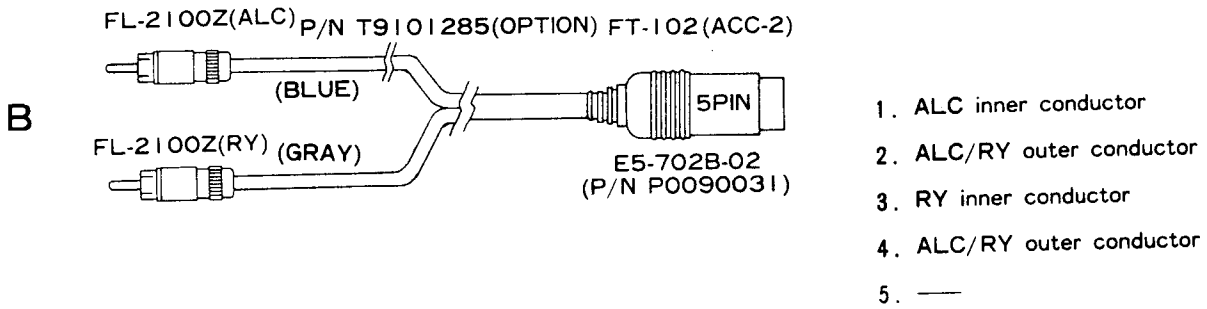
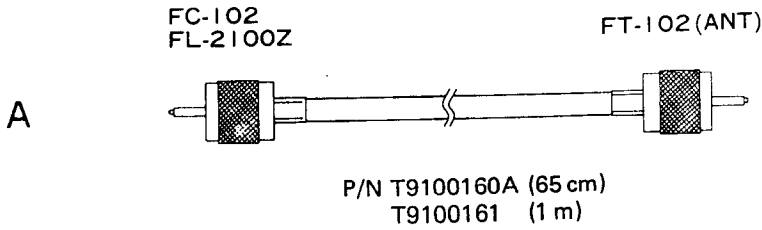
Step 3 of the procedure was corrected as follows:

3. Remove the plastic covers from the two connectors and connect the six connectors to the AM/FM Unit as shown in Figure 2.



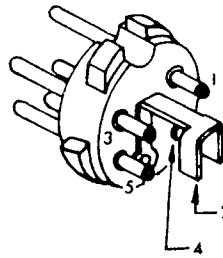
AM/FM UNIT

# INTERCONNECTION CABLE INFORMATION



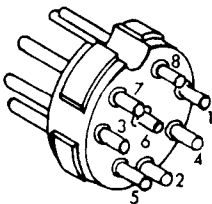
- PIN No.
1. TX GND
  2. KEY-1
  3. 100kHz(REF) OUT
  4. N.C.
  5. RX GND
  6. GND
- Shell GND

**ACC-1**



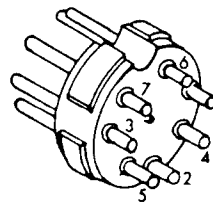
- PIN No.
1. ALC
  2. GND
  3. TX GND
  4. GND
  5. RX GND
- Shell GND

**ACC-2**



- PIN No.
1. +8V
  2. +12V
  3. +500kHz
  4. TX 12V
  5. CW 8V
  6. EXT VFO IN
  7. GND
  8. SAMPLE IN

**EXT VFO/RCVR A**



- PIN No.
1. UP
  2. FAST
  3. GND
  4. DWN
  5. MUTE
  6. SIDE TONE OUT
  7. 100kHz (REF) OUT

**EXT VFO/RCVR B**

## RF UNIT ALIGNMENT (PB-2342)

### Bandpass Filters

1. Connect the sweep generator output to J<sub>1001</sub> (TX IN), and connect the oscilloscope to RF OUT jack J<sub>5</sub> on the rear panel. Turn the HEATER switch OFF.
2. Key the transmitter and adjust the appropriate transformer for each band according to the following chart to obtain the correct 3 dB bandwidth with minimum ripple, as displayed on the scope. Ripple should not exceed 3 dB.

Band	Adjust	Passband (-3 dB)
1.8	T <sub>1011</sub> , T <sub>1022</sub>	1.8– 2.0 MHz
3.5	T <sub>1013</sub> , T <sub>1014</sub>	3.5– 4.0 MHz
7.0	T <sub>1015</sub> , T <sub>1016</sub>	7.0– 7.3 MHz
10.0	T <sub>1017</sub> , T <sub>1018</sub>	10.0–10.5 MHz
14.0	T <sub>1019</sub> , T <sub>1020</sub>	14.0–14.5 MHz
18.0	T <sub>1021</sub> , T <sub>1022</sub>	18.0–18.5 MHz
21.0	T <sub>1023</sub> , T <sub>1024</sub>	21.0–21.5 MHz
24.5	T <sub>1025</sub> , T <sub>1026</sub>	24.5–25.5 MHz
28/29	T <sub>1027</sub> , T <sub>1028</sub>	28.0–29.9 MHz

### Preselector

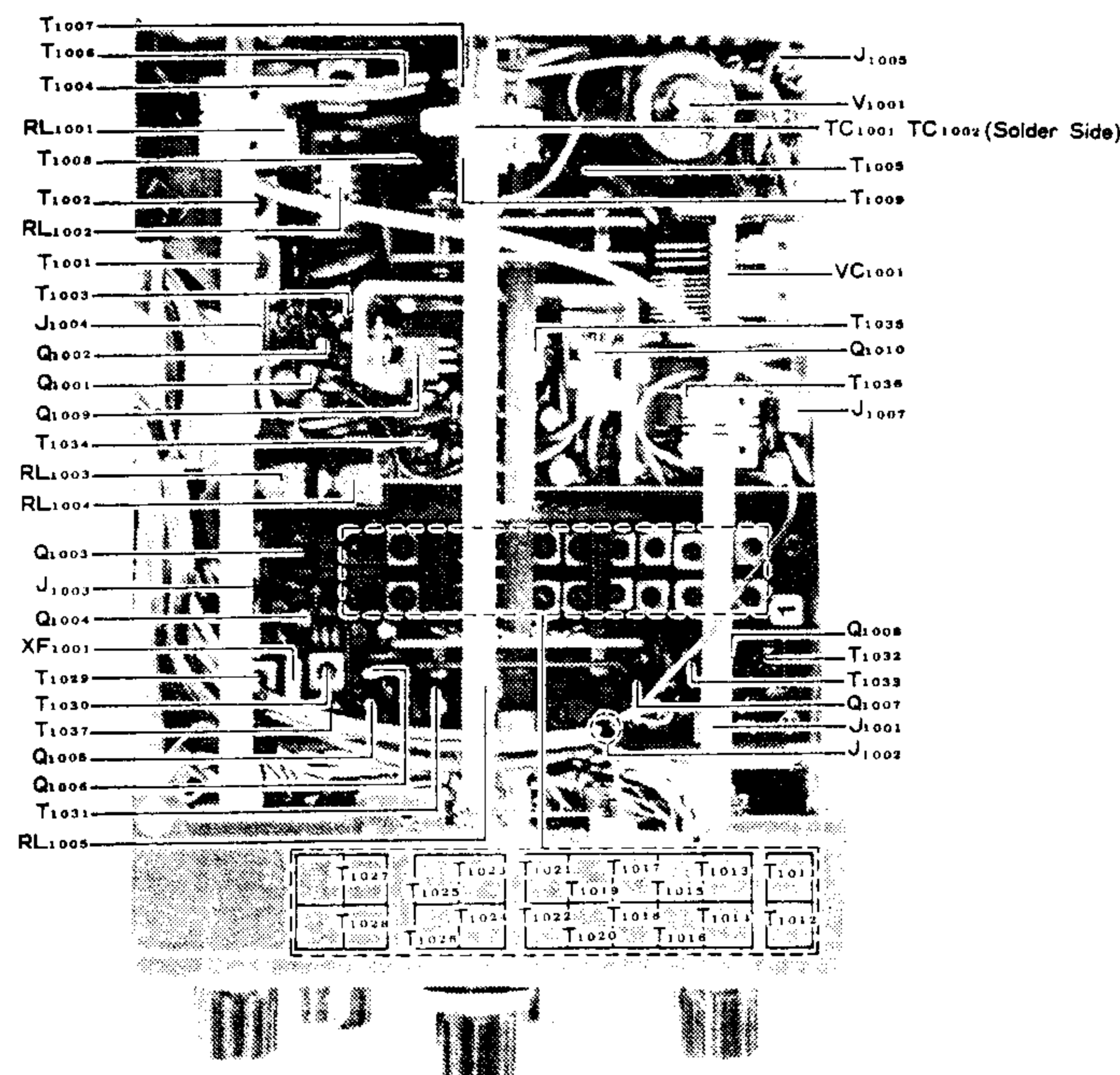
1. Connect the SSG to the ANT terminal, or alternatively, switch the MARK signal ON (rear panel switch).
2. Set the FT-102 to the band and frequency shown in the following chart, and set the

PRESELECT control to the position indicated. Switch the RF AMP ON.

3. Adjust the transformer indicated in the chart for maximum S-meter reading.

Band	Frequency	Preselect	Transformer	S-meter Reading
3.5	4.000 MHz	8	T <sub>1004</sub>	Maximum
7.0	7.000 MHz	5	T <sub>1005</sub>	
10.0	10.000 MHz	6	T <sub>1006</sub>	
14.0	14.500 MHz	8	T <sub>1007</sub>	
21.0	21.500 MHz	8	T <sub>1008</sub>	

4. Remove the SSG and connect the dummy load to the ANT terminal. Set to 29.5 MHz band, 30.000 MHz, PRESELECT to 8, key the transmitter and adjust T<sub>1009</sub> for maximum power output.
5. Reconnect the SSG to the ANT terminal and adjust TC<sub>1001</sub> for maximum RX S-meter indication.
6. Remove the SSG and connect the dummy load to the ANT terminal. Set to 28.5 MHz band, 28.500 MHz, and key the transmitter. Adjust the PRESELECT control for maximum power output, and leave at this setting for the next step.
7. Repeat step 5, adjusting TC<sub>1002</sub>.



RF UNIT

## SOLDERING AND DESOLDERING TECHNIQUE ON PRINTED CIRCUIT BOARDS

The FT-102 circuit boards are tough, but mishandling during soldering can cause circuit traces to "lift." While this does not cause permanent damage to the board, much servicing trouble can result, because of the tendency for this lifted trace to break. A few simple precautions will keep your circuit boards in A-1 condition.

1. Use only a 12 to 30-watt chisel-tip soldering iron, with the tip rounded or isolated from AC and DC potential. Voltage at the tip can easily destroy CMOS components.
2. Use only the minimum amount of heat necessary to remove a component, or to cause the solder to "flow" when installing a new component.
3. USE ONLY 60/40 ROSIN CORE SOLDER.
4. Use solder removing braid and flux to absorb excess solder before installing a new component. A solder sucker can also be used, but must be handled with care to avoid lifting traces.
5. Do not attempt to remove DIP ICs without first cutting all of the pins on the component side of the board, unless you have the correct desoldering equipment (spring-loaded clamp and all-pin desoldering tip).

If you do lift a trace, don't worry! Read on to find out how to repair traces like a pro.

## NOTES ON USE OF CMOS COMPONENTS:

As CMOS devices are extremely sensitive to damage from static electricity, special precautions must be observed.

In storage, use only conductive sponge specially designed for CMOS components.

When installing a CMOS part in a socket, or on a circuit board, be certain that the power is off. In addition, the technician should rest his hand on the chassis as the component is inserted, so as to place his hand at the same potential as the chassis (better to discharge small amounts of static electricity through your fingers than through a \$5 IC!).

When soldering a CMOS part onto a circuit board, use a low-wattage iron, and be sure to ground the tip with a clip lead, if the tip is not grounded through a three-wire power cord.

## INSERTION OF PARTS ON CIRCUIT BOARDS

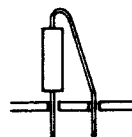
All of the below are acceptable ways of inserting components into circuit board mounting holes.



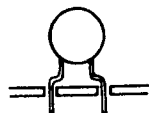
(a) Bend leads slightly



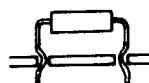
(b) Straight-in mounting



(c) Vertical mounting

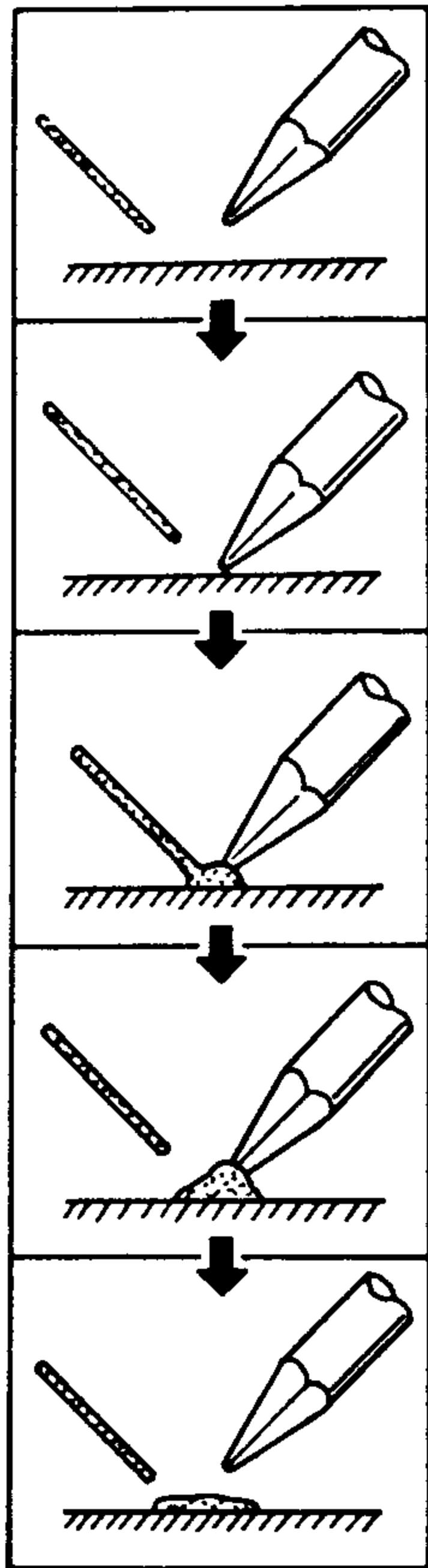


(d) Preformed disc ceramic capacitor



(e) Preformed resistor, diode, etc.

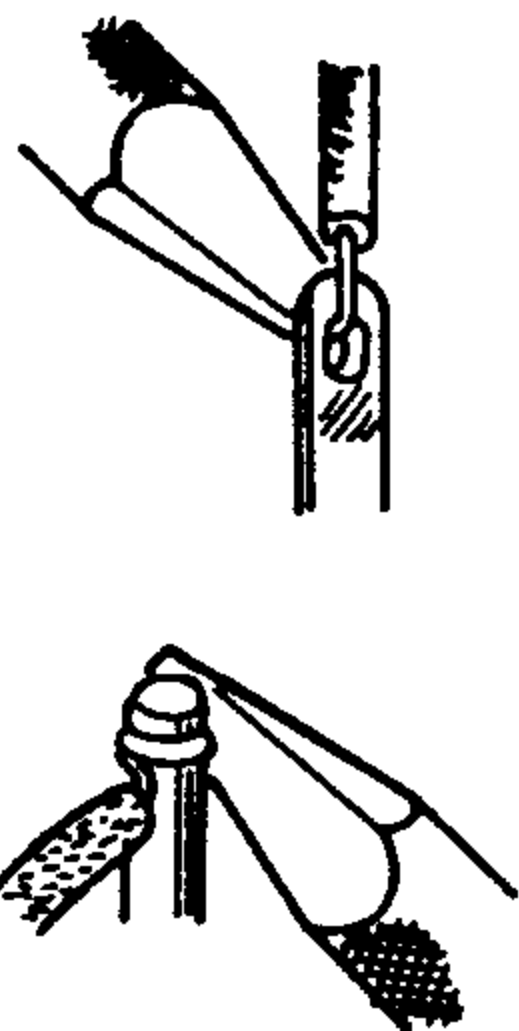
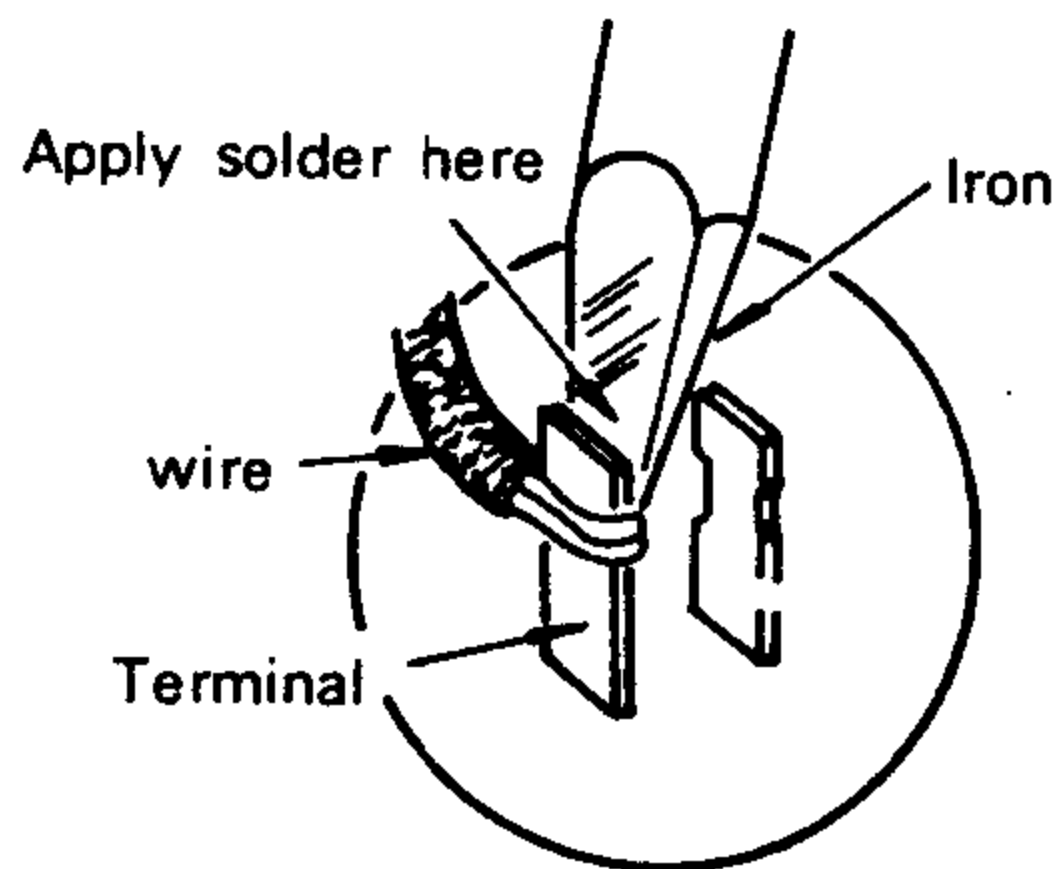
## BASIC SOLDERING PRACTICE



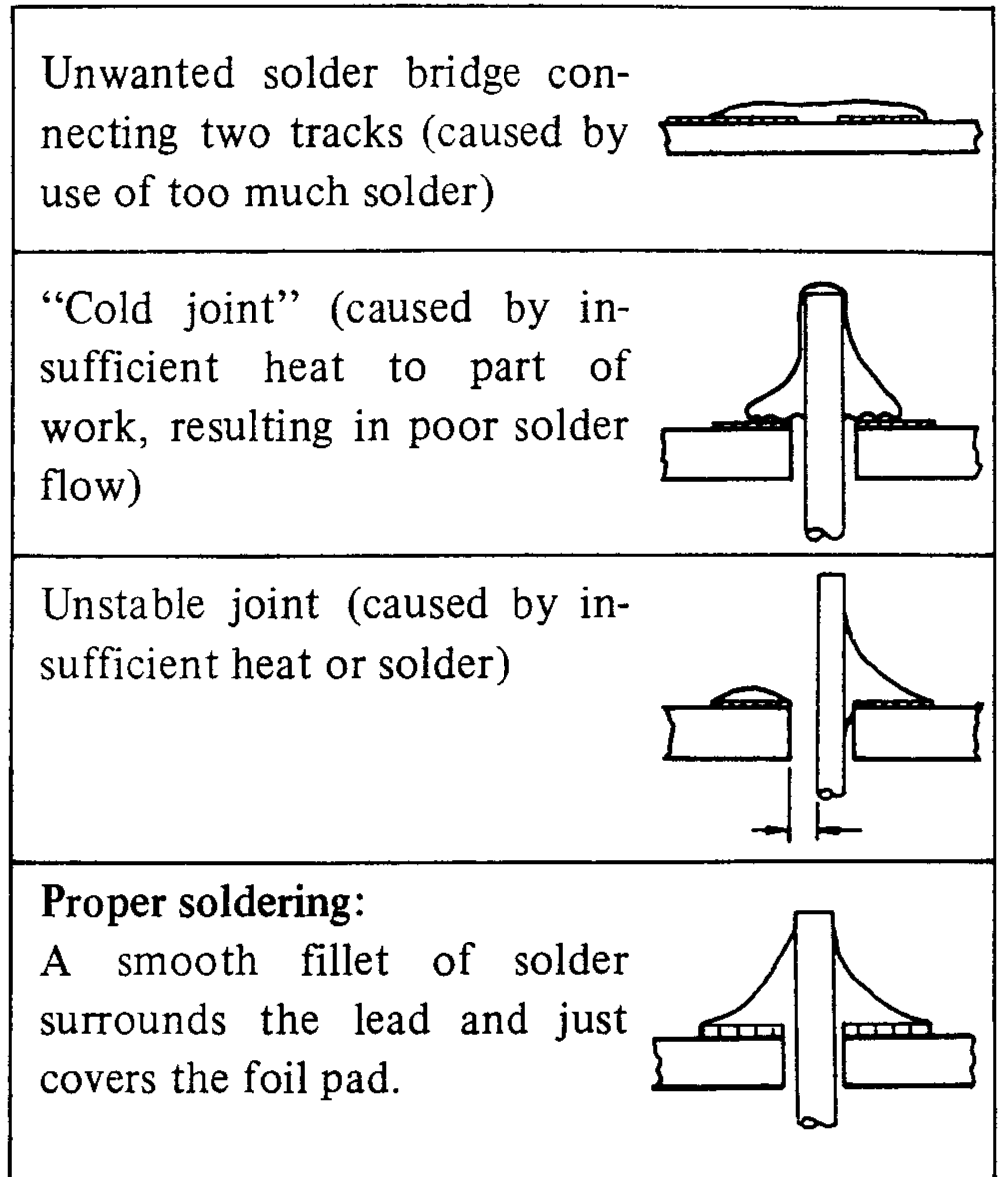
- (1) Prepare soldering iron and solder. The tip of the iron should be thoroughly tinned and wiped clean of excess solder.
- (2) Apply soldering iron to surface to be soldered. Do not press the iron into the surface.
- (3) Apply solder to junction of iron and heated surface.
- (4) When enough solder is applied, remove solder. Continue to apply heat just until solder flows cleanly.
- (5) Remove iron from work. Do not apply more heat than necessary for good solder flow.

### Soldering to terminal posts:

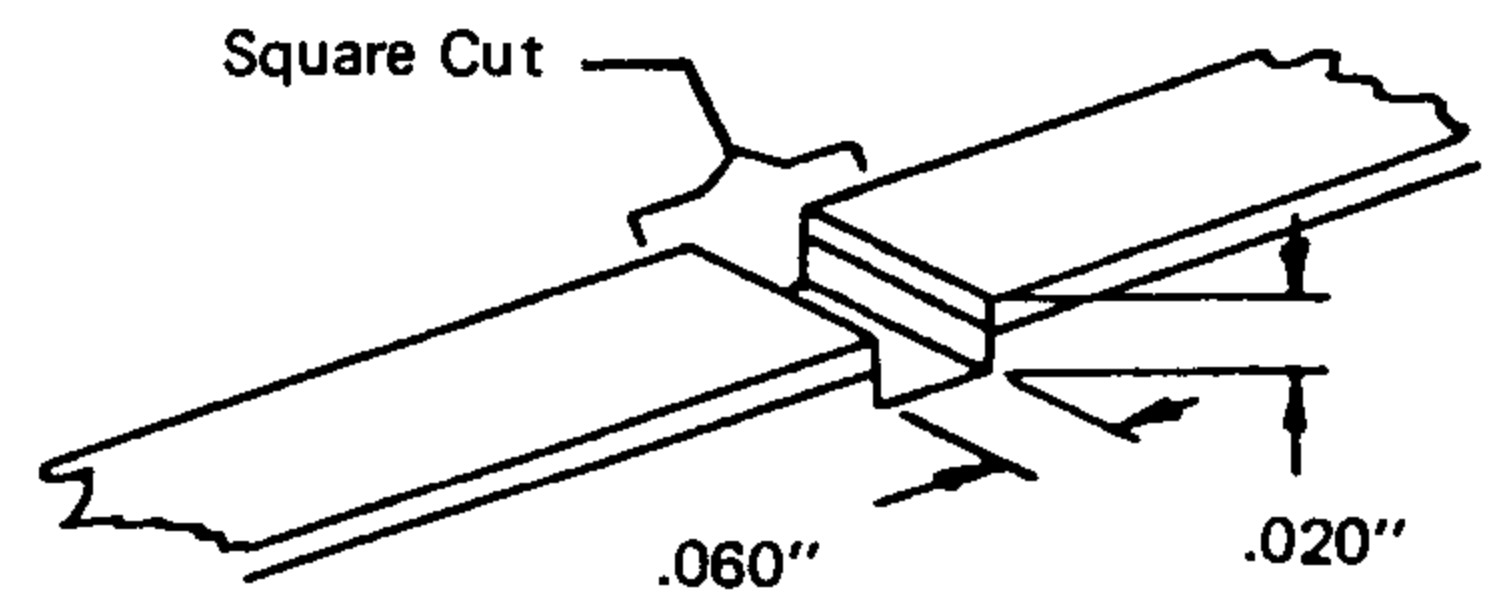
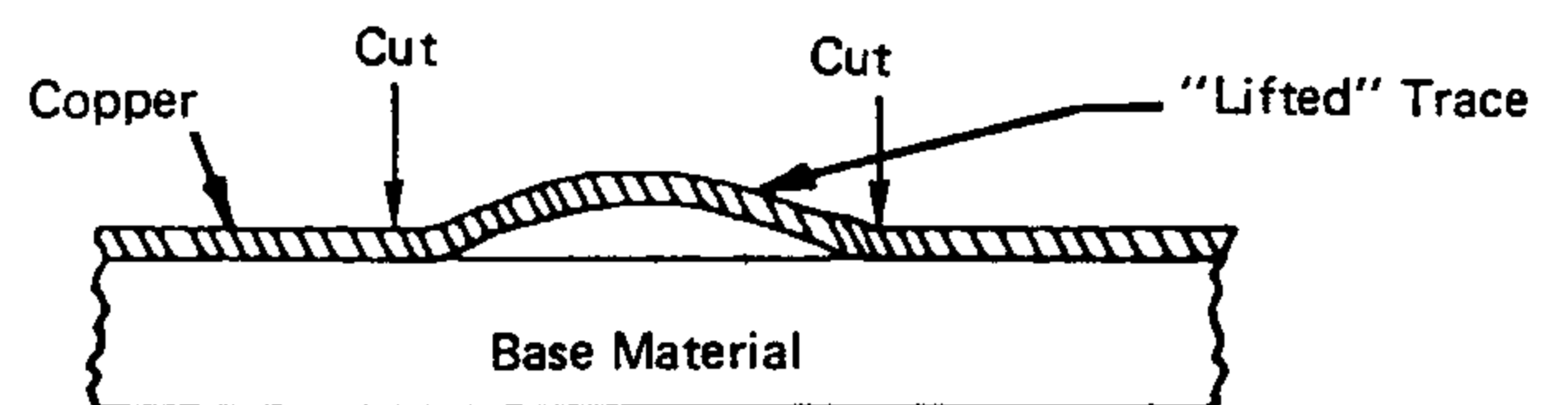
(Be certain to apply heat to both post and wire.)



## EXAMPLES OF POOR SOLDERING PRACTICE



If you have previously lifted a trace, make an etch cut on each side of the lifted trace as shown in the drawing, and install a wire bridge.



Coat Cut Area With Eastman 910  
After Soldering Wire Bridge



TYPICAL PART FAILURES, CAUSES AND SYMPTOMS

PARTS	CAUSE OF TROUBLE	SYMPTOMS
Semiconductors (IC, FET, TR)	High supply voltage Open circuit Excessive drive High temperature	Short or open circuit Output decreases to 1/2 at 80°C Internal noise Instability
MOS FET MOS IC	Static electricity	Total failure Short or open circuit
Crystal Crystal filter	Shock High temperature Aging	No oscillation Off frequency Frequency drift Filter bandpass change
Resistor	Excessive power High temperature	Component burned Value changed Open circuit
Potentiometer	Excessive power Shock Dust or oil Wear	Component burned Open circuit Noise Unsmooth rotation
Capacitor	Excess voltage High temperature Aging	Shorted Leakage Open/decreased capacitance
Variable capacitor Trimmer capacitor	Ratings exceeded Dust between plates Shock, forced rotation	Shorted Leakage Unsmooth rotation
Coils	Ratings exceeded Misadjusted Core or bobbin broken	Open or short circuit Leakage or shorted turns Detuned
Switch	Ratings exceeded Aging Dust or oil	Poor contact Unsmooth operation Open circuit
Relay	Ratings exceeded Humidity Dust or oil on contacts	Coil open Poor or intermittent contact Noise

# MODIFICATION PROCEDURES

This section includes modifications that were developed for the FT-102 for special operating requirements, as well as for improved transceiver performance. Also included are modifications that must be made in accessory equipment for use with the FT-102.

Modifications to improve transceiver performance have been incorporated into the production line at some point in time, so that those transceivers produced after that time do not require the modification. Each procedure indicates the range of serial numbers that were not modified when they left the factory. Serial numbers are composed of a letter and a number, indicating the date of manufacture, followed by six digits. The first two digits (closest to the date code) are the Production Lot number. So, for example, serial number OC123456 is from Production Lot 12, set number 3456. Before making any modification, make sure that the procedure to be followed applies to the Lot number of the particular transceiver being modified.

In some cases, the need for a modification did not exist originally, but became necessary later due to other changes in the transceiver circuitry made during the course of production. In such situations, the modification procedures which follow indicate a certain production lot prior to which the modification should not be performed. If any of the modifications are carried out on sets from production lots other than those specified, performance may be degraded.

Also, before making any modification, check to see if the intended modification has already been carried out by a Yaesu agent, dealer or previous owner.

Most of the following modifications require removal of the transceiver covers, and some require access to the RF Unit. These procedures are detailed here:

## Cover Removal

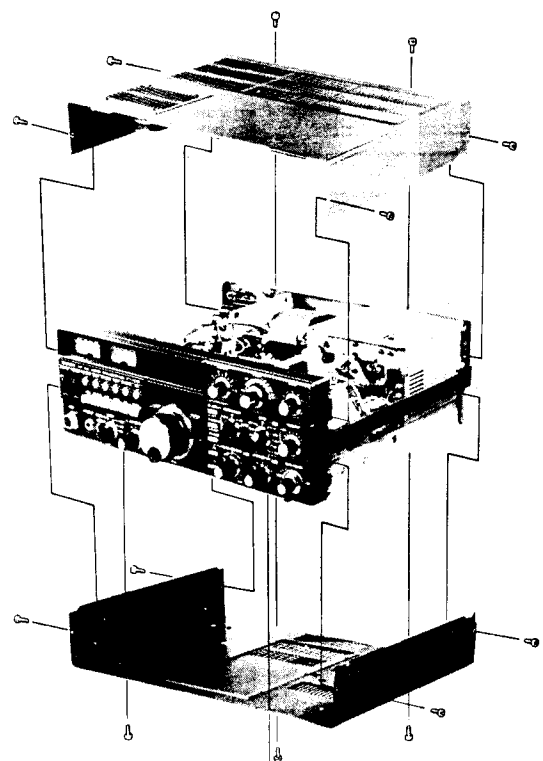
Disconnect the transceiver from the power source. Remove the two screws affixing the carrying handle, and then the fourteen screws affixing the top and bottom covers, as shown on this page. Remove the handle and covers, and stand the transceiver on its left side.

## RF Unit Access (Solder side)

Disconnect and remove the optional AM/FM Unit, if installed. Referring to page 38 of the Instruction Manual for Unit locations, remove the four screws from the AF Unit (PB-2344), and gently fold it over the VFO. Then remove the two machine screws affixing the shield panel that was behind the AF Unit, and remove the panel from the main chassis, using care to avoid bending the 7-lug terminal strip that also mounts under one of the panel screws. The solder side of the RF Unit is now accessible.

## WARNING

HIGH VOLTAGE IS PRESENT INSIDE THE TRANSCEIVER, AND IS RETAINED IN THE HIGH VOLTAGE CAPACITORS EVEN WHEN THE POWER IS OFF AND THE POWER SOURCE DISCONNECTED. BEFORE REMOVING THE COVERS TO WORK ON THE TRANSCEIVER, ALWAYS DISCONNECT THE POWER CORD AND ALLOW A FEW MINUTES FOR THE CAPACITORS TO DISCHARGE. DURING ALIGNMENT, USE EXTREME CAUTION TO AVOID TOUCHING ANY METAL PARTS INSIDE THE CHASSIS WITH FINGERS OR METAL TOOLS.



## Keyclick

This modification is provided to remedy possible keyclick trouble with FT-102s having serial numbers between XX030001 and XX069999. Keyclicks were not a problem in the first two production lots, but appeared after certain other modifications were carried out in production. This modification has already been incorporated in later production lots (after Lot 6).

1. On the component side of the RF Unit, install a  $1\mu\text{F}$ , 50 WV electrolytic capacitor, as shown in Figures 1 and 2. The positive lead of the capacitor is soldered to the lead of R1045, and the negative lead to the TEST PIN (G1).
2. Referring to Figures 3 and 4, cut the white wire connected to J4017 on the Local Unit, and wrap the end of the white wire with insulating tape to prevent it from shorting to other parts.

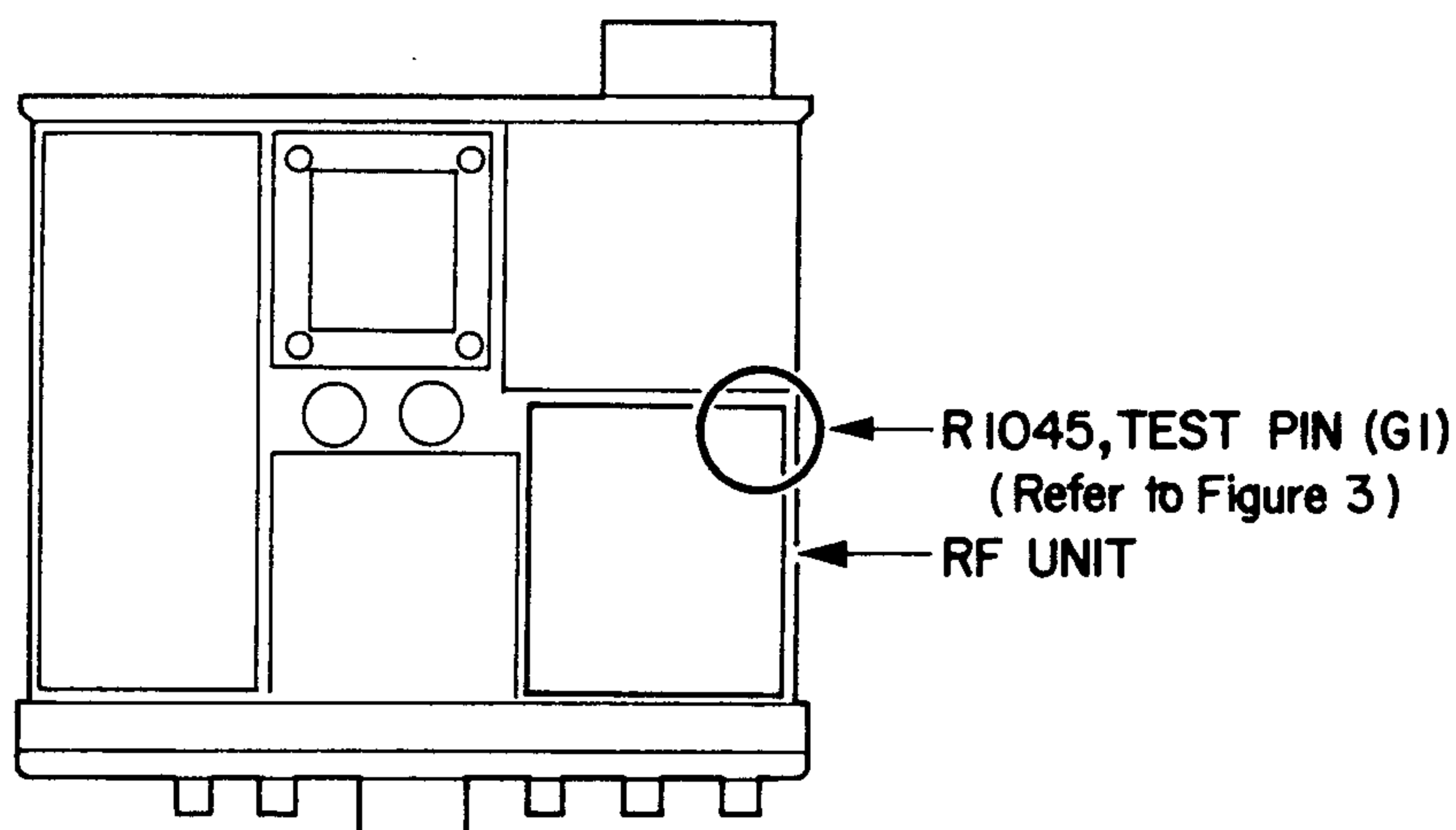


Figure 1

TOP VIEW

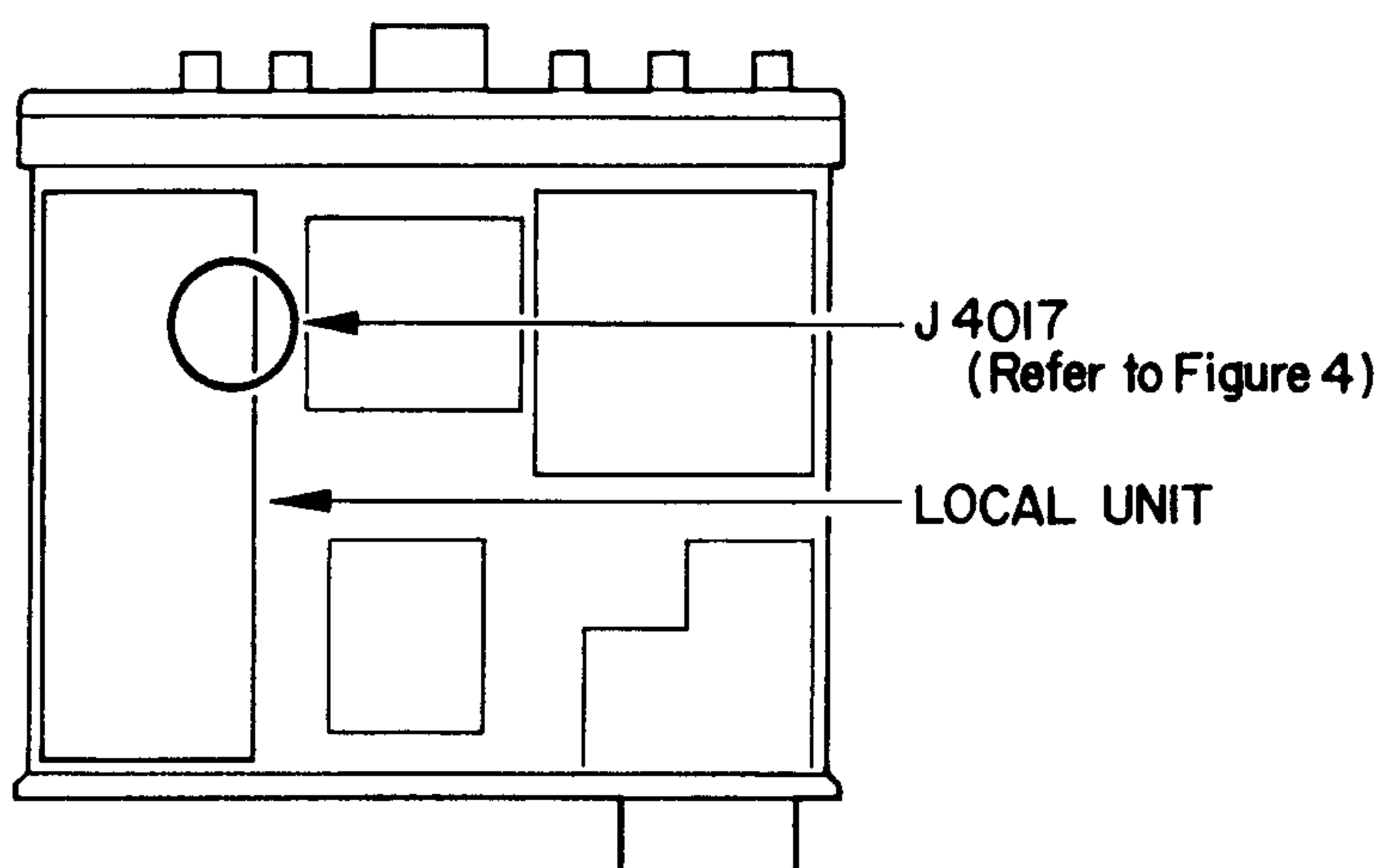


Figure 3

BOTTOM VIEW

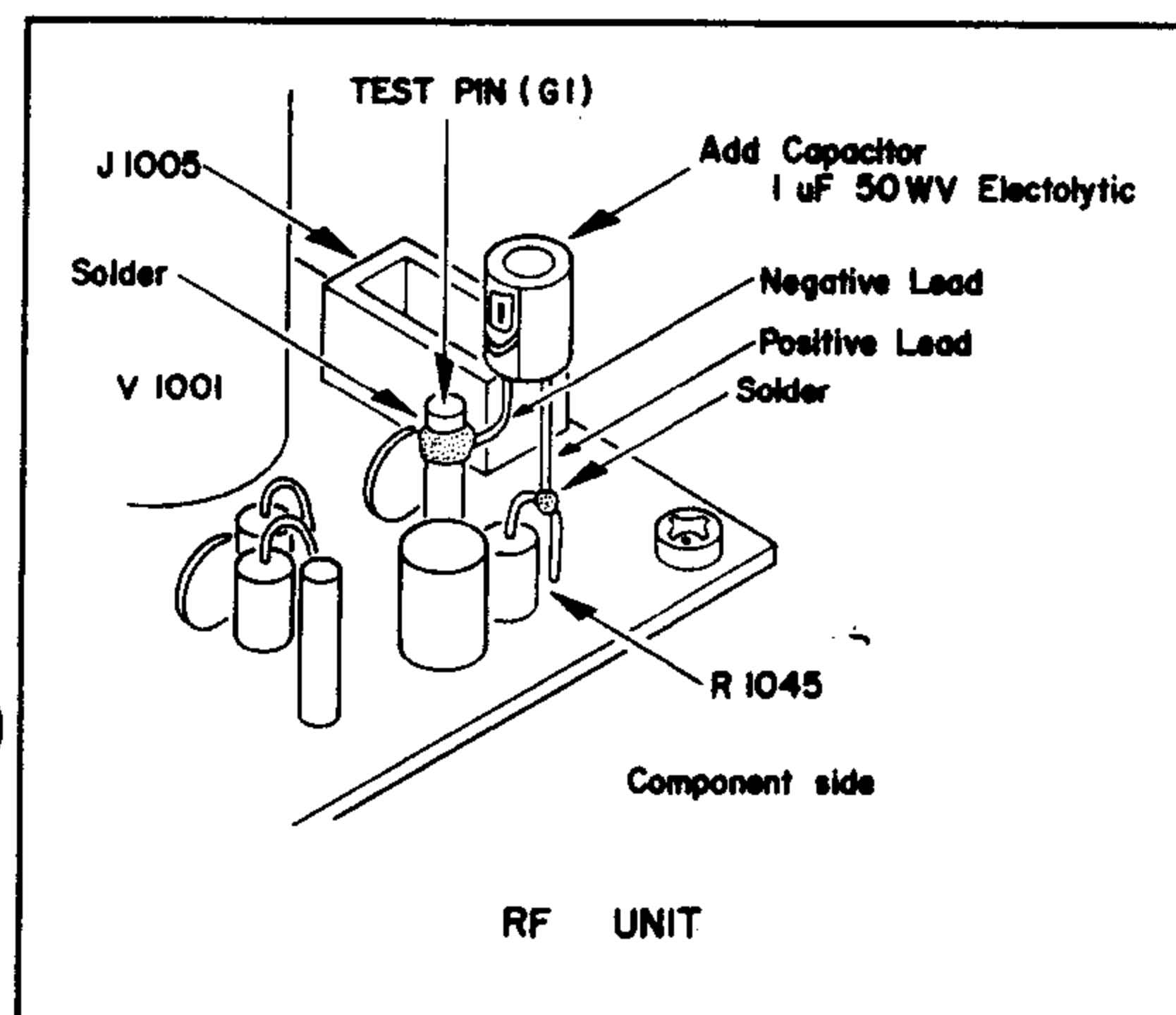


Figure 2

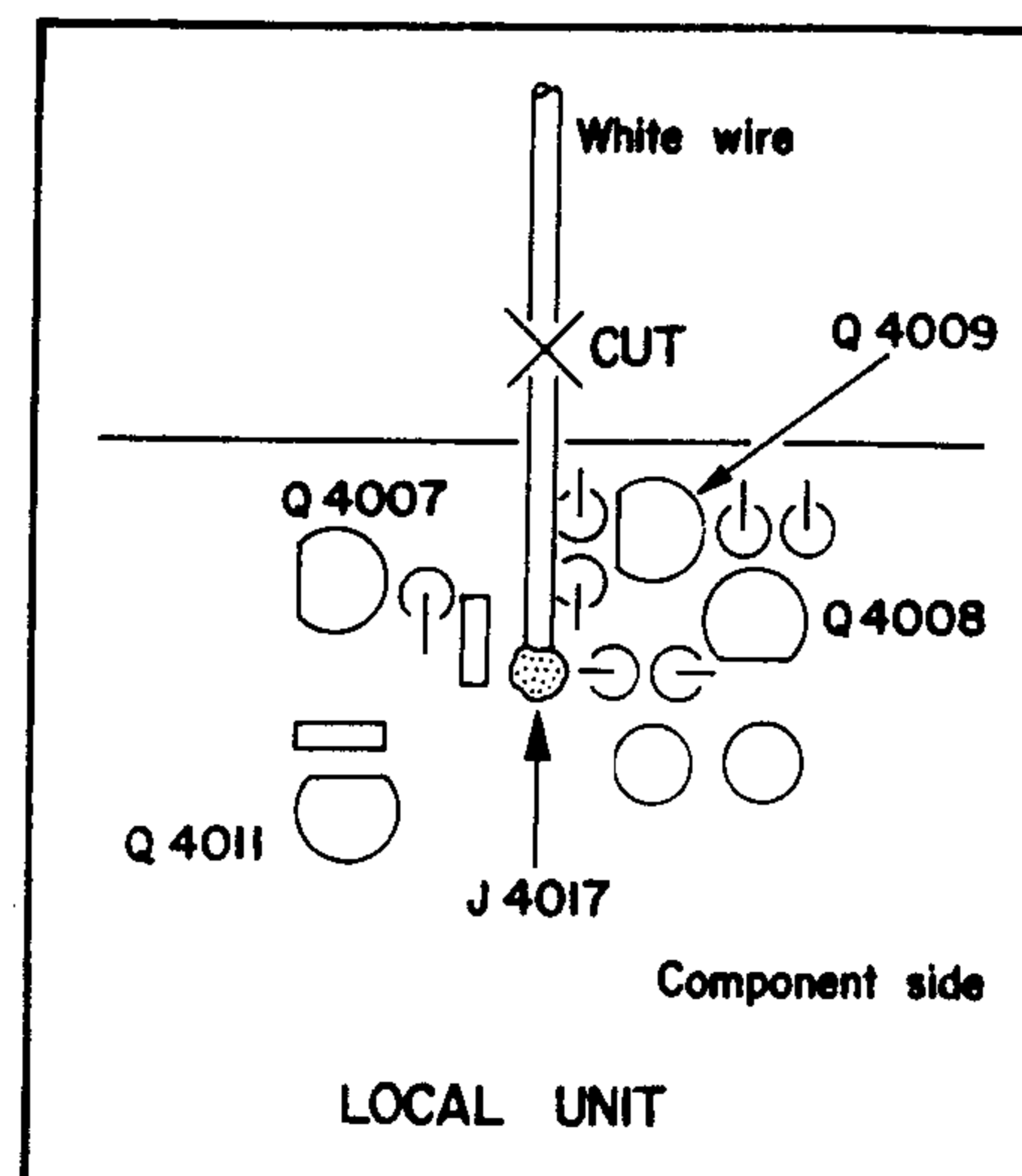
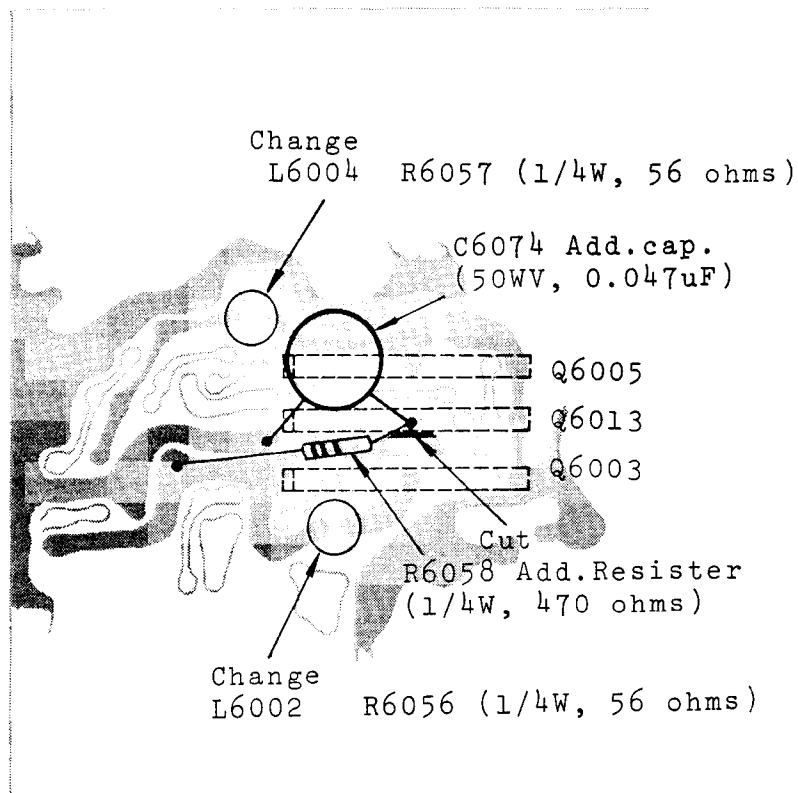
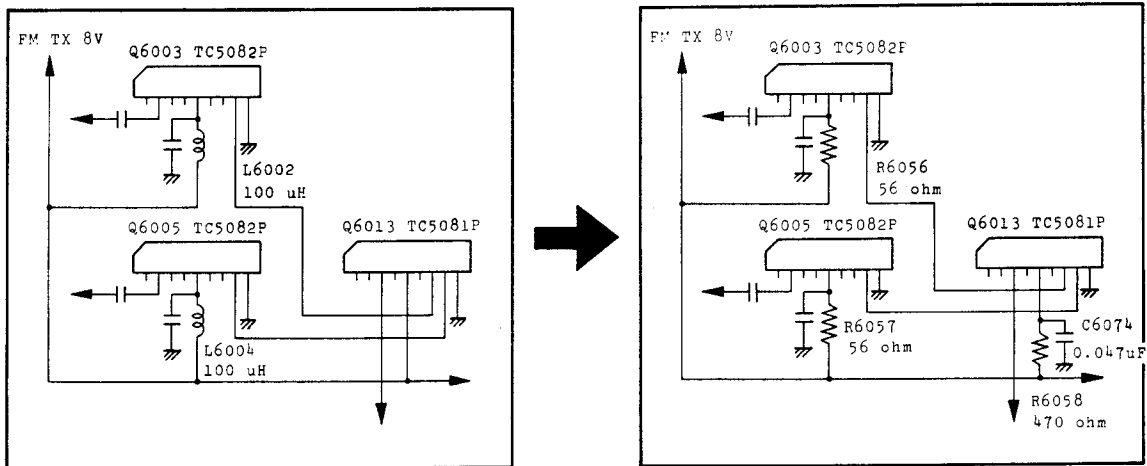


Figure 4

## FM Unit Protection

This modification can be adopted in the early models of the FM Unit in the FT-102, in order to prevent damage to the TC5081AP used in the Unit.

1. Remove the FM Unit from the transceiver, and L6002 and L6004 from the Unit.
2. Install 56-ohm resistors in the same locations where L6002 and L6004 were installed.
3. On the solder side of the Unit, cut the copper pattern connected to pin 5 of Q6013, and solder a 470-ohm resistor across the cut.
4. Solder a 0.047  $\mu$ F disc ceramic capacitor between pin 5 of Q6013 and ground.
5. Replace the FM Unit in the transceiver and reconnect all plugs.



VIEWED FROM SOLDER SIDE

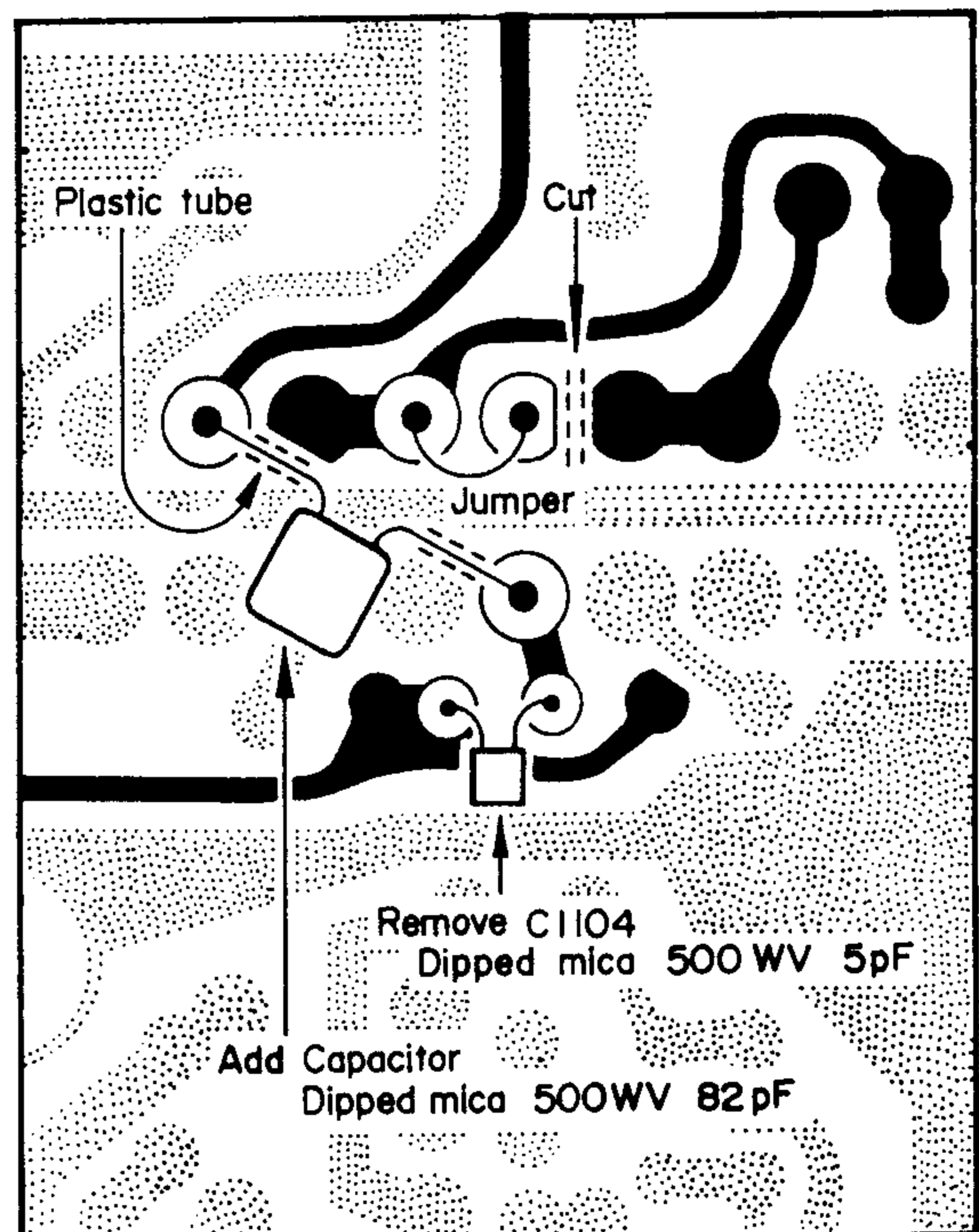
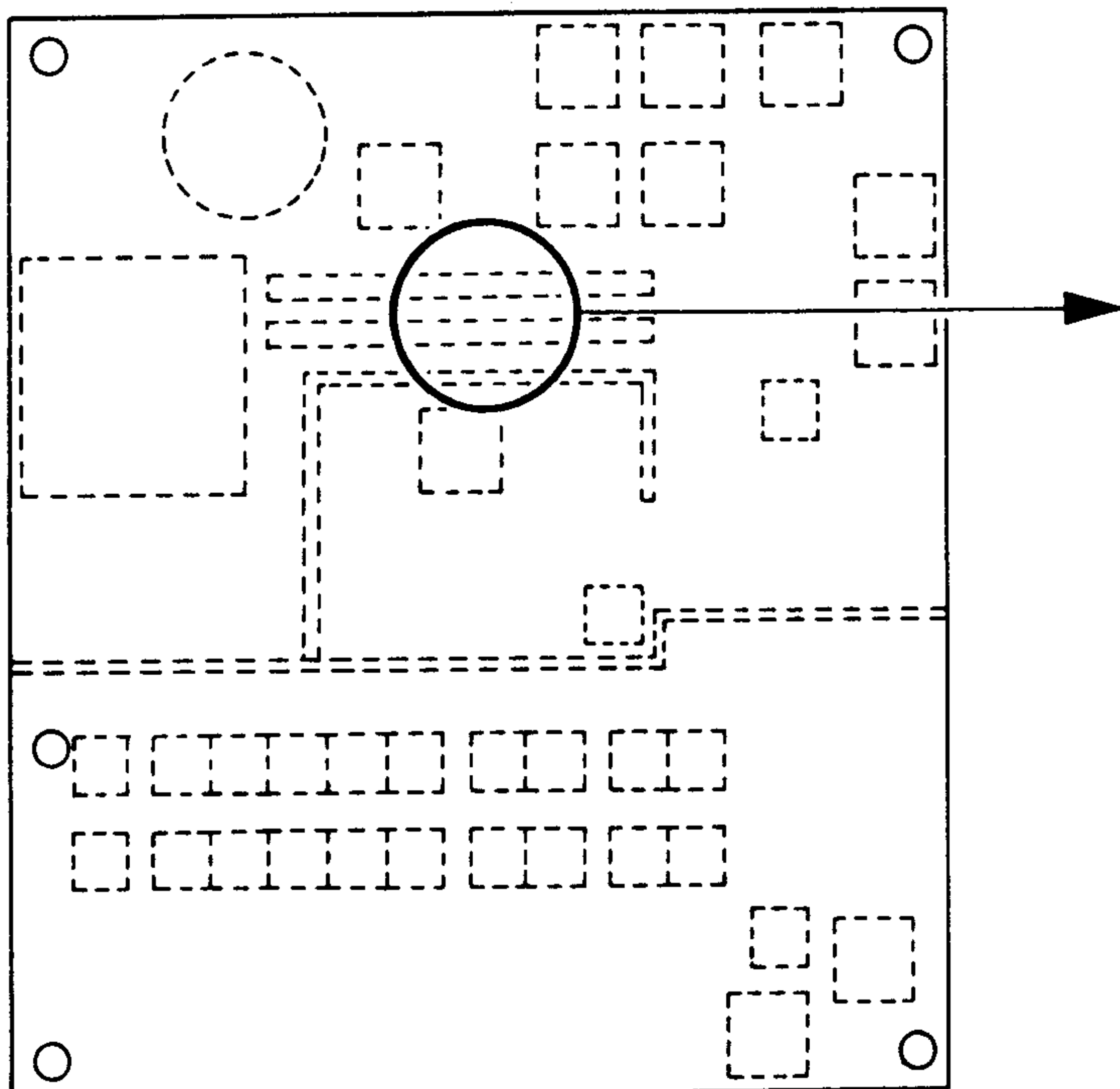
## 24.5 MHz ALC Reduction

This modification increases the drive level during transmission on the 24.5 MHz band in those transceivers having serial numbers under XX-080001. Later sets have this modification already incorporated.

1. Referring to the diagrams below, locate the places on the solder side of the RF Unit where the terminals from the stationary contacts of bandswitch wafers S11b-3 and S11b-4 are soldered to the RF Unit. Carefully cut the foil pattern to isolate the 24.5 MHz pad of wafer S11b-3 as shown. Make sure it is the right place before cutting.
2. Install a small jumper between the 24.5 MHz pad isolated in the previous step and the 21 MHz pad on the opposite side from the cut.

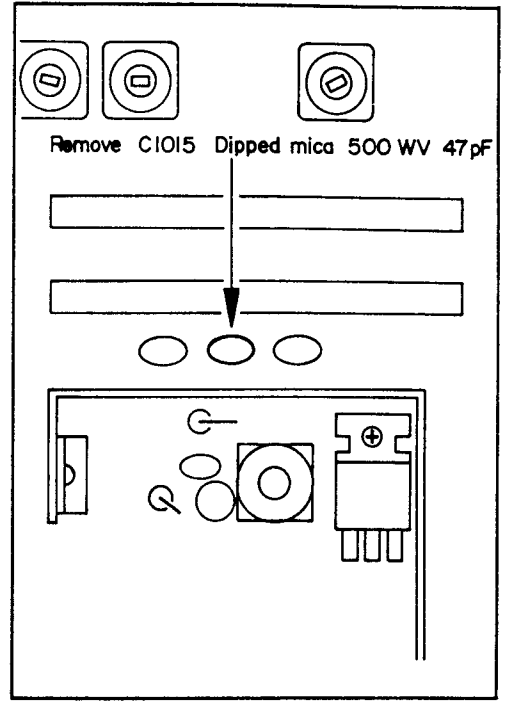
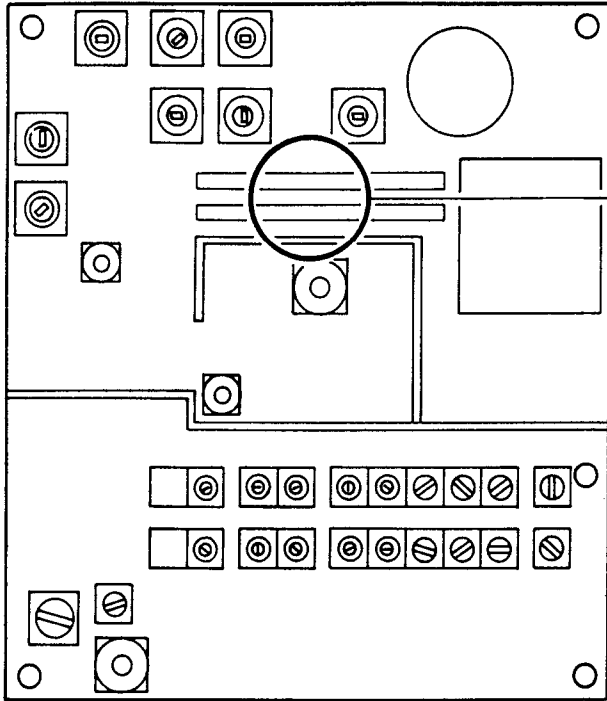
3. Now locate C1015 on the component side of the board, and C1104 on the solder side (connected in parallel to the same pads). Remove both of these capacitors to isolate the 24.5 MHz pad of wafer S11b-4.
4. Install plastic insulating sleeves over both leads of an 82 pF, 500 WV dipped mica capacitor, and connect from the 14 MHz pad of S11b-3 to the 24.5 MHz pad of S11b-4 on the solder side of the RF Unit, as shown in the diagram. This new capacitor is designated C1108.

This completes the modification.



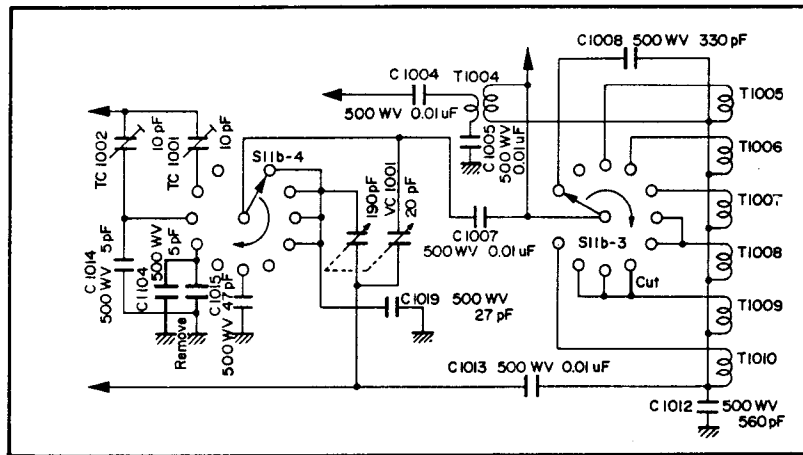
Solder side

RF UNIT

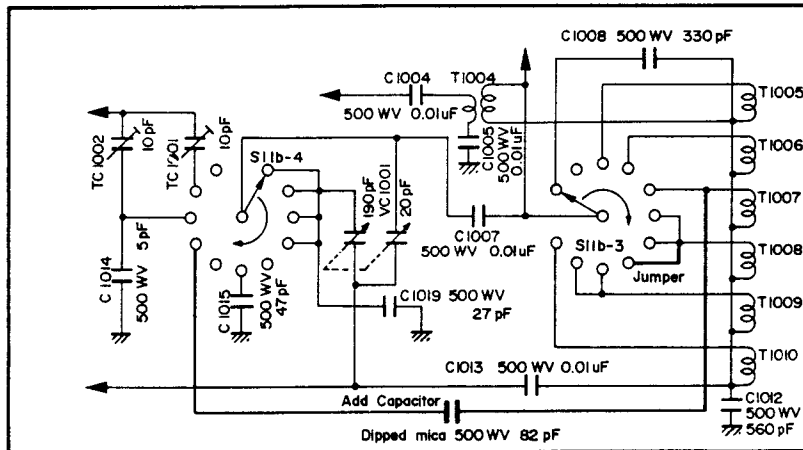


Component side

RF UNIT



Original

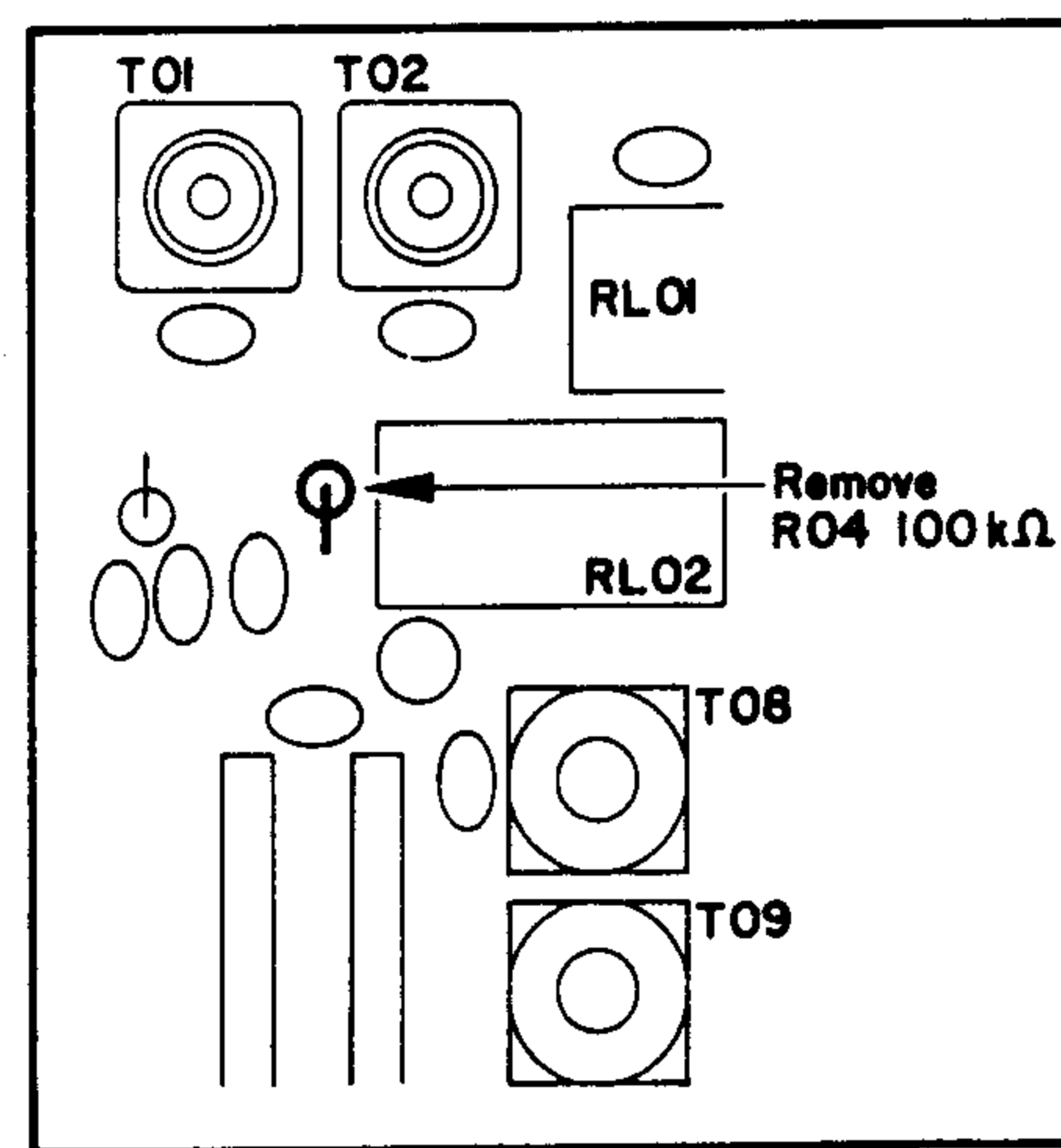
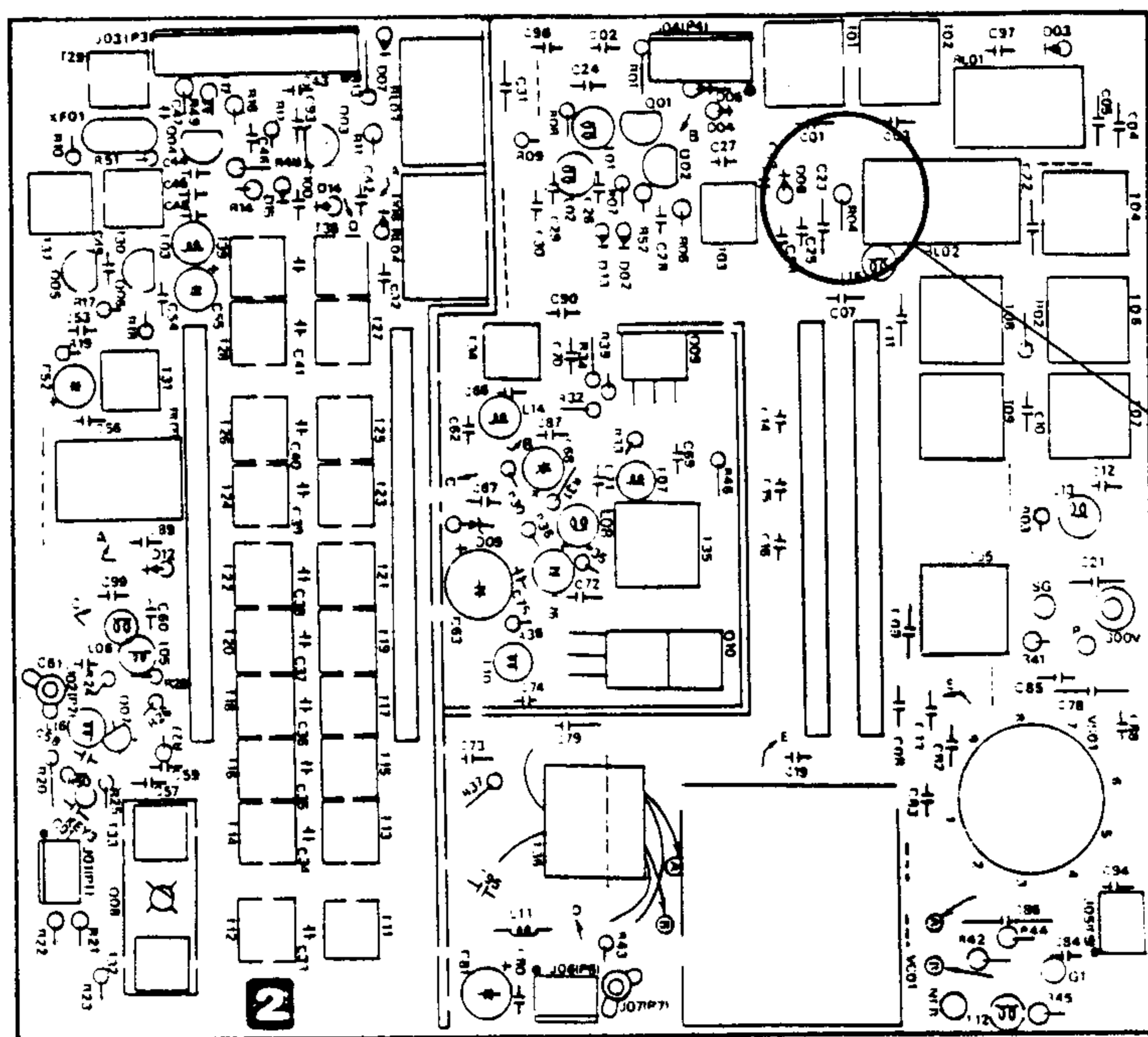


After modification

## Receiver RF Amplifier Protection

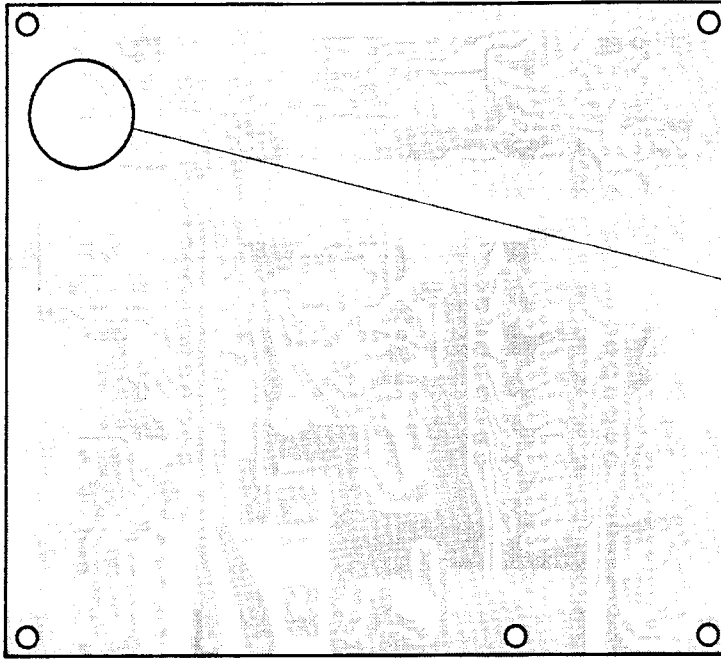
This modification provides better protection for the RF amplifier FETs from spikes that may appear at the input for those FT-102s having serial numbers below XX040000. It has been incorporated in all transceivers from Lot 4.

1. Remove the covers and expose the solder side of the RF Unit as described on page 8.
2. Referring to the drawings below, locate resistor R04, and carefully remove the indicated end of this resistor. Reconnect it as shown.
3. Replace the shield cover and AF Unit, the AM/FM Unit, and the covers and associated screws.

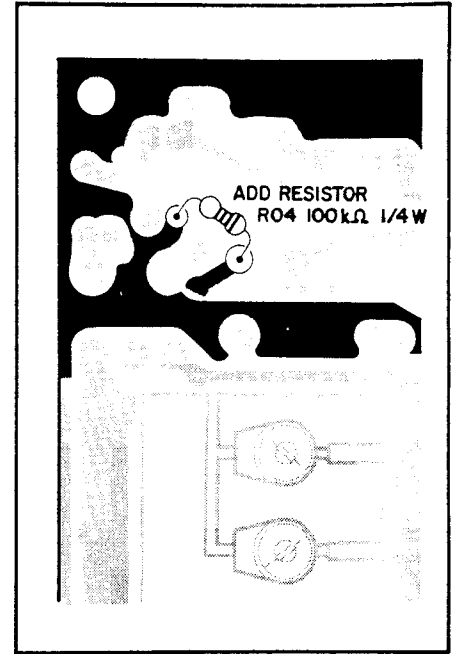


Component side

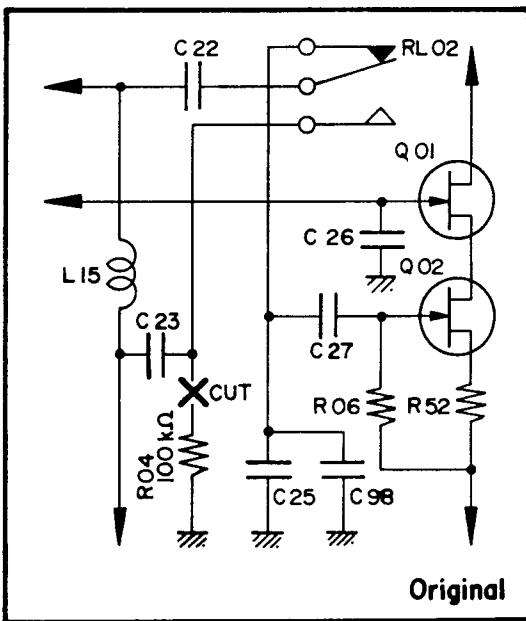
RF UNIT



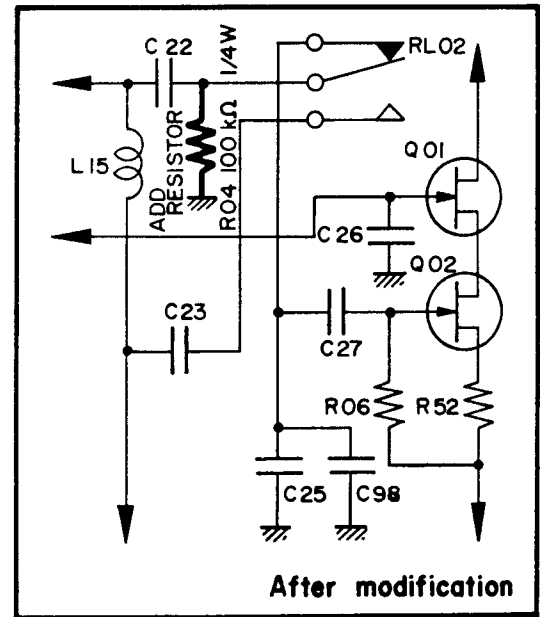
RF UNIT



Solder side



Original



After modification

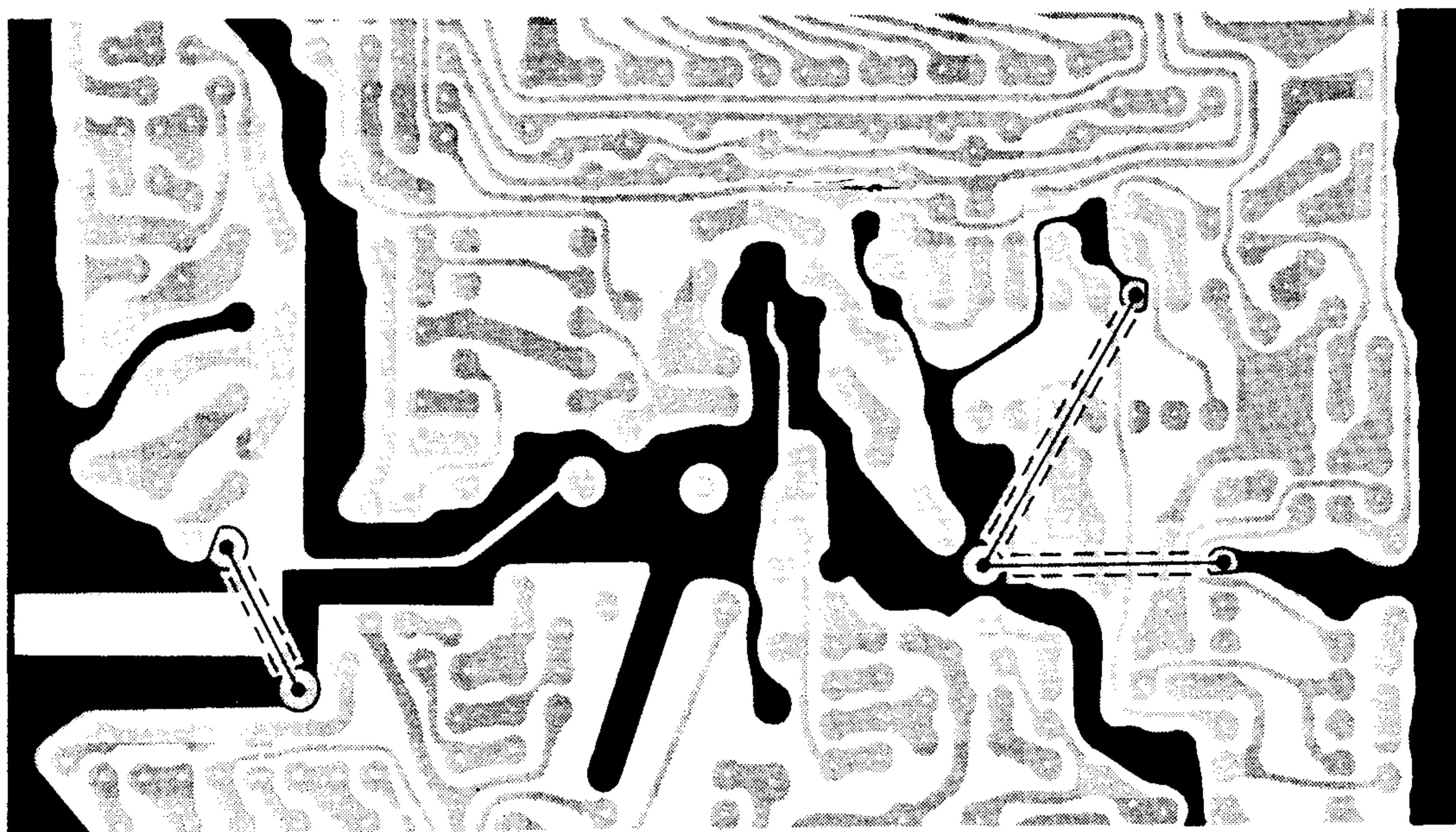
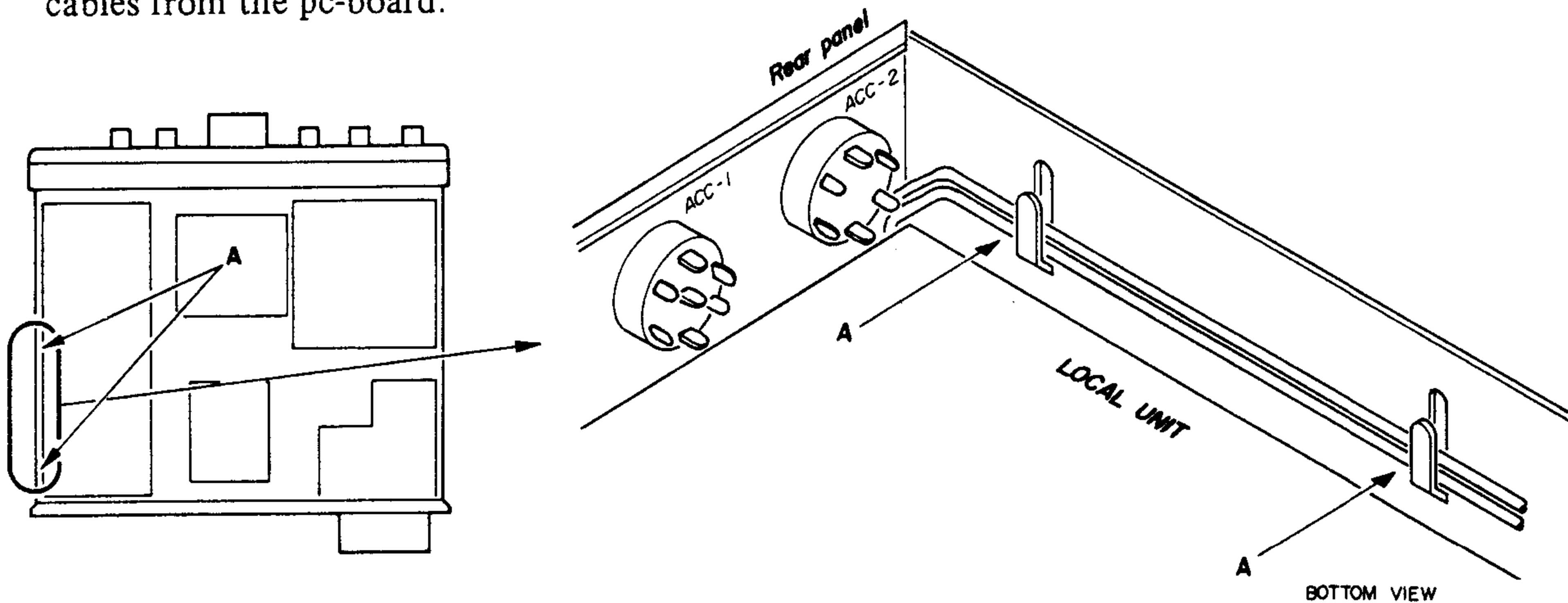


## Receiver Spurious Reduction

This modification serves to reduce the spurious signals of the receiver in the amateur bands in those FT-102s having serial numbers below XX040000.

1. Lay the transceiver upside down on the work surface, and remove the bottom cover.
2. Referring to the diagrams below, carefully bend the two chassis clips (marked A) slightly inwards about 5 mm, so that the two gray shielded cables can be removed from the clips. It is not necessary to disconnect these cables from the pc-board.

3. Remove the seven screws affixing the Local Unit (PB-2345), and carefully lift the outer edge of the board, folding it towards the middle of the transceiver so that the solder side is exposed.
4. Referring to the local unit diagram below, install heavy wire or copper straps insulated with plastic sleeving in the three locations shown, connecting the ground patterns on the Local Unit.
5. Replace the Local Unit and its screws, reinstall the gray cables in the chassis clips and bend them back into place, and replace the cover.

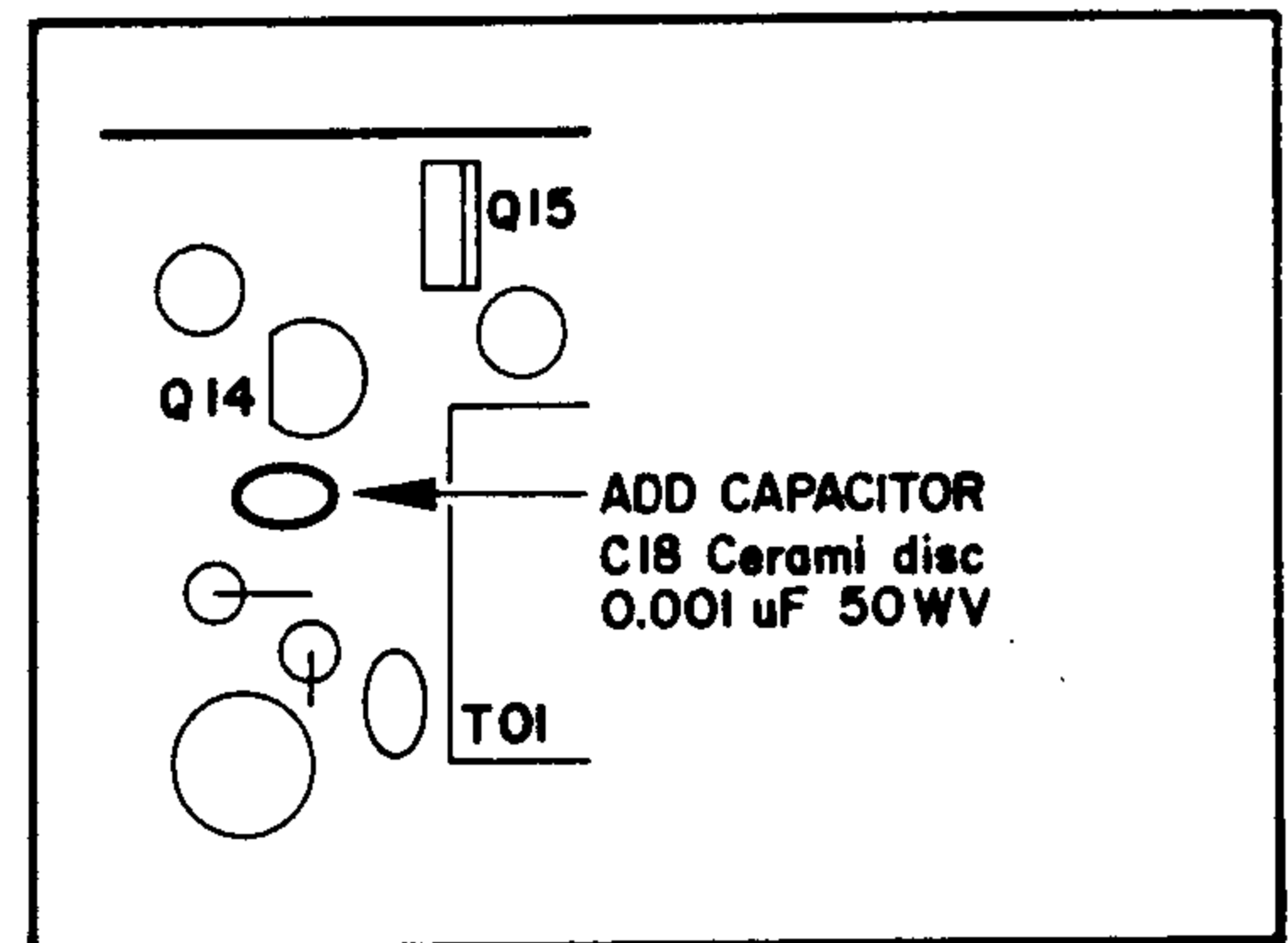
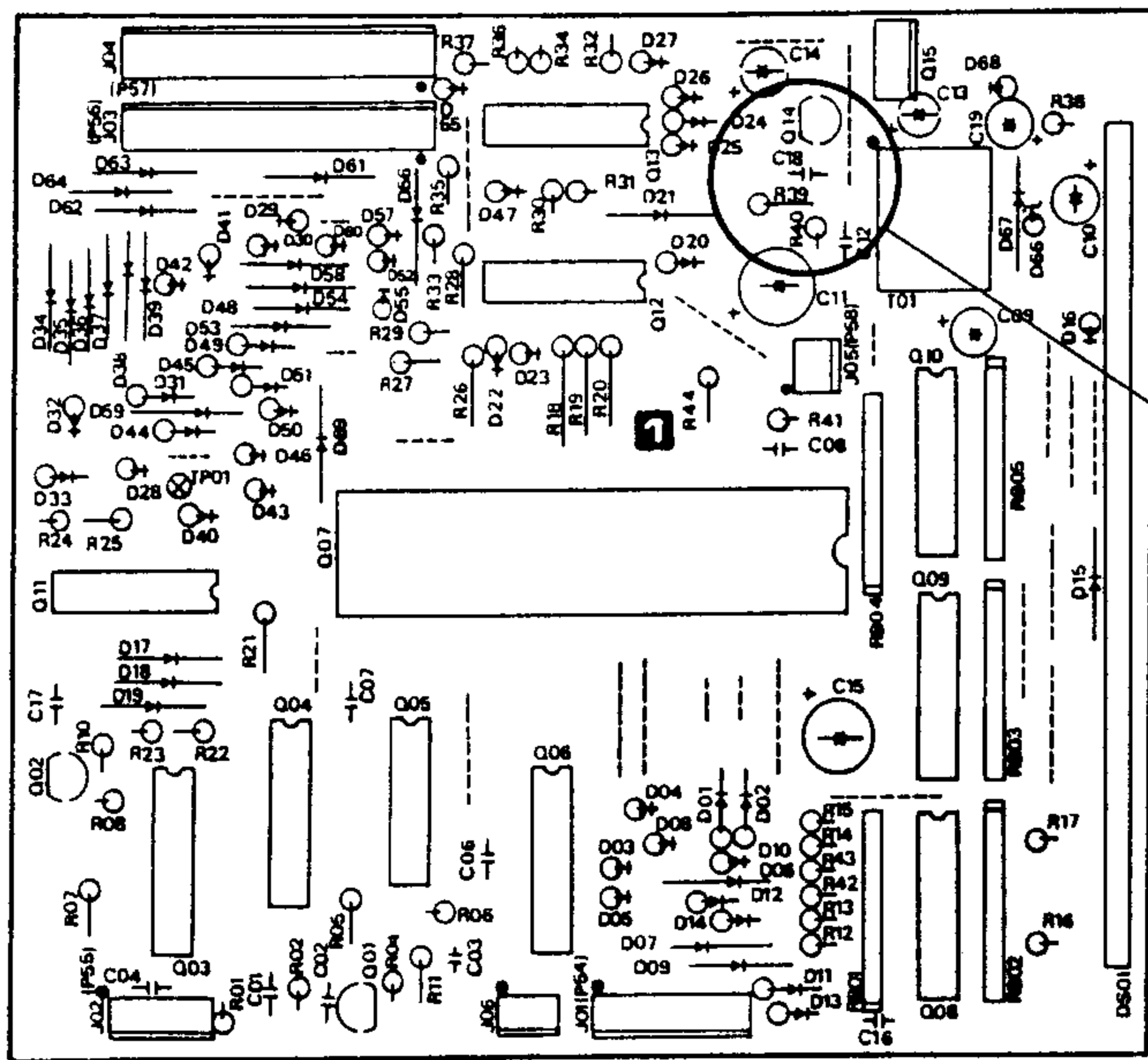


LOCAL UNIT

## Counter Noise Reduction

This modification will reduce drifting counter noise that may appear on the lower frequency bands in those FT-102s having serial numbers below XX040000. It has been incorporated into production from Lot 4.

1. Remove the top cover, and without pulling on the wires, remove P57, the 13-pin connector plug nearest the edge of the Counter Unit (PB-2346A). Then remove the four screws affixing the Unit, and slide the pc-board back so that it can be tipped up to expose the solder side.
2. Referring to the drawing below, install a 0.001  $\mu$ F, 50 WV ceramic capacitor between the collector of Q14 and ground.
3. Gently replace the pc-board in its original position. Replace the display-backing bracket with the two front mounting screws, and then replace the two rear screws. Reconnect P57 to J04, and replace the top cover.



Component side

COUNTER UNIT

## B. 10-meter Band Modification

The procedure for this modification is the same for all models. DO NOT perform this modification if Modification A has been performed.

It requires the sacrifice of all but one existing 10-meter 500 kHz segment. The new segment will be selected when the BAND selector and switch are set to the same position as used for the 10-meter segment being replaced.

1. Perform steps 1, 2 and 3 of the previous modification procedure.
2. Install 1SS53 diodes (white band) on the solder side of the Local Unit at the locations shown in Figure 5, making sure that the banded ends of the diodes are aligned as indicated. Install  $D_D$  for 28.0–28.5 MHz, or  $D_E$  for 28.5–29.0 MHz (DO NOT INSTALL BOTH). Then perform step 5 of the previous modification procedure.

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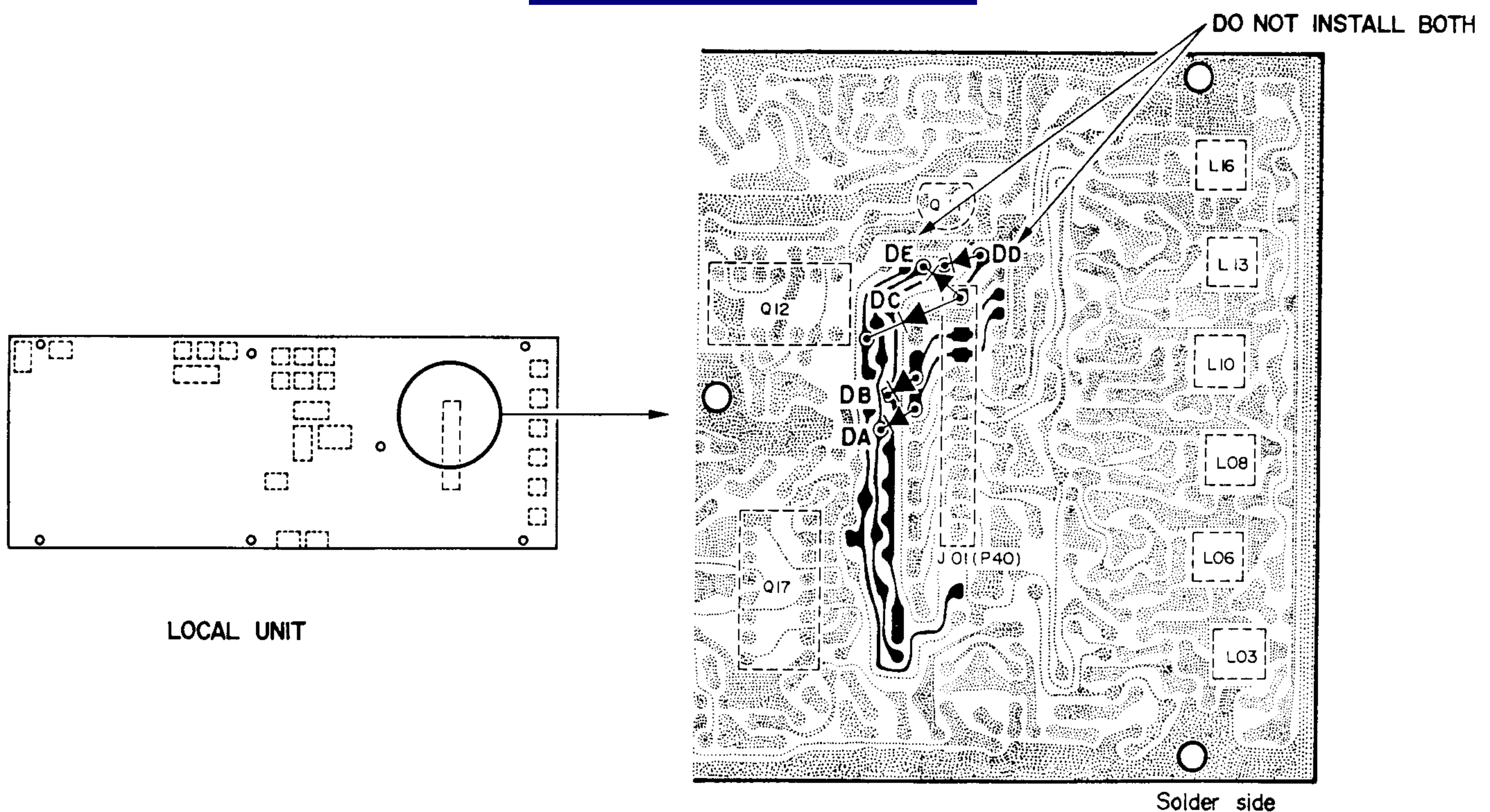


Figure 5

— MEMO —

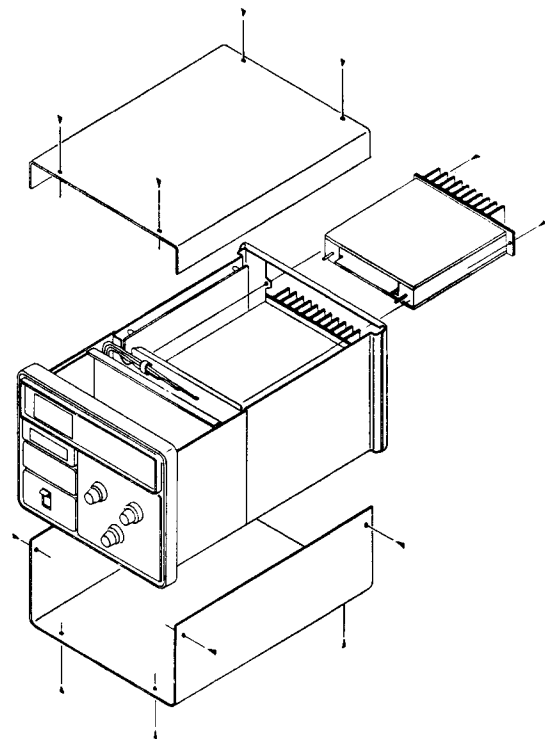
# MODIFICATION OF THE FTV-901R TRANSVERTER FOR USE WITH THE FT-102 TRANSCEIVER

This modification enables the FTV-901R to be used with those FT-102s having serial numbers above 030000 for VHF and/or UHF operation. Earlier FT-102s should first be modified by an authorized Yaesu agent.

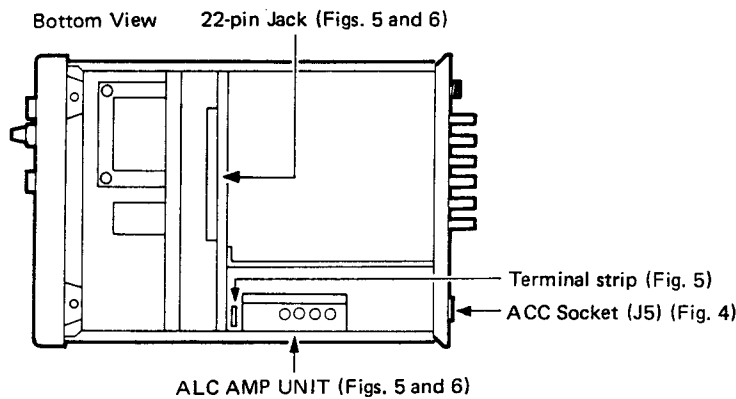
Parts required:

- One ALC AMP Unit, Part No. C022940
- One Connection Cable E, Part No. T9101282, shown in Fig.
- One 24-centimeter length of hookup wire

1. Remove the twelve screws affixing the top and bottom covers of the FTV-901R, and remove the covers (Figure 1).

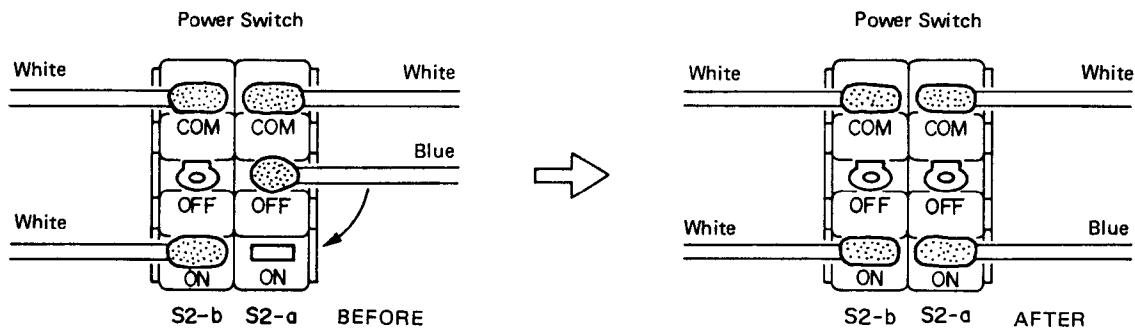


**Figure 1**



**Figure 2**

2. On POWER switch S2a, disconnect the blue wire from the OFF terminal, and reconnect this wire to the ON terminal, as shown in Figure 3.



**Figure 3**

3. On the ACC socket (J5), disconnect the large white wire from pins 2 and 5, and reconnect this wire to the ground terminal at the socket, as shown in Figure 4. Also, if a diode is connected to pins 1 and 4 of the ACC socket (early models), remove this diode from the transverter.

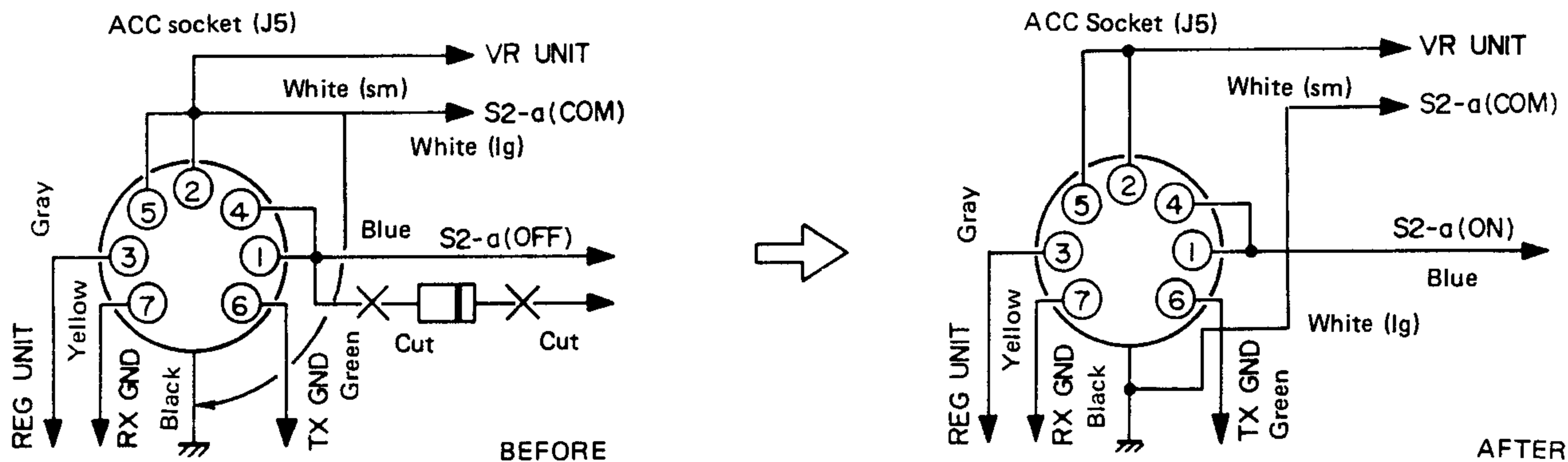


Figure 4

4. If the serial number of the FTV-901R is below 030000, perform the following procedure and skip part 5. Otherwise, skip this part and proceed directly to part 5.
  - a. Note on tags the connection point of each red wire connecting to the ALC AMP Unit and tape a tag to each of these wires. Then disconnect all wires (two shielded, three red, and one each orange, white/green and white/red).
  - b. Remove the four screws in the side of the chassis affixing the ALC AMP Unit, and replace the original Unit with the new ALC AMP Unit (Part No. C022940).
  - c. Reconnect the wires to the new Unit as shown in Figure 5 and described below:
    1. Connect the input shielded wire to the input terminal, and the output shielded wire to the output terminal of the ALC AMP Unit.
    2. Disconnect the brown wire from the terminal strip, and connect this wire to pin 4 of the ALC AMP Unit. Now remove the terminal strip, together with its components and red wire, from the transverter.
    3. Splice the red wire removed from pin 2 of the old ALC AMP Unit directly to the white/green wire, and carefully insulate the splice with plastic tape.
4. Disconnect the white/blue wire from pin 18 of the blue 22-pin connector jack, and connect this wire to pin 1 of the ALC AMP Unit.
5. Connect the 24-centimeter length of hookup wire from pin 18 of the blue 22-pin connector jack to pin 2 of the ALC AMP Unit.
6. Connect the orange wire, removed from pin 1 of the old ALC AMP Unit, to pin 3 of the new Unit. Then connect the red wire removed from pin 3 of the old Unit to pin 5 of the new Unit. Finally, connect the white/red wire, removed from pin 4 of the old Unit, to pin 6 of the new ALC AMP Unit. Skip the next part and proceed to part 6.

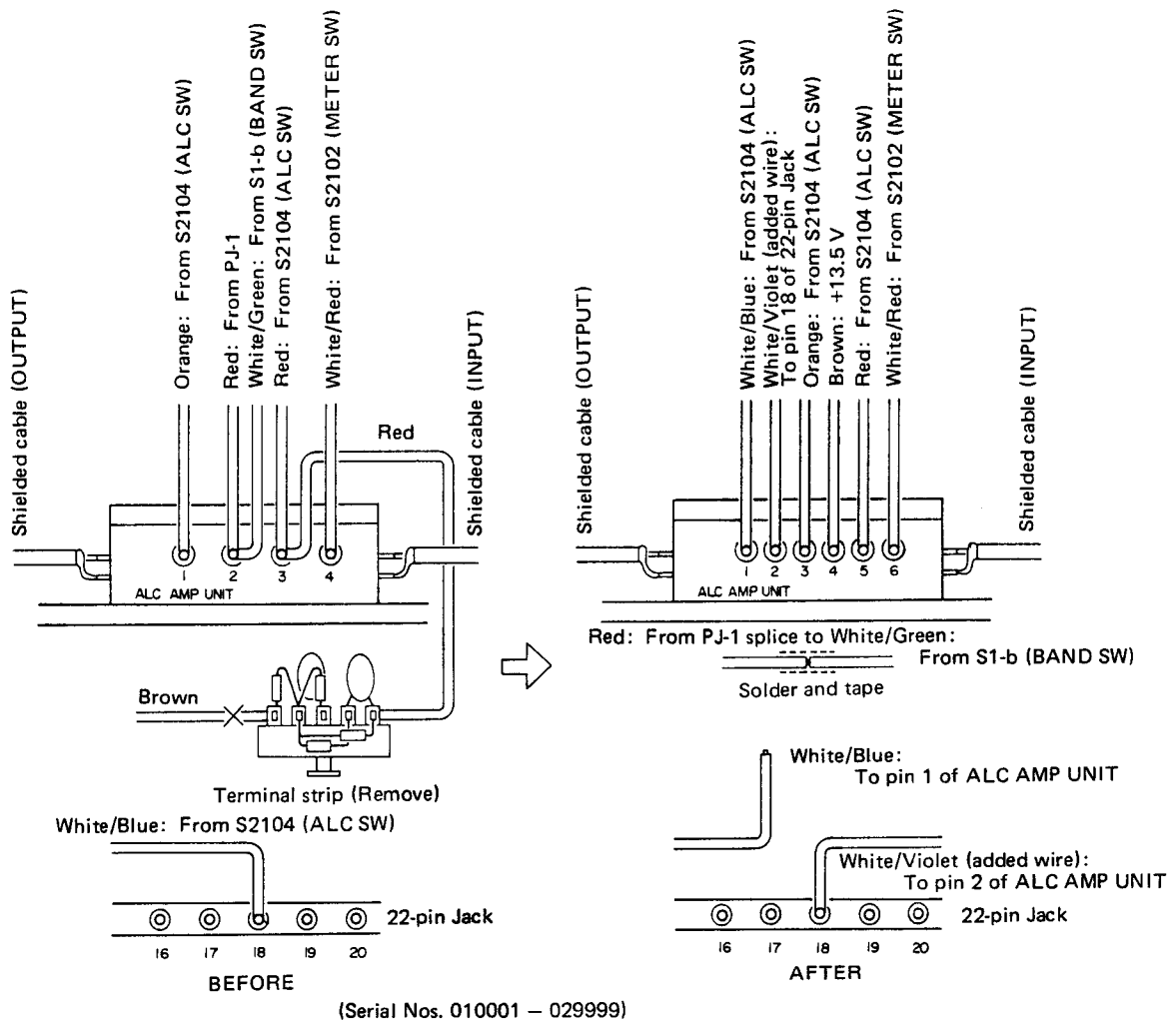
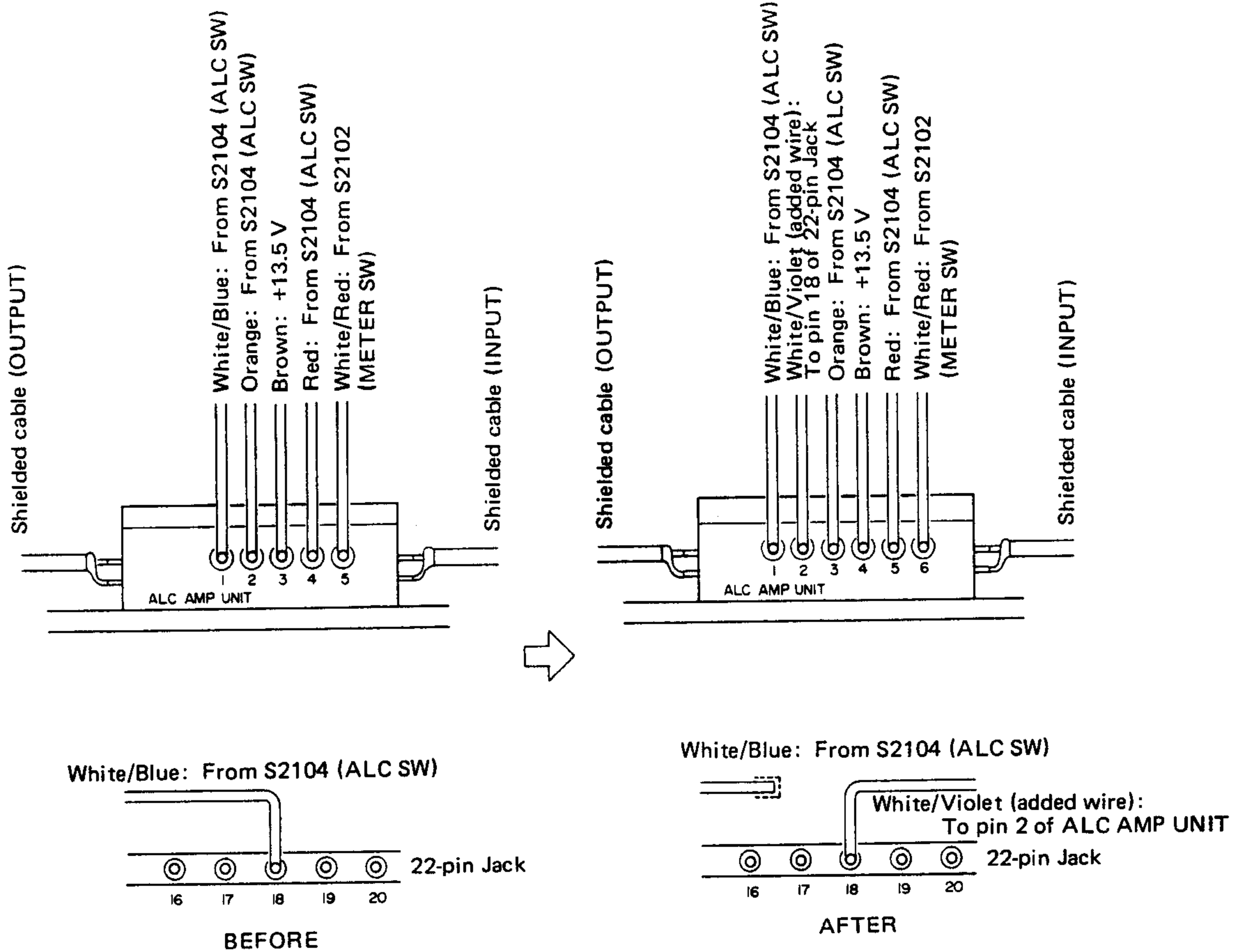


Figure 5

5. For those FTV-901Rs with serial number above 030000, perform the following procedure.
  - a. Disconnect all wires from the ALC AMP Unit (two shielded, and one each orange, brown, red, white/blue and white/red).
  - b. Remove the four screws in the side of the chassis affixing the ALC AMP Unit, and replace the original Unit with the new ALC AMP Unit (Part No. C022940).
  - c. Reconnect the wires to the new Unit as shown in Figure 6 and described below:
    1. Connect the input shielded wire to the input terminal, and the output shielded wire to the output terminal of the ALC AMP Unit.
    2. Connect the wires removed from the old ALC AMP Unit to the new Unit: white/blue to pin 1, orange to pin 3, brown to pin 4, red to pin 5, and white/red to pin 6.
    3. Disconnect the white/blue wire from pin 18 of the blue 22-pin connector jack, and carefully insulate the end of this wire with plastic tape.
    4. Connect the 24-centimeter piece of hookup wire from pin 18 of the 22-pin jack to pin 2 of the new ALC AMP Unit.
  6. Modification is now complete. Replace the top and bottom covers of the FTV-901R and their twelve screws, and connect the transverter to the FT-102 as shown in Figure 7.



(Serial No. 030001 & UP)

Figure 6

**CAUTION**

ONCE THE FTV-901R HAS BEEN MODIFIED IT MUST NOT BE USED WITH ANY MODEL TRANSCEIVER OTHER THAN THE FT-102, OR SEVERE DAMAGE TO THE EQUIPMENT MAY RESULT.

WHENEVER USING THE FTV-901R WITH THE FT-102 BE ABSOLUTELY CERTAIN THAT THE HEATER SWITCH ON THE FT-102 IS OFF, AND THAT THE TUBES HAVE HAD AT LEAST 30 SECONDS TO COOL.

WHEN USING THE FTV-901R WITH THE FT-102, THE IF MONITOR OF THE FT-102 WILL NOT FUNCTION NORMALLY. ALTHOUGH IT MAY SOUND DISTORTED, THIS IS NOT AN INDICATION OF DISTORTION OF THE OUTPUT OF THE FTV-901R.

ALSO, WHEN TRANSMITTING WITH THE FT-102 AND FTV-901R, THE IC, PO AND ALC METER FUNCTIONS IN THE FT-102 ARE DISABLED, AS WELL AS THE PLATE AND LOAD CONTROLS.



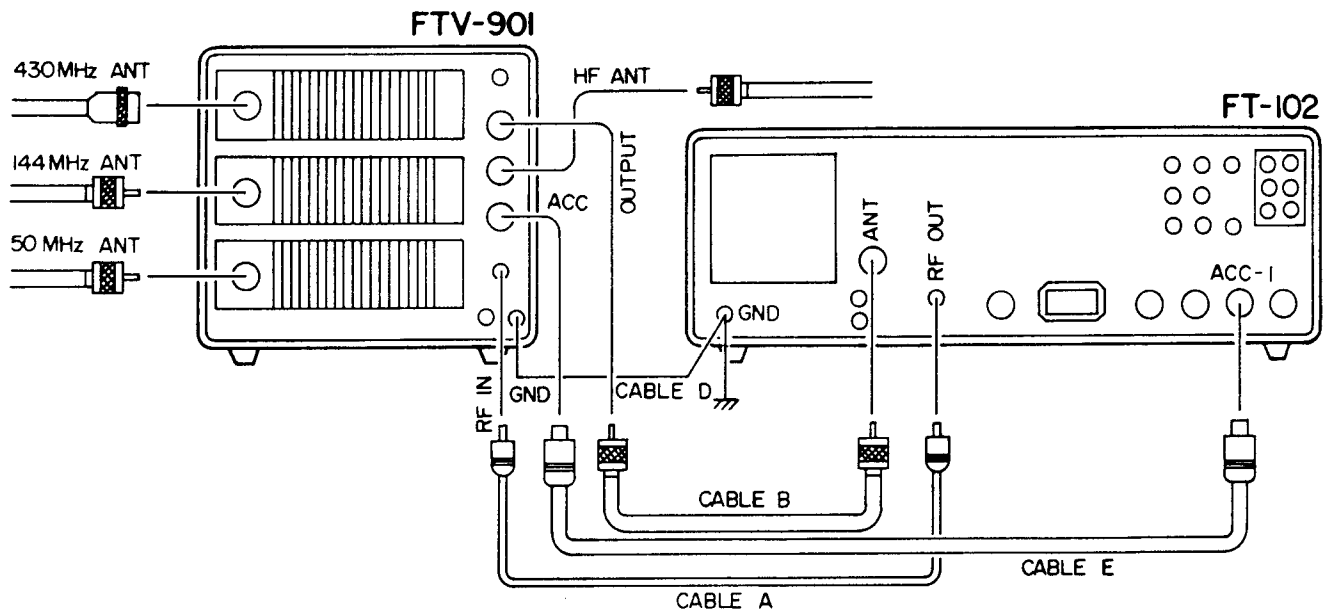


Figure 7

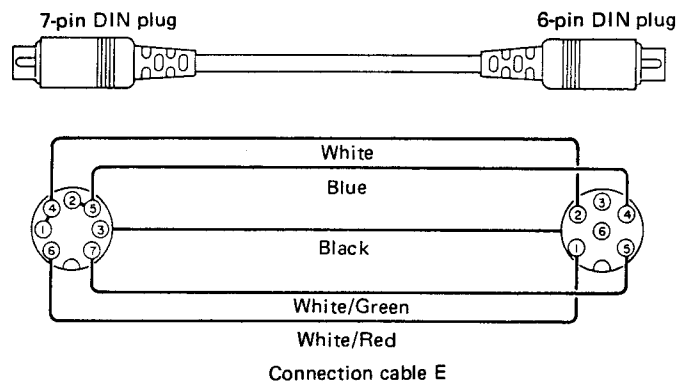


Figure 8

# MODIFICATION OF THE FTV-107 TRANSVERTER FOR USE WITH THE FT-102 TRANSCEIVER

This modification enables the FTV-107 to be used with those FT-102s having serial numbers above 030000 for VHF and/or UHF operation. Earlier FT-102s should first be modified by an authorized Yaesu agent.

## Parts required:

One Connection Cable E, Part No. T9101283, shown in Fig. 4

One 47-ohm, 2-watt wire-wound resistor, part No. J31336470

One piece of hookup wire, approximately 20 centimeters long

One piece of vinyl insulation sleeve

1. Remove the fourteen screws affixing the top and bottom covers of the FTV-107, and remove the covers. (Figure 1.)
2. Rewire POWER switch S02 as described below and shown in Figure 2.
  - a. Disconnect the yellow wire from the COM terminal of switch section S02-b and insulate the end of this wire with plastic tape.
  - b. Connect the 20 cm piece of hookup wire from this COM terminal to the ground terminal of the meter.
  - c. Disconnect the yellow wire from the ON terminal of the switch, and also insulate the end of this wire with plastic tape.
  - d. Disconnect the red wire from the ON terminal of the S02-a section of the switch, and connect this wire to the ON terminal of the S02-b section, as shown in the Figure.
  - e. Cut the insulation sleeve in half, and install over each lead of the 47-ohm resistor. Then connect the resistor from the ON terminal of S02-a to the meter lamp.
3. Replace the top and bottom covers and their screws, and connect the FT-102 to the FTV-107 as shown in Figure 3. This completes the modification.

## CAUTION

ONCE THE FTV-107 HAS BEEN MODIFIED IT MUST NOT BE USED WITH THE FT-107, FT-ONE, OR ANY TRANSCEIVER OTHER THAN THE FT-102, OR SEVERE DAMAGE TO THE EQUIPMENT MAY RESULT.

WHENEVER USING THE FTV-107 WITH THE FT-102 BE ABSOLUTELY CERTAIN THAT THE HEATER SWITCH ON THE FT-102 IS OFF, AND THAT THE TUBES HAVE HAD AT LEAST 30 SECONDS TO COOL.

WHEN USING THE FTV-107 WITH THE FT-102, THE IF MONITOR OF THE FT-102 WILL NOT FUNCTION NORMALLY. ALTHOUGH IT MAY SOUND DISTORTED, THIS IS NOT AN INDICATION OF DISTORTION OF THE OUTPUT OF THE FTV-107. ALSO, WHEN TRANSMITTING WITH THE FT-102 AND FTV-107, THE IC, PO AND ALC METER FUNCTIONS IN THE FT-102 ARE DISABLED, AS WELL AS THE PLATE AND LOAD CONTROLS.

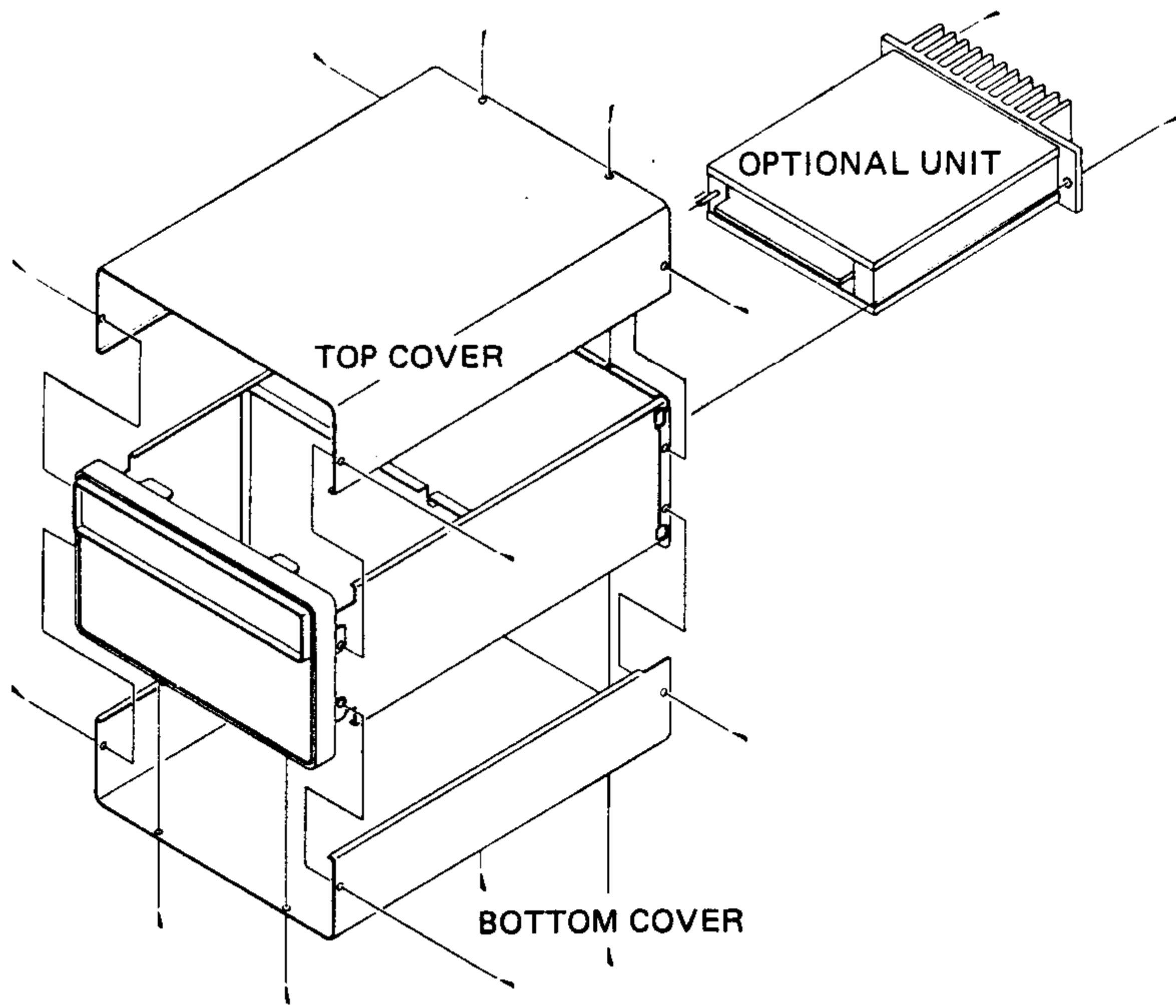


Figure 1

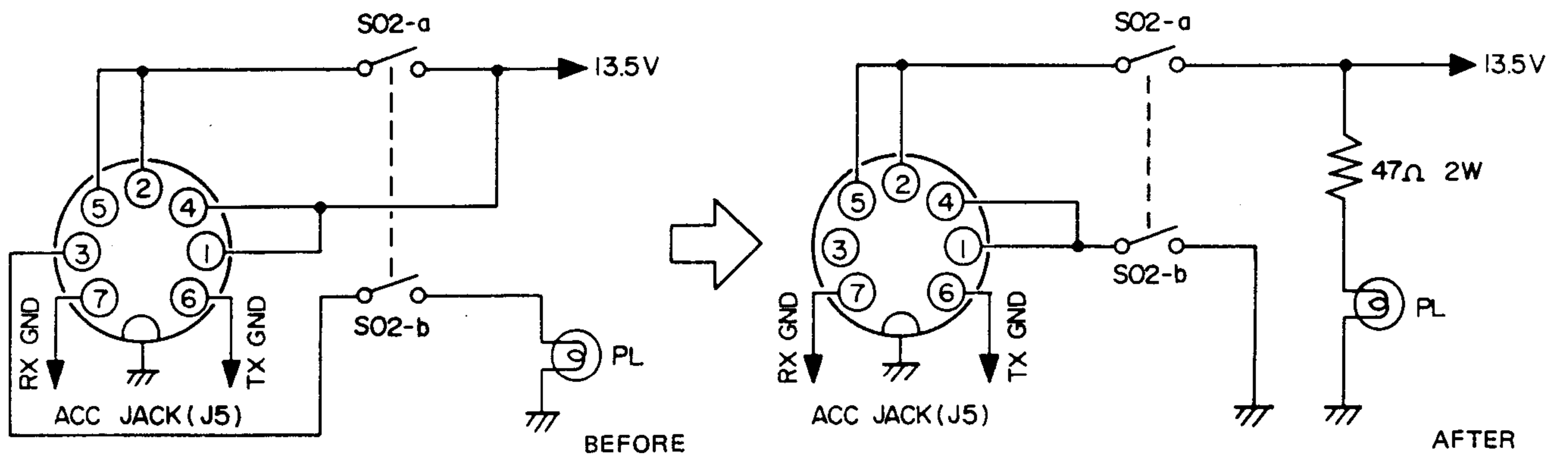
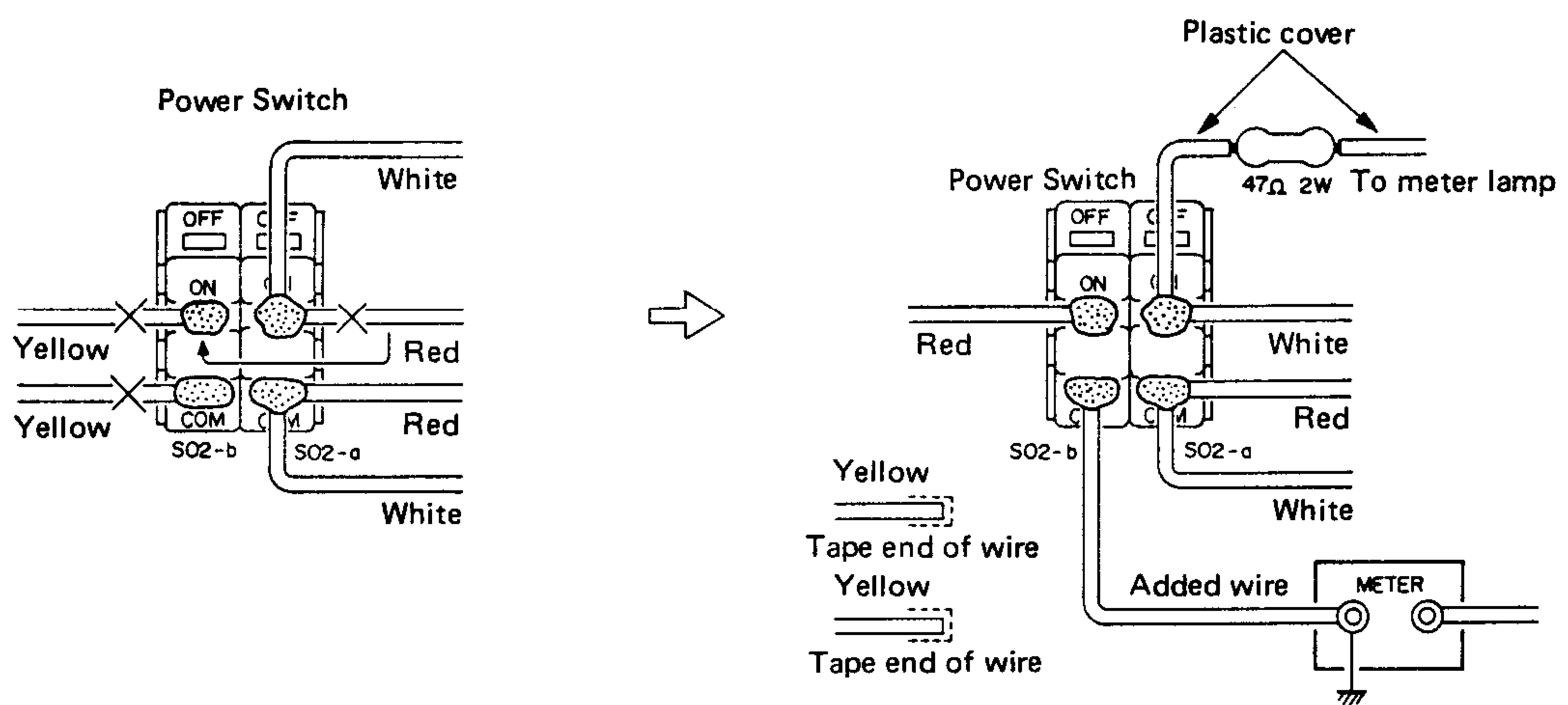


Figure 2

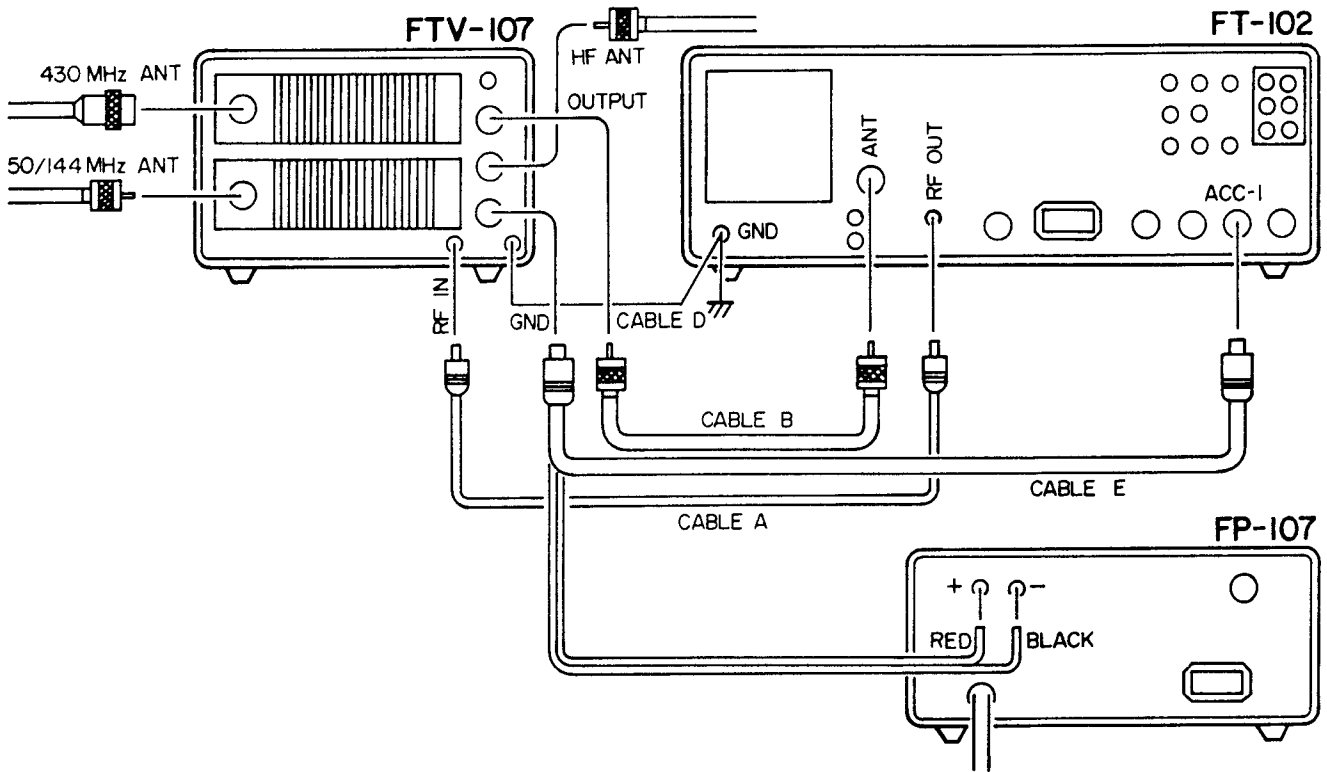


Figure 3

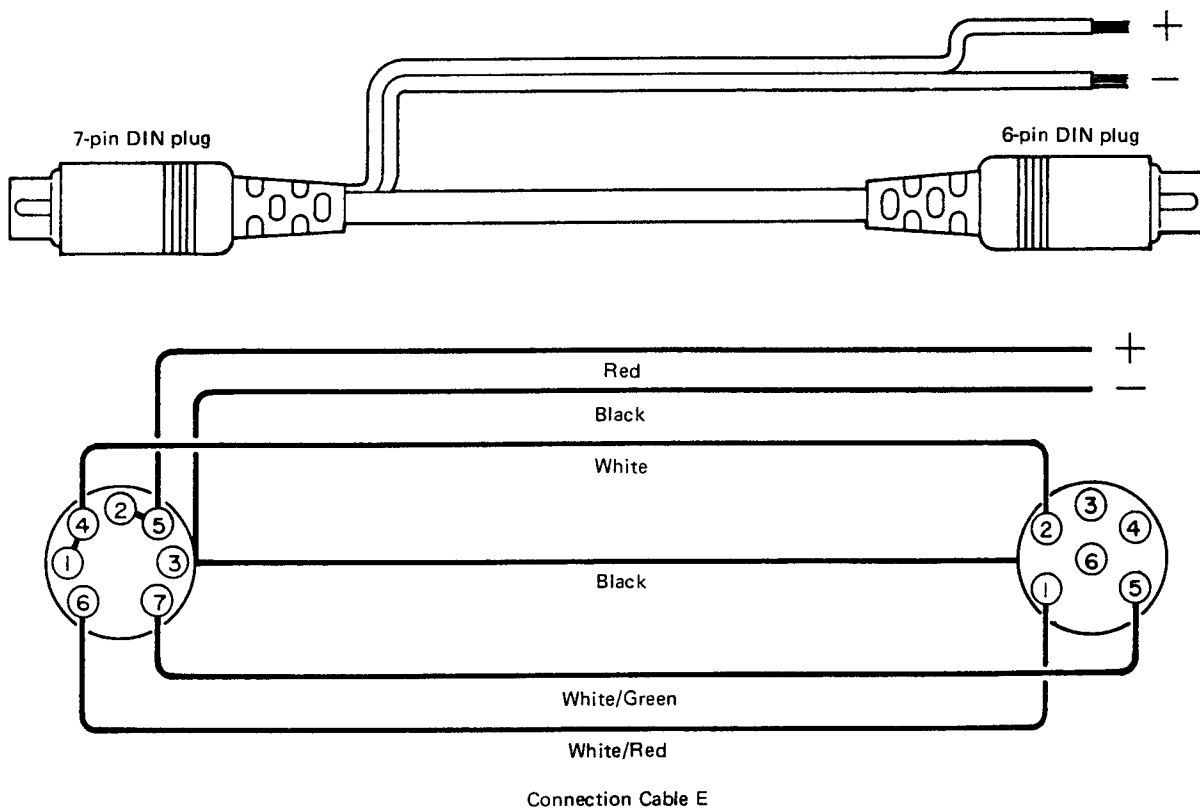


Figure 4

# MODIFICATION OF THE FTV-707 TRANSVERTER FOR USE WITH THE FT-102 TRANSCEIVER

This modification enables the FTV-707 to be used with those FT-102s having serial numbers above 030000 for VHF or UHF operation. Earlier FT-102s should first be modified by an authorized Yaesu dealer.

## Parts required:

One 6-pin DIN plug, Part No. P0090032

One Power Cord (1 meter), (Figure 7, not needed if FP-707 is used)

1. Remove the eight screws affixing the top cover of the FTV-707, and remove the cover (Figure 1).

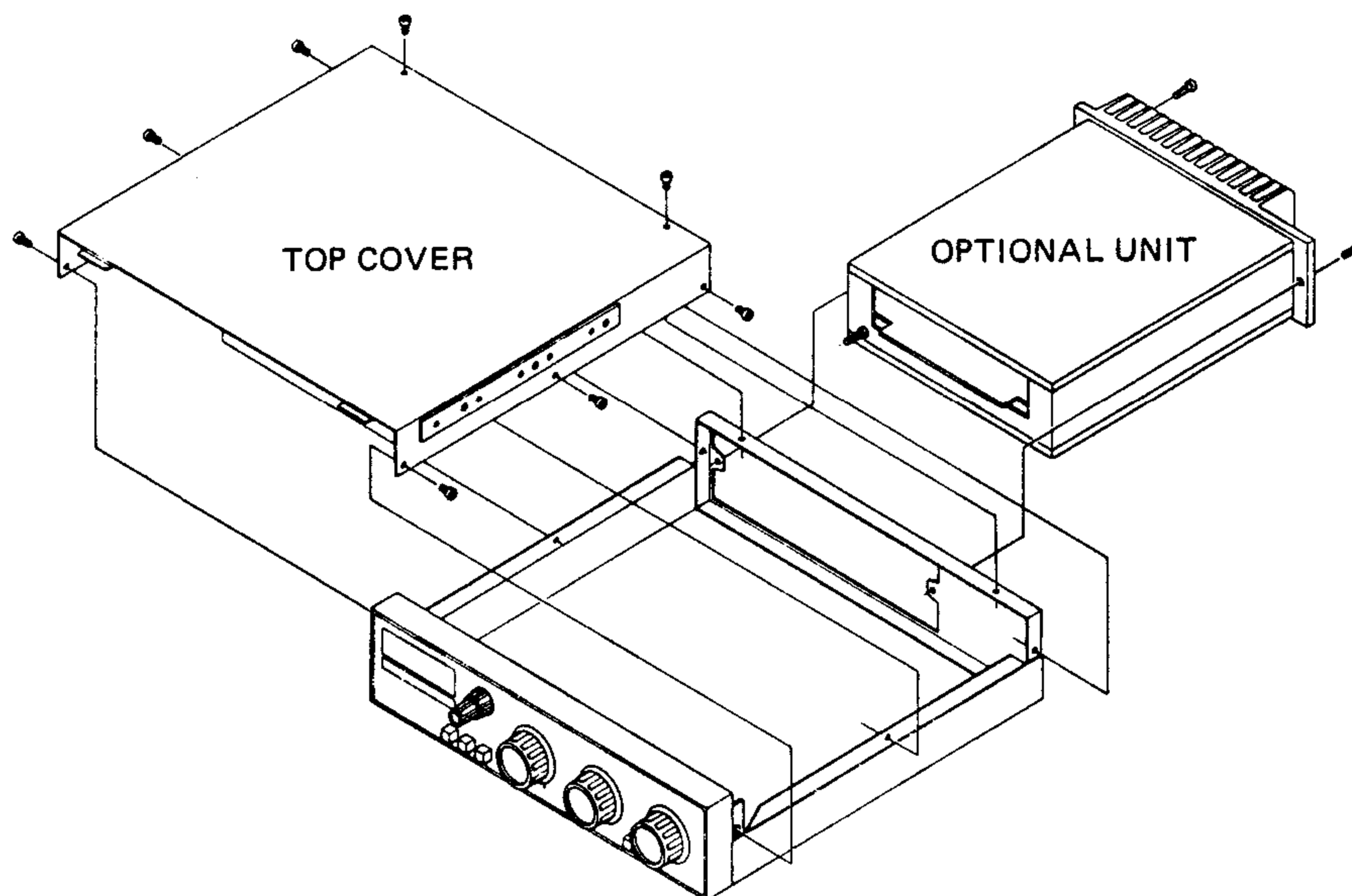


Figure 1

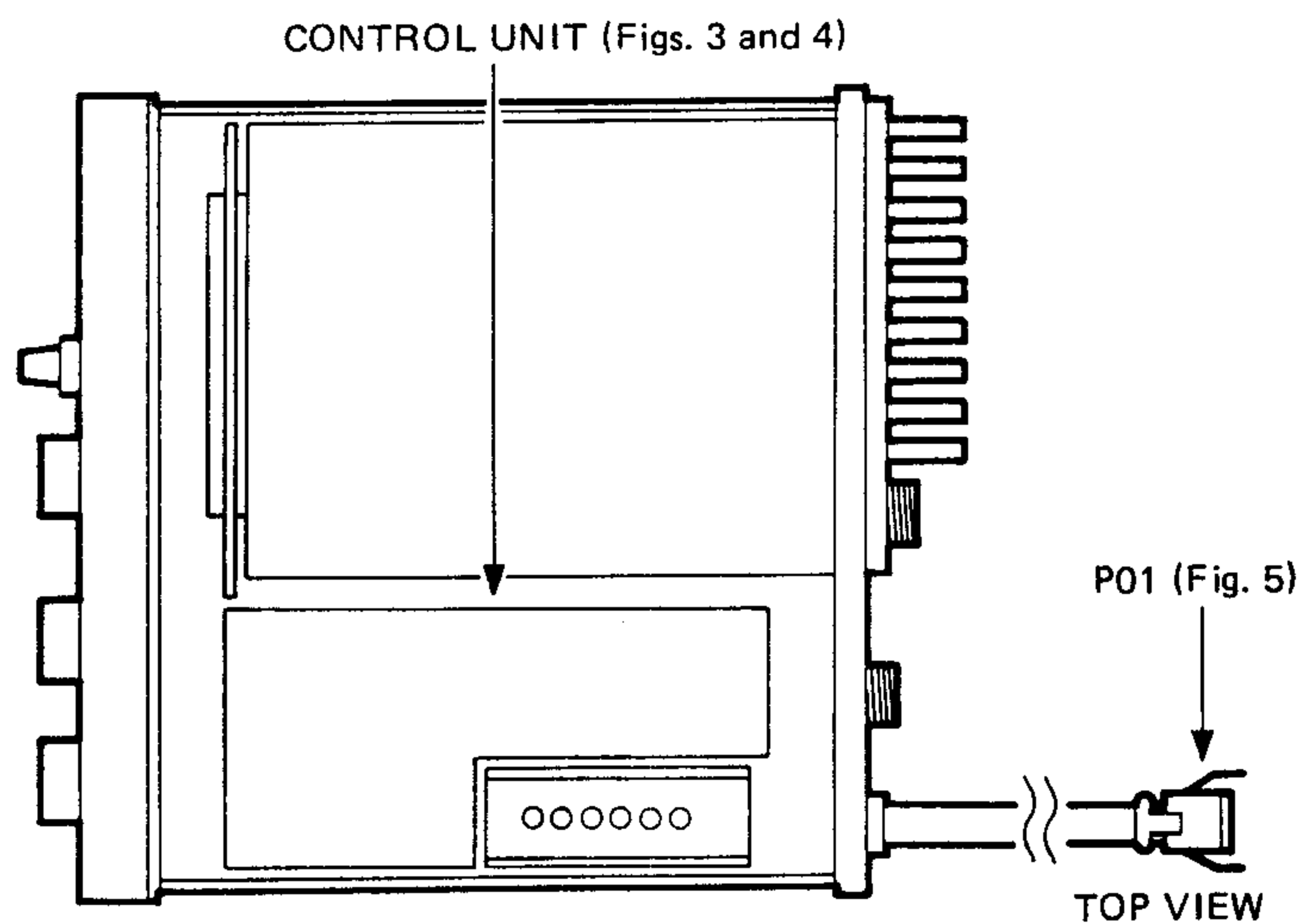


Figure 2

2. Referring to Figures 2 and 3, disconnect all wires and connectors from the Control Unit as described in the following steps:

- a. Disconnect 8-pin connector P02 from J01, and 9-pin connector P03 from J02.
- b. Disconnect the following wires by carefully sliding their connectors off of the contact pins on the Control Unit:
  1. the orange wire at the DC 13.5 V OUT terminal
  2. the small red wire at the S3 terminal
  3. the large red wire at pin 3
  4. the white/brown wire at the PO SW terminal
  5. the brown wire at the S1a terminal
  6. the white/orange wire at the RX HF terminal

c. Disconnect the next set of wires by unsoldering their connections at the Control Unit:

1. the white/brown wire at the TX 13.5 V IN terminal
2. the yellow wire at the TX 13.5 V OUT terminal
3. the center conductor of the coax at the RX OUT terminal
4. the bare solid wire at the 10 m OUT terminal
5. the bare solid wire at the HF ANT terminal

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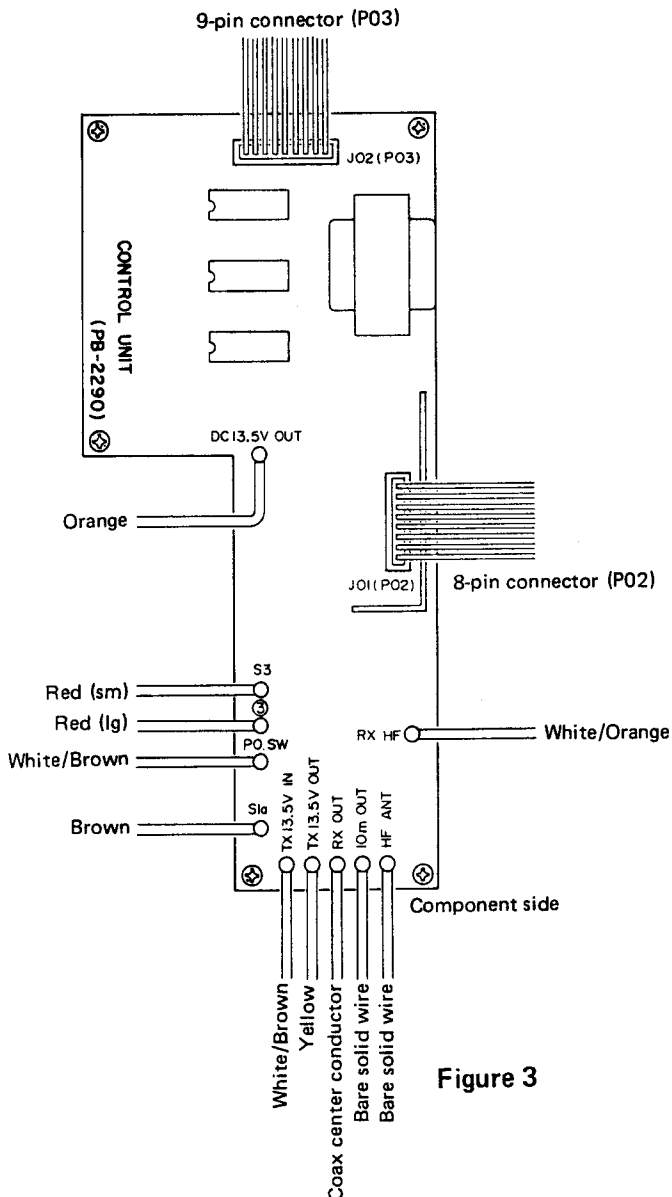


Figure 3

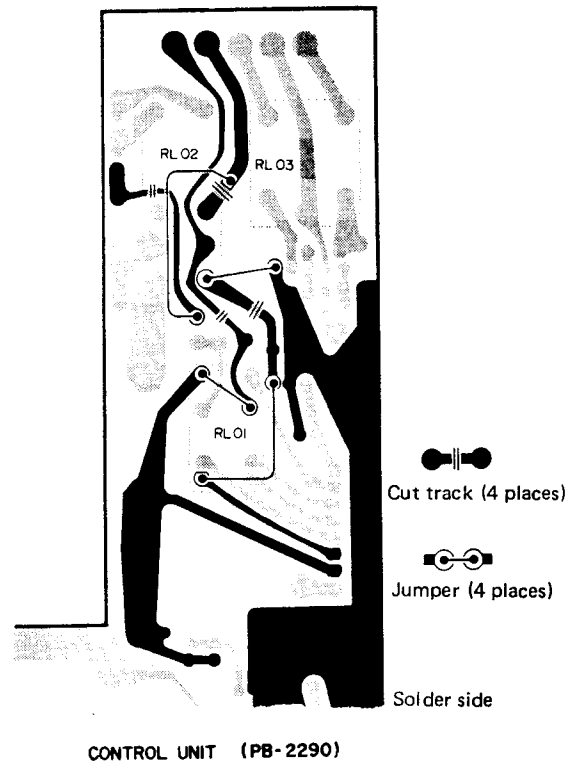


Figure 4

3. Now remove the five screws from the Control Unit, and remove the Unit from the transverter.
4. Referring to Figure 4, carefully cut the four tracks on the solder side of the Control Unit, and install four jumpers as illustrated.
5. Replace the Control Unit and its five screws, and reconnect each connector and wire in the same order that they were removed in part 2, above; i.e. connect P02 to J01 first, and solder the bare wire to the HF ANT terminal last.
6. Replace the top cover of the transverter, and replace the eight screws.
7. Replace the 4-pin connector (P01) at the end of the connection cable on the FTV-707 with the 6-pin DIN plug as shown in Figure 5 and described below:
  - a. Remove the four screws on the 4-pin connector, and slide the black metal cover back to expose the wire connections to the pins. Unsolder the wires and remove the 4-pin connector parts.
  - b. Slide the shell of the DIN connector over the cable, and connect the white/brown wire to pin 2 of the DIN plug. Connect the black wire to the case (ground) of the DIN plug, and the yellow wire to pin 1 of the DIN plug.
  - c. Carefully insulate the end of the red wire with plastic tape, and then slide the shell of the DIN plug over the connections. Schematic diagrams are shown in Figure 8.

Connect the FTV-707 to the FT-102 as shown in Figure 6. If the FP-707 supply is not being used, connect 12 V DC to the FTV-707 using the Power Cord mentioned under "Parts required", after connecting the 4-pin connector left from part 7, as shown in Figure 7.

#### CAUTION

ONCE THE FTV-707 HAS BEEN MODIFIED IT MUST NOT BE USED WITH ANY MODEL TRANSCEIVER OTHER THAN THE FT-102, OR SEVERE DAMAGE TO THE EQUIPMENT MAY RESULT.

WHENEVER USING THE FTV-707 WITH THE FT-102, BE ABSOLUTELY CERTAIN THAT THE HEATER SWITCH ON THE FT-102 IS OFF, AND THAT THE TUBES HAVE HAD AT LEAST 30 SECONDS TO COOL.

WHEN USING THE FTV-707 WITH THE FT-102, THE IF MONITOR OF THE FT-102 WILL NOT FUNCTION NORMALLY. ALTHOUGH IT MAY SOUND DISTORTED, THIS IS NOT AN INDICATION OF DISTORTION OF THE OUTPUT OF THE FTV-707.

ALSO, WHEN TRANSMITTING WITH THE FT-102 AND FTV-707, THE IC, PO AND ALC METER FUNCTIONS IN THE FT-102 ARE DISABLED, AS WELL AS THE PLATE AND LOAD CONTROLS.

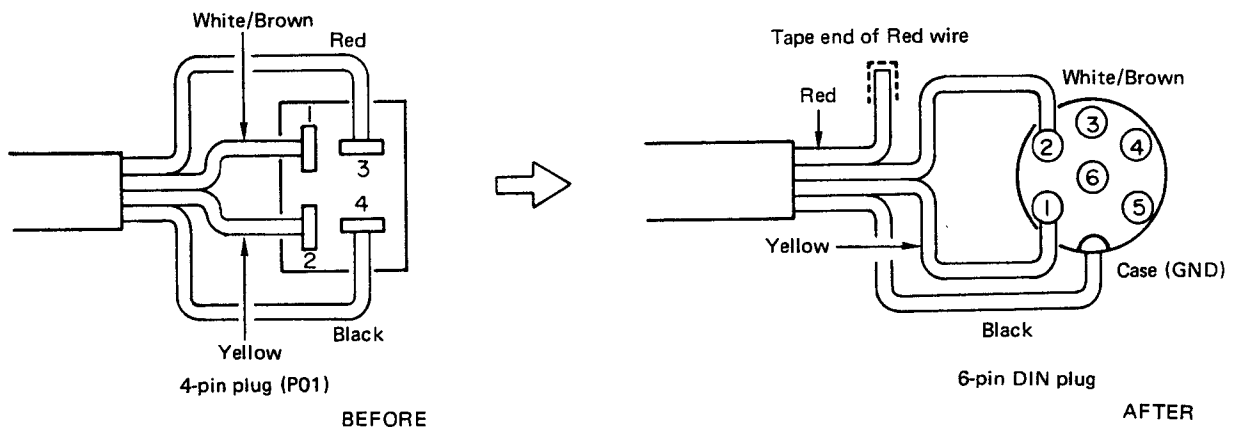


Figure 5

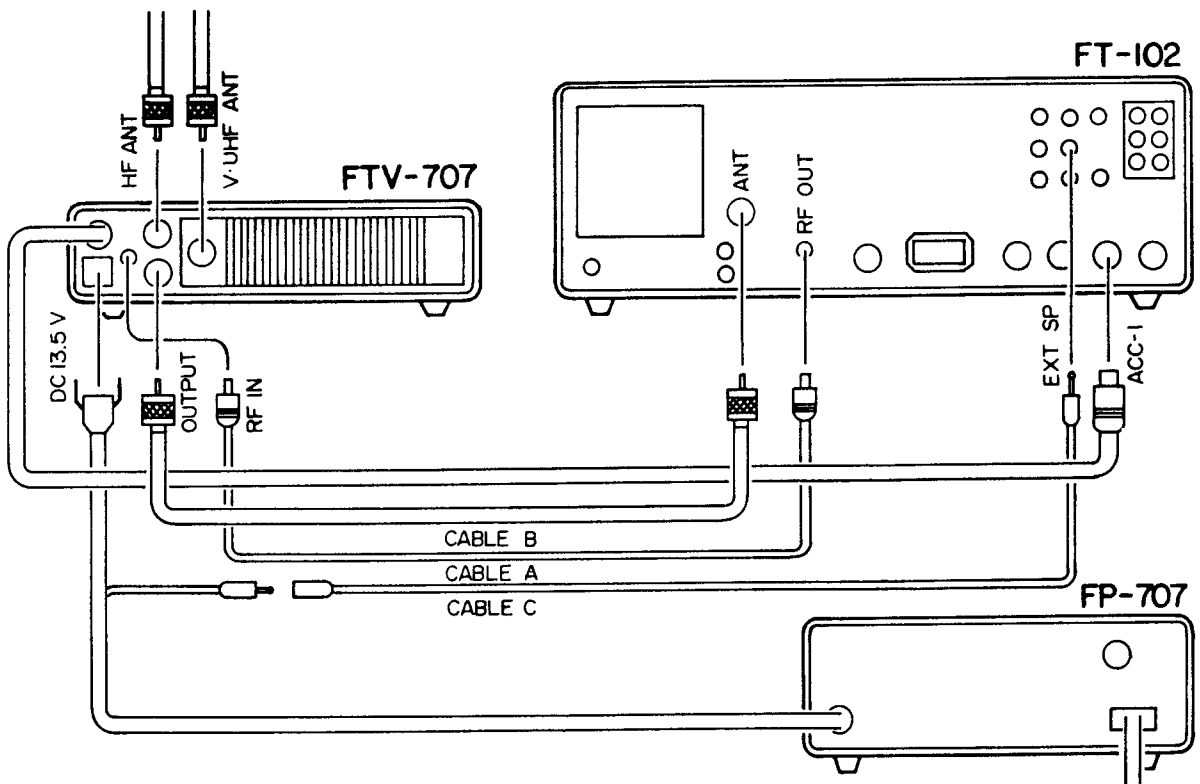


Figure 6

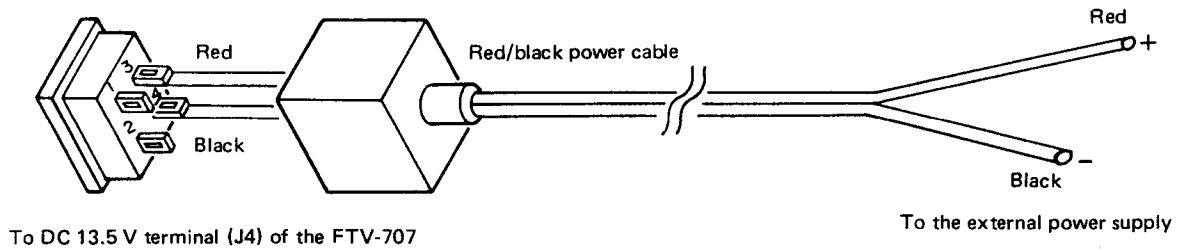


Figure 7



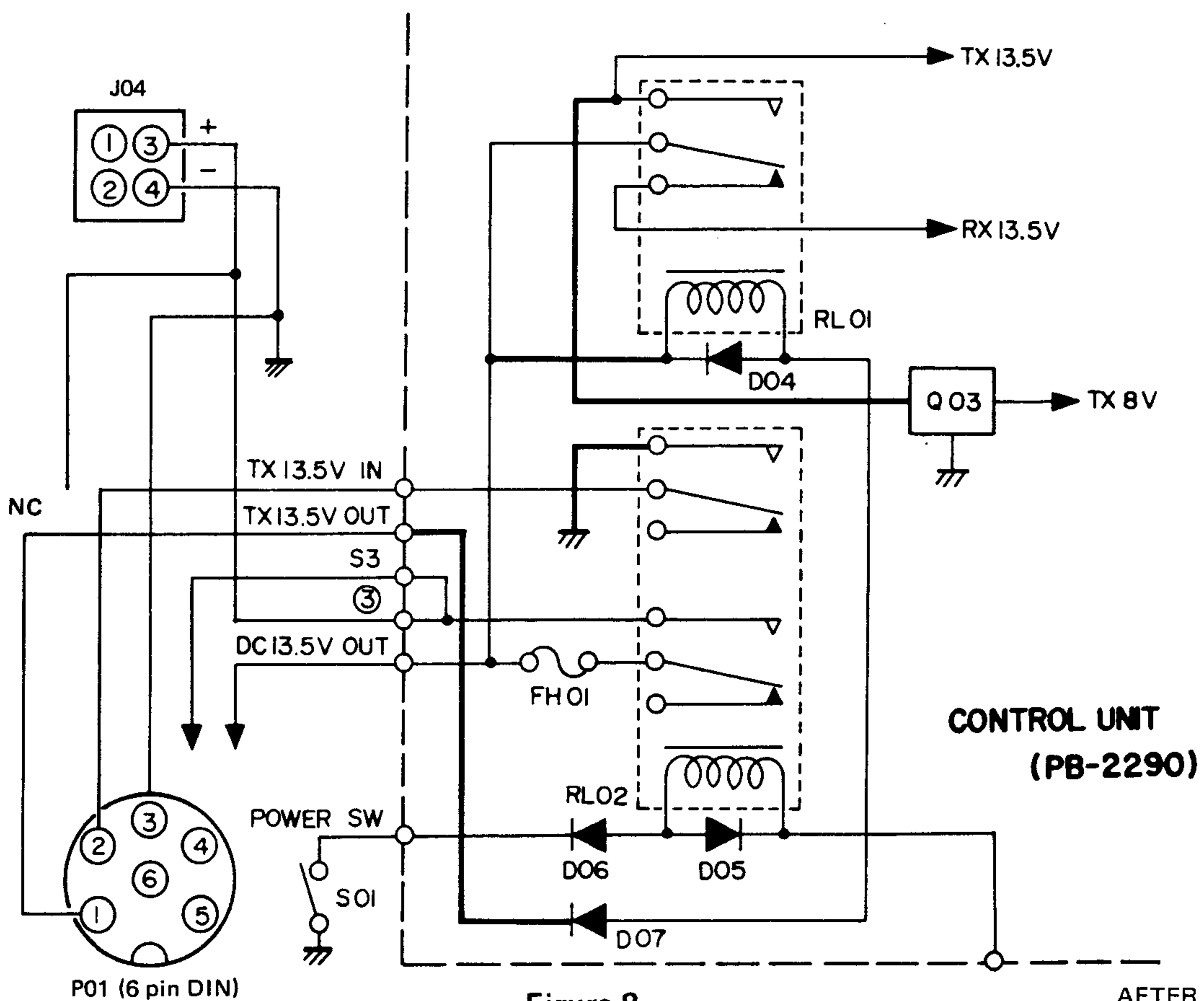
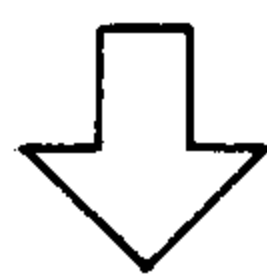
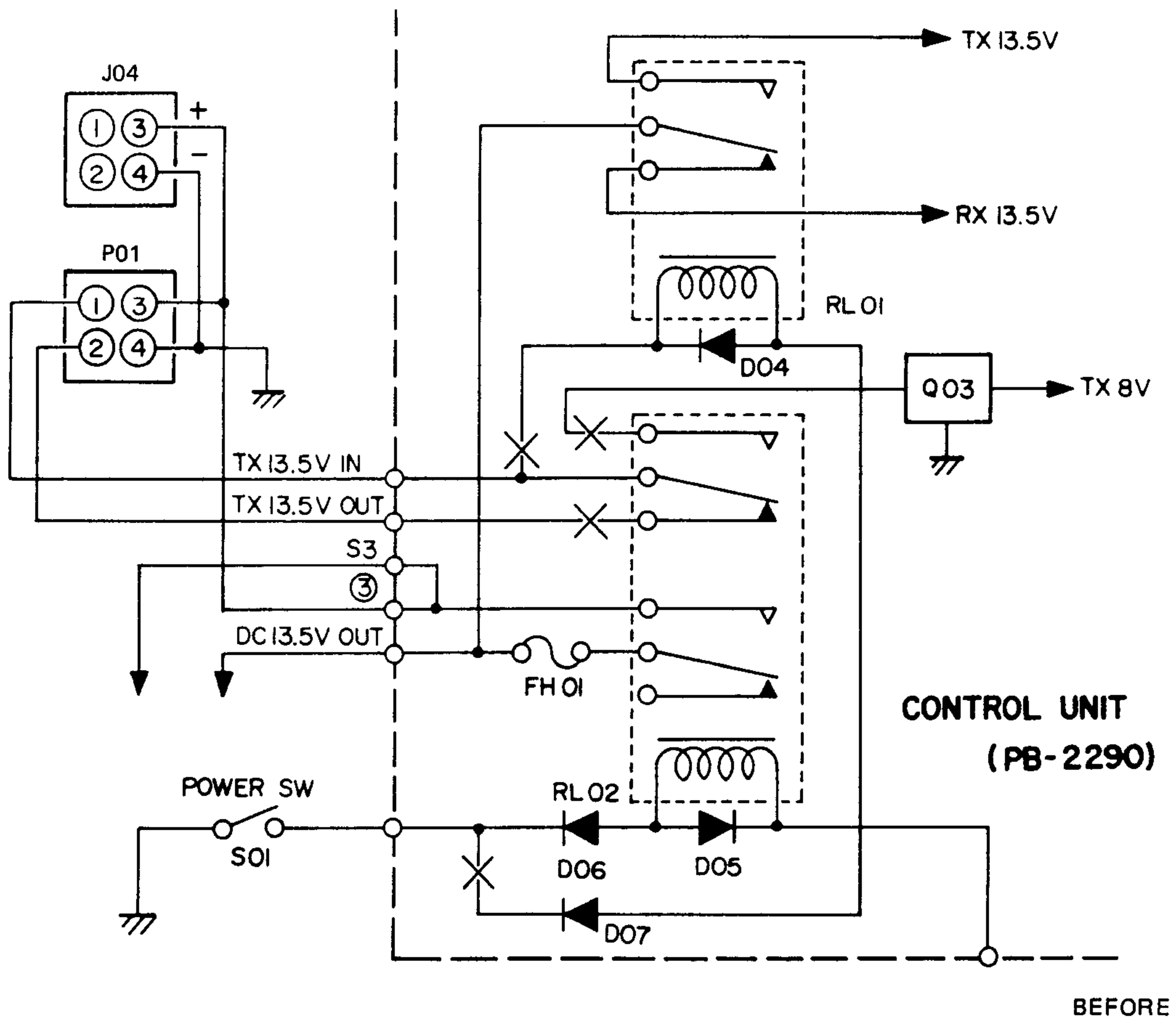


Figure 8

AFTER

# COMPONENT APPLICATIONS

## MAIN CHASSIS

PART NO.	DEVICE	TYPE	FUNCTION	V1001	12BY7A	Vacuum Tube	TX Driver Amplifier
Q1	2SB705R	Transistor	Regulator	XF1001	8.2M20A	Monolithic Filter	RX 1st IF Filter
Q2	μPC7808H	IC	"				
Q3	μPC7812H	"	"				
Q4	"	"	"				

PART NO.	DEVICE	TYPE	FUNCTION
D1	S4V10	Si Diode Bridge	Rectifier
D2	1S1555	Si Diode	Switch
D5	1S1555	Si Diode	Switch
D6	Not Used		
D7	"		
D8	1S1555	Si Diode	Switch
D9	"	"	"
D10	Not Used		
D11	1S1555	Si Diode	Switch
D12	"	"	"
D13	"	"	"
D14	10D1	"	Back Pulse Canceling Diode
D15	1S1555	Si Diode	Switch
D19	1S1555	Si Diode	Switch
D20	10D1	"	"
D21	1S1555	"	"

## IF UNIT

PART NO.	DEVICE	TYPE	FUNCTION
Q2001	2SK125Y	Junction FET	RX 1st IF Amplifier
Q2002	"	"	"
Q2003	3SK73GR	Dual Gate MOS FET	RX 1st IF Amplifier
			TX 2nd IF Amplifier (for CW, AM, FM)
Q2004	"	"	RX 2nd Mixer
Q2005	2SK19TM-GR	Junction FET	TX 1st IF Buffer Amplifier (for SSB)
Q2006	2SC1815Y	Transistor	RX Q Multiplier
Q2007	"	"	"
Q2008	"	"	RX 2nd IF Buffer Amplifier
Q2009	"	"	Regulator
Q2010	3SK73GR	Dual Gate MOS FET	RX 2nd IF Amplifier
			TX 1st IF Amplifier (@ Processor ON)
Q2011	2SC1815Y	Transistor	RX 2nd IF Buffer Amplifier (for IF OUT-1)
Q2012	2SC1815GR	"	RX AGC Amplifier
Q2013	2SK19TM-GR	Junction FET	RX S-Meter Amplifier
Q2014	2SA564AR	Transistor	"
Q2015	2SC1815Y	"	TX 1st IF Amplifier (@ Processor ON)

## RF UNIT

PART NO.	DEVICE	TYPE	FUNCTION
Q1001	2SK125Y	Junction FET	RX RF Amplifier
Q1002	"	"	"
Q1003	2SC1815Y	Transistor	RX Buffer Amplifier (for IF OUT-2)
Q1004	2SK125Y	Junction FET	RX Buffer Amplifier (for FM, N.B)
Q1005	"	"	RX 1st Mixer
Q1006	"	"	"
Q1007	2SC2407	Transistor	TX RF Amplifier
Q1008	ND487C2-3R	IC (Ring Module)	TX 2nd Mixer
Q1009	2SC1589	Transistor	TX RF Amplifier
Q1010	2SC1971	"	"
D1001	Not Used		
D1002	1S1555	Si Diode	Regulator
D1003	"	"	Back Pulse Canceling Diode
D1004	"	"	Switch
D1005	"	"	"
D1006	"	"	Back Pulse Canceling Diode
D1007	"	"	"
D1008	"	"	"
D1009	HZ3C1	Zener Diode	Regulator
D1010	10D10	Si Diode	Temperature Compensator
D1011	"	"	"
D1012	1S1555	"	Back Pulse Canceling Diode
D1013	"	"	Regulator
D1014	"	"	Switch
D1015	"	"	"

D2001	1SS97	Schottky Barrier Di.	RX N.B. GATE	D2067	1S1555	Si Diode	Switch
D2002	"	"	"	D2068	"	"	Threshold Level Compensator
D2003	FC63	Varactor Diode	"	D2069	Not Used		
D2004	1S1555	Si Diode	Switch	D2070	"		
}	}	}	}	D2071	1S1555	Si Diode	Switch
				D2072	"	"	"
}	}	}	}	D2073	BZ090	Zener Diode	Regulator
				D2074	"	"	"
D2010	1S1555	Si Diode	Switch	D2075	1S1555	Si Diode	Switch
D2011	1SS97	Schottky Barrier Di.	Switch	D2076	1S1555	Si Diode	Switch
}	}	}	}	}	}	}	}
D2021	1S1555	Si Diode	"	D2078	1S1555	Si Diode	Switch
D2022	1SS97	Schottky Barrier Di.	"	D2079	Not Used		
D2023	1S1555	Si Diode	"	D2080	1N60	Ge Diode	RX AM Detector
D2024	1SS97	Schottky Barrier Di.	Switch	D2081	1S1555	Si Diode	Switch
}	}	}	}	D2082	"	"	"
				TH2001	D33A	Thermistor	Temperature Compensator
}	}	}	}	XF2001	XF-8.2HS	Crystal Filter	RX 1st IF Filter (for SSB, CW) TX SSB Filter
				XF2002	XF-8.2GA	"	RX 1st IF Filter (for AM; Option)
D2028	1SS97	Schottky Barrier Di.	Switch	XF2003	XF-8.2HC	"	RX 1st IF Filter (for CW(W); Option)
D2029	1S1555	Si Diode	"	XF2003	XF-8.2HCN	"	RX 1st IF Filter (for CW(N); Option)
D2030	"	"	"	XF2004	XF-8.2HSN	"	RX 1st IF Filter (for SSB(N); Option)
D2031	FC-53M-4	Varactor Diode	RX Notch Filter Rejection Frequency Controller	XF2005	XF-455C	"	RX 2nd IF Filter (for CW(W); Option)
D2032	1S1555	Si Diode	Switch	XF2005	XF-455CN	"	RX 2nd IF Filter (for CW(N); Option)
}	}	}	}	CF2001	CFM-455J1	Ceramic Filter	RX 2nd IF Filter (for SSB(W), (N), CW(W)) TX SSB Filter
				D2036	1S1555	Si Diode	Switch
D2037	Not Used						
D2038	1N60	Ge diode	RX AM Detector				
D2039	1N270	"	RX AGC Detector				
D2040	"	"	"				
D2041	1S1555	Si Diode	Switch				
}	}	}	}	<b>AF UNIT</b>			
				D2045	1S1555	Si Diode	Switch
D2046	1SS97	Schottky Barrier Di.	TX ALC Detector	Q3001	2SC732TM-GR	Transistor	TX MIC Amplifier
}	}	}	}	Q3002	2SC1815GR	"	"
				Q3003	2SC1815BL	"	"
D2047	1S1555	Si Diode	Back Pulse Canceling Diode	Q3004	2SC732TM-GR	"	TX MIC Tone Controller
D2048	HZ9C1	Zener Diode	"	Q3005	2SC1815Y	"	TX CW Side Tone Oscillator
D2049	1S1555	Si Diode	Switch	Q3006	"	"	TX ANTI-TRIP Amplifier
D2050	"	"	"	Q3007	"	"	TX ANTI-TRIP DC Amplifier
D2051	"	"	"	Q3008	2SA733AQ	"	"
D2052	"	"	"	Q3009	"	"	Switch
D2053	1N60	Ge Diode	RX N.B. Noise Detector	Q3010	2SC1815Y	"	TX VOX Amplifier
D2054	"	"	"	Q3011	"	"	TX VOX DC Amplifier
D2055	"	"	RX N.B. AGC Detector	Q3012	2SA733AQ	"	Switch
D2056	"	"	"	Q3013	2SC1815Y	"	Relay Driver
D2057	1S1555	Si Diode	TX COMP M Detector	Q3014	"	"	"
D2058	"	"	"	Q3015	2SA496Y	"	Relay Controller
D2059	1SS97	Schottky Barrier Di.	Logarithmic Compensator	Q3016	2SC1815Y	"	TX AF OUT Buffer Amplifier
D2060	1S1555	Si Diode	Switch	Q3017	"	"	TX Carrier Buffer Amplifier
D2061	"	"	"	Q3018	"	"	RX Carrier Buffer Amplifier
D2062	1N60	Ge Diode	TX MONI. AM Detector				
D2063	Not Used						
D2064	1S1555	Si Diode	Back Pulse Canceling Diode				
D2065	Not Used						
D2066	1S1555	Si Diode	Switch				

				LOCAL UNIT			
				PART NO.	DEVICE	TYPE	FUNCTION
Q3019	MC14066B	IC	Switch				
Q3020	2SC1815Y	Transistor	RX AF Active L.P.F. (for CW)				
Q3021	"	"	RX AF Buffer Amplifier (for CW)	Q4001	2SC945AQ	Transistor	RX 1st Local VCO. TX 2nd Local VCO. (for 1.9, 3.5 MHz)
Q3022	2SC1815GR	"	RX AF Active L.P.F. (for AM, SSB)				
Q3023	"	"	RX AF Buffer Amplifier (for AM, SSB)	Q4002	"	"	RX 1st Local VCO. TX 2nd Local VCO. (for 7, 10 MHz)
Q3024	AN6551	IC	RX AF A.P.F.				
Q3025	μPC2002V	"	RX Audio Amplifier	Q4003	"	"	RX 1st Local VCO. TX 2nd Local VCO. (for 14 MHz)
Q3026	2SK19TMY	Junction FET	Carrier Oscillator (for CW, AM, FM)				
Q3027	2SC380Y	Transistor	Carrier Buffer Amplifier (for CW)	Q4004	"	"	RX 1st Local VCO. TX 2nd Local VCO. (for 18 MHz)
Q3028	"	"	Carrier Frequency Controller	Q4005	"	"	RX 1st Local VCO. TX 2nd Local VCO. (for 21, 24.5 MHz)
Q3029	"	"	Carrier Buffer Amplifier (for AM, FM)				
Q3030	2SC1815Y	"	MUTE Switch	Q4006	"	"	RX 1st Local VCO. TX 2nd Local VCO. (for 28 MHz, AUX)
D3001	1S1555	Si Diode	Switch				
D3002	1SS97	Schottky Barrier Di.	TX Balanced Modulator	Q4007	2SC535B	"	RX 1st Local Buffer Amplifier, TX 2nd Local Buffer Amplifier
				Q4008	2SC2407	"	"
				Q4009	2SC945AQ	"	PLL UNLOCK Switch
D3005	1SS97	Schottky Barrier Di.	TX Balanced Modulator	Q4010	"	"	"
				Q4011	2SC535B	"	RX 1st Local Buffer Amplifier, TX 2nd Local Buffer Amplifier
D3006	1S1555	Si Diode	Switch				
D3007	1N270	Ge Diode	"				
D3008	HZ3C1	Zener Diode	"	Q4012	SN76514N	IC	PLL Mixer
D3009	1N270	Ge Diode	"	Q4013	2SC535B	Transistor	PLL IF Buffer Amplifier
D3010	1S1555	Si Diode	"	Q4014	"	"	"
D3011	1N60	Ge Diode	TX ANTI-TRIP Detector	Q4015	"	"	"
D3012	1S1555	Si Diode	Switch	Q4016	2SA733AQ	"	PLL UNLOCK Amplifier
D3013	"	"	"	Q4017	SN74LS192	IC	PLL Programmable Divider
D3014	1N60	Ge Diode	TX VOX Detector				
D3015	10D1	Si Diode	Back Pulse Canceling Diode	Q4018	MC4044	"	PLL Phase Detector
				Q4019	SN74LS90	"	PLL Reference 1/5, 1/10 Divider
D3016	1S1555	Si Diode	Switch	Q4020	MC14518BCP	"	PLL Reference 1/2, 1/40 Divider
				Q4021	2SC945AQ	Transistor	PLL Reference Buffer Amplifier
D3020	1S1555	Si Diode	Switch	Q4022	2SC732GR	"	PLL Active L P F.
D3021	1N60	Ge Diode	RX Balanced Demodulator	Q4023	"	"	"
				Q4024	SN76514N	IC	PLL Mixer
				Q4025	3SK73GR	Dual Gate MOS FET	"
D3024	1N60	Ge Diode	RX Balanced Demodulator	Q4026	2SC945AQ	Transistor	PLL Reference Oscillator
				Q4027	"	"	PLL Reference Buffer Amplifier
D3025	1S1555	Si Diode	Switch	Q4028	"	"	"
				Q4029	"	"	PLL Reference Doubler
D3028	1S1555	Si Diode	Switch	Q4030	3SK73GR	Dual Gate MOS FET	PLL Mixer
D3029	Not Used						
D3030	1S1555	Si Diode	Switch	Q4031	2SC945AQ	Transistor	PLL Buffer Amplifier
D3031	"	"	"	Q4032	"	"	RX 2nd, TX 1st Local Frequency Controller
D3032	"	"	"	Q4033	"	"	RX 2nd, TX 1st Local VCXO
D3033	Not Used			Q4034	"	"	RX 2nd, TX 1st Local Buffer Amplifier
D3034	"						
D3035	1S1555	Si Diode	Switch	Q4035	"	"	"
				Q4036	"	"	Carrier VCXO (for CW, SSB)
X 3001	8.2159 MHz	Crystal	Carrier Oscillator (for CW, AM, FM)	Q4037	"	"	VCXO Buffer Amplifier
				Q4038	3SK73GR	Dual Gate MOS FET	RX 2nd, TX 1st Local Mixer
				Q4039	2SC945AQ	Transistor	RX 2nd, TX 1st Local Buffer Amplifier
				Q4040	3SK73GR	Dual Gate MOS FET	Carrier Mixer
				Q4041	2SC945AQ	Transistor	Carrier Buffer Amplifier
				Q4042	"	"	Switch

D4001	1SS53	Si Diode	Switch
D4041	1SS53	Si Diode	Switch
D4042	FC-52M	Varactor Diode	RX 1st Local VCO. TX 2nd Local VCO. (for 1.9, 3.5 MHz)
D4043	1SS53	Si Diode	Switch
D4044	"	"	"
D4045	"	"	"
D4046	FC-52M	Varactor Diode	RX 1st Local VCO. TX 2nd Local VCO. (for 7, 10 MHz)
D4047	1SS53	Si Diode	Switch
D4048	FC-52M	Varactor Diode	RX 1st Local VCO. TX 2nd Local VCO. (for 14 MHz)
D4049	1SS53	Si Diode	Switch
D4050	FC-52M	Varactor Diode	RX 1st Local VCO. TX 2nd Local VCO. (for 18 MHz)
D4051	1SS53	Si Diode	Switch
D4052	"	"	"
D4053	"	"	"
D4054	FC-52M	Varactor Diode	RX 1st Local VCO. TX 2nd Local VCO. (for 21, 24.5 MHz)
D4055	1SS53	Si Diode	Switch
D4056	"	"	"
D4057	"	"	"
D4058	FC-52M	Varactor Diode	RX 1st Local VCO. TX 2nd Local VCO. (for 28 MHz, AUX)
D4059	1SS53	Si Diode	Switch
D4060	"	"	"
D4061	"	"	"
D4062	HZ5C2	Zener Diode	Regulator
D4063	1SS53	Si Diode	Switch
D4074	1SS53	Si Diode	Switch
D4075	1SS97	Schottky Barrier Di.	Switch
D4076	Not Used		
D4077	1SS53	Si Diode	Switch
D4078	"	"	"
D4079	1SV50	Varactor Diode	RX 2nd, TX 1st Local VCXO
D4080	1SS53	Si Diode	Switch
D4081	"	"	"
D4082	1SV50	Varactor Diode	Carrier VCXO (for CW, SSB)
D4083	10D1	Si Diode	Back Pulse Canceling Diode
D4084	1SS97	Schottky Barrier Di.	Switch
D4085	1SS53	Si Diode	"
D4086	1S1555	Si Diode	Switch
D4089	1S1555	Si Diode	Switch
X4001	10.0 MHz	Crystal	PLL Reference Oscillator
X4002	19.215 MHz	"	RX 2nd, TX 1st Local VCXO
X4003	10.5434 MHz	"	Carrier VCXO (for LSB)
X4004	10.5466 MHz	"	Carrier VCXO (for USB)

### COUNTER UNIT

PART NO.	DEVICE	TYPE	FUNCTION
Q5001	2SC1815Y	Transistor	Counter Buffer Amplifier
Q5002	"	"	"
Q5003	MC14518B	IC	Counter Divider
Q5004	"	"	"
Q5005	MC14011B	"	Counter Mixer
Q5006	MC14022	"	Counter Divider
Q5007	TC5070	"	Counter
Q5008	TC5066	"	Frequency Display Driver
Q5009	"	"	Frequency Display Digit Driver
Q5010	"	"	Frequency Display Segment Driver
Q5011	MC14011	"	Counter Encoder
Q5012	MC14081B	"	"
Q5013	"	"	"
Q5014	2SC1815GR	Transistor	Oscillator (for DC-DC Converter)
Q5015	78L05	IC	Regulator
D5001	1S1555	Si Diode	Switch
D5065	1S1555	Si Diode	Switch
D5066	HZ5C2	Zener Diode	Regulator
D5067	1S1554	Si Diode	Switch
D5068	Not Used		
D5069	1S1555	Si Diode	Switch

### FM/AM UNIT (OPTION)

PART NO.	DEVICE	TYPE	FUNCTION
Q6001	TA7069P	IC	TX AM Modulator
Q6002	2SK19TM-GR	Junction FET	TX 2nd IF Buffer Amplifier
Q6003	TC5082P	IC	TX 2nd IF 1/2 <sup>8</sup> Divider
Q6004	2SK19TM-GR	Junction FET	VCO Buffer Amplifier
Q6005	TC5082P	IC	VCO 1/2 <sup>8</sup> Divider
Q6006	2SK19TM-BL	Junction FET	VCO (for FM TX Carrier)
Q6007	2SC380Y	Transistor	VCO Buffer Amplifier
Q6008	MC3359	IC	RX FM Mixer, Limiter Amplifier, Discriminator
Q6009	Not Used		Noise Amplifier, Squelch Switch
Q6010	2SC1815GR	Transistor	RX Squelch Switch
Q6011	"	"	"
Q6012	"	"	"
Q6013	TC5081P	IC	RX Mute Switch
Q6014	μPC577H	"	Phase Detector
Q6015	2SC1815GR	Transistor	TX MIC Limiter Amplifier (for FM) Active L.P.F.
D6001	1S1555	Si Diode	Switch
D6002	"	"	"
D6003	MV104	Varactor Diode	TX FM Modulator
D6004	1N60	Ge Diode	RX FM Noise Detector
D6005	"	"	"

D6006	1S1555	Si Diode	TX IDC.
D6007	"	"	"
XF6001	8.2M20A	Crystal Filter	RX FM 1st IF Filter
CF6001	CFX455D	Ceramic Filter	RX FM Discriminator
TH6001	Not Used		
TH6002	D33A	Thermistor	Temperature Compensator

D8501	10D10	Si Diode	Rectifier
D8504	10D10	Si Diode	Rectifier
D8505	V06B	"	"
D8506	HZ6C1	Zener Diode	Regulator
D8507	AW01-24	"	"

### VFO UNIT

PART NO.	DEVICE	TYPE	FUNCTION
Q7001	VFO-01	IC	Oscillator, Buffer Amplifier
D7001	1S2236	Varactor Di	Clarifier Frequency Controller

### VR UNIT

PART NO.	DEVICE	TYPE	FUNCTION
D9001	1S1555	Si Diode	Switch

### SW UNIT A

PART NO.	DEVICE	TYPE	FUNCTION
D9201	1S1555	Si Diode	Switch
D9202	"	"	"
D9203	GD4-203SRD	LED	Clarifier Indicator
D9204	"	"	"

### RECT A UNIT

PART NO.	DEVICE	TYPE	FUNCTION
Q8001	2SA733AQ	Transistor	KEY Switch
Q8002	2SC1815Y	"	"
Q8003	2SA639Q	"	"
Q8004	2SC2229	"	TX ALC DC Amplifier
D8001	SM1-12	Si Diode	Rectifier
D8002	10D10	"	"
D8003	"	"	"
D8004	"	"	Back Pulse Canceling Diode
D8005	"	"	"
D8006	"	"	Rectifier
D8007	1S1555	"	Switch
D8008	"	"	"
D8009	Not Used		
D8010	"		
D8011	1S1555	Si Diode	Temperature Compensator
D8012	"	"	"
D8013	"	"	KEY Switch
D8014	"	"	"
D8015	"	"	TX ALC Detector
D8016	"	"	Switch
D8017	"	"	Temperature Compensator
D8018	"	"	Switch

### SW UNIT B

PART NO.	DEVICE	TYPE	FUNCTION
D9401	1S1555	Si Diode	Switch
D9405	1S1555	Si Diode	Switch

### RELAY UNIT A

PART NO.	DEVICE	TYPE	FUNCTION
D9601	1S1555	Si Diode	Back Pulse Canceling Diode
D9602	1N60	Ge Diode	TX PO. Meter Voltage Detector

### RECT B UNIT

PART NO.	DEVICE	TYPE	FUNCTION
Q8501	2SA733AQ	Transistor	Regulator
Q8502	μPC78L12	IC	"
Q8503	2SC496Y	Transistor	"
Q8504	2SC1815Y	"	Switch
Q8505	μPC78L15	IC	Regulator

### FINAL BOARD

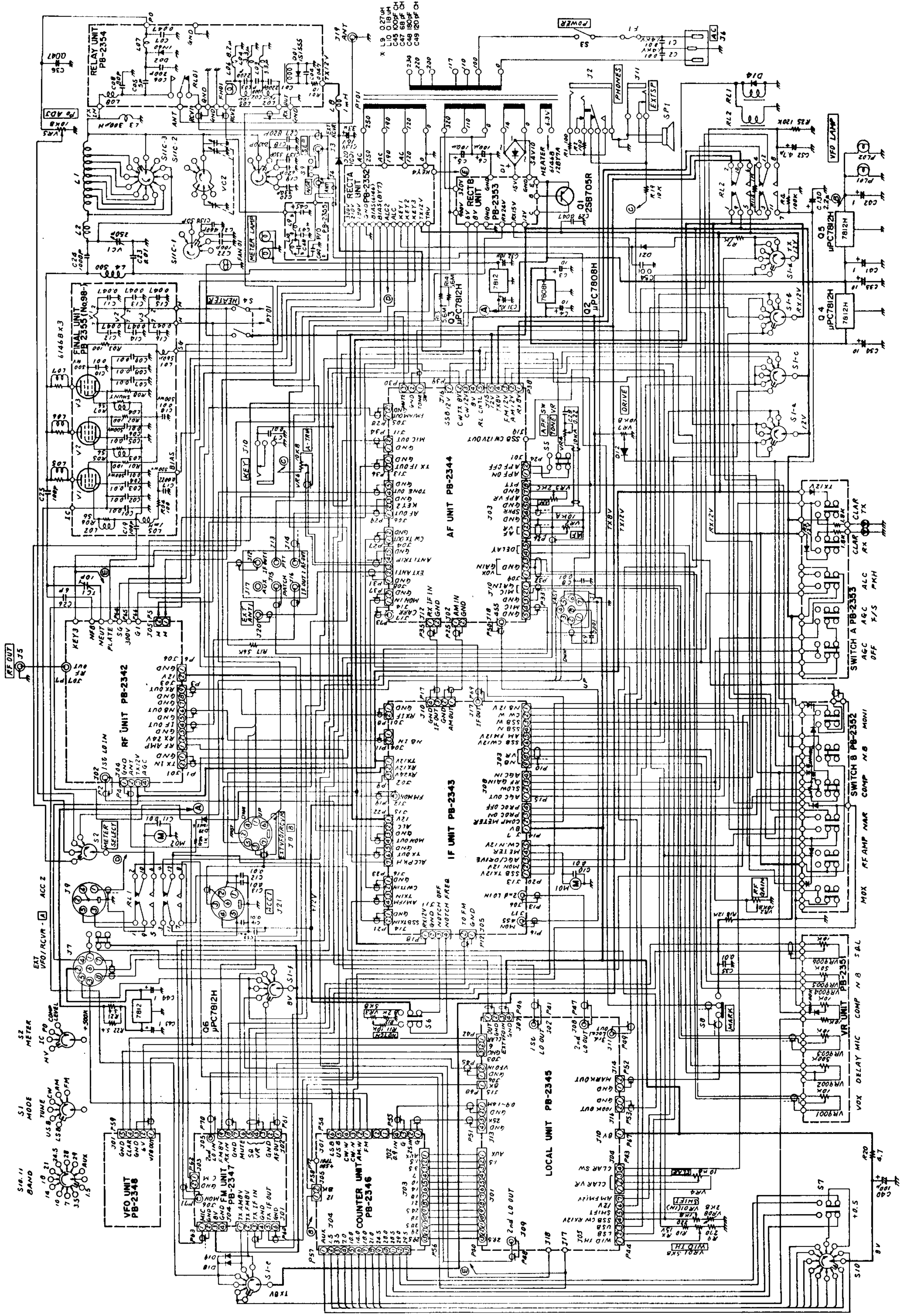
PART NO.	DEVICE	TYPE	FUNCTION
V9801	6146B	Vacuum Tube	TX Final Amplifier
V9802	"	"	"
V9803	"	"	"

(V9801, V9803: 100W Type)

### RELAY UNIT B

PART NO.	DEVICE	TYPE	FUNCTION
D9901	1S1555	Si Diode	Switch
D9902	10D10	"	Back Pulse Canceling Diode

— MEMO —



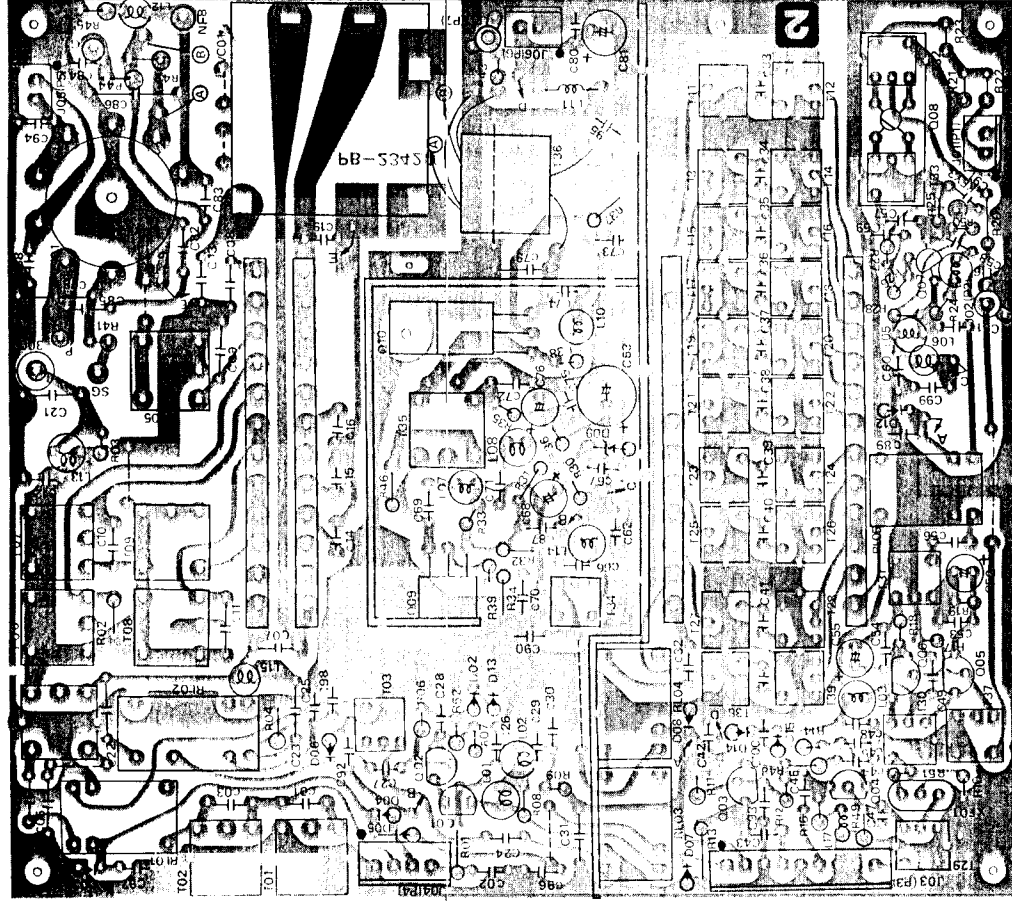
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WIRING DIAGRAM

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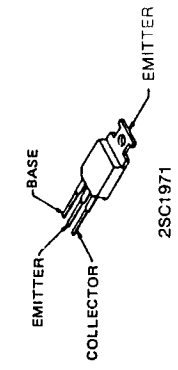
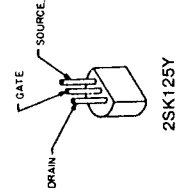
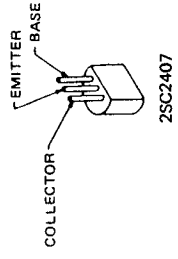
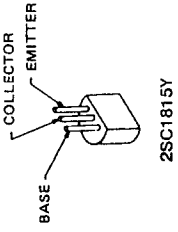
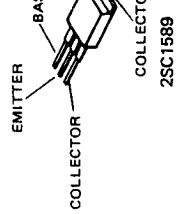
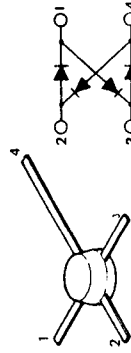
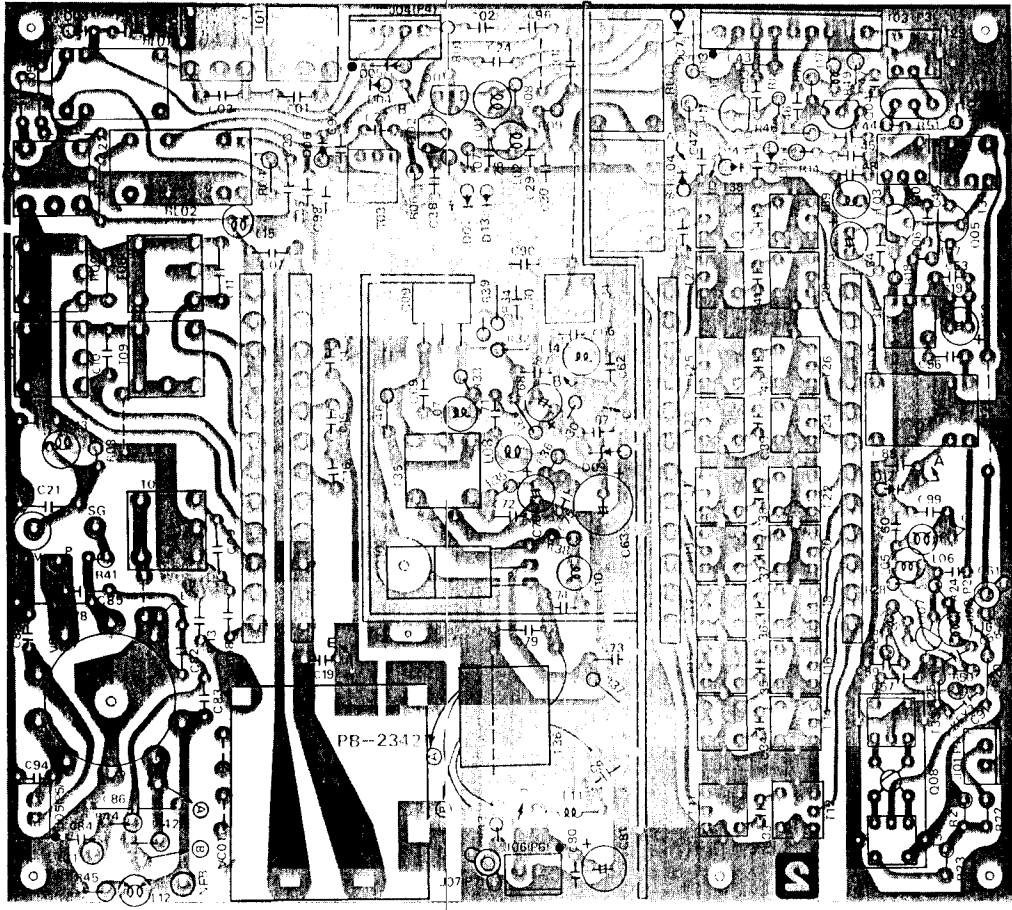




# RF UNIT PARTS LAYOUT



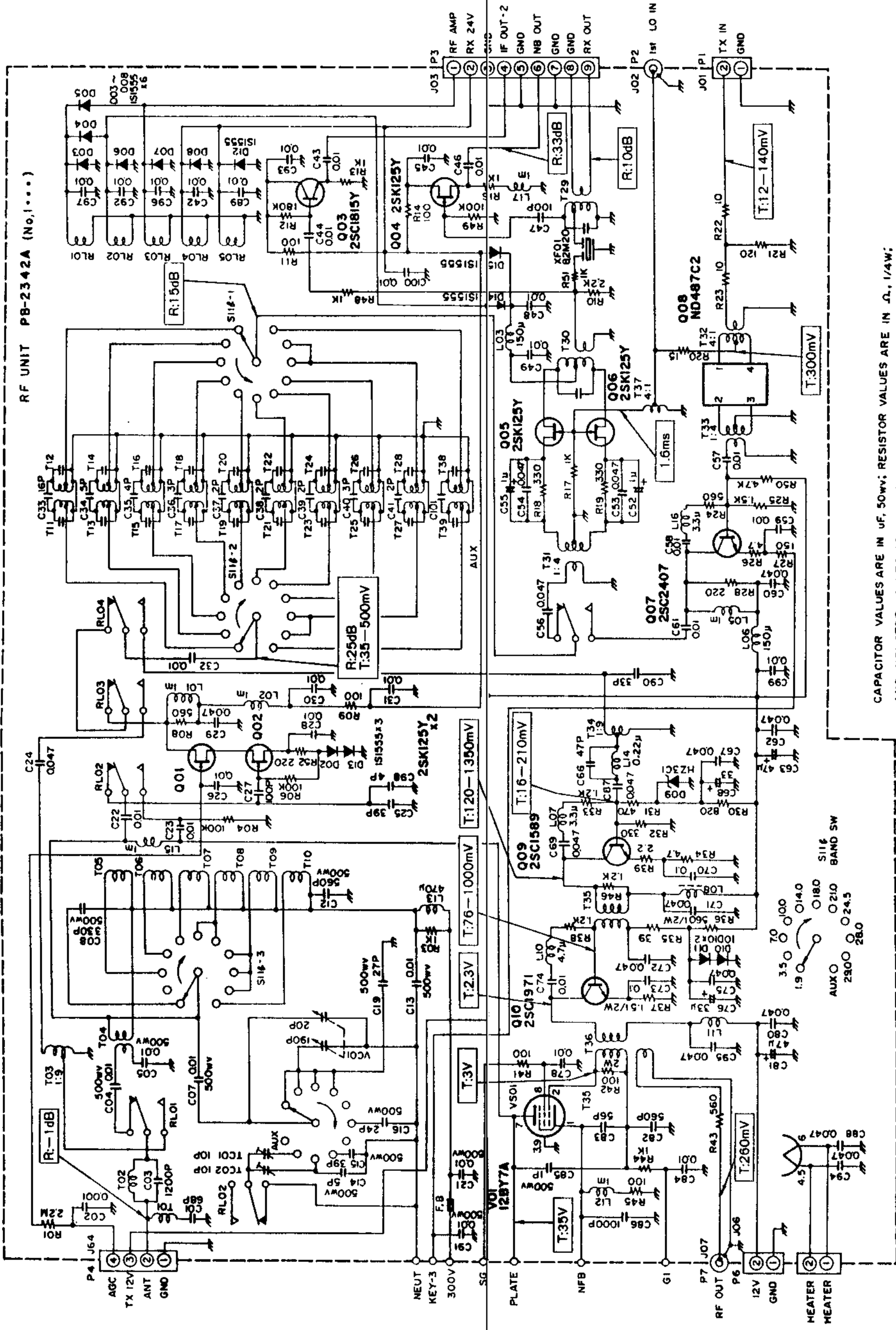
# RF UNIT PARTS LAYOUT



Viewed from Component Side

Viewed from Solder Side

# RF UNIT

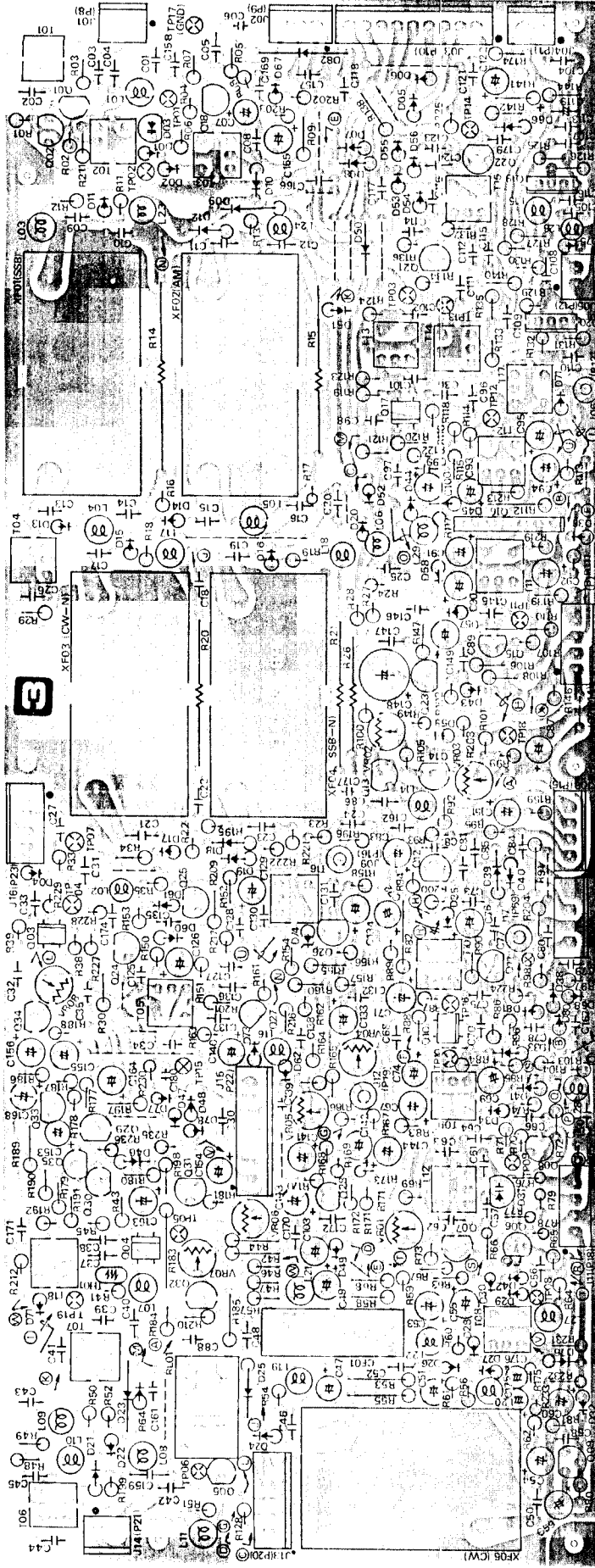


CAPACITOR VALUES ARE IN µF, 50V; RESISTOR VALUES ARE IN Ω, 1/4W;  
AND INDUCTOR VALUES ARE IN HENRIES UNLESS OTHERWISE NOTED.

	E/S (V)	C/D (V)	B/G (V)	G <sub>2</sub> (V)	REM
Q1001	7.5	24.0	4.1		
Q1002	4.0	7.5	1.6		
Q1003	12.0	24.0	12.8		
Q1004	3.4	24.0	0		
Q1005	2.8	23.5	0		
Q1006	2.8	23.5	0		
Q1007	5.9	12.0	6.4		TX
Q1009	0.4	12.0	1.2		
Q1010	0.3	12.0	1.2		

V1001	0	-19/0	0	H	H	300	235/180	0
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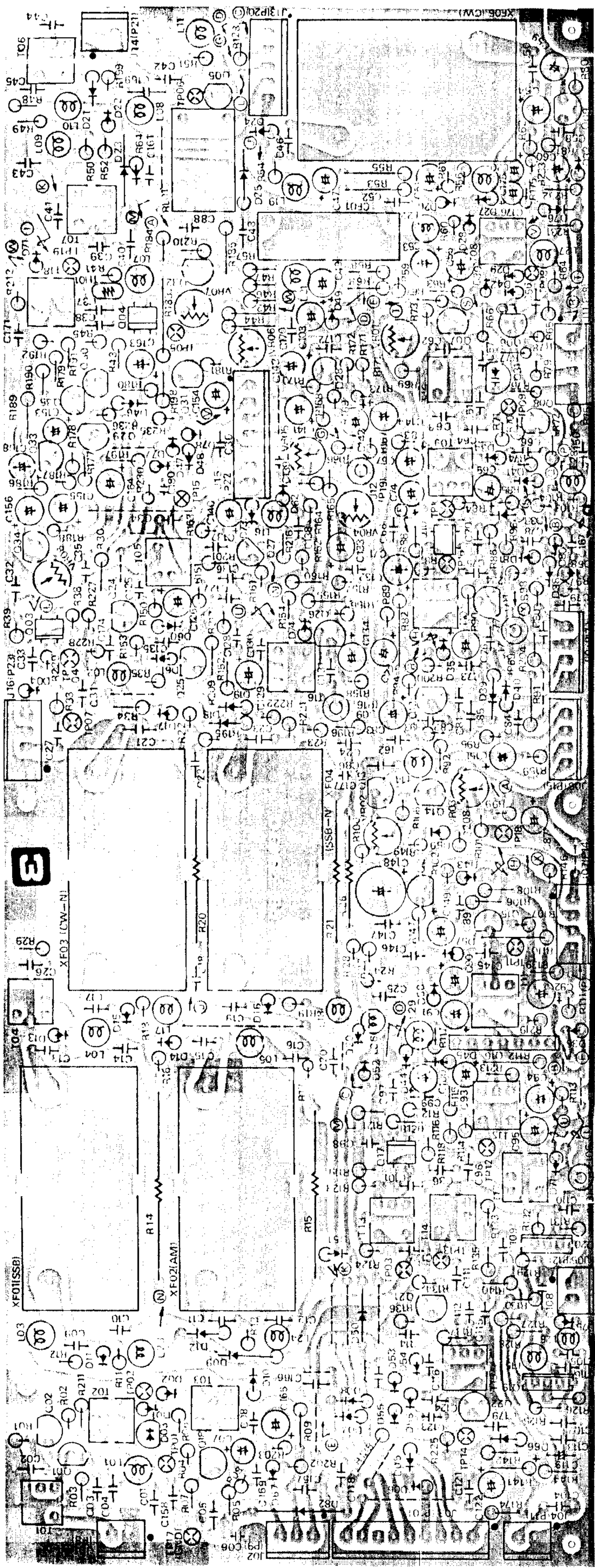
# IF UNIT PARTS LAYOUT



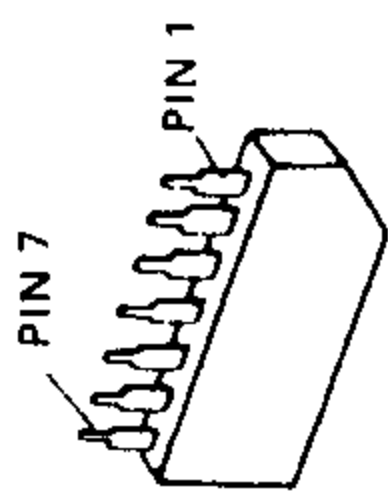
Viewed from Component Side

Q	E/S	G/D	B/G	G <sub>2</sub>	REM	E/S	C/D	B/G	G <sub>2</sub>	REM
Q2001	2.2	9.6	0			Q2019	1.0	7.8	2.2	B 1.2
Q2002	9.6	24.0	7.5			Q2020	1.0	7.8	B 1.6	B 1.5
Q2003	1.0	12.0	1.4	4.6		Q2021	2.0	11.8	2.6	NB ON
Q2004	2.3	8.6	2.0	3.6		Q2022	0	3.0	0	NB ON
Q2005	0.4	12.0	0		T	Q2023	0	12.0	0	T COMP ON
Q2006	3.0	9.8	3.6			Q2024	5.3	9.0	6.0	T MONI ON
Q2007	3.0	9.7	3.7			Q2025	1.1	9.2	0	T MONI ON
Q2008	3.7	9.8	4.3			Q2026	7.0	2.5	0	T MONI ON
Q2009	9.8	11.5	10.3			Q2027	1.2	3.5	2.0	T MONI ON
Q2010	2.3	8.3	2.2	5.3		Q2028	1.1	4.8	1.6	T MONI ON
Q2011	4.0	7.8	4.6			Q2029	1.6	3.1	0.7	T
Q2012	0	4.8	0			Q2030	0	0.1	0.5	T
Q2013	7.0	8.0	5.2			Q2031	4.2	10.0	3.0	T
Q2014	4.8	0	5.0			Q2032	11.5	0	11.0	T
Q2015	2.2	12.0	2.8		T COMP ON	Q2033	0.3	8.3	0.7	T
Q2016	0	12.0			T	Q2034	11.8	3.7	11.5	T
Q2017	2.0	11.8	2.4	4.2	T	Q2035	4.3	4.2	3.7	T
Q2018	0	8.2	0							

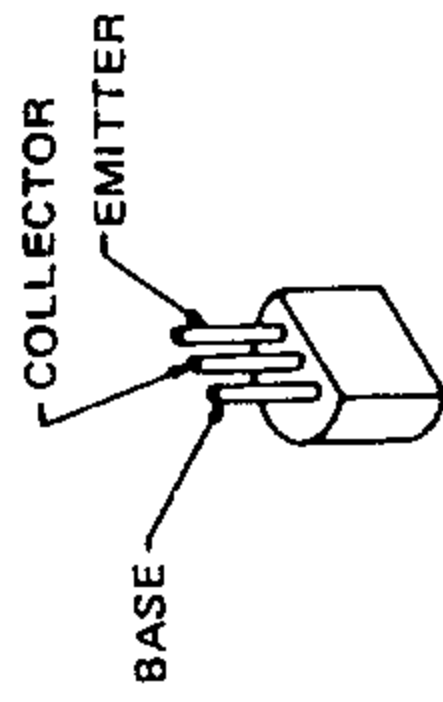
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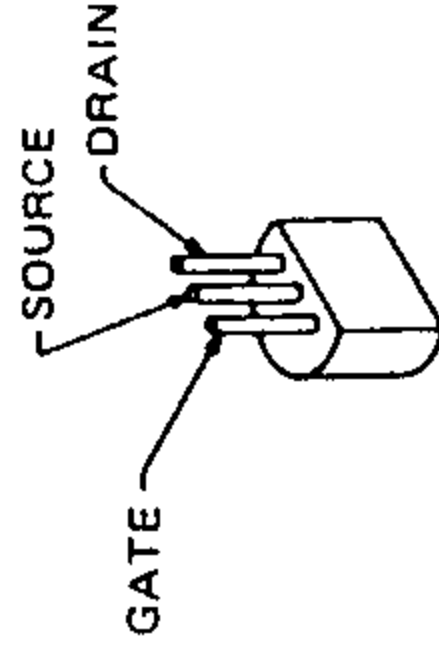
Viewed from Solder Side



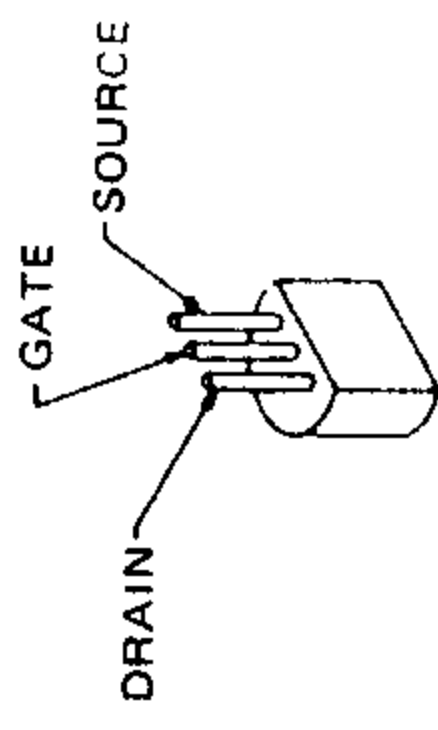
TA7060AP



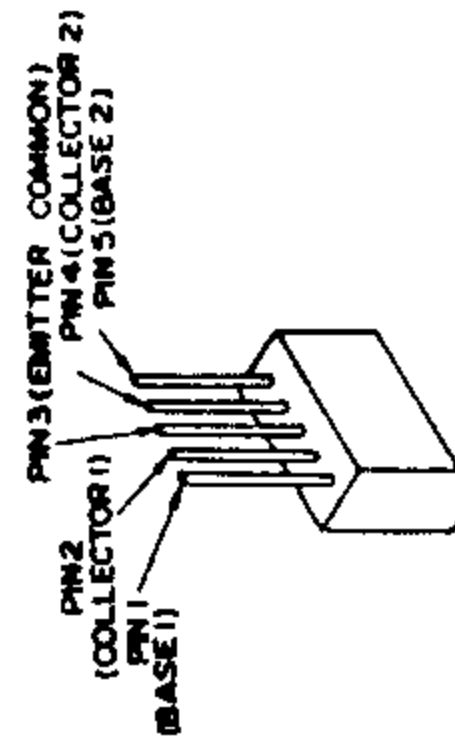
2SA564AR  
2SC380Y  
2SC1815GR  
2SC1815Y



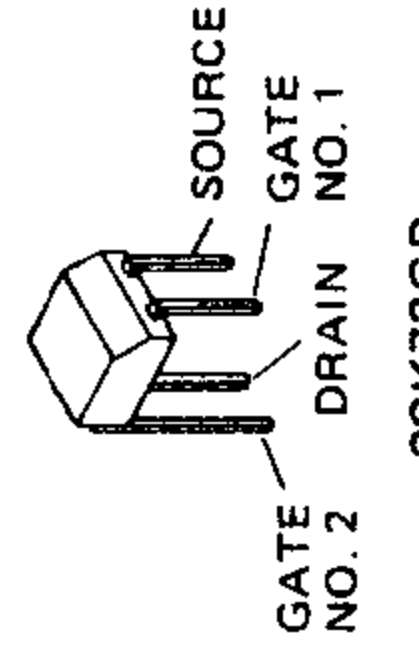
2SK19BL  
2SK19GR  
2SK19Y



2SK125Y



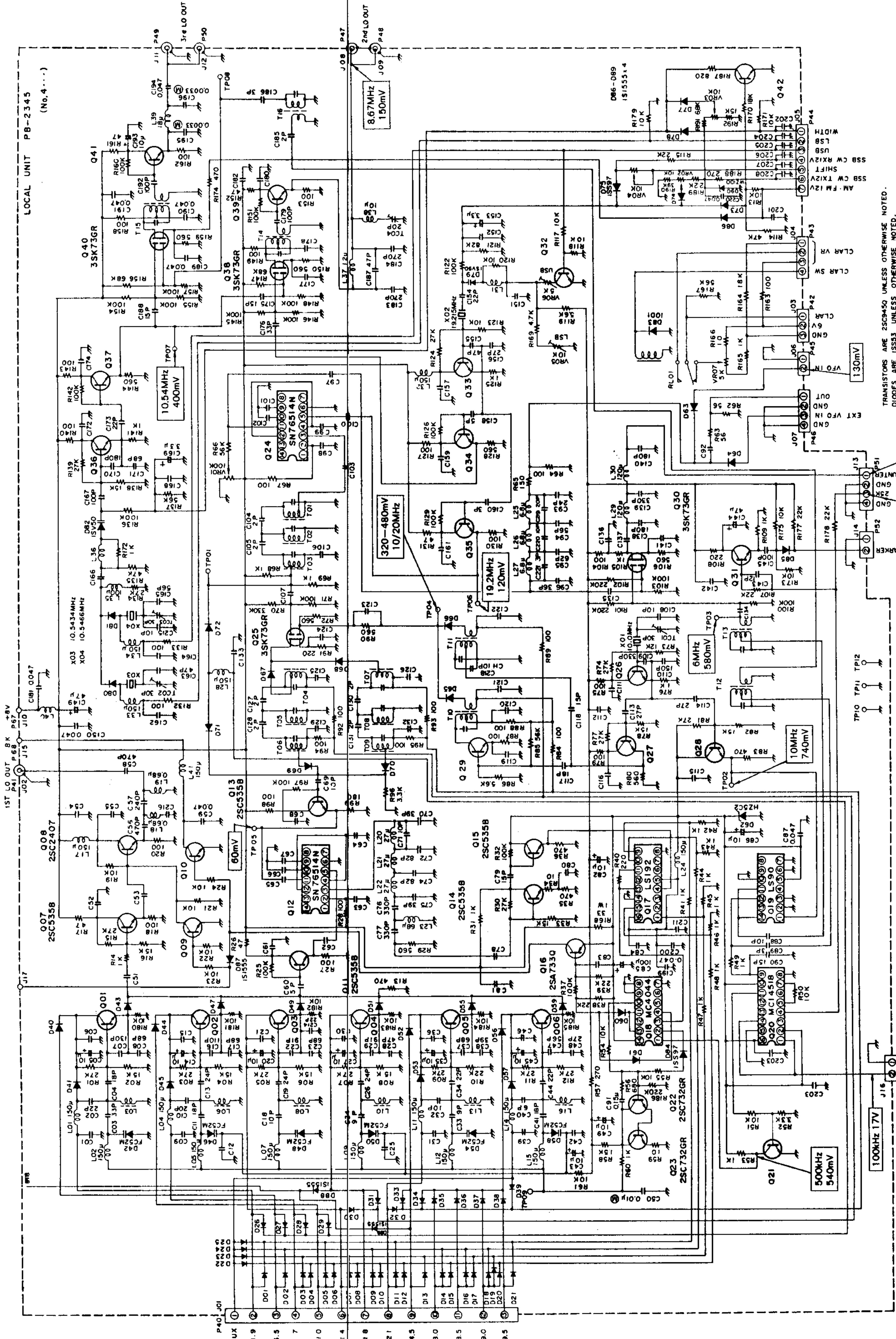
2SC1583



3SK73GR

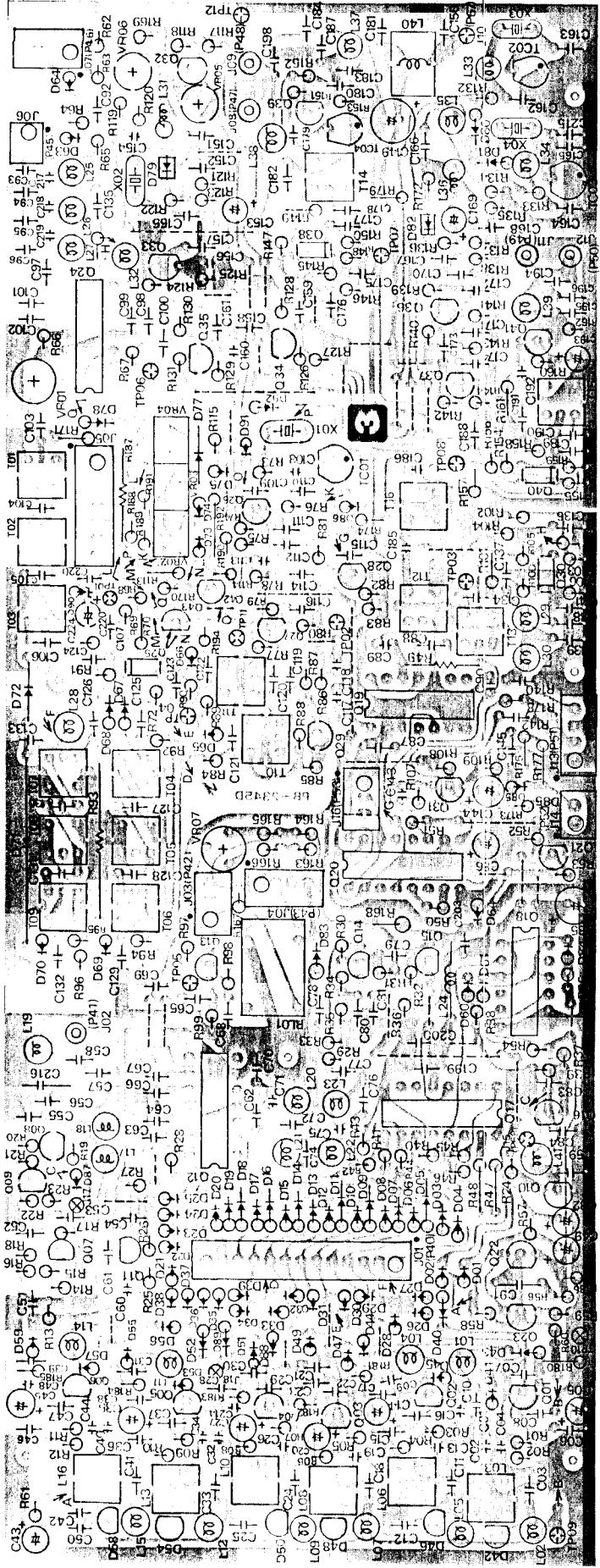


LOCAL UNIT



TRANSISTORS ARE 2SC350 UNLESS OTHERWISE NOTED.  
 DIODES ARE 1SS53 UNLESS OTHERWISE NOTED.  
 CAPACITORS ARE IN  $\mu\text{F}$  UNLESS OTHERWISE NOTED.  
 CAPACITOR VALUES ARE IN  $\mu\text{F}$ , 50mV, RESISTOR VALUES  
 ARE IN  $\Omega$ , 1/4 W, AND INDUCTOR VALUES ARE IN HENRIES  
 UNLESS OTHERWISE NOTED.

LOCAL UNIT PARTS LAYOUT

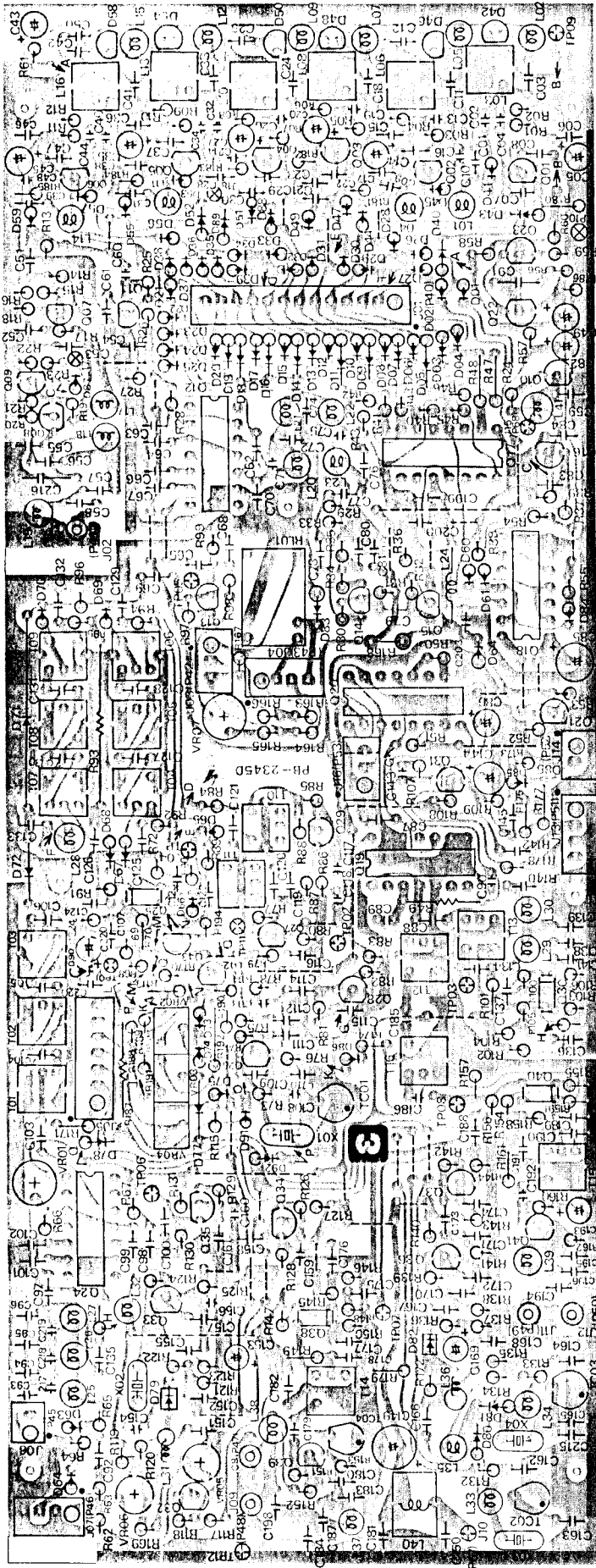


Viewed from Component Side

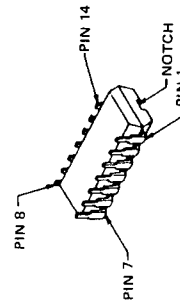
Q	E/S	C/D	B/G	G <sub>2</sub>	REM	E/S	C/D	B/G	G <sub>2</sub>	REM
Q4001	2.3	7.2	2.6	2.6	1.8MHz	0.8	Q4022	(VGV)		21MHz
Q4002	2.3	7.2	2.6	2.6	7 MHz	0	Q4023	(VGV) (0.8)		
Q4003	2.3	7.2	2.6	2.6	14 MHz	0	Q4024	8.0		
Q4004	2.3	7.2	2.6	2.6	18 MHz	1.7	Q4025	5.7	1.8	3.0
Q4005	3.0	7.2	3.0	3.0	21 MHz	2.5	Q4026	7.8	2.6	
Q4006	2.7	6.5	3.1	3.1	28 MHz	2.2	Q4027	7.8	2.6	
Q4007	0.9	7.8	1.8	1.8		1.7	Q4028	5.2	1.8	
Q4008	2.0	7.8	2.6	2.6		0.3	Q4029	6.5	2.5	21MHz
Q4009	0	2.6	0	0		2.2	Q4030	4.0	0.6	2.5
Q4010	0/0	5.2/0	0/0.7	0/0.7	UNLOCK	2.0/4.0	Q4031	7.8/-	1.8/4.5	-/□□□□25MHz
Q4011	0.7	7.8	1.5	1.5		0/0	Q4032	5.8/0	0/0.7	LSB/USB
Q4012	0	7.8				2.1	Q4033	8.0	2.3	
Q4013	1.0	7.8	1.8	1.8		3.5	Q2034	7.3	3.6	
Q4014	1.1	5.2	1.8	1.8		1.0	Q2035	7.8	1.7	
Q4015	2.0	5.2	2.7	2.7		2.2	Q2036	7.8	2.7	
Q4016	5.2	5.5	4.7	4.7		3.5	Q2037	7.8	4.2	
Q4017	0.0	5.2				4.2	Q2038	7.8	4.3	5.1
Q4018	0	5.2				1.3	Q2039	7.8	1.8	
Q4019	0	5.2				4.2	Q2040	7.8	4.3	5.1
Q4020	0.0	5.2				1.1	Q2041	7.8	1.8	
Q4021	0	2.0/5.2	0.5/0.9	0.5/0.9	/□□□□29MHz	0/0	Q2042	4.8/0	0/0.7	SSB/AM



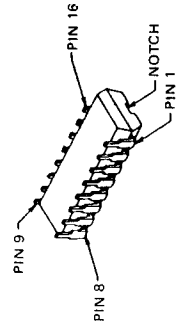
# LOCAL UNIT PARTS LAYOUT



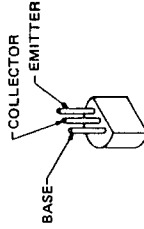
Viewed from Soliter Side



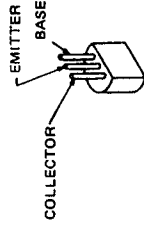
MC4044  
SN76514N



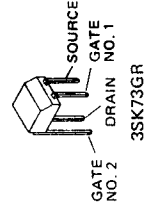
MC14518BCP  
SN74LS192



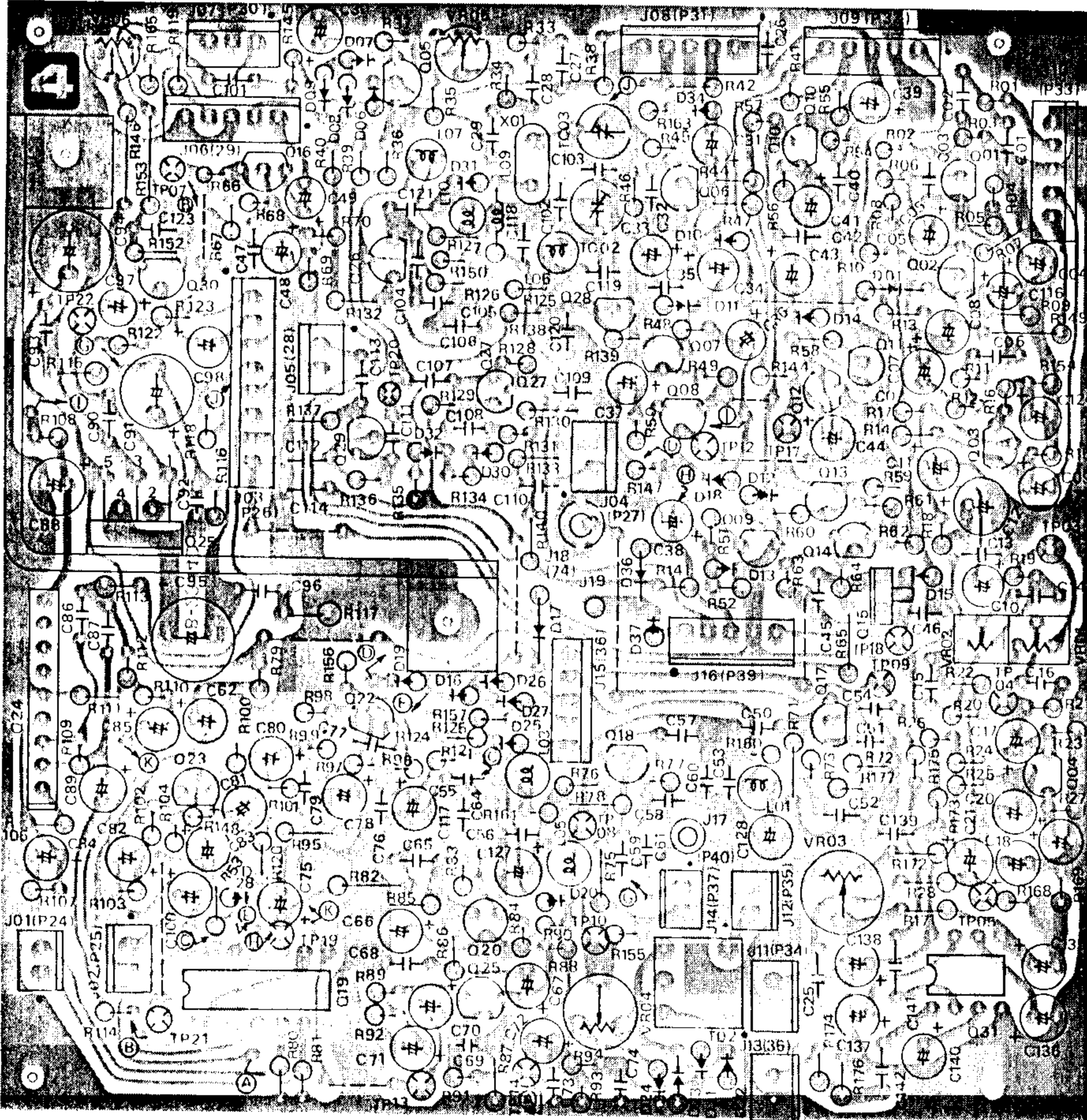
2SA7330  
2SC535B  
2SC732GR  
2SC945Q



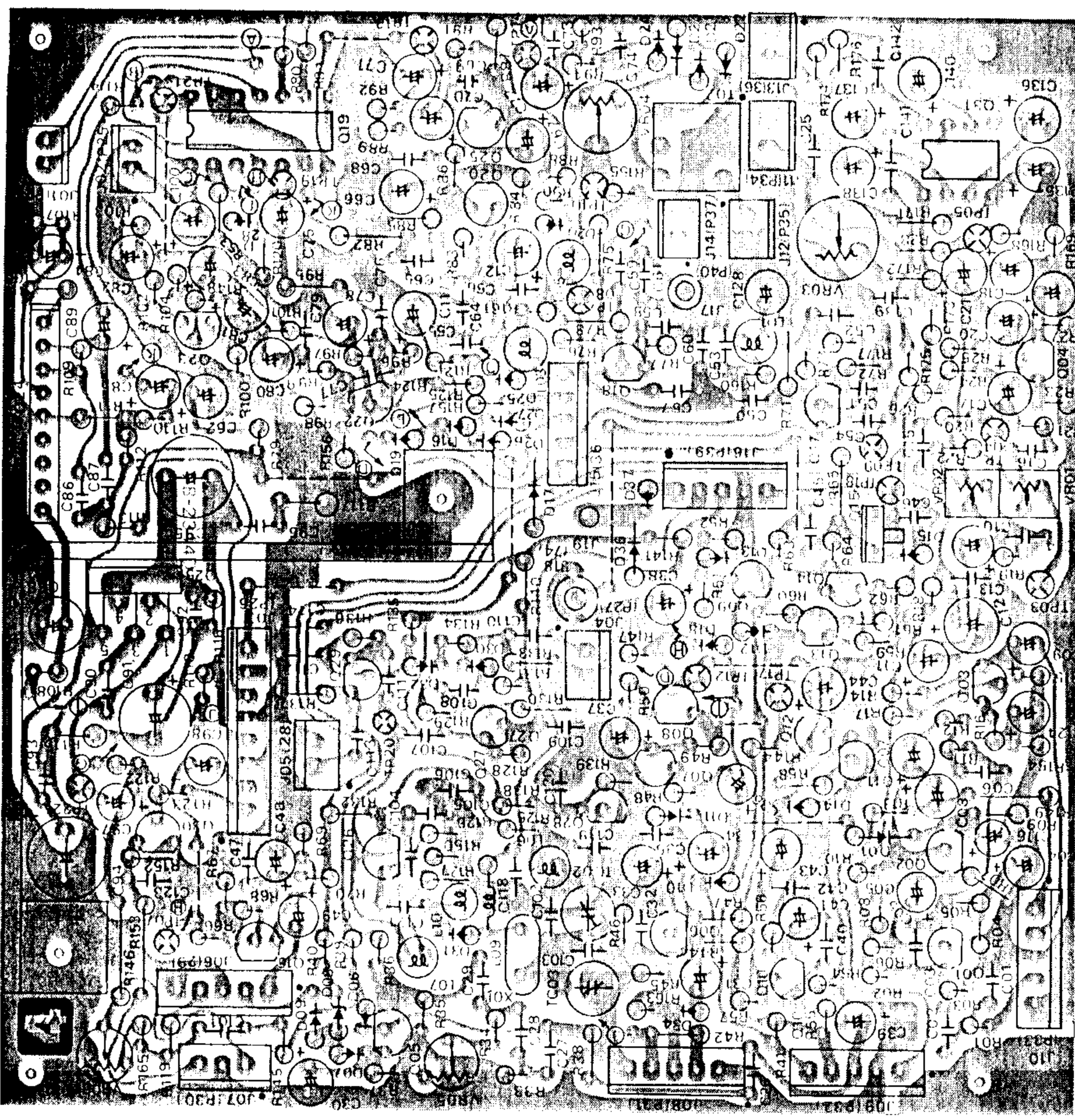
2SC2407



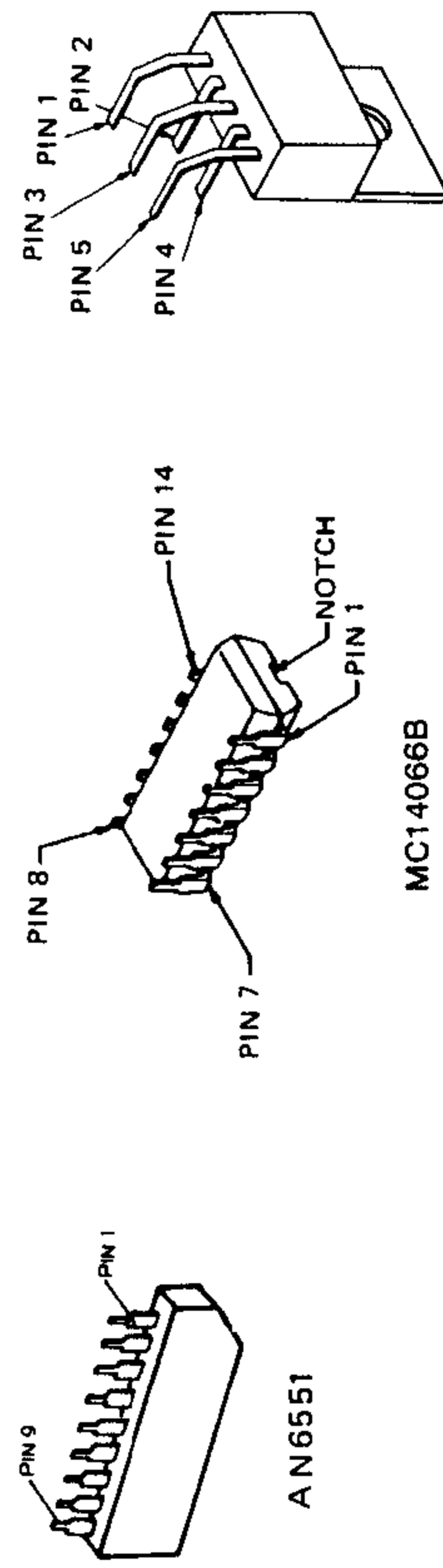
AF UNIT PARTS LAYOUT



AF UNIT PARTS LAYOUT



Viewed from Component Side



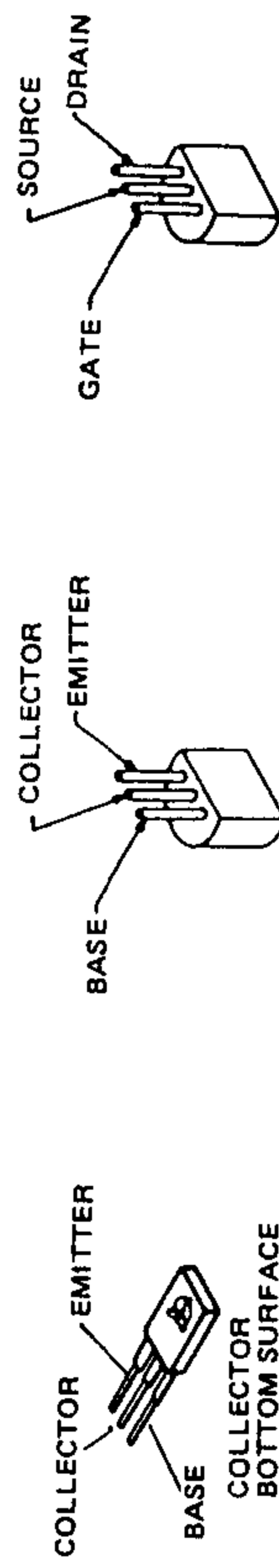
A N6551

MC14066B

µPC2002V

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RadioAmateur.EU

Viewed from Solder Side

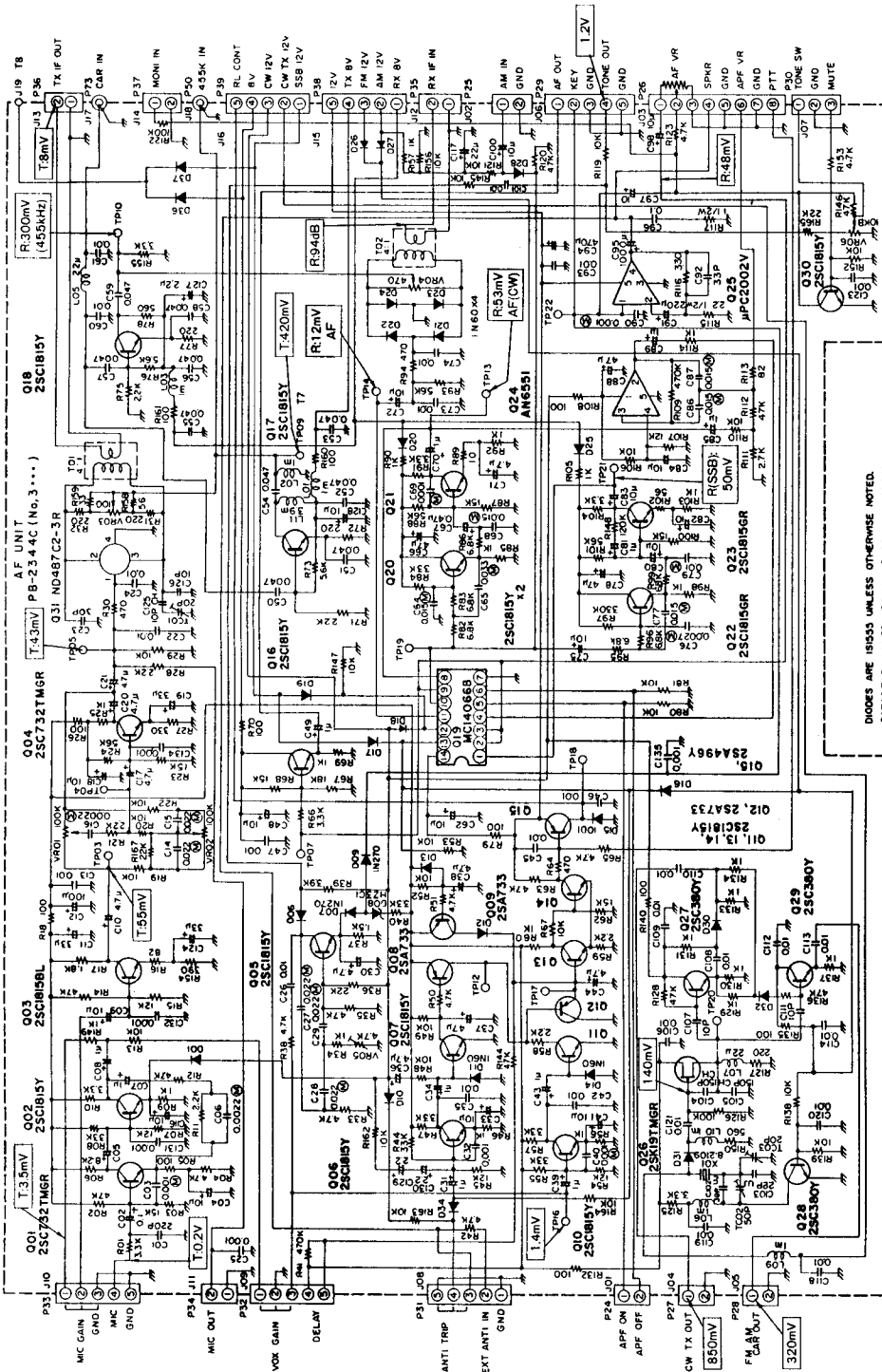


2SA496Y

2SA733Q  
2SC380Y  
2SC732TM-GR  
2SC1815BL  
2SC1815GR  
2SC1815Y

2SK19Y

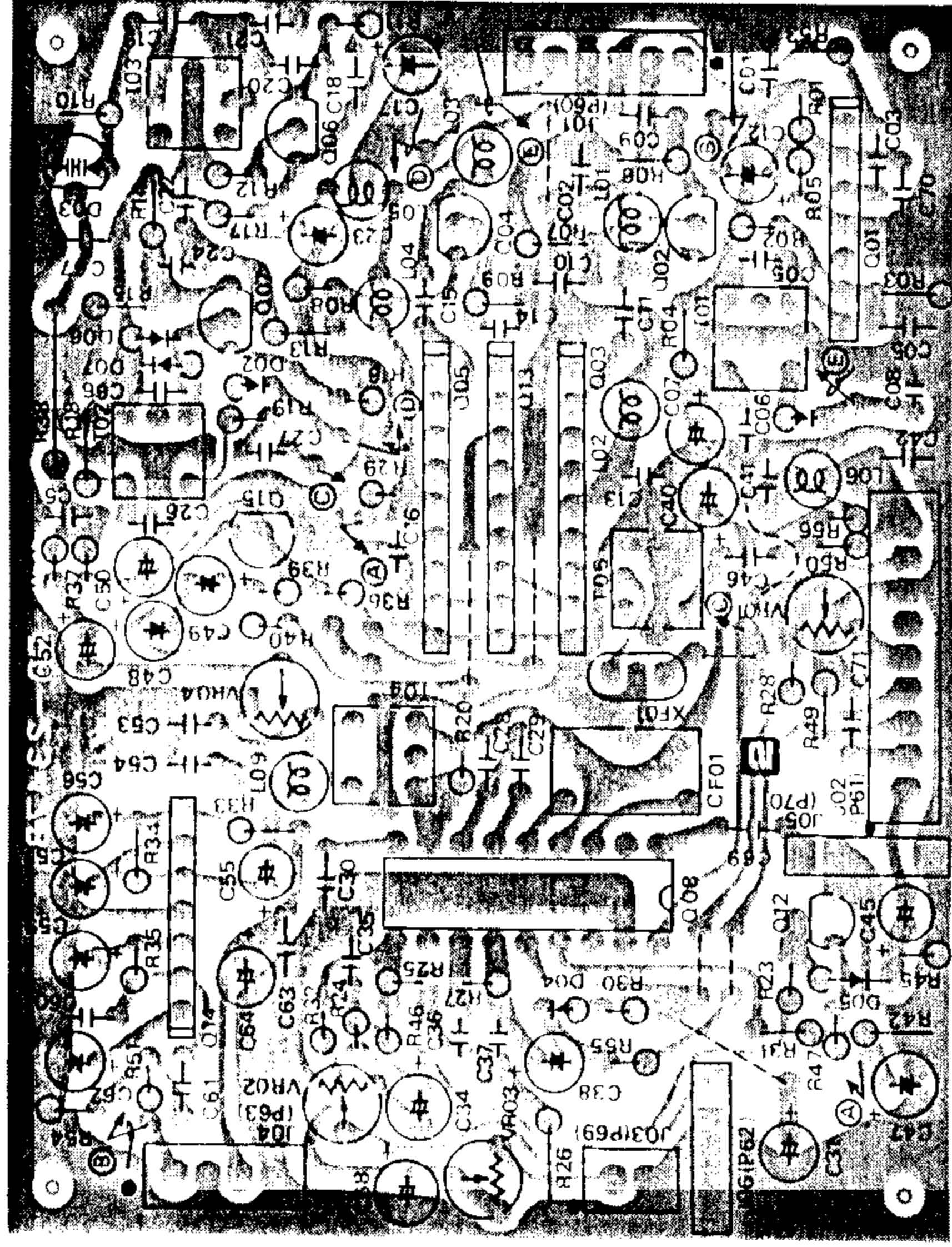
# AF UNIT



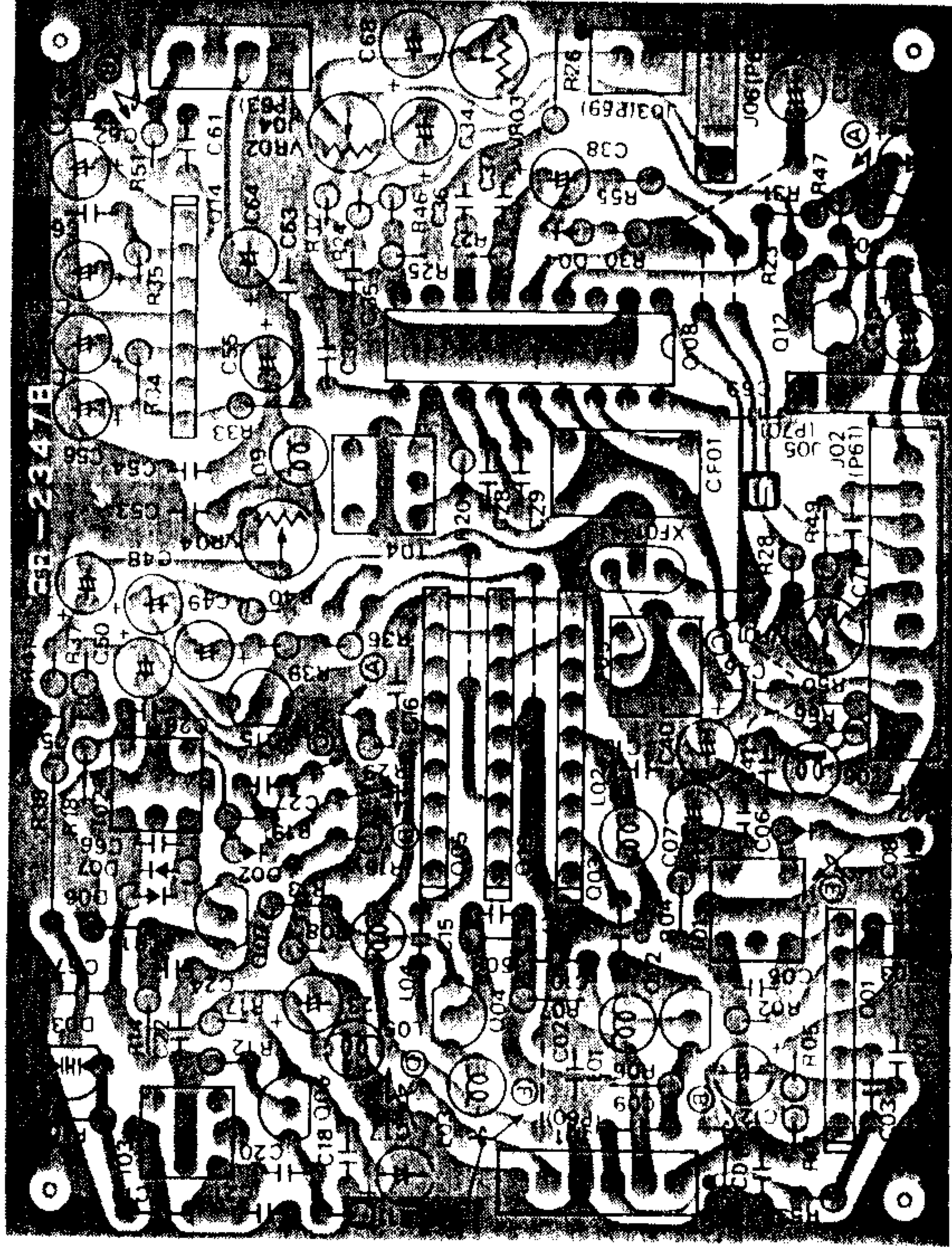
DIODES ARE 1S55 UNLESS OTHERWISE NOTED.  
CAPACITOR VALUES ARE IN  $\mu$ F, 500V; RESISTOR VALUES ARE IN  $\Omega$ ,  
1/4W; AND INDUCTOR VALUES ARE IN HEMPIRES UNLESS OTHERWISE NOTED.

	E/S	C/D	B/G <sub>1</sub>	REM	E/S	C/D	B/G <sub>1</sub>	REM	E/S	C/D	B/G <sub>1</sub>	REM
Q3001	1.2	4.5	1.8		Q3011	0	7.8	0	Q3021	0.7	3.9	1.3
Q3002	2.0	3.3	1.3		Q3012	6.2	0	0	Q3022	1.8	5.3	2.5
Q3003	0.9	4.3	1.5		Q3013	5.6	5.6	6.2	Q3023	0.6	3.9	1.3
Q3004	0.8	5.2	1.3		Q3014	5.6	12.0	1.8	Q3024	0	12.0	6.2
Q3005	1.7	11.2	2.2	CW	Q3015	0/11.5	12.0/12.0	12.0/11.3	Q3025	0	12.0	0
Q3006	1.3	3.2	2.1		Q3016	3.5	7.8	4.2	Q3026	0.8	7.8	0
Q3007	0	7.8	0		Q3017	1.5	7.5	2.3	Q3027	8.4	12.0	9.5
Q3008	8.0	0	7.5		Q3018	1.5	4.2	2.2	Q3028	0	8.0	0.7
Q3009	8.0	0	7.8		Q3019	0	12.0	0	Q3029	7.2	10.5	7.8
Q3010	1.3	3.2	2.1		Q3020	1.3	5.7	2.0	Q3030	0	0	0

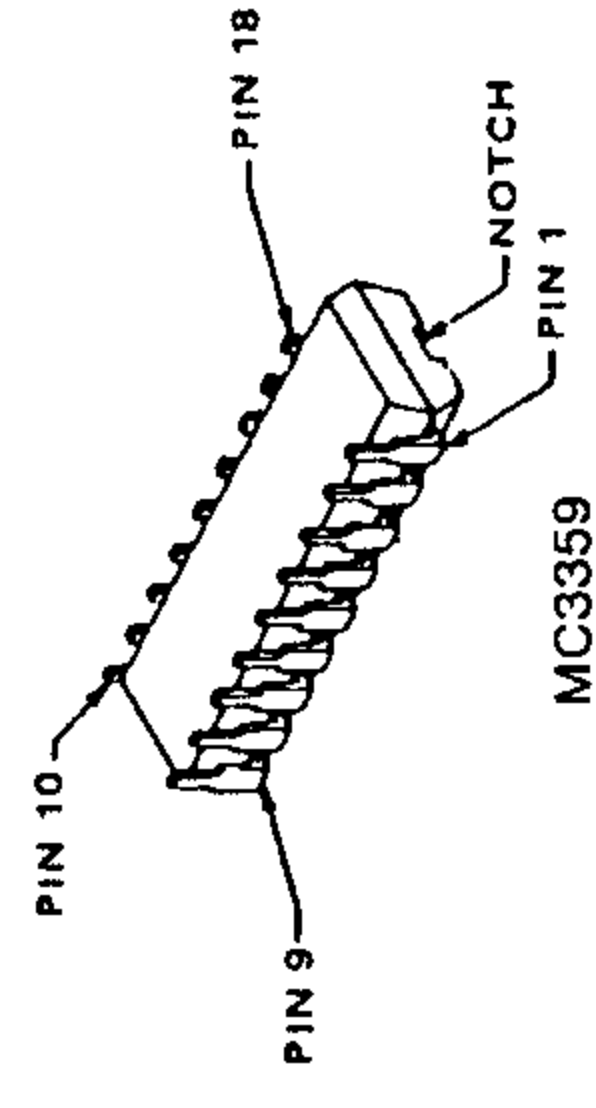
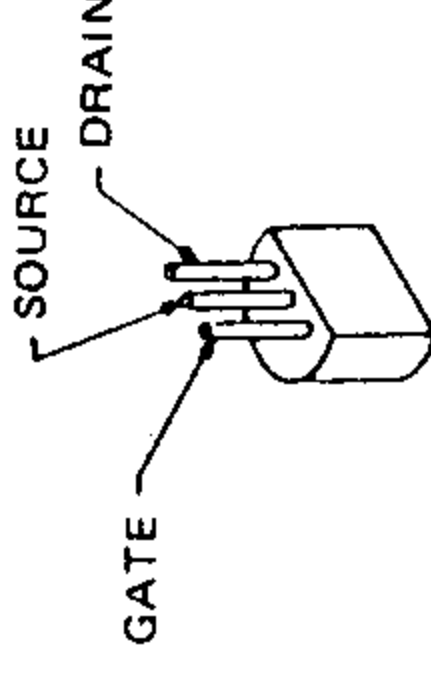
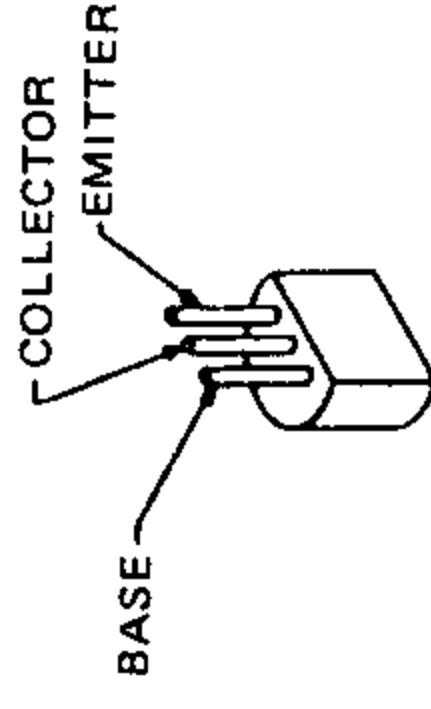
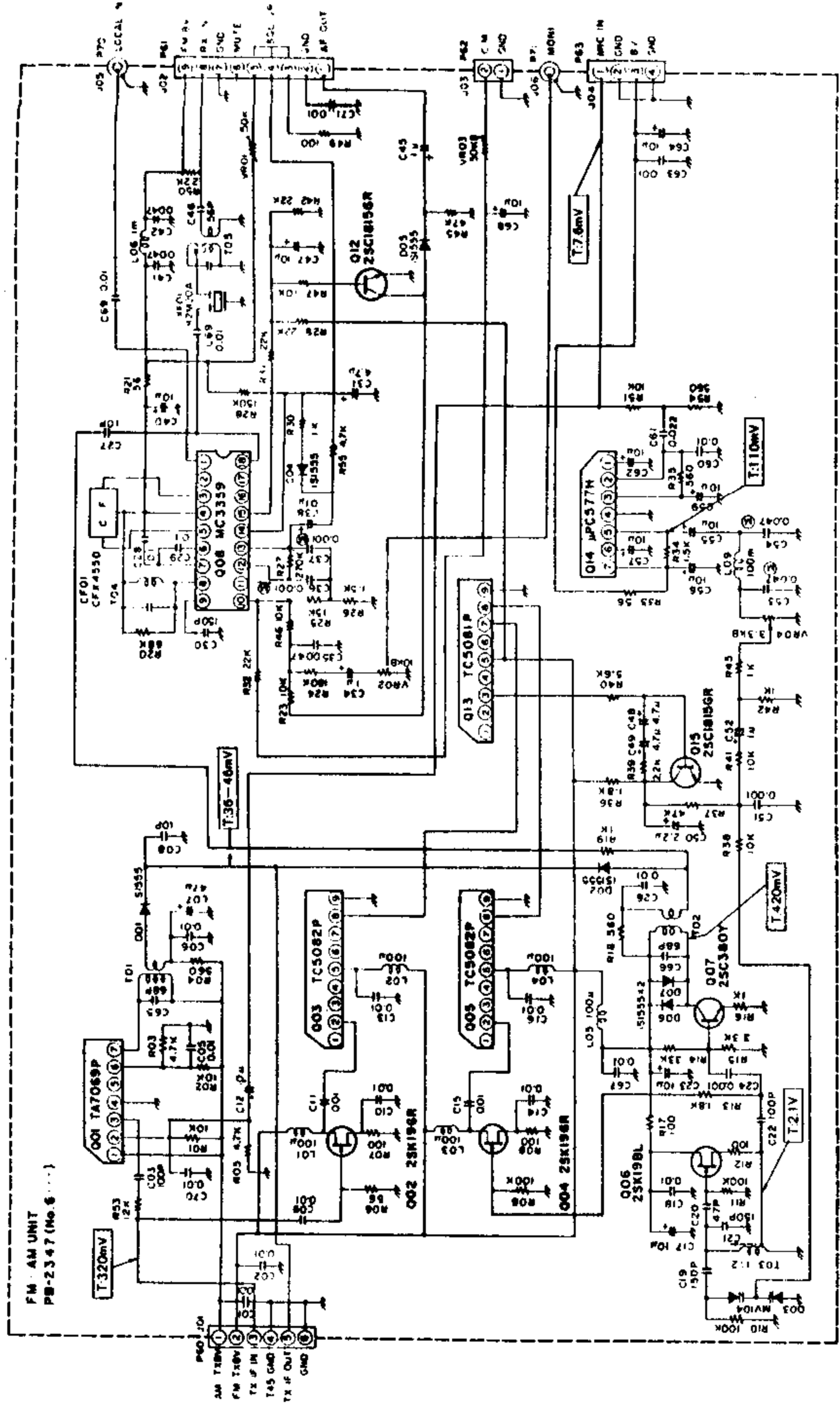
# AM/FM UNIT PARTS LAYOUT



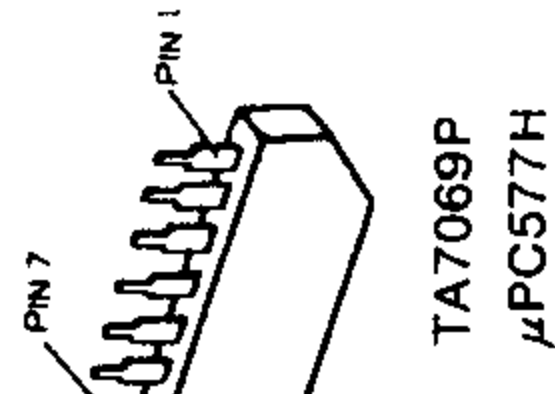
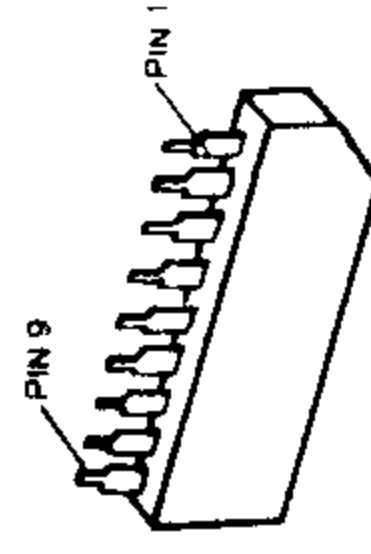
Viewed from Component Side



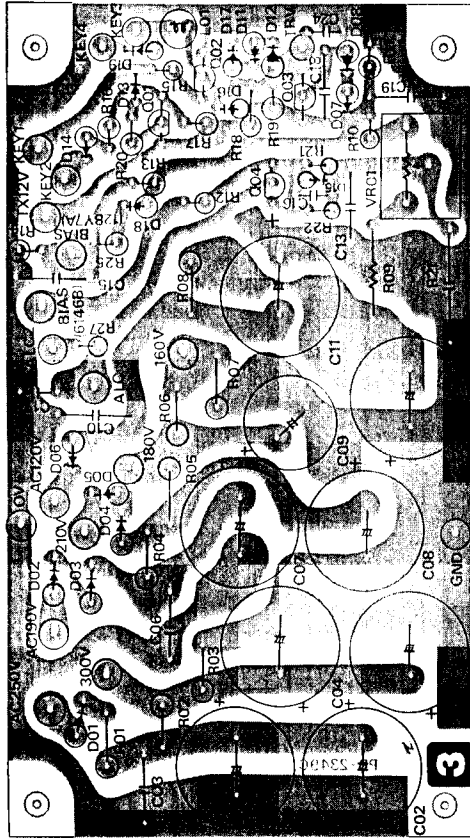
Viewed from Solder Side



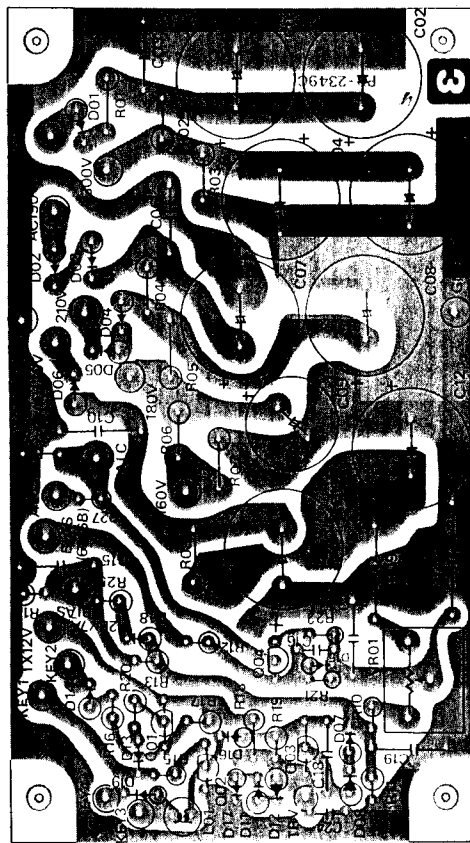
	E/S	C/D	B/G	G <sub>2</sub>	REM
Q6001	④ 0	①② 8.0			AM - T
Q6002	0.5	8.0	0		FM - T
Q6003	③ 0	⑤ 8.0			FM - T
Q6004	0.7	8.0	0		FM - T
Q6005	⑥ 0	⑤ 8.0			FM - T
Q6006	1.0	7.2	0		FM - T
Q6007	0.8	8.0	0.7		FM - T
Q6008		④⑧ 8.0			FM
Q6012	0	0	0/0.7		R/T
Q6013	⑨ 0	⑤ 8.0			FM - T
Q6014	④ 0	⑦ 8.0			FM - T
Q6015	0	(VCV)	(VCV)		
Q6016					
Q6017					



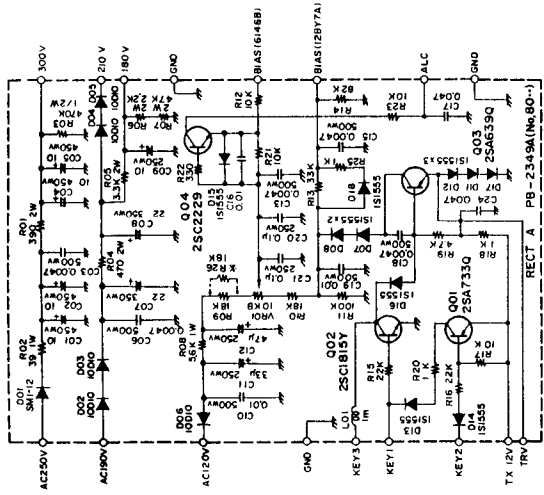
# RECT A UNIT PARTS LAYOUT



Viewed from Component Side



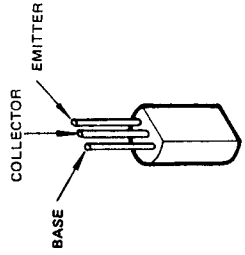
Viewed from Solder Side



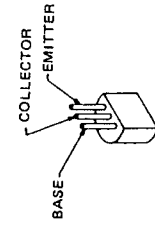
CAPACITOR VALUES ARE IN  $\mu\text{F}$ , 50 $\mu\text{V}$ ; RESISTOR VALUES ARE IN  $\Omega$ , 1/4 $\text{W}$ . AND INDUCTOR VALUES ARE IN HENRIES UNLESS OTHERWISE NOTED.

	E/S	C/D	B/G	REM
Q8001	0/120	0/0	0/120	KEY UP R/T CW
Q8002	0/0	0/10.5	0/0	"
Q8003	0/20	-65/-65	0/20	"
Q8004	-100/-100	11.5/11.5	-100/-100	"

	E/S	C/D	B/G	REM
Q8001	120	11.7	11.3	KEY DOWN T CW
Q8002	0	0	0.7	"
Q8003	2.0	2.0	1.3	"
Q8004	-60	0.3	-60	"

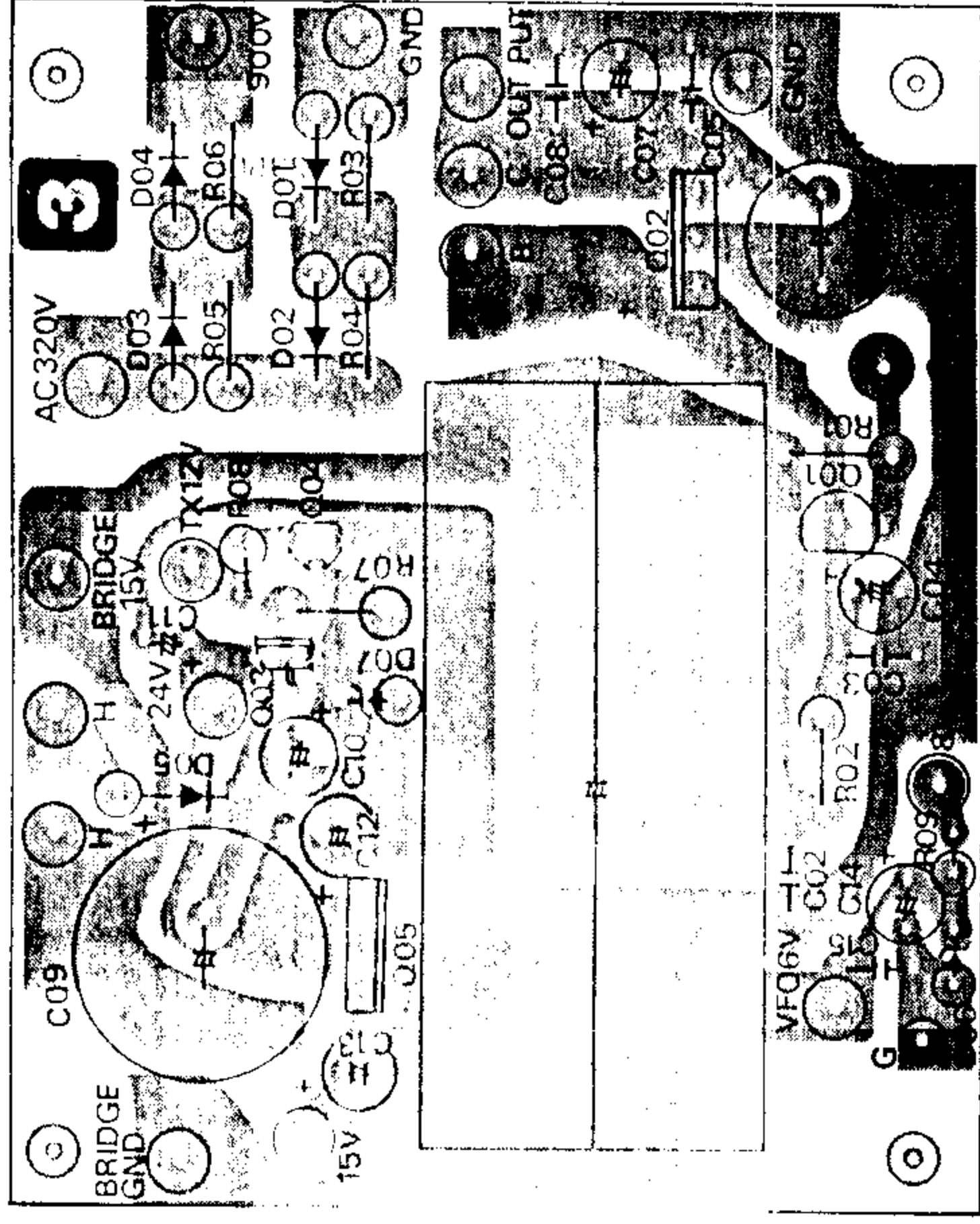


2SC2229

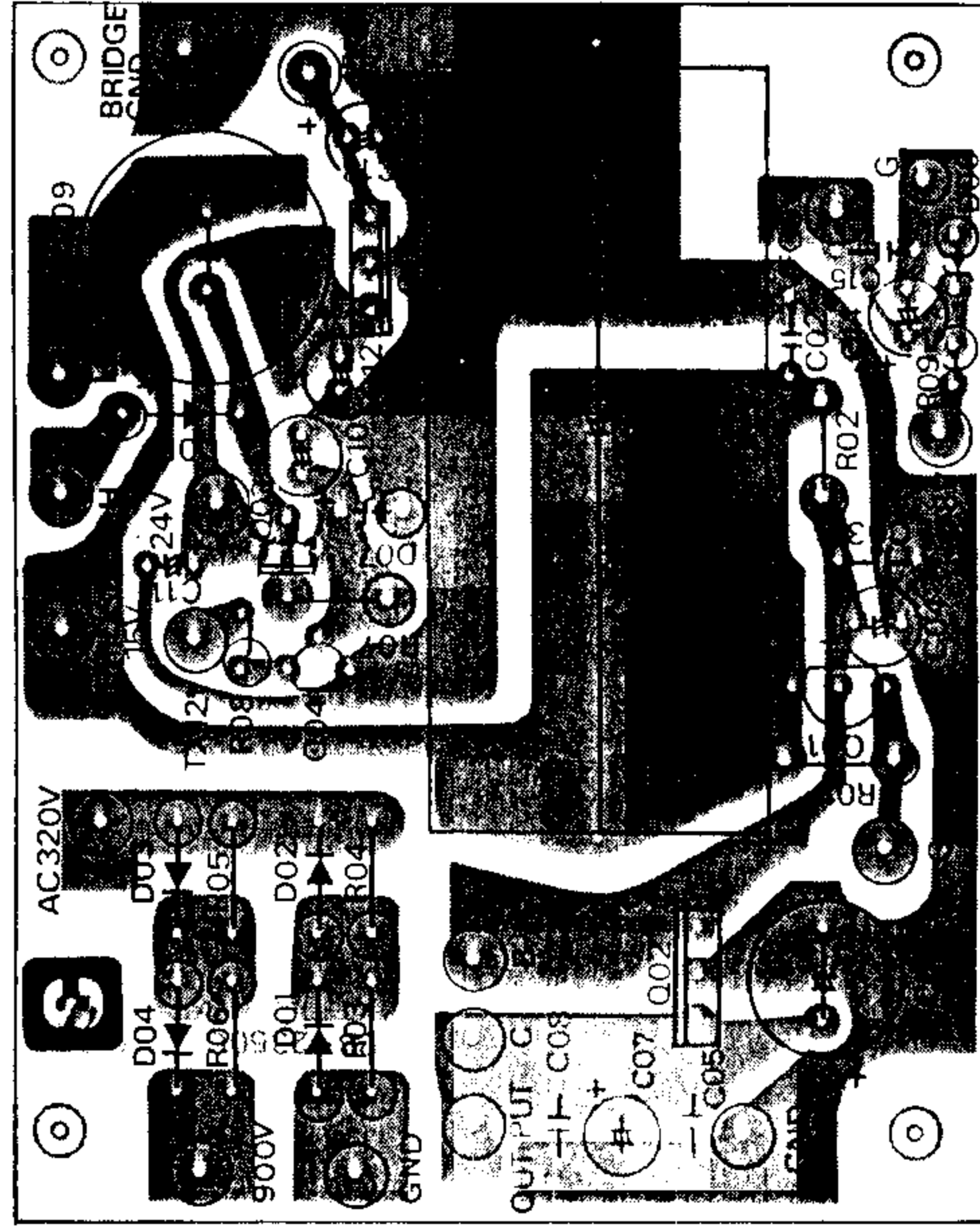


2SA639Q  
2SA733Q  
2SC1815Y

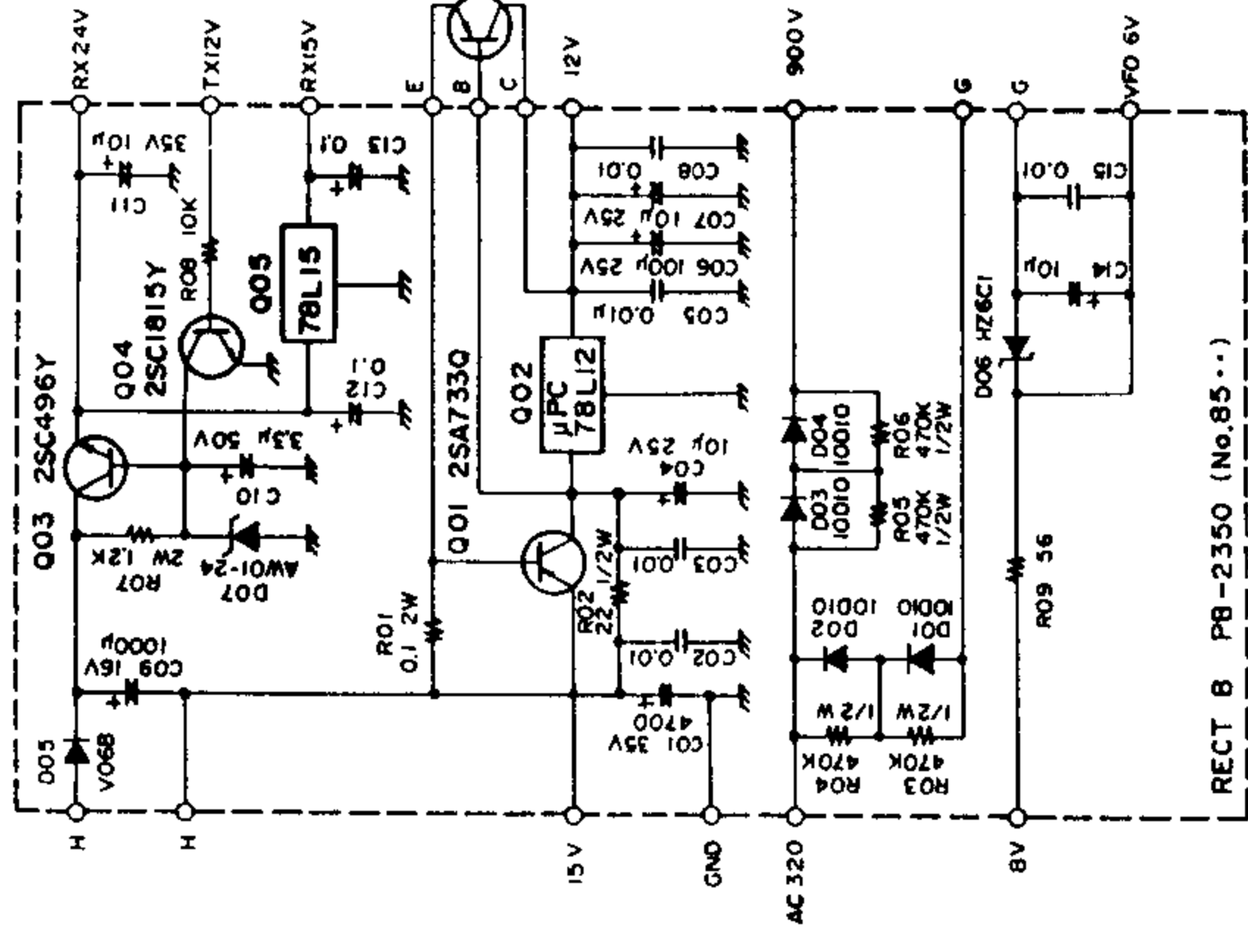
# RECT B UNIT PARTS LAYOUT



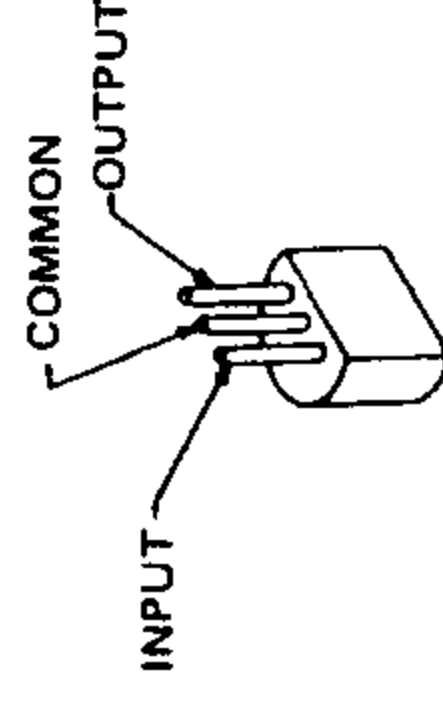
Viewed from Component Side



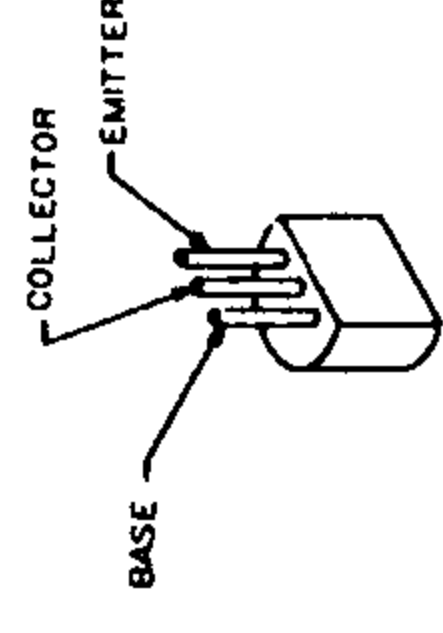
Viewed from Solder Side



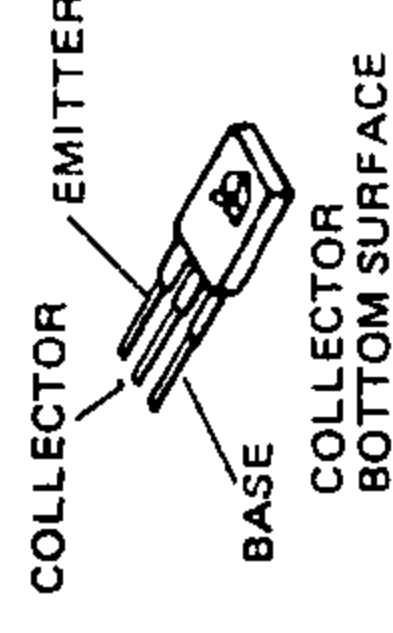
	E	C	B
Q8501	24.0	23.3	24.0
Q8502	IN 13.3	OUT 12.0	-
Q8503	24.0	32.0	24.5
Q8504	0	24.5	0.7



μPC78L12  
μPC78L15

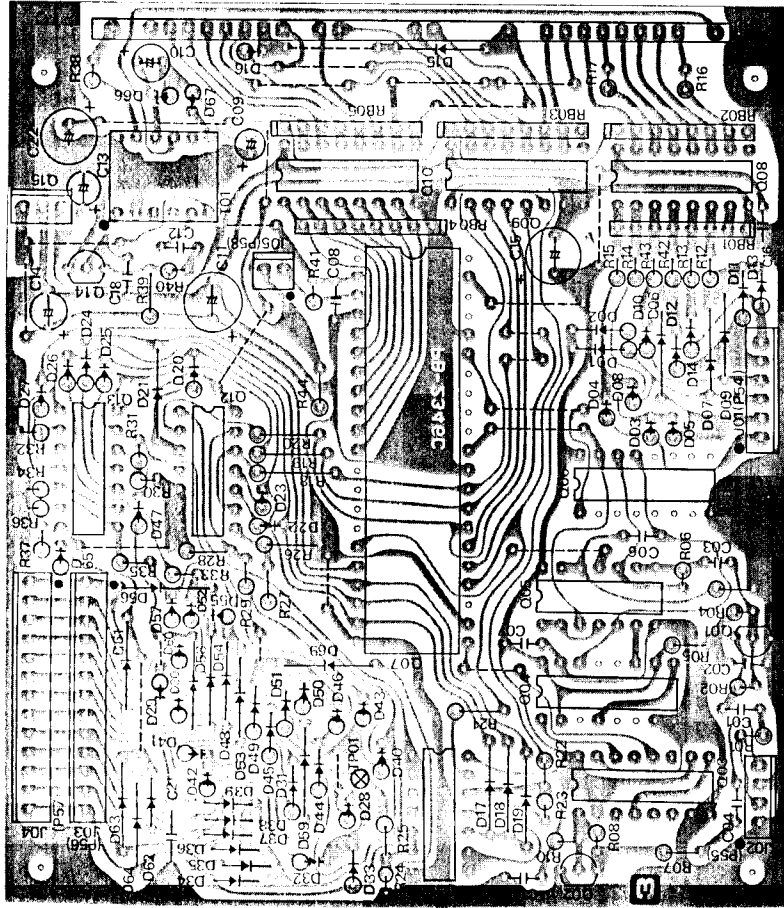


2SA733Q  
2SC1815Y

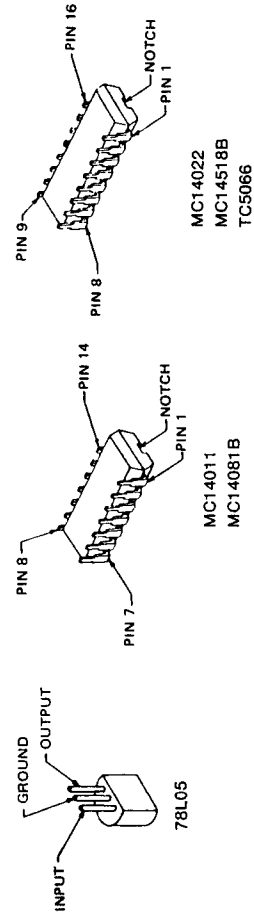


2SC496Y

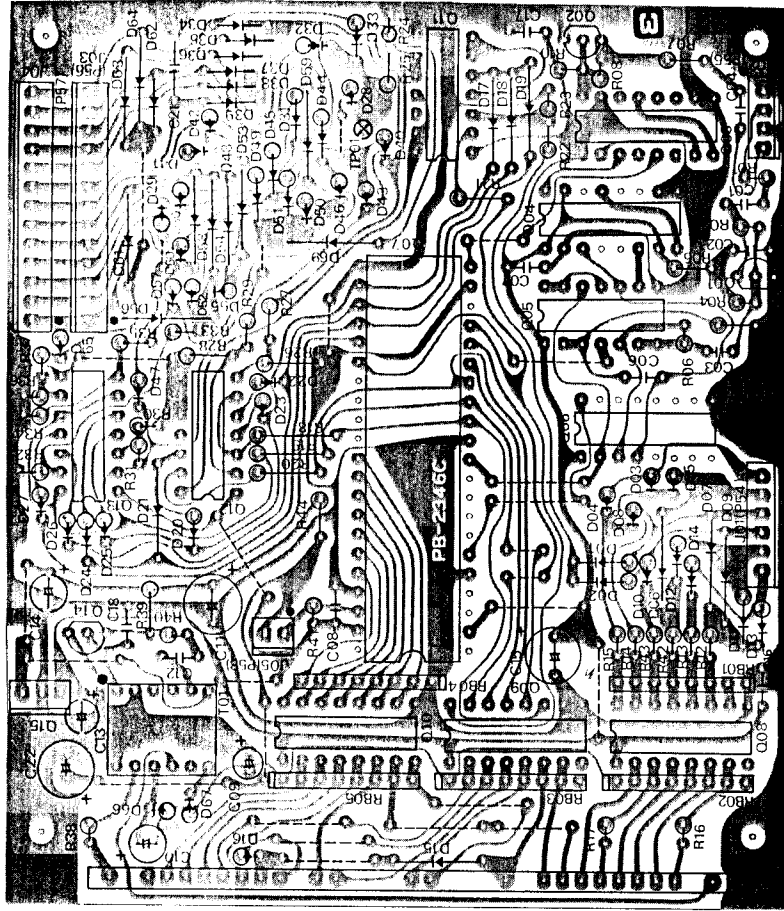
COUNTER UNIT PARTS LAYOUT



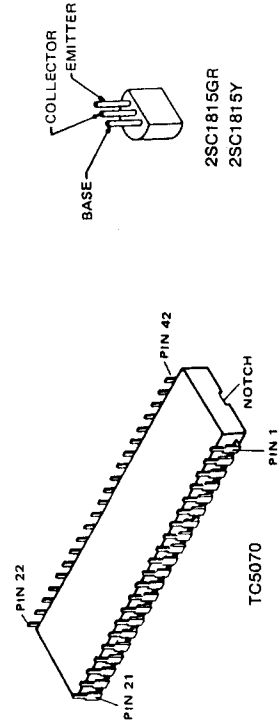
Viewed from Component Side



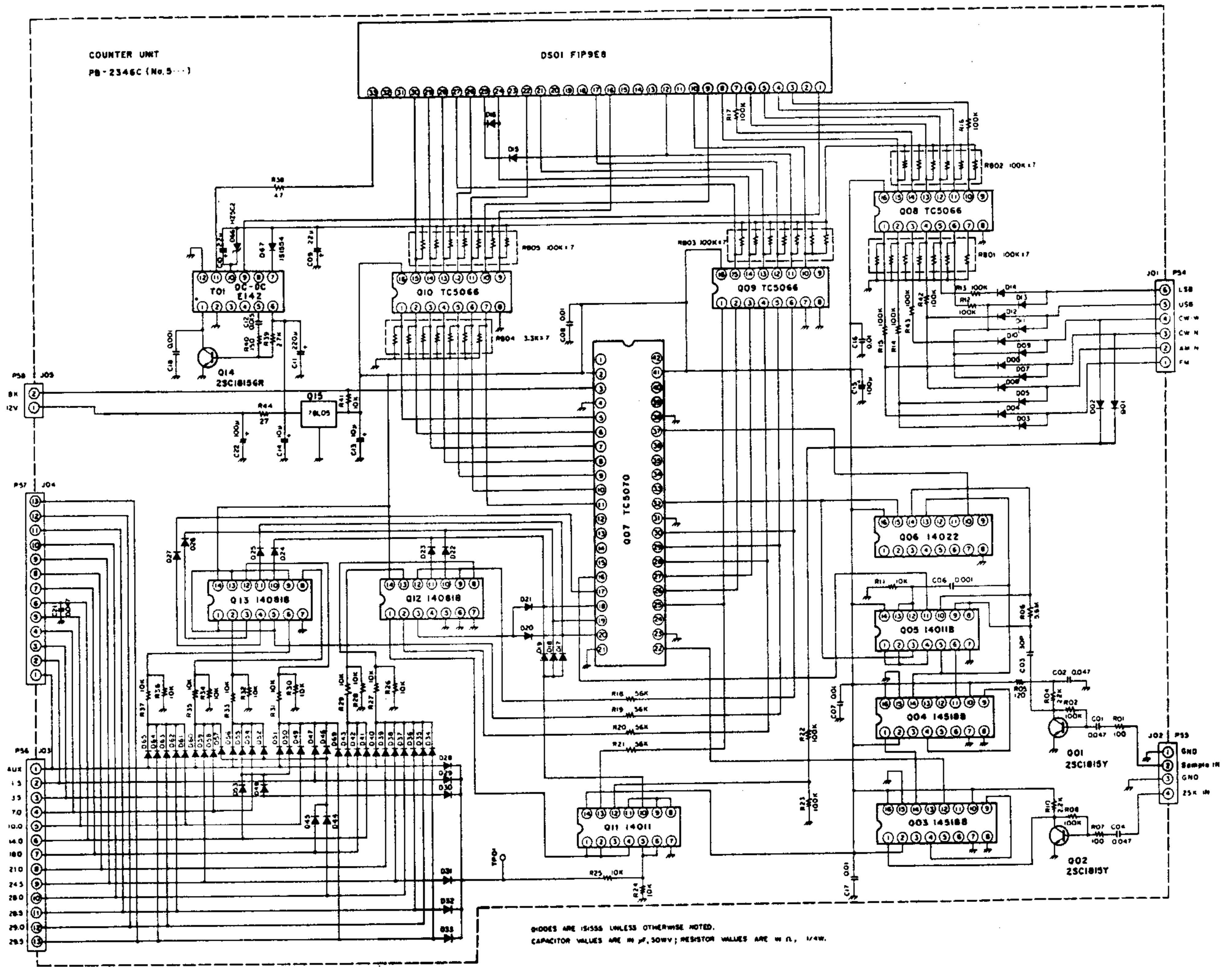
COUNTER UNIT PARTS LAYOUT



Viewed from Solder Side



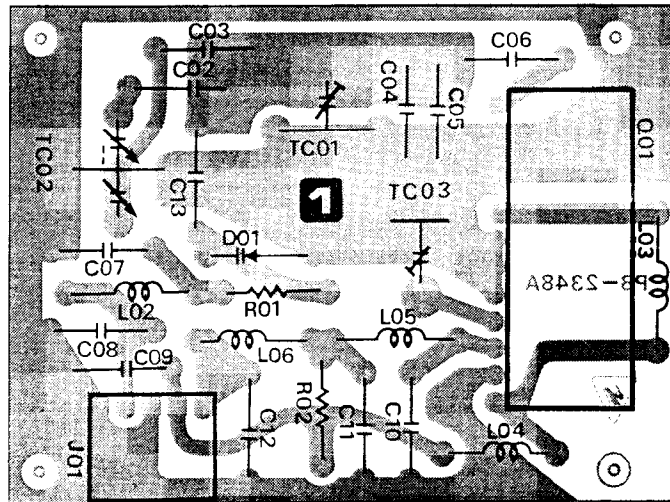
# COUNTER UNIT



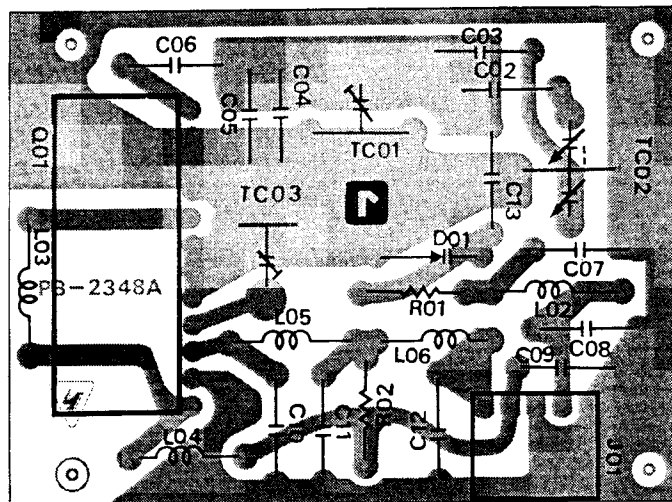
	E/S	C/D	B/G
Q5001	0	1.8	0.6
Q5002	0	1.8	0.6
Q5014	0	—	—
Q5015	IN 10.5	OUT 5.0	



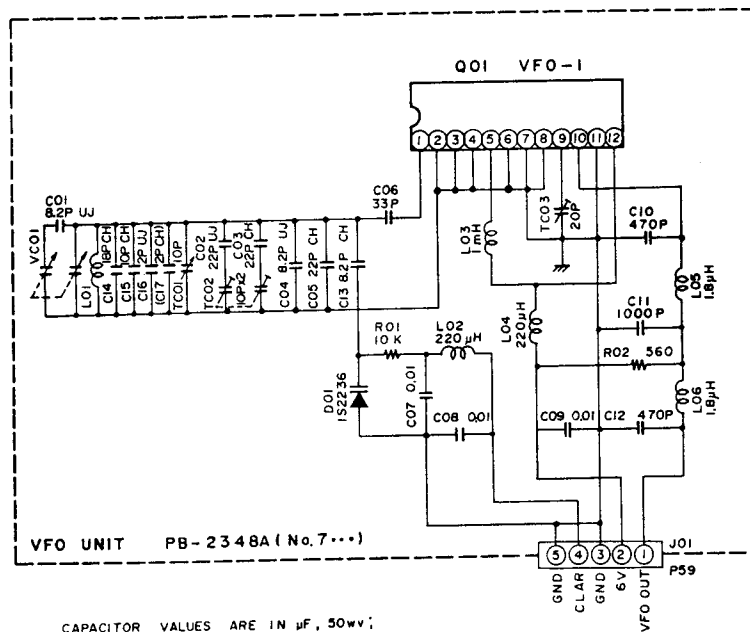
# VFO UNIT PARTS LAYOUT



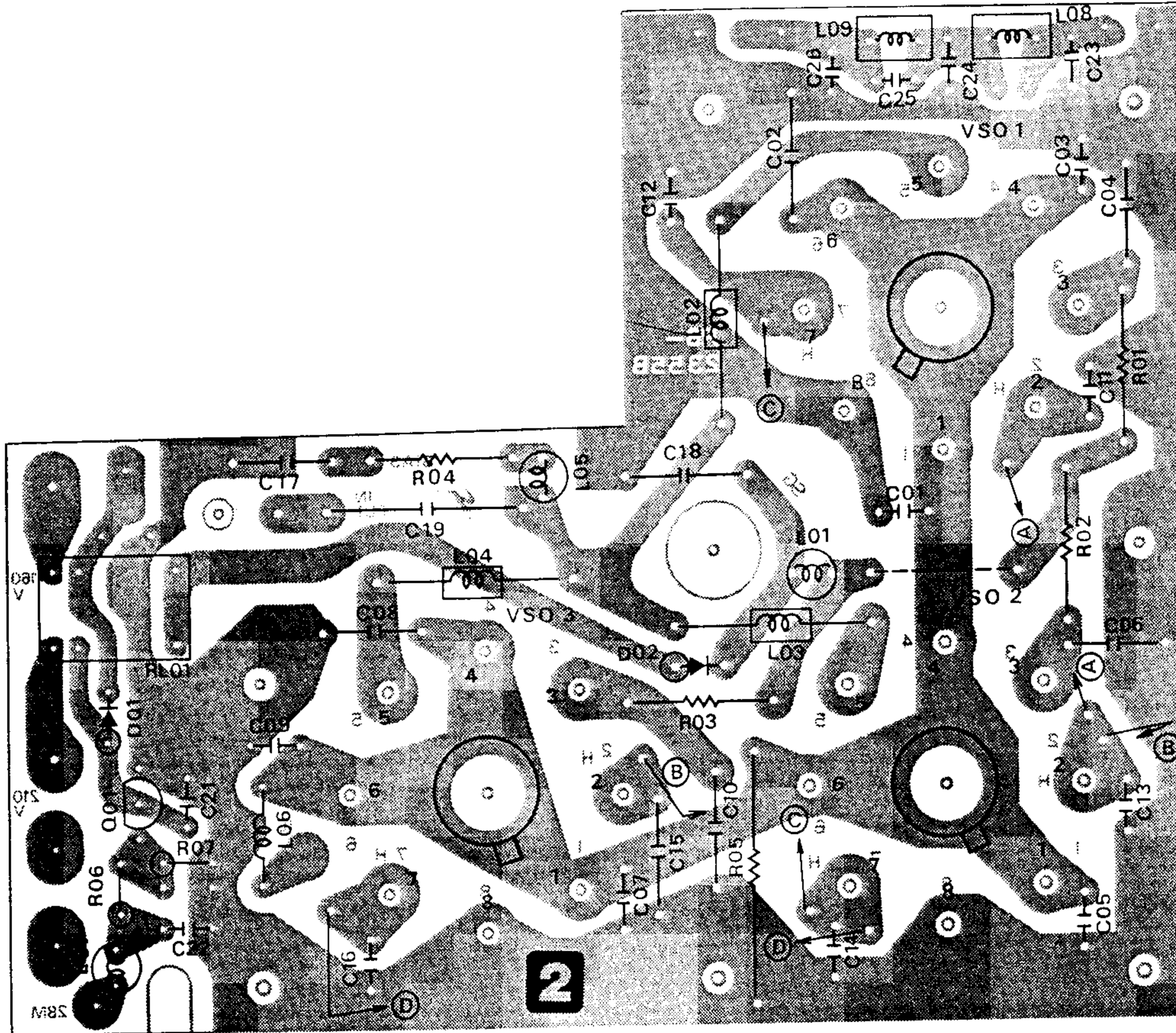
Viewed from Component Side



Viewed from Solder Side

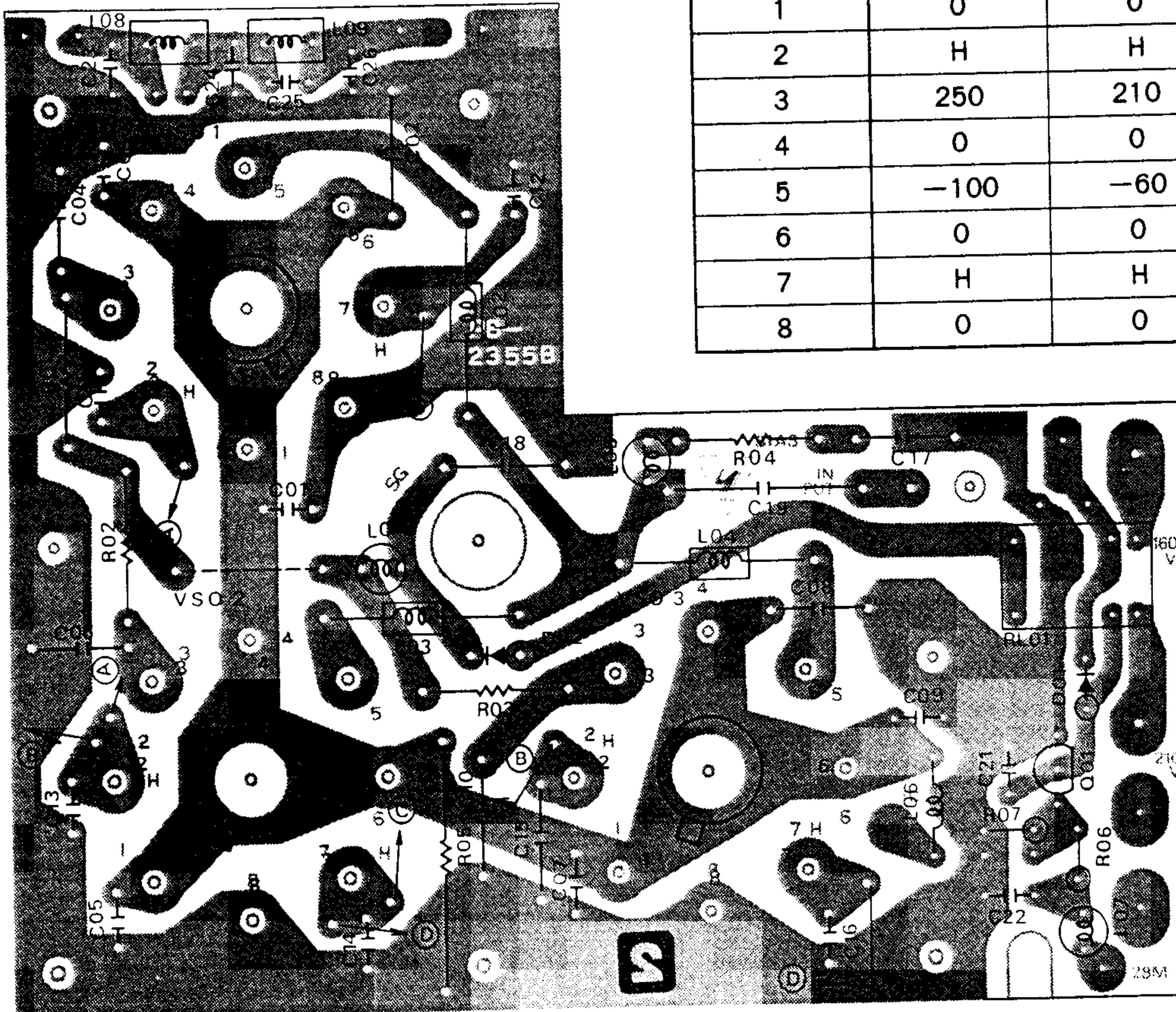


# FINAL UNIT PARTS LAYOUT



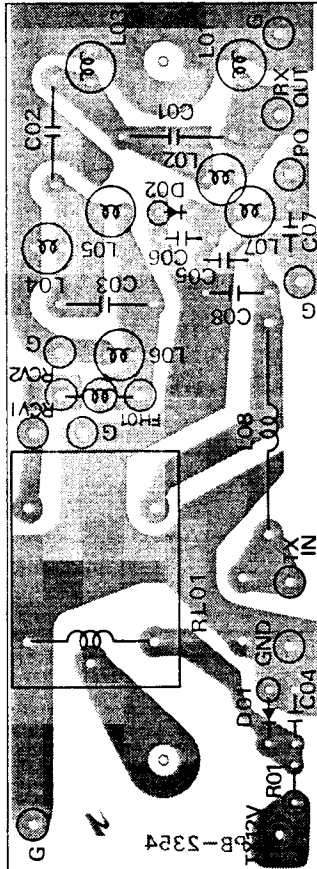
Viewed from Component Side

V01, 02	RX	TX
1	0	0
2	H	H
3	250	210
4	0	0
5	-100	-60
6	0	0
7	H	H
8	0	0

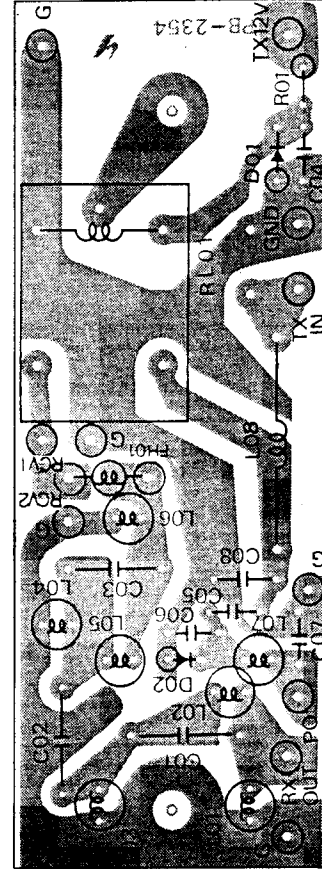


Viewed from Solder Side

# RELAY UNIT PARTS LAYOUT

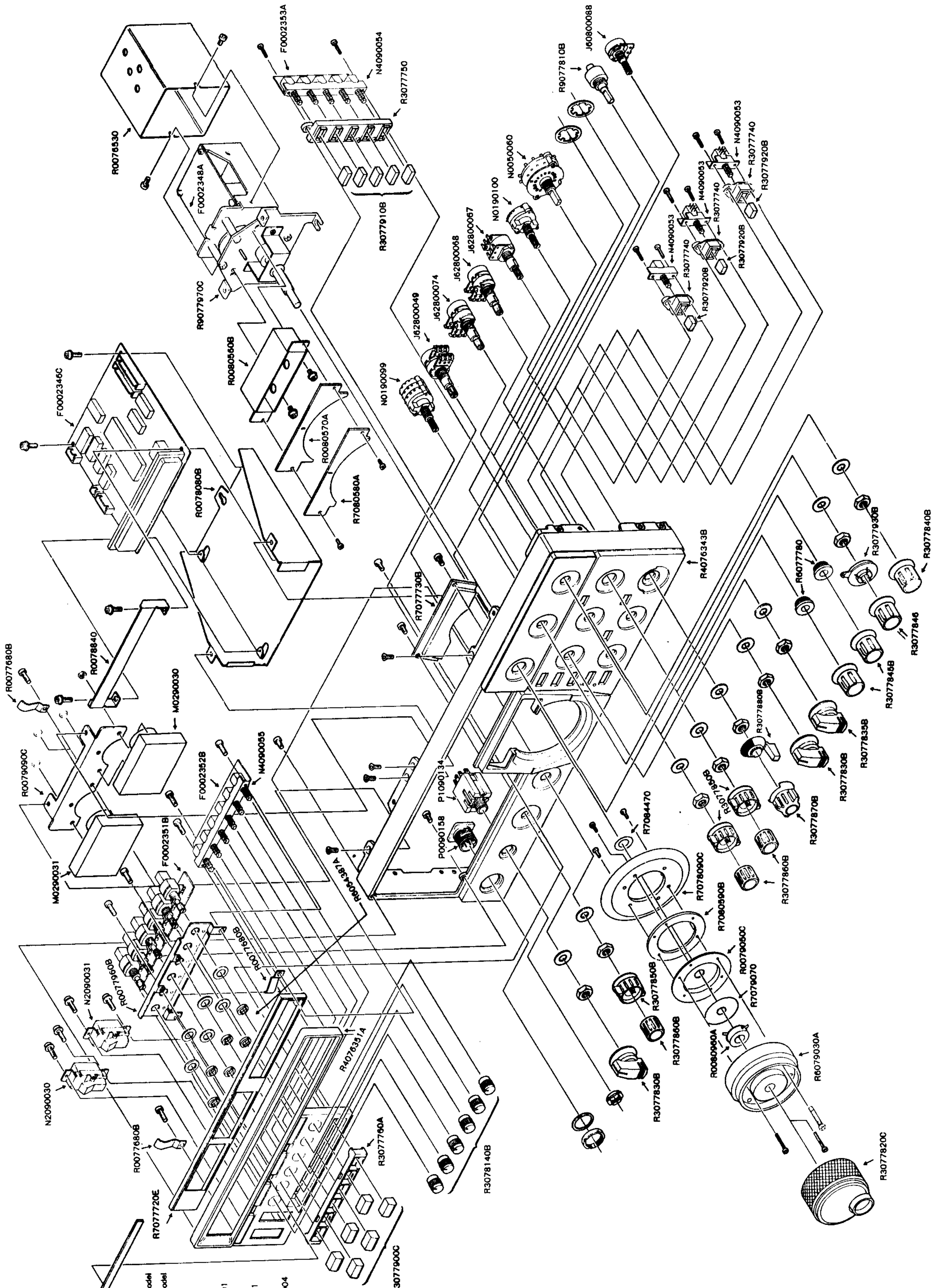


Viewed from Component Side



Viewed from Solder Side

# FRONT PANEL REMOVAL



\* JA : R8078020 100W Model  
 R8078030 10W Model  
 USA/EU/VK : R8078020  
 SOKA : R8078060  
 VOX GAIN VR : J66800001  
 DELAY VR : J66800002  
 MIC GAIN VR : J66800001  
 COMP VR : J66800001  
 NB LEVEL VR : J66800004  
 SOL VR : J66800001

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# PARTS LIST

MAIN CHASSIS				C22, 25	K00359001	Ceramic Disc 3KWV 100 pF (CC45SL3F101KY)
Symbol No.	Part No.	Name & Description				
		<b>VACUUM TUBE</b>		C21	K00329002	" " 1.5KWV 460 pF (MD25WK461J1.5KV)
V1, 2, 3	G6090001	6146B				
		<b>IC</b>		C24	K12359001	" " 3KWV 1000 pF (CK45E3F102KY)
Q2	G1090294	μPC7808H		C20	K30279039	Dipped Mica 500WV 330 pF (DM19D331K5)
Q3, 4, 5, 6	G1090301	μPC7812H				
		<b>TRANSISTOR</b>		C37	K30276331	" " " 330 pF (LCQ17331K5)
Q1	G3207050R	2SB705R		C19	K30279046	" " " 620 pF (DM19D621K5)
		<b>DIODE</b>		C27	K30279049	" " " 820 pF (DM19D821K5)
D12(9701), 18, 19, 21(9702), 22(9703)	G2015550	Si 1S1555		C18	K30279127	" " " 2400 pF (DM19D242K5)
D14, 20	G2090001	" 10D1		C9, 51	K12171102	Ceramic Disc 50WV 0.001μF (DD104E102P50V)
D1	G2090031	" S4V10				
		<b>RESISTOR</b>		C1, 2, 23	K12329001	" " 1.4kV 0.01μF (ECK DAL 103)
R1, 2	J01275101	Carbon Film	1/2W TJ 100Ω	C7, 8, 10-15, 35, 50, 53, 54 (9703)	K13179008	" " 50WV 0.01μF (DD106F103Z50V)
R20(R9703)	J01245479	" "	1/4W " 4.7Ω			
R10	J01245221	" "	" " 220Ω			
R9	J01245271	" "	" " 270Ω	C29, 36	K13179009	" " 0.047μF (DD110F473Z50V)
R7(9702), R23(9704)	J01245102	" "	" " 1kΩ	C28	K50177224	Mylar 50WV 0.22μF (50F2U224M)
R13, 17	J01245562	" "	" " 5.6kΩ	C31, 34, 41-43	K40179013	Electrolytic " 1μF (50RE1RO)
R12	J01245822	" "	" " 8.2kΩ	C30(9704)	K40170225	" " 2.2μF (50RL2R2)
R11, 19	J01245103	" "	" " 10kΩ	C52(9702)	K40140475	" 25WV 4.7μF (25RL4R7)
R16	J02245103	" "	" SJ 10kΩ	C3, 4	K40149008	" " 10μF (25RE10)
R18	J01245123	" "	" TJ 12kΩ	C39	K40129008	" 16WV 33μF (16RE33)
R4(9705)	J01245104	" "	" " 100kΩ	C5, 6	K43270002	" 500WV 100μF (CE62L500L100)
R25(9701)	J01245124	" "	" " 120kΩ	C40(9701), 55	K40129007	" 16WV 100μF (16RE100)
R15	J02245104	" "	" SJ 1MΩ			<b>VARIABLE CAPACITOR</b>
R13, 14	J01245563	" "	" TJ 5.6MΩ	VC1	K90000026	YB-250 250 pF
R21	J20336569	Metallic Film	2W 5.6Ω	VC2	K90000016	C134E12
		<b>POTENTIOMETER</b>				<b>TRIMMER CAPACITOR</b>
VR1	J62800067	K16B2-5KB/1KB		TC1	K91000007	TSN120C10PX2
VR2	J62800049	DM10A638A10KB/10KA				<b>INDUCTOR</b>
VR3	J62800068	K16BA-2KC/5KB		L1	L0021167C	
VR4	J62800074	K16BA004C 10KA/10KB		L2	L0021168A	
VR5, 6	J60800084	UM10A654A-10KB		L3	L1020064	
VR7	J60800088	K1611 10KB		L4	L1020690	500μH
VR8(9701)	J51724202	PN822H	202KH 2kΩB	L5-7	L1020308B	
		<b>CAPACITOR</b>		L8	L1190017	FL5H102K 1 mH
	K02179009	Ceramic Disc	50WV 22 pF (DD104CH220J50V02)		L0190032	RF3855-R27K
	K02175680	" "	" 68 pF (DD107CH680J50V02)		L0190030	RF3855-R18K
	K02175101	" "	" 100 pF (DD107CH101J50V02)			<b>POWER TRANSFORMER</b>
	K02175121	" "	" 120 pF (DD107CH121J50V02)	PT1	L3030100	
	K30175181	Dipped Mica	" 180 pF (LCQ17181J05)			
C26	K00359005	Ceramic Disc	3KWV 9 pF (CC45SL3F090DY)			
C38	K00329005	" "	1.5KWV 51 pF (DE0707SL510J)			

		<b>METER</b>	P24 (with wire)	T9204377	
M1	M0290030	Y38-01	P26 ( " )	T9204382B	
M2	M0290031	Y38-02	P29 ( " )	T9204378A	
			P30 ( " )	T9204401	
			P34 ( " )	T9204390	
		<b>SPEAKER</b>	P40 ( " )	T9204380	
SP1	M4090044	SE-92BYM2 8Ω 2W	P41 ( " )	T9302301A	
			P42 ( " )	T9204381B	
			P46 ( " )	T9204383A	
		<b>RELAY</b>	P51 ( " )	T9204384A	
RL1, 2	M1190004	FRC-203D012/04CS01 DC 12V	P52 ( " )	T9204385	
			P53 ( " )	T9204386A	
			P54 ( " )	T9204393	
		<b>RELAY SOCKET</b>	P57 ( " )	T9204387	
RLS1, 2	M1490010	263H204	P58 ( " )	T9204388B	
			P62 ( " )	T9024389	
		<b>TERMINAL BOARD</b>			
	Q6000003	1L2PS (0-1-0)			<b>CONNECTION CABLES</b>
	Q6000012	1L4PS (3-0-1)		T9302200B	
	Q6000006	1L3PS (1-0-2)		T9302300C	
		<b>SWITCH</b>			
S1	N0190099	SRN-3066			<b>FUSE</b>
S2	N0190100	SRN-1034	F1	Q0000012	6A (100V-117V)
S3	N2090030	EST-159R		Q0000004	3A (200V-234V)
S4	N2090031	EST-157R			
S5-7	N4090053	SUJ 12A			
S8	N6090004	SSF-22-08b			<b>DC FUSE HOLDER</b>
S9	N6090043	SSF-12-045	FH1	P2000012	SN2059
S10	N0050060	BAND SW A			
S11	N0050061A	BAND SW C			
		<b>JACK</b>			<b>COOLING FAN</b>
J9	P1090031	D5-701B-00	FAN1	M2090003	FB-08B12LY
J21	P1090033	D6-701B-00			
J8	P1090034	D7-701B-00			<b>*** CONNECTION UNIT ***</b>
J7	P1090152	D8-703B-11		F0002476	Printed Circuit Board
J1	P0090158	FM214-8SS		C024760A	PCB with D9701-9703, R9701-9705, VR9701, C9701-9704
J2	P1090134	SG-7627		R3077830B	FT-22VK MODE, METER SELECT
J10	P1090004	SG-7814		R3077835B	FT-22VF BAND
J11	P1090230	SG-8022		R3077840B	FT-22WK DRIVE
J6	P0090094	NC-174-PA125		R3077845B	FT-22WF (W/WHITE LINE) LOADING, PRESELECT
J3-5, 20, 24	P1090133	STR-01-H		R3077850B	FT-22WDNS RF, TONE, APF
J12-17	Q9000195	JACK BOARD ASSY		R3077860B	FT-15WK AF, CLAR, NOTCH
J19	P1090194	FM-MR-M2		R3077870B	FT-22WNAK SHIFT/WIDTH
		<b>CONNECTOR</b>		R3077880B	FT-22WS (Lever) "
P1 (with wire)	T9204376A			R3078140B	FT-10SAK VOX, DELAY, MIC, COMP, NB, SQL
P2 ( " )	T9302301A			R3077846	FT-22WF (W/O WHITE LINE) PLATE
P3 ( " )	T9204367			R3077900C	Push knob A MDX, RF AMP, NAR, MONI, NB, PROC
P4 ( " )	T9204368B			R3077910B	Push knob G AGC, FAST/SLOW, ALC M, RX, TX
P5 ( " )	T9204369A			R3077920B	Push knob H +0.5, APF, NOTCH
P6 ( " )	T9204370				
P9 ( " )	T9204371A				
P10 ( " )	T9204372B				
P12 ( " )	T9204379B				
P17 ( " )	T9204373A				
P18 ( " )	T9204374A				
P21 ( " )	T9204375				

RF UNIT							
Symbol No.	Part No.	Name & Description					
PB-2342D	F0002342D	Printed Circuit board	R1033, 1038 1050	J02245122	" " " SJ	1.2kΩ	
	C0023420	PCB with Components	R1025	J02245152	" " " "	1.5kΩ	
			R1010, 1054	J02245222	" " " "	2.2kΩ	
			R1046	J02245472	" " " "	4.7kΩ	
		<b>VACUUM TUBE</b>	R1053	J01215103	" " 1/8W TJ	10kΩ	
V1001	G6090002	12BY7A	R1006, 1049	J02245104	" " 1/4W SJ	100kΩ	
			R1004	J01215104	" " 1/8W TJ	100kΩ	
			R1012	J02245184	" " 1/4W SJ	180kΩ	
		<b>VACUUM TUBE SOCKET</b>	R1001	J02245225	" " " "	2.2MΩ	
VS1001	P3090022	SB-9403					
							<b>CAPACITOR</b>
		<b>IC</b>	C1037-1040	K02179003	Ceramic Disc 50WV CH (DD104CH020C50V02)	2 pF	
Q1008	G2090135	ND487C2-3R	C1036, 1041 1102	K02179004	" " " "	3 pF (DD104CH030C50V02)	
		<b>TRANSISTOR</b>	C1035	K02172040	" " " "	4 pF (DD104CH040C50V02)	
Q1009	G3315890	2SC1589	C1098	K00172040	" " " SL	4 pF (DD104SL040C50V02)	
Q1003	G3318150Y	2SC1815Y	C1101	K02172050	" " " CH	5 pF (DD104CH050C50V02)	
Q1010	G3319710	2SC1971	C1034	K02173070	" " " "	7 pF (DD104CH070D50V02)	
Q1007	G3324070	2SC2407	C1001, 1002 1004-1006	K02173160	" " " "	16 pF (DD104CH160J50V02)	
		<b>FET</b>	C1090	K02173330	" " " SL	33 pF (DD104SL330J50V02)	
Q1001, 1002 1004-1006	G3801250Y	2SK125Y	C1025	K02175390	" " " CH	39 pF (DD105CH390J50)	
		<b>DIODE</b>	C1027, 1047	K00175101	" " " SL	100 pF (DD105SL101J50V02)	
D1002-1008 1112-1115	G2015550	Si 1S1555	C1085	K30273010	Dipped Mica 500WV (LCQ11010D5)	1 pF	
D1010, 1011	G2090002	" 10D10	C1106	K30173010	" " " "	1 pF (LCQ11010D05)	
D1009	G2090217	Zener HZ3C1	R1037	J01275159	Carbon Film 1/2W TJ	1.5Ω	
		<b>CRYSTAL FILTER</b>	R1039	J02245229	" " 1/4W SJ	2.2Ω	
XF1001	H1102050	8.2M20A	R1026, 1034	J02245479	" " " "	4.7Ω	
		<b>RESISTOR</b>	R1022, 1023	J02245100	" " " "	10Ω	
			R1020	J02245150	" " " "	15Ω	
			R1035	J02245390	" " " "	39Ω	
R1007, 1011 1014, 1041 1042, 1045	J02245101	" " " "	R1007, 1011 1014, 1041 1042, 1045	J02245101	" " " "	100Ω	
R1021	J02245121	" " " "	R1021	J02245121	" " " "	120Ω	
R1027	J02245151	" " " "	R1027	J02245151	" " " "	150Ω	
R1028, 1052	J02245221	" " " "	R1028, 1052	J02245221	" " " "	220Ω	
R1018, 1019 1032	J02245331	" " " "	R1018, 1019 1032	J02245331	" " " "	330Ω	
R1031	J02245471	" " " "	R1031	J02245471	" " " "	470Ω	
R1008, 1024 1043	J02245561	" " " "	R1008, 1024 1043	J02245561	" " " "	560Ω	
R1036	J01275561	" " 1/2W TJ	R1036	J01275561	" " 1/2W TJ	560Ω	
R1030	J02245821	" " 1/4W SJ	R1030	J02245821	" " 1/4W SJ	820Ω	
R1003, 1013 1016, 1017 1044, 1048 1051	J01215102	" " 1/8W TJ	R1003, 1013 1016, 1017 1044, 1048 1051	J01215102	" " 1/8W TJ	1kΩ	



C1086	K30276102	Dipped Mica 500WV 1000 pF (LCQ21102K5)	T1001	L0020294	TRANSFORMER
C1003	K30279095	" " " 1200 pF (DM19D122J5)	T1002	L0020418	
			T1003	L0020789A	
C1002	K10179016	Ceramic Disc 50WV 0.001 $\mu$ F (DB201YB102K5L5)	T1004	L0020170	
			T1005	L0021169A	
C1004, 1005 1007, 1013 1021, 1022 1023, 1077 1078, 1084	K12279007	" " 500WV 0.01 $\mu$ F (CD110E103P500)	T1006, 1007	L0021170A	
			T1008	L0021172A	
			T1009	L0021173A	
			T1011	L0021175	BPF 160B
			T1012	L0021174	BPF 160A
C1026, 1028 1030-1032 1042, 1043 1045, 1046 1048, 1049 1057, 1058 1059, 1061 1074, 1092-1094 1096, 1097 1099, 1100	K13179008	" " 50WV 0.01 $\mu$ F (DD106F103Z50V)	T1013	L0021177	BPF 80B
			T1014	L0021176	BPF 80A
			T1015	L0021179	BPF 40B
			T1016	L0021178	BPF 40A
			T1017	L0021181	BPF 30B
			T1018	L0021180	BPF 30A
			T1019	L0021183	BPF 20B
			T1020	L0021182	BPF 20A
			T1021	L0021185	BPF 17B
			T1022	L0021184	BPF 17A
			T1023	L0021187	BPF 15B
C1024, 1029 1044, 1053 1054, 1056 1060, 1062 1069, 1071 1072, 1075 1087, 1088	K13179009	" " " 0.047 $\mu$ F (DD110F473Z50V)	T1024	L0021186	BPF 15A
			T1025	L0021189	BPF 12B
			T1026	L0021188	BPF 12A
			T1027	L0021191	BPF 10B
			T1028	L0021190	BPF 10A
			T1029	L0021192	
			T1030	L0021193	
C1103	K19149001	Semiconductor Ceramic 25WV 0.01 $\mu$ F (UAT04X102K-L05AE)	T1031-1034	L0020788A	
			T1035	L0021194	
C1070	K19149005	" " " 0.0022 $\mu$ F (UAT04X222K-L05AE)	T1036	L0021195	
			T1037	L0020788A	
C1067, 1080 1095	K19149021	" " " 0.047 $\mu$ F (UAT08X473L45AE)			
C1073, 1089	K19149025	" " " 0.1 $\mu$ F (UAT13X104K-L46AE)			
C1068, 1076	K40129008	Electrolytic 16WV 33 $\mu$ F (16RE33)			RELAY
C1063, 1081	K40129002	" " 47 $\mu$ F (16RE47)	RL1001, 1003	M1190002	FBR211AD012
			RL1004, 1005	M1190037	FBR211AD024
C1105	K70120003	Tantalum 16WV 47 $\mu$ F (489D476X0016F1)	RL1002	M1190006	FBR221D012M
		<b>VARIABLE CAPACITOR</b>			
VC1001	K90000038	20P/190P C121D113			
		<b>TRIMMER CAPACITOR</b>			<b>FERRITE BEADS</b>
TC1001, 1002	K91000028	ECV-1ZW10X53		L9190024	FB-101
		<b>INDUCTOR</b>			
L1001, 1002 1005, 1015	L1190017	FL5H102K 1 mH			
L1003, 1006	L1190020	FL5H151K 150 $\mu$ H			
L1007, 1016	L1190009	FL4H3R3M 3.3 $\mu$ H			
L1010	L1190011	FL4H4R7M 4.7 $\mu$ H			<b>SWITCH</b>
L1012, 1017 1018	L1190090	LAL04102K-NA 1 mH	S1001	N0050062A	CSP4-4-11
L1013	L1190120	FL5H471K 470 $\mu$ H			
L1008	L0021214A			Q5000025	Wrapping terminal A
L1011	L1020032			Q5000011	" " C

IF UNIT					CRYSTAL FILTER
Symbol No.	Part No.	Name & Description	XF2001	H1102051	XF-8.2HS
PB-2343C	F0002343C C00023430	Printed Circuit Board PCB with Components			
					CERAMIC FILTER
			CF2001	H3900290	CFJ-455K13
		IC			
Q2016	G1090381	TA7060AP			
					RESISTOR
			R2172	J02245010	Carbon Film 1/4W SJ 1Ω
		TRANSISTOR	R2007, 2094	J02245100	" " " " 10Ω
Q2014, 2032 2034, 2035	G3105641R	2SA564AR	R2226, 2229	J02245330	" " " " 33Ω
			R2003	J02245470	" " " " 47Ω
Q2021, 2024 2027, 2028	G3303800Y	2SC380Y	R2051	J02245560	" " " " 56Ω
			R2149	J02245680	" " " " 68Ω
Q2019, 2020	G3315830	2SC1583	R2020, 2021 2055, 2218	J01245101	" " " TJ 100Ω
Q2012, 1018 2022, 2023	G3318150G	2SC1815GR	R2030, 2034	J02245101	" " " SJ 100Ω
Q2006-2009 2011, 2015 2030, 2033	G3318150Y	2SC1815Y	2046, 2058 2068, 2072 2088, 2091 2095, 2102 2110-2113 2123, 2028 2133, 2140 2151, 2154 2160, 2174 2197, 2198		
		FET			
Q2029	G3800190G	2SK19GR			
Q2005, 2013 2031	G3090035	2SK19GR-1			
Q2025, 2026	G3090034	2SK19Y			
Q2001, 2002	G3801250Y	2SK125Y	R2216	J01245151	" " " TJ 150Ω
Q2003, 2004 2010, 2017	G4800730G	3SK73GR	R2186	J02245151	" " " SJ 150Ω
			R2122, 2221	J02245181	" " " " 180Ω
			R2163, 2222	J02245221	" " " " 220Ω
			R2175	J01245221	" " " TJ 220Ω
		THERMISTOR	R2114, 2115 2117, 2155	J02245331	" " " SJ 330Ω
TH2001	G9090003	D-33A			
			R3026	J01245391	" " " TJ 390Ω
			R2009, 2028 2124	J02245391	" " " SJ 390Ω
		DIODE			
D2038, 2053-2056 2062, 2080	G2090029	Ge 1N60	R2066, 2166 2126, 2131 2177, 2224	J02245471	" " " " 470Ω
D2039, 2040	G2090093	" 1N270	2038, 2047		
D2004, 2010 2021, 2023 2029, 2030 2032-2036 2041-2045 2047, 2049- 2052, 2057 2058, 2060 2061, 2064 2066-2069 2071, 2072 2075-2078 2081, 2082	G2015550	Si 1S1555	2052, 2062 2098, 2153 2199		
			R2053	J01245561	" " " TJ 560Ω
			R2203	J02245821	" " " SJ 820Ω
			R2008, 2029 2045, 2048 2063, 2064 2073, 2074 2079, 2082 2083, 2089 2096, 2099 2103-2104 2117, 2127 2130, 2136 2138, 2146 2152, 2157 2162	J02245102	" " " " 1kΩ
D2026-2028 2046, 2059	G2090118	Schottky 1SS97			
D2031	G2090179	Varactor FC-53M-(5)			
D2073, 2074	G2090030	Zener BZ090			
D2048	G2090218	" HZ9C1			

2168, 2187 2200				2150, 2169 2192, 2227		
R2236	J01245102	Carbon Film	1/4W TJ	1k $\Omega$	R2084	J02245124 Carbon Film 1/4W SJ 120k $\Omega$
R2011, 2013 2022	J02245122	" "	" SJ	1.2k $\Omega$	R2090, 2189	J02245154 " " " " 150k $\Omega$
R2014, 2015 2067, 2101 2147, 2178 2234	J01245152	" "	" TJ	1.5k $\Omega$	R2076, 2180	J02245224 " " " " 220k $\Omega$
R2004, 2012 2035, 2054 2056, 2057 2060, 2125 2173, 2202	J02245222	" "	" SJ	2.2k $\Omega$	R2230	J02245394 " " " " 390k $\Omega$
R2212, 2217	J01215222	" "	1/8W TJ	2.2k $\Omega$	R2039, 2105	J02245564 " " " " 560k $\Omega$
R2042, 2050 2107, 2118	J02245272	" "	1/4W SJ	2.7k $\Omega$	R2065	J02245824 " " " " 820k $\Omega$
R2129, 2204 2208	J02245332	" "	" "	3.3k $\Omega$	R2039, 2179	J02245105 " " " " 1M $\Omega$
R2213	J01215332	" "	1/8W TJ	3.3k $\Omega$	R2235	J02245335 " " " " 3.3M $\Omega$
R2033	J02245392	" "	1/4W SJ	3.9k $\Omega$	R2231	J02245565 " " " " 5.6M $\Omega$
R2016, 2017 2106, 2119 2134, 2195 2196	J02245472	" "	" "	4.7k $\Omega$		
R2024, 2080 2092, 2100 2132, 2137 2185	J02245562	" "	" "	5.6k $\Omega$		
R2192	J02245682	" "	" "	6.8k $\Omega$		
R2001, 2005 2006, 2041 2043, 2049 2059, 2061 2075, 2077 2078, 2081 2087, 2097 2120, 2139 2159, 2165 2166, 2170 2181, 2183 2184, 2188 2190, 2101 2209, 2210	J02245103	" "	" "	10k $\Omega$		
R2219	J01215103	" "	1/8W TJ	10k $\Omega$		
R2225	J02245123	" "	1/4W SJ	12k $\Omega$		
R2108, 2135 2228	J02245153	" "	" "	15k $\Omega$		
R2211	J01215153	" "	1/8W TJ	15k $\Omega$		
R2069, 2142	J02245183	" "	1/4W SJ	18k $\Omega$		
R2002, 2144 2171	J02245223	" "	" "	22k $\Omega$		
R2085, 2164	J02245273	" "	" "	27k $\Omega$		
R2044, 2101	J02245333	" "	" "	33k $\Omega$		
R2121	J02245393	" "	" "	39k $\Omega$		
R2141, 2156 2167	J02245473	" "	" "	47k $\Omega$		
R2158	J02245563	" "	" "	56k $\Omega$		
R2070	J02245823	" "	" "	82k $\Omega$		
R2071	J02245104	" "	" "	100k $\Omega$		
						<b>POTENTIOMETER</b>
					VR2002, 2003 2006	J51752502 RGS6-FAN 5KB 5k $\Omega$ B
					VR2001, 2004 2005	J51752103 RGS6-FAN 10KB 10k $\Omega$ B
					VR2007, 2008	J51752504 RGS6-FAN 500KB 500k $\Omega$ B
						<b>CAPACITOR</b>
					C2125	K00175180 Ceramic Disc 50WV SL 2 pF (DD104SL020C50V02)
					C2112	K00172030 " " " " 3 pF (DD104SL030C50V02)
					C2127	K10176102 " " " " 10 pF (DD104SL100D50V02)
					C2177	K00175180 " " " " 18 pF (DD104SL180J50V02)
					C2035, 2116 2138	K00175330 " " " " 33 pF (DD104SL330J50V02)
					C2036, 2037 2123, 2124	K00175101 " " " " 100 pF (DD105SL101J50V02)
					C2128	K00175181 " " " " 180 pF (DD104SL181D50V02)
					C2077, 2078 2081, 2118 2174	K00175221 " " " " 220 pF (DD107SL221J50V02)
					C2075, 2117 2135, 2145	K00175331 " " " " 330 pF (DD107SL331J50V02)
					C2062, 2063	K51176102 Styrol 1000 pF (50SU102K)
					C2006, 2027 2056, 2146 2180	K10176102 Ceramic Disc 50WV 0.001 $\mu$ F (DD104B102K50V02)
					C2001-2004 2008, 2009 2011, 2013 2015, 2017 2019, 2021 2023, 2025 2031, 2033 2034, 2040 2061, 2064 2068, 2073 2079, 2080 2086, 2089 2098, 2099 2104-2111 2113, 2121	K13179008 " " " " 0.01 $\mu$ F (DD106F103Z50V)

2130, 2131 2137, 2157- 2159, 2161 2162, 2166 2169, 2170 2172			C2148	K40129007	" "	100 $\mu$ F (16RE100)
			C2182	K70167334	Tantalum	35WV 0.33 $\mu$ F (CS15E1VR33M)
			C2154	K70140008	"	25WV 1 $\mu$ F (489D105X0025A1)
C2005, 2010 2012, 2014 2016, 2018 2020, 2022 2024, 2026 2039, 2058 2097, 2114 2115, 2147 2179	K13179009	Ceramic Disc 50WV 0.047 $\mu$ F (DD110F473Z50V)		K70120001	"	16WV 4.7 $\mu$ F (489D475X0016B1)
			C2175, 2176 2182	K70120002	" "	10 $\mu$ F (489D106X0016C1)
					<b>INDUCTOR</b>	
			L2001-2006 2016-2018 2023, 2024	L1190020	FL5H151K	150 $\mu$ H
			L2007-2011 2022	L1190035	FL7H392J	3.9 mH
C2139	K50177222	Mylar 50WV 0.0022 $\mu$ F (50F2U222M)	L2014, 2019-2021 2026-2029	L1190017	FL5H102K	1 mH
C2132	K50177223	" " 0.022 $\mu$ F (50F2U223M)				
C2030, 2032 2038, 2041-2046 2048 2050, 2052 2066, 2070 2084, 2085 2088, 2096 2150, 2167 2171	K19149021	Semiconductor Ceramic " 0.047 $\mu$ F (UAT08X473-L45AE)		L1190090	LAL04102K-NA	1 mH
			L2015	L1190023	FL5H220K	22 $\mu$ H
			L2012	L0021196		250 $\mu$ H
					<b>TRANSFORMER</b>	
			T2001, 2005	L0021192		
			T2002-2004 2013-2015	L0021199		
			T2006-2008 2010-2012 2016	L0020422	R12-7947	
C2057, 2101 2102, 2132	K19149025	" " 0.1 $\mu$ F 25WV (UAT13X104K-L46AE)	T2009 T2017, 2018	L0020420 L0021294	R12-7943	
					<b>RELAY</b>	
C2047, 2049 2051, 2053-2055 2060, 2067 2069, 2071 2072, 2074 2076, 2083 2090-2095 2100, 2103 2133, 2149 2153, 2165 2168	K40179013	Electrolytic 50WV 1 $\mu$ F (50RL1)	RL2001	M1190002	FBR211AD012	
					<b>TP TERMINAL</b>	
				Q5000037	TP-H	
					<b>AF UNIT</b>	
			Symbol No.	Part No.	Name & Description	
			PB-2344D	F0002344D	Printed Circuit Board	
				C0023440	PCB with Components	
					<b>IC</b>	
			Q3024	G1090248	AN6551	
	K40179001	" " 1 $\mu$ F (50RC21)	Q3019	G1090257	MC14066B	
			Q3025	G1090284	$\mu$ PC2002V	
C2151, 2157	K40179009	" " 2.2 $\mu$ F (50RL2R2)	Q3031	G1090012	SN16913P	
					<b>TRANSISTOR</b>	
C2126, 2129 2140, 2142 2143	K40179011	" " 3.3 $\mu$ F (50RE3R3)	Q3015	G3104960Y	2SA496Y	
			Q3008, 3009 3012	G3107331Q	2SA733Q	
C2008, 2087 2119, 2122 2144, 2155 2163, 2164	K40129004	" 16WV 10 $\mu$ F (16RE10)	Q3027-3029	G3303800Y	2SC380Y (2SC380 TMY)	
			Q3001, 3004	G3307320G	2SC732TM-GR	
			Q3003	G3318150B	2SC1815BL	
			Q3022, 3023	G3318150G	2SC1815GR	
C2059	K40129016	" " 22 $\mu$ F (16RL22)	Q3002, 3005- 3007, 3010 3011, 3013 3014, 3016- 3018, 3020	G3318150Y	2SC1815Y	
C2134, 2141	K40129002	" " 47 $\mu$ F (16RE47)				

3021, 3030			R3017	J02245182	" " " "	1.8k $\Omega$
			R3011, 3021	J02245222	" " " "	2.2k $\Omega$
			3059, 3071			
			3075, 3121			
		<b>FET</b>	R3111	J02245272	Carbon Film 1/4W SJ	2.7k $\Omega$
Q3026	G3090034	2SK19Y	R3001, 3010	J02245332	" " " "	3.3k $\Omega$
			3040, 3047			
			3057, 3066			
		<b>DIODE</b>	3091, 3104			
D3015	G2090001	Si 10D1	3125, 3155			
D3011, 3014	G2090029	Ge 1N60	R3039	J02245392	" " " "	3.9k $\Omega$
3021-3024			R3004, 3012	J02245472	" " " "	4.7k $\Omega$
D3007, 3009	G2090093	" 1N270	3033, 3035			
D3001, 3006	G2015550	Si 1S1555	3038, 3042			
3010, 3012			3050, 3051			
3013, 3016			3063, 3065			
3020, 3025-			3120, 3123			
3028, 3030-			R3153	J01245472	" " " TJ	4.7k $\Omega$
3032, 3034			R3073, 3076	J02245562	" " " SJ	5.6k $\Omega$
3036, 3037			3093			
	G2090118	Schottky 1SS97	R3082, 3083	J02245682	" " " "	6.8k $\Omega$
D3008	G2090217	Zener HZ3C1	3086, 3095			
			3096, 3099			
		<b>CRYSTAL</b>	R3006	J02245822	" " " "	8.2k $\Omega$
X3001	H0102449	8.2159MHz	R3013, 3019	J02245103	" " " "	10k $\Omega$
			3020, 3022			
			3028, 3048			
			3052, 3053			
		<b>RESISTOR</b>	3061, 3080			
R3115	J01275229	Carbon Film 1/2W TJ	3081, 3082			2.2 $\Omega$
	J00245330	" " 1/4W VJ	3106, 3110			33 $\Omega$
R3102	J02245560	" " " SJ	3119, 3121			56 $\Omega$
R3016, 3113	J02245820	" " " "	3138, 3139			82 $\Omega$
R3005, 3018	J02245101	" " " "	3145, 3147			100 $\Omega$
3026, 3070			3152, 3162-			
3079, 3089			3164, 3172			
3108, 3132			R3156	J00215103	" " 1/8W VJ	10k $\Omega$
3135, 3140			R3007, 3015	J02245123	" " 1/4W SJ	12k $\Omega$
3160, 3161			3045, 3054			
3173			3107			
R3072, 3077	J02245221	" " " "	R3003, 3023	J02245153	" " " "	15k $\Omega$
3127		220 $\Omega$	3062, 3068			
R3027, 3116	J02245331	" " " "	3087, 3100			
		330 $\Omega$	R3067	J02245183	" " " "	18k $\Omega$
R3154	J02245391	" " " "	R3036, 3165	J02245223	" " " "	22k $\Omega$
R3064, 3094	J02245471	" " " "	3167			
R3078, 3150	J02245561	" " " "	R3008, 3044	J02245333	" " " "	33k $\Omega$
3174, 3177		560 $\Omega$	3055, 3084			
R3009, 3025	J02245102	" " " "	R3002, 3014	J02245473	" " " "	47k $\Omega$
3034, 3046		1k $\Omega$	3112, 3128			
3056, 3060			3136, 3144			
3069, 3085			3146			
3090, 3092			R3024, 3088	J02245563	" " " "	56k $\Omega$
3098, 3103			3101			
3105, 3114			R3122, 3126	J02245104	" " " "	100k $\Omega$
3129-3131			3171			
3133, 3134			R3097	J02245334	" " " "	330k $\Omega$
3137, 3149			R3041, 3109	J02245474	" " " "	470k $\Omega$
3168			R3117	J31276010	Wire Wound 1/2W	1 $\Omega$
R3157	J00215102	" " 1/8W VJ				
R3175	J02245122	" " 1/4W SJ				
R3037	J02245152	" " 1/4W SJ				

POTENTIOMETER				(50F2U103M)		
VR3003	J51727103	CR19R101	10k $\Omega$	C3064, 3068	K50177153	" " 0.015 $\mu$ F
VR3004	J51723471	SR19R471	470 $\Omega$	3077, 3086		(50F2U153M)
VR3005	J51752502	RGS6FAN	5k $\Omega$	3087		
VR3006	J51752103	RGS6FAN	10k $\Omega$	C3014, 3015	K50177223	Mylar 50WV 0.022 $\mu$ F
VR3001, 3002	J51752104	RGS6FAN	100k $\Omega$	3027-3029		(50F2U223)
CAPACITOR				C3065	K50177333	" " 0.033 $\mu$ F
C3107, 3111	K02173100	Ceramic Disc 50WV CH 10 pF (DD104CH100D50V02)		C3002	K40179002	Electrolytic " 0.1 $\mu$ F (ECE-A1HK0R1)
	K06175120	" " " UJ 12 pF (DD104UJ120J50V02)		C3067	K40179010	" " 0.47 $\mu$ F (50RER47)
	K02173180	" " " CH 18 pF (DD104CH180J50V02)		C3005, 3007	K40179013	" " 1 $\mu$ F (50RE1)
C3103	K06175220	" " " UJ 22 pF (DD105UJ220J50V02)		3008, 3031		
C3144	K02175270	" " " CH 27 pF (DD105CH270J50V)		3034, 3039		
C3092	K00175330	" " " SL 33 pF (DD104SL330J50V02)		3043, 3049		
C3102	K06175390	" " " UJ 39 pF (DD105UJ390J50V02)		3070, 3081		
	K06175510	" " " " 51 pF (DD106UJ510J50V02)		3085, 3089		
C3104, 3105	K02175151	" " " CH 150 pF (DD109CH151J50V02)		3136, 3137		
C3001	K00175221	" " " SL 220 pF (DD107SL221J50V02)		3140		
	K23170002	Ceramic Chip " 0.001 $\mu$ F (GR43Y5V103Z)		C3127	K40179009	" " 2.2 $\mu$ F (50RE2R2)
C3025	K12171102	Ceramic Disc " 0.001 $\mu$ F (DD104E102P50V)		C3010, 3017	K40149001	" 25WV 4.7 $\mu$ F (25RE4R7)
C3131-3134	K10176102	" " " 0.001 $\mu$ F (DD104B102K50V02)		3020, 3021		
C3013, 3026	K13179008	" " " 0.01 $\mu$ F (DD106F103Z50V)		3030,		
3035, 3042				3036, 3037		
3045-3047				3044, 3071		
3073, 3074				C3004, 3009	K40129004	" 16WV 10 $\mu$ F (16RE10)
3093, 3101				3018, 3033		
3106, 3108-				3041, 3048		
3110, 3112-				3062, 3072		
3114, 3118-				3075, 3080		
3121, 3123				3082-3084		
3139				3097, 3100		
C3060, 3061	K19149013	Semiconductor Ceramic 50WV 0.01 $\mu$ F (UAT05X103K-L05AE)		3116, 3128		
C3050-3059	K19149021	" " 0.047 $\mu$ F (UAT08X473-L45AE)		3135-3138		
C3096	K19149025	" " 0.1 $\mu$ F (UAT13X104K-L46AE)		C3117	K40129016	" " 22 $\mu$ F (16RE22)
				C3011, 3019	K40129008	" " 33 $\mu$ F (16RE33)
C3003, 3032	K50177102	Mylar " 0.001 $\mu$ F (50F2U102M)		3124		
3040, 3069				C3066, 3067	K40109002	" 10WV 47 $\mu$ F (10RE47)
3090				C3088, 3138	K40129002	" 16WV 47 $\mu$ F (16RE47)
C3006, 3016	K50177222	" " 0.0022 $\mu$ F (50F2U222M)		C3012	K40129020	" " 100 $\mu$ F (16RC100)
C3076	K50177272	" " 0.0027 $\mu$ F (50F2U272M)		C3091	K40129033	" " 220 $\mu$ F (16RC220)
C3079	K50177103	" " 0.01 $\mu$ F		C3094	K40129006	" " 470 $\mu$ F (16RE470)
				C3095	K40129021	" " 1000 $\mu$ F (16R102S)
				C3129, 3130	K70127225	Tantalum " 2.2 $\mu$ F (CS15E1C2R2M)
				C3098	K70120002	" " 10 $\mu$ F (489D106X0016C1)
				TRIMMER CAPACITOR		
				TC3003	K9100086	CTZ51E 20P
				TC3002	K9100089	CTZ51G 50P
					K9100091	CT81E 20p

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		INDUCTOR				DIODE	
L3001, 3003 3006, 3010	L1190017	FL5H102K	1 mH	D4083	G2090001	Si	10D1
				D4086-4089	G2015550	"	1S1555
L3005, 3007	L1190023	FL5H220	22μH	4093, 4094			
	L1190035	FL7H392J	3.9 mH	D4001-4041	G2090027	"	1SS53
L3002	L1190040	S-4	1 mH	4043-4045			
L3009	L1190090	LAL04-102K	1 mH	4047, 4049			
		TRANSFORMER		4051-4053			
T3002	L0020883			4055-4057			
				4059-4061			
				4063-4074			
		CONNECTOR		4077, 4078			
	P0090191	B2B-XH-A	2P	4080, 4081			
	P0090194	B5B-XH-A	5P	4085, 4092			
	P0090197	B8B-XH-A	8P	D4075, 4084	G2090118	Schottky	1SS97
	P0090192	B3B-XH-A	3P	D4079, 4082	G2090023	Varactor	1SV50
				D4042, 4046	G2090073	"	FC52M
				4048, 4050			
		TP TERMINAL		4054, 4058			
	Q50000037	TP-H		D4062	G2090185	Zener	HZ5C2
				D4090	G2090240	"	WZ105
						CRYSTAL	
				X4001	H0102450		10.0MHz
				X4003	H0102452		10.5434MHz
				X4004	H0102453		10.5466MHz
				X4002	H0102451		19.5434MHz
<b>LOCAL UNIT</b>						<b>RESISTOR</b>	
Symbol No.	Part No.	Name & Description		R4034, 4059	J02245100	Carbon Film	1/4W SJ 10Ω
PB-2345 D	F0002345 D	Printed Circuit Board		4166			
	C0023450	PCB with Components		R4017, 4026	J02245470	" "	47Ω
				4131, 4152			
				4161			
		IC		R4062, 4063	J02245560	" "	56Ω
Q4018	G1090087	MC4044		R4018, 4020	J02245101	" "	100Ω
Q4020	G1090108	MC14518BCP		4027, 4028			
Q4017	G1090019	SN74LS192N		4064, 4067			
Q4012, 4024	G1090062	SN76514N		4075, 4079			
				4084, 4087-			
				4089, 4092			
		TRANSISTOR		4094, 4095			
Q4016, 4043	G3107331Q	2SA733AQ		4098, 4104			
Q4007, 4011 4013-4015	G3305350B	2SC535B		4127, 4130			
Q4022, 4023	G3307320G	2SC732GR		4132, 4133			
Q4001, 4006 4009, 4010 4021, 4026- 4029, 4031- 4037, 4039 4041, 4042	G3309451Q	2SC945Q		4140, 4143			
				4149, 4153			
				4158, 4162			
				4163			
				R4093	J01245101	" "	TJ 100Ω
					J01245151	" "	150Ω
				R4065	J02245151	" "	SJ 150Ω
Q4008	G3324070	2SC2407		R4099	J02245181	" "	180Ω
				R4040, 4091	J02245221	" "	220Ω
				4108			
				R4057, 4188	J02245271	" "	270Ω
				R4013, 4035	J02245471	" "	470Ω
				4036, 4083			
				4174			
Q4025, 4030 4038, 4040	G4800730G	3SK73GR		R4029, 4072	J02245561	" "	560Ω
				4080, 4090			

4106, 4128					R4121	J02245823	" "	" "	82kΩ
4144, 4150					R4025, 4037	J02245104	" "	" "	100kΩ
4159					4071, 4097				
R4056	J02245681	Carbon Film	1/4W SJ	680Ω	4100, 4103				
R4187	J01245821	" "	" TJ	820Ω	4122, 4126				
R4014, 4022	J02245102	" "	" SJ	1kΩ	4129, 4136				
4031, 4041-					4142, 4145				
4048, 4053					4146, 4148				
4060, 4068					4151, 4154				
4069, 4076					4155, 4157				
4105, 4109					4160				
4125, 4141					R4101, 4102	J02245224	Carbon Film	1/4W SJ	220kΩ
4165, 4172					R4186	J00215224	" "	1/8W VJ	220kΩ
R4049	J01245102	" "	" TJ	1kΩ	R4070	J02245334	" "	1/4W SJ	330kΩ
R4058	J02245152	" "	" SJ	1.5kΩ	R4168	J20306330	Metallic Film	1W	33Ω
	J00215222	" "	1/8W VJ	2.2kΩ			<b>POTENTIOMETER</b>		
R4134	J02245272	" "	1/4W SJ	2.7kΩ	VR4006, 4007	J51724502	PN822H502H		5kΩB
R4052, 4096	J02245332	" "	" "	3.3kΩ	VR4002-4005	J51724103	PN822H103H		10kΩB
	J02245472	" "	" "	4.7kΩ	VR4001	J51752104	RGS6FAN	100KB	100kΩB
R4023, 4086	J02245562	" "	" "	5.6kΩ			<b>CAPACITOR</b>		
4119					C4217	K02182059	Ceramic Disc	50WV CH	0.5 pF
R4191	J00215682	" "	1/8W VJ	6.8kΩ			(RD870-1CG0R5C)		
R4019, 4021,	J02245103	" "	1/4W SJ	10kΩ	C4101, 4105	K13170103	Ceramic Disc	50WV SL	2 pF
4024, 4050					4127, 4128		(DD104SL020C50V02)		
4051, 4054					4130, 4131				
4055, 4061					4185, 4221				
4113, 4117					C4089, 4160	K00172030	" "	" "	3 pF
4118, 4120					4186		(DD104SL030C50V02)		
4123, 4169					C4060, 4158	K00172050	" "	" "	5 pF
4171, 4173							(DD104SL050C50V02)		
4199					C4040	K02173060	" "	" CH	6 pF
R4179,	J00215103	" "	1/8W VJ	10kΩ			(DD104CH060D50V02)		
4180-4185					C4024, 4033	K02173090	" "	" "	9 pF
R4175, 4193	J01215103	" "	" TJ	10kΩ			(DD104CH090D50V02)		
R4073	J02245123	" "	1/4W SJ	12kΩ	C4018, 4032	K02173100	" "	" "	10 pF
R4002, 4004	J02245153	" "	" "	15kΩ	4108, 4163		(DD104CH100D50V02)		
4006, 4008					4215				
4016, 4033					C4069, 4071	K00173100	" "	" SL	10 pF
4078, 4082					4088, 4220		(DD104SL100D50V02)		
4138					C4143	K00175120	" "	" "	12 pF
R4192	J00215153	" "	1/8W VJ	15kΩ			(DD104SL120J50V02)		
R4164, 4170	J02245183	" "	1/4W SJ	18kΩ	C4090, 4118	K00175150	" "	" "	15 pF
	J01215223	" "	1/8W TJ	22kΩ	4175, 4188		(DD104SL150J50V02)		
R4010, 4038	J02245223	" "	1/4W SJ	22kΩ	C4226	K00189012	" "	" 63WV	15 pF
4039, 4107							(RD870-2SL150J63V)		
4115, 4177					C4004, 4011	K02175180	" "	" CH	18 pF
4178							(DD104CH180J50V02)		
R4001, 4003	J02245273	" "	" "	27kΩ	C4041	K06175180	" "	" UJ	18 pF
4005, 4007							(DD104UJ180J50V02)		
4009, 4011					C4117	K00175180	" "	" SL	18 pF
4012, 4015							(DD104SL180J50V02)		
4030, 4074					C4010	K02179008	" "	" CH	20 pF
4077, 4081							(DD104CH200J50V02)		
4124, 4139					C4219	K00179005	" "	" SL	20 pF
R4190	J00215393	" "	1/8W VJ	39kΩ			(DD104SL200J50V02)		
R4135	J02245473	" "	1/4W SJ	47kΩ	C4002, 4034	K06179009	" "	" UJ	22 pF
R4066, 4085	J02245563	" "	" "	56kΩ	4044		(DD104UJ220J50V02)		
4137, 4167					C4154	K02179009	" "	" CH	22 pF
R4032, 4147	J02245683	" "	" "	68kΩ			(DD104CH220J50V02)		
4156									



C4173, 4214	K00175220	" " " SL 22 pF (DD104SL220J50V02)	C4183, 4184	K00175271	" " " " 270 pF (DD107SL271J50V02)
C4093	K00179006	Ceramic Disc 50WV SL 24 pF (DD104SL240J50V02)	C4076, 4070 4139	K00175331	" " " " 330 pF (DD107SL331J50V02)
C4019	K02179010	" " " CH 24 pF (DD104CH240J50V02)	C4056, 4058	K00175471	Ceramic Disc 50WV SL 470 pF (DD109SL471J50V02)
C4013, 4026	K06179010	" " " UJ 24 pF (DD104UJ240J50V02)	C4109	K30176331	Dipped Mica 50WV 330 pF (LCQ17331K05)
C4048, 4156	K02179011	" " " CH 27 pF (DD105CH270J50V02)	C4216	K30176681	" " " " 680 pF (LCQ18681K05)
C4113, 4114	K00175270	" " " SL 27 pF (DD104SL270J50V02)	C4001, 4006 4009, 4012 4015, 4021 4025, 4030 4031, 4036 4039, 4042 4046, 4051- 4055, 4061- 4068, 4078 4080, 4081 4083, 4092 4097-4103 4106, 4107 4111, 4112 4115, 4116 4119-4126 4129, 4132- 4134, 4136 4137, 4141 4142, 4151 4152, 4157 4159, 4161 4162, 4164 4166, 4168 4172, 4174 4177, 4178 4180, 4182 4198, 4200 4203	K13179008	Ceramic Disc " 0.01 $\mu$ F (DD106F103Z50V)
C4003	K02179013	" " " CH 33 pF (DD105CH330J50V02)			
C4079, 4176	K00175330	" " " SL 33 pF (DD107SL330J50V02)			
C4038	K02175390	" " " CH 39 pF (DD105-257CH390J50V02)			
C4070, 4075	K00175390	" " " SL 39 pF (DD104SL390J50V02)			
C4028, 4155	K02175470	" " " CH 47 pF (DD106CH470J50V02)			
C4165, 4223	K06175470	" " " UJ 47 pF (DD104UJ470J50V02)			
C4187	K00175470	" " " SL 47 pF (DD104SL470J50V02)			
C4047	K02175560	" " " CH 56 pF (DD106CH560J50V02)			
C4096	K00179008	" " " SL 36 pF (DD104SL360J50V02)			
C4094	K00179011	" " " " 62 pF (DD104SL620J50V02)			
C4095	K00175560	" " " " 56 pF (DD104SL560J50V02)			
C4008, 4037 4171	K02175680	" " " CH 68 pF (DD107CH680J50V02)			
C4017, 4023	K06175680	" " " UJ 68 pF (DD105-257UJ680J50V02)			
C4135	K00175680	" " " SL 68 pF (DD104SL680J50V)			
C4072	K00175820	" " " SL 82 pF (DD105SL820J50V02)	C4201, 4202-4208	K23140001	MKH Chip 25WV 0.01 $\mu$ F (GR42Y5V103Z25V)
C4022	K06179019	" " " UJ 91 pF (DD106UJ910J50V02)	C4211	K14189002	Ceramic Disc 63WV 0.01 $\mu$ F (RD871-2FZ-103Z63V)
C4029	K02179019	" " " CH 91 pF (DD107CH910J50V02)	C4059, 4087 4150, 4189- 4191, 4194 4199	K13179009	" " 50WV 0.047 $\mu$ F (DD110F473Z50V)
C4167	K02175101	" " " " 100 pF (DD107CH101J50V02)			
C4145, 4179 4192	K00175101	" " " SL 100 pF (DD104SL101D50V02)	C4195, 4196	K50177332	Mylar " 0.0033 $\mu$ F (50F2U332M)
C4016	K06179020	" " " UJ 110 pF (DD106UJ111J50V02)	C4050	K50177103	" " 0.01 $\mu$ F (50F2U103M)
C4007	K02179021	" " " CH 130 pF (DD109CH131J50V02)	C4153	K40179013	Electrolytic 50WV 1 $\mu$ F (50RE1)
C4110	K02175151	" " " " 150 pF (DD109CH151J50V02)	C4169	K40179011	Electrolytic " 3.3 $\mu$ F (50RE3.3)
C4138, 4040	K00175181	" " " SL 180 pF (DD106SL181J50V02)	C4005, 4014 4020, 4027 4035, 4043 4045, 4049 4082, 4086	K40129004	" 16WV 10 $\mu$ F (16RE10)
C4057	K00179020	" " " " 240 pF (DD107SL241J50V02)			

				COUNTER UNIT		
Symbol No.	Part No.	Name & Description				
4193						
C4224	K40129008	" "	33 $\mu$ F	Symbol No.	Part No.	Name & Description
		(16RE33)		PB-2346C	F0002346C	Painted Circuit Board
C4144, 4149	K40129002	" "	47 $\mu$ F		C0023460	PCB with Components
		(16RE47)				
C4085	K40129007	Electrolytic	16WV			
		(16RE100)	100 $\mu$ F			IC
C4091	K5420000	MKH	100WV	Q5015	G1090084	78L05
		((32560A1154K)	0.15 $\mu$ F	Q5005, 5011	G1090068	MC14011
C4225	K70127225	Tantalum	16WV	Q5006	G1090385	MC14022
		(CS15E1C2R2M)	2.2 $\mu$ F	Q5012, 5013	G1090053	MC14081B
		<b>TRIMMER CAPACITOR</b>		Q5003	G1090476	TC4518BP or $\mu$ PC4518C
	T91000075	TZ03R200E	20 pF	Q5004	G1090108	MC14518B
TC4001-4003	K91000081	TZ03R300E	30 pF	Q5008-5010	G1090387	TC5066
		<b>INDUCTOR</b>		Q5007	G1090386	TC5070
L4001, 4002 4004, 4005 4007, 4009 4011, 4012 4014, 4015 4017, 4024 4028, 4032-4034	L1190020	FL5H151K	150 $\mu$ H			<b>TRANSISTOR</b>
				Q5014	G3318150G	2SC1815GR
				Q5001, 5002	G3318150Y	2SC1815Y
						<b>DIODE</b>
				D5067	G2015540	Si 1S1554
L4018, 4019	L1190004	FL4HR68M	0.68 $\mu$ H	D5061-5064	G2015550	" 1S1555
L4020-4022	L1190073	FL5H270K	27 $\mu$ H	5069		
L4023	L1190031	FL5H680K	68 $\mu$ H	D5066	G2090185	Zener HZ5C2
L4026, 4027	L1190013	FL4H6R8K	6.8 $\mu$ H			
L4029, 4030	L1190018	FL5H121K	120 $\mu$ H			
L4035	L1190016	FL5H101K	100 $\mu$ H			<b>FCD</b>
L4037, 4038	L1190006	FL4H1R2M	1.2 $\mu$ H	DS5001	G6090027	FIP9E8
L4039, 4026 4027	L1190021	FL5H180K	18 $\mu$ H			
L4041	L1190096	LAL04151K-NA	150 $\mu$ H			<b>TRANSFORMER</b>
L4003	L0021200			T5001	L3030077	E-142
L4006	L0021201					
L4008	L0021202					
L4010	L0021203					<b>RESISTOR</b>
L4016	L0021205			R5038	J02245479	Carbon Film 1/4W SJ 4.7 $\Omega$
L4031	L0020145			R5044	J02245270	" " " " 27 $\Omega$
L4036	L0021206B			R5001	J02215101	" " 1/8W " 100 $\Omega$
L4040	L2190001			R5007	J02245101	" " 1/4W " 100 $\Omega$
		<b>TRANSFORMER</b>		R5005	J02245121	" " " " 120 $\Omega$
T4001-4003	L0021207			R4040	J02245151	" " " " 150 $\Omega$
T4004-4006	L0021208			R4004, 4010	J02245222	" " " " 2.2k $\Omega$
T4007-4009	L0021209			R4039	J02245272	" " " " 2.7k $\Omega$
T4010	L0020801			R5011, 5024	J02245103	" " " " 10k $\Omega$
T4011,	L0021295			5037, 5041		
T4012, 4016	L0020638			R5018-5021	J02245563	" " " " 56k $\Omega$
T4013	L0021210			R5002, 5008	J02245104	" " " " 100k $\Omega$
T4014	L0021197			5012-5017		
T4015	L0020421			5022, 5023		
		<b>RELAY</b>		5042, 5043		
RL4001	M1190002	FBR211AD012				
		<b>TERMINAL</b>				
	Q5000029	Terminal A				<b>BLOCK RESISTOR</b>
	Q5000037	TP-H		RB5004	J40900028	RK1/16B-7E 3.3k $\Omega$ x 7
				RB5001-5003	J4090003	RK1/16B-7E 100k $\Omega$ x 7
				5005		

		CAPACITOR					CRYSTAL FILTER		
C5003	K06179006	Ceramic Disc	50WV UJ	30 pF	XF6001	H1102050	8.2M20A		
		(DD104UJ300J50V02)							
C5007, 5008 5016, 5017	K13179008	" "	" "	0.01μF			CERAMIC FILTER		
		(DD106F103Z50V)			CF6001	H3900270	CFX455D	455kHz	
C5001, 5002 5004, 5021	K13179009	" "	" "	0.047μF					
		(DD110F473Z50V)					RESISTOR		
C5006, 5018	K50177102	Mylar	"	0.001μF	R6006, 6021 6033, 6056 6057	J02245560	Carbon Film	1/4W SJ	56Ω
C5012	K50177153	"	"	0.015μF			" "	" "	100Ω
		(50F2U153M)			R6007, 6009 6012, 6017 6049	J02245101	" "	" "	100Ω
C5010	K40179009	Electrolytic	"	2.2μF					
		(50RE2R2)							
C5013, 5014	K40129004	"	16WV	10μF	R6058	J02245471	" "	" "	470Ω
		(16RE10)			R6004, 6018	J02245561	" "	" "	560Ω
C5009	K40129016	"	"	22μF	6035				
		(16RE22)			R6054	J02245561	" "	" "	560Ω
C5015, 5022	K40129007	"	"	100μF	R6016, 6019 6030, 6034	J02245102	" "	" "	1kΩ
		(16RE100)							
C5011	K40129009	"	"	220μF		J01245102	" "	" TJ	1kΩ
		(16RE220)			R6026	J02245152	" "	" SJ	1.5kΩ
					R6013, 6036	J02245182	" "	" "	1.8kΩ
					R6039, 6050	J02245222	" "	" "	2.2kΩ
		TP TERMINAL			R6015	J02245332	" "	" "	3.3kΩ
	Q5000036	TP-G			R6003, 6005 6055	J02245472	" "	" "	4.7kΩ
					R6040	J02245562	" "	" "	5.6kΩ
					R6001, 6002 6023, 6041 6046, 6047 6051	J02245103	" "	" "	10kΩ
<b>AM/FM UNIT (OPTION)</b>									
Symbol No.	Part No.	Name & Description			R6038	J01245103	" "	1/8W TJ	10kΩ
PB-2347 B	F0002347 B	Printed Circuit Board			R6053	J02245123	" "	" SJ	12kΩ
	C0023470	PCB with Components			R6025	J02245153	" "	" "	15kΩ
					R6029, 6031 6032	J02245223	" "	1/4W "	22kΩ
		IC			R6042	J02215223	" "	1/8W "	22kΩ
Q6001	G1090388	TA7069P			R6014	J02245333	" "	1/4W "	33kΩ
Q6008	G1090389	MC3359			R6024, 6037 6045	J02245473	" "	" "	47kΩ
Q6013	G1090048	TC5081P				J01215473	" "	1/8W TJ	47kΩ
Q6003, 6005	G1090239	TC5082P			R6020	J02245683	" "	1/4W SJ	68kΩ
Q6014	G1090072	μPC577H			R6008, 6010 6011	J02245104	" "	" "	100kΩ
		TRANSISTOR			R6028	J02245154	" "	" "	150kΩ
Q6007	G3303800Y	2SC380Y			R6027	J02245274	" "	" "	270kΩ
Q6012, 6015	G3318150G	2SC1815GR							
							POTENTIOMETER		
		FET			VR6004	J51752102	RGS6-FAN1KB 1KB		
Q6006	G3090036	2SK19BL			VR6001, 6003	J51752503	RGS6-FAN50KB 50KB		
Q6002, 6004	G3090035	2SK19TMGR			VR6002	J51752103	RGS6-FAN10KB 10KB		
		DIODE					CAPACITOR		
D6001, 6002 6004-6007	G2015550	Si	1S1555		C6008, 6027	K00173100	Ceramic Disc	50WV SL	10 pF
							(DD104SL100D50V02)		
					C6020	K05185470	" "	63WV "	47 pF
							(RD871-1N220-470J63V)		

C6046	K02175560	Ceramic Disc 63WV CH 56 pF (DD106CH560J50V02)	T6001, 6002	L0020892	<b>TRANSFORMER</b>
C6065, 6066	K00175680	" " " " 68 pF (DD104SL680J50V02)	T6003	L0021212	
C6003, 6022	K00175101	" " " " 100 pF (DD105SL101J50V02)	T6004	L0020422	R12-7947
C6030	K02175151	" " " " 150 pF (DD109CH151J50V02)	T6005	L0021199	
C6019, 6021	K05185151	" " " RH 150 pF (RD8742N220151J63V)			
C6024, 6051	K10176102	" " " 0.001μF (DD104B102K50V02)	<b>VFO UNIT</b>		
C6001, 6002 6005, 6006 6009-6011 6013-6016 6018, 6026 6060, 6063 6067, 6069-6071	K13179008	" " " 0.01μF (DD106F103Z50V)	Symbol No.	Part No.	Name & Description
			PB-2348 A	F0002348 A	Printed Circuit Board
				C0023480	PCB with Components
					<b>IC</b>
			Q7001	G1090390	VFO-1
C6041, 6074	K13179009	" " " 0.047μF (DD110F473Z50V)			<b>DIODE</b>
			D7001	G2022360	Varactor 1S2236
C6061	K19149017	Semiconductor Ceramic 25WV0.022μF (UAT06X223K)			<b>RESISTOR</b>
			R7002	J01245561	Carbon Film 1/4W TJ 560Ω
C6035, 6042	K19149021	" " " 0.047μF (UAT08X473-L45AE)	R7001	J01245103	" " " " 10kΩ
					<b>CAPACITOR</b>
C6028, 6029	K19149025	" " 50WV 0.1μF (UAT13X104L46AE)	C7017	K6172020	Ceramic Disc 50WV UJ 2 pF (DD104UF020C50V02)
C6036, 6037	K50177102	Mylar 50WV 0.001μF (50F2U102M)	C7016	K06172040	" " " " 4 pF (DD104UJ040C50V)
	K23140001	Ceramic Chip 25WV 0.01μF (GR42Y5V103Z25V)	C7001, 7004	K06179052	" " " " 8.2 pF (UP125UJ8R2K-NA)
	K50177223	Mylar 50WV 0.022μF (50F2U223)	C7013	K02179062	" " " CH 8.2 pF (UP125CH8R2-NA)
C6053, 6054	K50177473	" " 0.047μF (50F2U473)	C7015	K02173080	" " " " 8 pF (DD104CH080D50V02)
C6038	K40179002	Electrolytic " 0.1μF (50RC2-R1)	C7014	K02179065	" " " " 18 pF (UP125CH180-NA)
C6048, 6049	K40179010	" " 0.47μF (50RER47)	C7002	K06179053	" " " UJ 22 pF (UP125UJ220K-NA)
C6034, 6045 6052	K40179013	" " 1μF (50RE1)	C7003, 7005	K02179063	" " " CH 22 pF (UP125CH220J-NA)
C6050	K40179009	" " 2.2μF (50RE2.2)	C7006	K02179064	" " " " 33 pF (UP125CH330J-NA)
C6031, 6059	K40149001	" 25WV 4.7μF (25RE4R7)	C7010, 7012	K10179034	" " " " 470 pF (UP125B471K-NA)
C6012, 6017 6023, 6040 6047, 6055- 6057, 6062 6024, 6068	K40129004	" 16WV 10μF (16RE10)	C7011	K10179035	" " " " 1000 pF (UP125SB102K-NA)
			C7007-7009	K15179001	" " " " 0.01μF (TP125X103N-NA)
C6007	K40129002	" " 47μF (16RE47)			<b>VARIABLE CAPACITOR</b>
			VC7001	K90000024	C521R112
					<b>INDUCTOR</b>
					<b>TRIMMER CAPACITOR</b>
L6001, 6003- 6005	L1190016	FL5H101K 100μH	TC7002	K91000090	PS100 10 pF x 2
			TC7001	K91000103	PSS-100-10P 10 pF
L6006	L1190017	FL5H102K 1 mH	TC7003	K91000116	CTZ81F 30 pF
L6009	L1190102	S-104K			

		INDUCTOR					POTENTIOMETER		
L7002, 7004	L1190132	LAL04NA221K	220 $\mu$ H	VR8001	J50753103	EVTJ6A505B14	10k $\Omega$ B		
L7003	L1190090	LAL04NA102K	1 mH						
L7005, 7006	L1190131	LAL04NA1R8M	1.8 mH						
				CAPACITOR					
				C8003, 8006 8013, 8018	K12279004	Ceramic Disc	500WV	0.0047 $\mu$ F	
				(ECK-D-2H-472-PE)					
	P0090149	PI021-05M	5 pF	C8010, 8016 8019	K12279002	" "	"	0.01 $\mu$ F	
				(ECK-D-2H-103-PE)					
				C8017, 8024	K19149021	Semiconductor Ceramic			
				" 0.047 $\mu$ F					
				(UAT08X473K-L45AE)					
PL7001, 7002	Q1000049	K0320.Z.1	12V 100 mA	C8001, 8002 8004, 8005	K40270106	Electrolytic	450WV	10 $\mu$ F	
				(450RH10)					
				C8009	K40240106	"	250WV	10 $\mu$ F	
				(250RH10)					
				C8007, 8008	K40260226	"	350WV	22 $\mu$ F	
				(350RH22)					
<b>RECT A UNIT</b>				C8011	K40240336	"	250WV	33 $\mu$ F	
				(250RH33)					
Symbol No.	Part No.	Name & Description			C8015	K40179009	"	50WV	2.2 $\mu$ F
PB-2349C	F0002349C	Printed Circuit Board			(50RE2R2)				
	C0023490	PCB with Components				K52240002	Metallized Film	250WV	0.1 $\mu$ F
				(MD1-2E104M)					
				TRANSISTOR					
Q8003	G3106390Q	2SA639Q			C8021	K52240003	" " "		0.22 $\mu$ F
Q8001	G3107331Q	2SA733AQ			(MD1-2E224M)				
Q8002	G3318150Y	2SC1815Y							
Q8004	G3322290	2SC2229							
				INDUCTOR					
				L8001	L1190090	LAL04-102K			1 mH
				DIODE					
D8002-8006	G2090002	Si	10D10						
D8007, 8008 8011-8019	G2015550	"	1S1555						
				TP TERMINAL					
D8001	G2090081	"	SM1-12		Q5000038	TP-I			
				RESISTOR					
R8022	J02245331	Carbon Film	1/4W SJ	300 $\Omega$					
R8017, 8018 8020, 8025 8027	J02245102	" "	" "	1k $\Omega$					
				<b>RECT B UNIT</b>					
R8028	J01245222	" "	" TJ	2.2k $\Omega$	Symbol No.	Part No.	Name & Description		
R8016	J02245332	" "	" SJ	3.3k $\Omega$	PB-2350C	F0002350C	Printed Circuit Board		
R8019	J02245472	" "	" "	4.7k $\Omega$		C0023500	PCB with Components ;		
R8012, 8021	J02245103	" "	" "	10k $\Omega$					
R8014	J02245153	" "	" "	15k $\Omega$					
R8009	J01245183	" "	" TJ	18k $\Omega$	IC				
R8010	J02245183	" "	" SJ	18k $\Omega$	Q8502	G1090507	$\mu$ PC78L12A		
R8015	J02245223	" "	" "	22k $\Omega$	Q8505	G1090391	$\mu$ PC78L15		
R8013	J02245393	" "	" "	39k $\Omega$					
R8011	J02245274	" "	" "	270k $\Omega$					
R8003	J10276474	Carbon Composition							
				1/2W GK	470k $\Omega$				
R8001	J20306390	Metallic Film	1W	39 $\Omega$	Q8501	G3107331Q	2SA733AQ		
R8002	J20336391	" "	2W	390 $\Omega$	Q8503	G3304960Y	2SC496Y		
R8004	J20336471	" "	2W	470 $\Omega$	Q8504	G3318150Y	2SC1815Y		
R8006	J20336222	" "	2W	2.2k $\Omega$					
R8005	J20336332	" "	"	3.3k $\Omega$					
R8008	J20336562	" "	"	5.6k $\Omega$					
R8007	J20336473	" "	"	47k $\Omega$					

		DIODE					POTENTIOMETER	
D8501-8504	G2090002	Si	10D10		VR9001, 9003	J66800001	K1213000310KB	10KB
D8505	G2090003	"	V06B		9004			
D8507	G2090224	Zener	AW01-24		VR9005	J66800003	K12130004-10KA	10KA
D8506	G2090111	"	HZ6C1		VR9002	J66800002	K12130003500KB	500KB
		<b>RESISTOR</b>						
R8509	J02245560	Carbon Film	1/4W SJ	56Ω				
R8508	J02245103	" "	" "	10kΩ				
R8503-8506	J10276474	Carbon Composition	1/2W GK470kΩ		<b>SW UNIT A</b>			
R8502	J20336220	Metallic Film	2W	22Ω	Symbol No.	Part No.	Name & Description	
R8507	J20336122	" "	" "	1.2kΩ	PB-2353A	F0002353A	Printed Circuit Board	
R8501	J31336019	Wire Wound	"	0.1Ω		C0023530	PCB with Components	
		<b>CAPACITOR</b>					<b>DIODE</b>	
C8502, 8503 8505, 8508 8515	K13179008	Ceramic Disc	50WV (DD106F103Z50V)	0.01μF	D9201, 9202	G2015550	Si	1S1555
					D9203, 9204	G2090060	LED	GD-4-203SR-D
C8510	K40179011	Electrolytic	"	3.3μF				
		(50RE3R3)					<b>RESISTOR</b>	
C8504, 8507	K40149008	"	25WV	10μF	R9201, 9202	J02245182	Carbon Film	1/4W SJ 1.8kΩ
		(25RL10)						
C8514	K40129004	"	16WV	10μF				
		(16RE10)					<b>SWITCH</b>	
C8506	K40149003	"	25WV	100μF	S9201	N4090053	SUJ52A	
		(25RL100)					<b>TP TERMINAL</b>	
C8509	K40129021	"	16WV	1000μF		Q5000020	MS60121	
		(16R102S)			<b>SW UNIT B</b>			
C8501	K41160478	"	35WV	4700μF	Symbol No.	Part No.	Name & Description	
		(35TL4700)			PB-2352C	F0002352C	Printed Circuit Board	
C8512, 8513	K70160003	Tantalum	"	0.1μF		C0023520	PCB with Components	
		(35SC0.1μF)						
							<b>DIODE</b>	
		<b>TP-TERMINAL</b>			D9401, 9403-9407	G2015550	Si	1S1555
	Q5000038	TP-I						
							<b>RESISTOR</b>	
					R9403	J02245392	Carbon Film	1/4W SJ 3.9kΩ
					R9401, 9402	J02245103	" "	" " 10kΩ
							<b>SWITCH</b>	
Symbol No.	Part No.	Name & Description			S9401	N4090055	SUJ62A	
PB-2351B	F0002351B C0023510	Printed Circuit Board PCB with Components						
					<b>RELAY UNIT</b>			
					Symbol No.	Part No.	Name & Description	
		<b>DIODE</b>			PB-2354	F0002354	Printed Circuit Board	
D9001	G2015550	Si	1S1555		C0023540	PCB with Components		
							<b>RESISTOR</b>	
R9002	J02245223	Carbon Film	1/4W SJ	22kΩ	D9602	G2090029	Ge	1N60
R9001	J02245104	" "	" "	100kΩ	D9601	G2015550	Si	1S1555

		RESISTOR					CAPACITOR		
R9601	J02245100	Carbon Film	1/4W SJ	10Ω	C9820	K30275270	Dipped Mica	500WV	27 pF (LCQ12270J5)
					C9823	K02175121	" "	50WV CH	120 pF (DD109CH121J50V02)
		CAPACITOR							
C9605	K30273050	Dipped Mica	500WV	5 pF	C9824	K30175181	" "	" "	180 pF (LCQ17181J05)
C9608	K31306800	Mica	1KV	80 pF	C9819	K02309003	Ceramic Disc	3KWV	100 pF (CC45CH3F101KY)
C9606	K00179019	Ceramic Disc	50WV SL	200 pF	C9825	K02175680	" "	50WV CH	68 pF (DD107CH680J50V02)
C9602	K30279051	" "	500WV	1000 pF	C9826	K02175101	" "	" "	100 pF (DD107CH101J50V02)
C9601, 9603	K30279058	" "	"	2000 pF	C9817	K12279003	" "	500WV	0.0022μF (ECKD2H222PE)
C9604, 9607	K13179009	" "	50WV	0.047μF	C9804, 9806 9810	K12279002	" "	" "	0.01μF (ECKD2H103PE)
					C9801, 9802 9803, 9805 9807, 9808 9809, 9821 9822	K13179008	" "	50WV	0.01μF (DD106F103Z50V)
		INDUCTOR							
L9602, 9605	L1190014	FL5H100		10μH	C9811, 9812 9813, 9814 9815, 9816	K13179009	" "	" "	0.047μF (DD110F473250V)
L9603, 9604	L1190009	FL5H3R3		3.3μH					
L9606	L1190070	FL4H8R2		8.2μH					
L9607	L1190024	FL5H221		220μH					
L9608	L0021293						INDUCTOR		
					L9807	L1190020	FL5H151K		150μH
		RELAY			L9805	L1190024	FL5H221K		220μH
RL9601	M1190043	G2U112P-14	10V		L9801	L1190039	FL5H561K		560μH
					L9802, 9803 9804	L1020307			
		LAMP FUSE							
FH9601	Q1000010	BQ041-22803A				L1190017	FL5H102K		1 mH
					L9806	L1190090	LAL04102K		1 mH
					L9808	L0190032	RF3855-R27K		
	Q5000021	Wrapping Terminal C			L9809	L0190030	RF3855-R18K		
							RELAY		
					RL9801	M1190002	FBR211AD012		
<b>FINAL BOARD</b>									
Symbol No.	Part No.	Name & Description			ACCESSORIES				
PB-2355 B	F0002355 B C0023550	Printed Circuit Board PCB with Components			Symbol No.	Part No.	Name & Description		
							AC POWER CORD		
						T9000482	YFC-03K 3 wire, 3 prong plug (UL)		
						T9013284	EC-4007-007 3 wire, 2 prong EU plug		
		TRANSISTOR				T9013283	SC-4111-001 3 wire, 3 prong Australian plug		
Q9801	G3318150Y	2SC1815Y							
		DIODE							
D9802	G2090002	Si	10D10				FUSE		
D9801	G2015550	"	1S1555			Q0000012	6A (100V-117V)	100W	
						Q0000004	3A (200V-234V)	"	
		VACUUM TUBE SOCKET				Q0000004	3A (100V-117V)	10W	
VS9801, 9802 9803	P3090024	SB3606				Q0000003	2A (200V-234V)	"	
							PLUG		
		RESISTOR				P0090018	STP-58	RCA PLUG	
R9801, 9802 9803, 9804	J01275101	Carbon Film	1/2W TJ	100Ω		P0090007	SH3001	KEY PLUG	
						P0090034	P2240	SP PLUG	
R9806, 9807	J02245103	" "	1/4W SJ	10kΩ		P0090031	E5-702B-02	DIN PLUG (5P)	
R9805	J32009014	Meter Shunt		0.67Ω		P0090032	E6-701B-02	DIN PLUG (6P)	