RCI 2950 Service Manual

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RCI-2950 Specifications

Key Features

·**Full Band Coverage** - Covers the 10 Meter Amateur Band from 28.0000 to 29.6999 MHz.
·**All Mode Operation** - Operates on USB, LSB, CW, AM and FM.
·**Brightness Control** - Four Step LCD brightness control for easy viewing under any condition.
·**Repeater Offset Switch** - Gives you standard offsets for repeater operation.
·**Programmable Frequencies** - Allows you to program up to 10 individual frequencies. Includes battery backup.
·**Built in Dual VFO** - Choose steps of 10kHz, lkHz or 100Hz, manual or scan
·**RIT** - Receiver Incremental Tuning to fine tune the receive frequency up to +/- 3kHz.
·**Squelch** - Cuts off or eliminates receiver background noise in the absence of incoming signals.
·**Noise Blanker** - Greatly reduces repetitive impulse noise.
·**RF Gain Control** - Reduces the gain of the receiver under strong signal conditions to prevent overloading.
·**RF Power Output Selector** - Lets you select transmitting output power
·**External Speaker Connection** - Place a speaker anywhere for convenient listening.
·**PA Mode** - Use an external speaker for a mobile PA system.
·**LCD Display** - Large, easy to read backlit LCD display.
·**Multi-Function LCD Meter** - Indicates transmit power, receive signal strength, modulation, SWR Calibration and SWR.

Specifications

General

·Frequency Range: 28.0000~29.6999 MHz
·Tuning Steps: 100Hz, 1kHz, 10kHz, 100kHz, 1MHz
·Emission Types: USB, LSB(A3J), CW(A1), AM(A3), FM(F3)
·Frequency Control: Phase-Locked Loop Synthesizer
·Frequency Tolerance: 0.005%
·Frequency Stability: 0.001%
·Operating Temperature Range: 0 to 40 degrees C.
·Antenna Impedance: 50 Ohms
·Microphone: 400 Ohms, Dynamic PTT
·Speaker: 8 Ohms, 2 Watts
·Display: Digital Frequency, LCD
·Meter Function: RF Output, Receive Signal Strength, Modulation, SWR Calibration, SWR
·Power Requirements: 13.8 Volt DC Negative Ground

Transmitter

·Antenna Connector: UHF TYPE, 50 Ohm
·RF Transmit Modes: USB, LSB, CW, AM, FM
·RF Output Power: USB, LSB (25W); CW (8W); AM/FM (8W)
·Spurious Emissions: -50dB
·Carrier Suppression (SSB Modes): -50 dB

Receiver

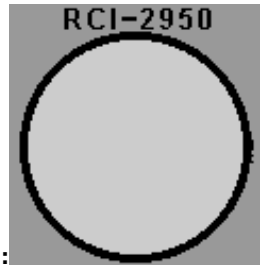
·Sensitivity for 10dB SINAD: AM 0.5uV
·Sensitivity for 10dB SINAD: USB/LSB/CW 0.15uV
·Sensitivity for 12dB SINAD: FM 0.25uV
·Image Rejection Ratio: 65dB
·AGC Figure of Merit: SSB/CW/AM 80dB for 50mV for 10dB Change in Audio Output
·Audio Output Power: 2.5 Watts

RCI-2950 Controls and Connections

INTRODUCTION

This section explains the basic operating procedures for the RCI-2950/2970 amateur 10 meter mobile transceiver.

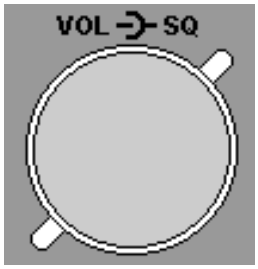
CONTROL & CONNECTIONS



1. FREQUENCY SELECTOR:
This control is used to select a desired transmit and receive frequency. It enables you to make a continuous tuning over the entire range of the transceiver.

2. RF POWER CONTROL:
This control enables you to adjust RF power continuously over the range of 1 watt through 25 watts (RCI-2970: 10 watts through 100 watts).

3. MIC GAIN CONTROL:
This control adjusts the microphone gain in the transmit and PA modes. This feature is designed for use in a h-ambient noise environment or to maxize talk power.



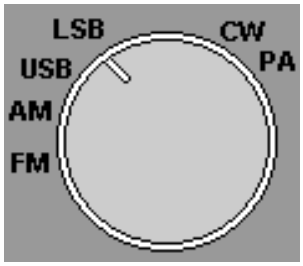
4. ON/OFF VOLUME CONTROL:
Turn clockwise to apply power to the radio and to set the desired listening level.

5. SQUELCH CONTROL:
This control is used to control or eliminate receiver background noise in the absence of an incoming signal.
For maximum receiver sensitivity, it is desired that the control be adjusted only to the point where the receiver background noise is eliminated. Turn fully counterclockwise then slowly turn clockwise until the receiver noise disappears. Any signal to be received must now be slightly stronger than the average received noise. Further clockwise rotation will increase the threshold level which a signal must overcome in order to be heard. Only strong signals will be heard at a maximum clockwise setting.

6. RF GAIN CONTROL: 

This control is used to reduce the gain of the RF amplifier under strong conditions.

7. CLARIFIER CONTROL:
This control is used to fine tune the received signal for the maximum clarity in SSB or OW mode. It can adjust the receive frequency about + / - 500 Hz, but does not affect the transmit frequency or the frequency display.

8. MODE SWITCH: 

This switch allows you to select one of the six following operating modes: FM, AM, USB, LSB, CW, and PA.

9. NB/ANL BUTTON: 

The noise blanker is very effective in eliminating repetitive impulse noise such as ignition interference. In the ANL position, the automatic noise limiter in the audio circuits is activated.

10. ROGER BEEP BUTTON: 

This button activates the ROGER BEEP Circuit when its function is selected.

11. SPLIT BUTTON: 

This control enables you to split an operating frequency for FM Repeater operation.

12. PROGRAM BUTTON: 

This button is used to program operating or scanning frequencies into memory. See the OPERATION section of the manual for further details.

13. MANUAL BUTTON: 

This is used to return the unit to manual mode.

14. SHIFT BUTTON: 

This is used to select 100Hz, 1kHz, 10kHz, 100kHz or 1MHz frequency steps.

15. DIM BUTTON: 

This button adjusts the display backlighting in four different steps to best match the environment.

16. SWR BUTTON: 

This control is used to check SWR.

17. SCAN BUTTON: 

This is used to scan frequencies in each band segment. The OPERATION segment of this manual provides detailed information on using the SCAN control.

18. MEMORY BUTTON: 

This button is used to program memory channels. Detailed information on how to use this control is provided in the OPERATION section of this manual.

19. ENTER BUTTON: 

This is used to program frequencies in memory. See the OPERATION section of this manual for more information on using this control.

20. LOCK BUTTON : 

This button is used to lock a selected frequency. Press it activate the switch. In this position, it disables the Frequency Selector Control, up/down buttons on the front control panel, or remote up/down buttons on the microphone. Repressing the switch will unlock the frequency.

21. UP/DOWN SELECTORS: 
These buttons are used to move frequency upward or downward to select a desired frequency.

22. METER:
This meter indicates received signal strength, transmitter RF output power and SWR level.

23. LCD DISPLAY:
The LCD displays the frequency selected, functions and memory channel.

24. MIC JACK: 
Accepts 6 pin female connector with a type Philmore T6160 and Calrad 30445 to be connected.

INTRODUCTION

This section explains the **basic programming procedures** for the RCI-2950/2970 amateur 10 meter mobile transceiver.

FREQUENCY SELECTION

Frequency selection in the RCI-2950/2970 can be accomplished using three of the following methods:

1. The first method of frequency selection is through the use of the 

(Shift) key and the  and 
arrows. To accomplish this, press the 

button until the cursor arrow is positioned under the digit of the frequency that is to be changed. Then use the  arrow to increase the number. If a decrease in frequency is desired, press the  arrow. Perform the steps described above for each digit of the frequency until the desired frequency is displayed in the LCD display window.

2. The second method of frequency selection is accomplished using the 

button and the frequency select knob located above the microphone jack. Use the SHF button in the manner described above to select the digit to be changed. Then proceed to rotate the frequency select knob clockwise to increase the frequency. Rotate the frequency select knob counterclockwise to decrease the frequency.

3. The third method of selecting the operating frequency of the radio is through the use of the 

button and the channel Up and Down button located on the microphone Frequency selection by this method is accomplished in the same manner as with the  and  arrows on the key pad. The only difference is that the channel Up and Down buttons on the microphone are used.

While in receive mode, once a signal has been detected on a particular frequency, it may be necessary to slightly change the frequency to provide the best audio through the speaker. This can be accomplished by rotating the clarifier control to vary the frequency by ± 0.5 kHz. After this fine tuning has been accomplished, press the 

button to lock in the frequency at the point of best reception.

FREQUENCY SCANNING

Frequency scanning can be achieved using one of two methods: the first method involves the scanning of pre-programmed memory channels; the second method will permit the user to scan all frequencies between a preset upper and lower scan limit. Both methods of frequency scanning follow.

All Frequency Scanning

To allow All Frequency Scanning, one must first program the upper and lower scanning limits. The scan limits are simply the highest and lowest frequencies that will be scanned. To program these limits, perform the following steps:

1. Press the 

(Program) key.

2. Press the 

key. (“PRG SCAN+” should appear in the lower right corner of the display window.

3. Using the SHF key and the ▲ and ▼ arrows, select the upper scan limit, then press ENT.

4. Press the SCAN key again. (“SCAN -“ should appear in the display window.)

5. Using the SHF key and the ▲ and ▼ arrows, select the lower scan limit, then press ENT.

The upper and lower scan limits have now been programmed. To activate the scan feature, return the radio to manual operation and press the SCAN button. If the display shows ‘SCAN the radio will scan from the lower limit to the upper limit. If “SCAN -‘ is displayed, the unit will scan from the upper limit to the lower limit. To change from SCAN + to SCAN - or vice versa, press SCAN.

NOTE: When programmed, the upper and lower scan limits will also act as the upper and lower operating limits of the radio. The radio cannot now be programmed to operate above or below the scan limits.

Memory Scanning

The RCI-295012970 has 10 non-volatile (i.e* memory resident) memory locations which can be programmed with any available frequency within the operating band of the radio. The scan function of the unit can be programmed to scan these memory channels. The radio will then scan only those memory channels which have been programmed.

The first step in utilizing the memory scan function is to program the desired frequencies into the radio memory. This can be accomplished by performing the following steps:

1. With the radio operating in the manual mode, press the PRG (Program) key.

2. Press the MEM (Memory) key. “PRG” should be displayed in the lower right-hand corner of the LCD display window. In the upper left portion of the display, “MEMORY” should be displayed. Directly below MEMORY, a number between 0 and 9 will be displayed. This number represents the memory location currently being displayed. Pressing the MEM key will increase the memory counter to the next memory location and the contents of that memory location will be displayed.

3. Using the SHF key and the ▲ and ▼ arrows, enter the frequency to be stored in the memory location displayed. After the desired frequency has been entered, press ENT.

4. Repeat steps 2 and 3 for all of the memory locations to be programmed.

5. After all desired memory locations have been programmed with frequencies, return the unit to the manual mode of operation by pressing the MAN key.

6. To initiate memory scanning, press MEM and then press SCAN. As previously discussed, the display will show “SCAN + “ or “SCAN -“ to indicate whether the radi0 is scanning from the lowest or the highest merory location or vice versa.

7. To return the radio to normal (non-scanning) operation, press the 

key.

OFFSET FREQ. OPERATION

The RCI-2950/2970 has an offset or **split frequency** feature that will permit the radio to be operated in a half-duplex mode This will allow the user to talk on FM repeaters operating in the 10 Meter band. (NOTE The FM repeaters may require a sub-audible (CTCSS) tone be transmitted to gain access to the repeater. The RCI-2950 is not factory-equipped with a CTCSS encoder/ decoder.) The split frequency function offsets the transmitter frequency either above or below the receive frequency by a user programmable amount. In the following example, programming of a 100kHz offset will be described. Before attempting to program the offset frequency, ensure that the radio is operating in the manual mode by pressing the 

key.

1. Press the 

key.

2. Press the 

key. The LCD display window will display “00000” with “PRG” and “SPLIT” being displayed in the lower left-hand corner.

3. Using the 

key and the  and  arrows as described earlier, program the display to read “010000.”

4. Press 

. A 100kHz offset has now been programmed into the radio.

5. Return the radio to manual operation by pressing the 

key.

6. Using the 

key and the  and  arrows as described previously, set the radio for the desired receive frequency.

7. Press 

. In the lower right corner of the display, either “SPLIT + “or “SPLIT -“ will be displayed. If SPLIT + is displayed, the transmitter will be offset 100kHz above the receive frequency when keyed. If SPLIT - is displayed, the transmitter will be offset 100kHz below the receive frequency.

9. **NOTE:** When the transmitter Is keyed, the frequency display will change to show the frequency being transmitted.

8. To return the radio to simplex operation (i.e, same transmit and receive frequency), press the 

key.

Technical Analysis of the RCI 2950, RCI 2970, RCI 2990, Saturn Turbo circuitry

The first striking element of the RCI is the complex frequency synthesizer. As most of the CB rigs use a + 10 Khz step , the RCI uses a 100 times thinner 100 Hz step.

The brain of the RCI is the Microprocessor. The microprocessor is hold by the small board located behind the LCD display. This board rules the rig. It is a double sided board which holds a battery, an alignment of 2.54mm connectors, a voltage regulator (5V - MC7805) on its back. The regulator feeds all the digital components, a network of internal resistors. On the same side of the board, you can find a buzzer and a lithium battery which is here to keep the memories when the rig is switched off. Note that, in the latest versions of RCI rigs, the lithium battery has been replaced by a capacitor.

The other side of the board holds 3 CMS chips, a double Op-Amp (5223), a box containing 6 inversors gates (buffers) CD4069. This last one is controlling the 6 digits of the display. This side of the board also holds a 64 pins CMS chip, driven at 4 Mhz by a crystal, which is a CMOS circuit. It owns a ROM of 2 K, Four 4 bits registers, a 8 bit timer, a serial 8 bits communication interface, 24 Input/Output. Everything is controlled by 10 microseconds cycles. A controller-Driver of Liquid Display Boards is supervising all the needed display cycles on the 24 lines of the LCD segments to display the 6 numbers (7 segments by number) on the orange screen. The microprocessor is having very low consumption characteristics: less than 900 µA.

The programming of the microprocessor is done at factory. All the functions and the frequencies range are stored into the ROM. A jumper allows us to change the frequency range. All the main informations are send to the frequency synthesizer by a limited amount of links: clock signals (CLK), transfers (LAT), serial data (DATA). All these informations are not given by the schematic diagram but were useful to know. Let's pay a visit to the main board.

The Frequency Synthesizer is complex because of the 100 Hz resolution. It owns a dozen of integrated circuits: a programmable divider (IC17:7925 Sony) addressed in serial mode by the microprocessor, a first VCO (IC8: TA7310 Toshiba), two phase comparers (IC5-IC7 TC5081 Toshiba), three mixers (IC9-IC10-IC14: TA7310), an oscillator-divider driven by a 10.250 Mhz crystal. This part of the rig generates 2 different frequencies: in RC mode to get an infradyne pulse of the first conversion (RX QRG - Interm.QRG of 10.695 Mhz) and in TX, the necessary to produce a supradyne (Interm.QRG of 10.695Mhz + FVCO). Depending of the TX mode, in AM/FM, the Q44 oscillator is controlled by X3 (10.695 Mhz). In SSB and CW, there is a 1500 Hz jump (+ 1500 Hz in USB and CW and -1500 Hz in LSB).

The transmit circuits follow the frequency synthesizer. It has a HF mixer (IC20 : SO42P Siemens). It is adapted in large band conditions by a set of varicaps D93-D94-D95. The result of the mixing is then applied to a band filter (L43-L46), amplifier in voltage by a transistor Q50: 2SC1730L. The output level of this TR is enough to control the pre-driver (Q49: 2SC1973). The pre-driver, via L41, excites two finals in parallel (Q46-Q47: 2SC2312). They are followed by a low-pass filter in PI (L32-L31) and associated capacitors C243-247-251).. And then a hi-pass filter follows (L33/C248-VC3). A line of measurement of the SWR is present in the form of a vertical mini circuitry board, plugged between the TX output and the antenna plug. All the 3 power transistors are biased VR11. In AM and FM, the mixer IC20 adds the VCO QRG to 10.695 (Q44). In SSB and CW, it is the output of the crystal filter that is added.

The receiver is classical: superheterodyne with 2 IF conversions. It is very similar to the one of most cb rigs. There are output stages: HF Amp (Q18: 2SC1674), transfo L8, first mixer Q19: 310), L9-L11 filter, the IF output by L12,L13,L14. What strikes is the presence of varicaps D19,D23,D24 which works to produce a perfect tune in this large band rig. The band filtering is also perfect. It is done by two combined transfos linking the HF amp to the mixer. The ceramic IF filter FL2: 10.995 Mhz is attacked by L14. The a second stage of IF Q8 is feeding the second IF filter FL3 455 Khz. The first following TR loads Q5. Then Q10 & Q11 produce a Hugh gain before the first IF transfo L6. The follow AM and FM demodulators. In AM you have a diode circuit to detect and gain control (D11-D12). The Op-Amp IC1: LM324 follows. IC2, is the discriminator (UPC1028H). It handles the FM.

In SSB, the signal from the first mixer is bandwidth reduced by FL3 then applied to the first amplification IF stage Q20. A high gain amp follows Q21-Q22-Q23. The audio output is controlled by a classical audio amp IC19 (TA7222P)

The noise blanker is very good. It is composed of 6 stages with at least 7 TR and 3 diodes assuming the amplification of HF interference coming from the first QRG changer.

The AM is using a classical and reliable technology: a ballast PNP transistor (Q51).

In FM, we can find the old good MC14558P (IC16) which handles modulation of the mike before exciting the varicap of the VCO to produce frequency excursions.

In SSB, IC16 pre-amplifies the mike signals. It is followed by IC3 (AN612) which produces a double side band modulation (DSB). Once going through the crystal filter, the un-wanted side band is eliminated.

You now know more about the hiddent componentes of your RIG.

Transistor Voltage Chart

Ref #	Function	Part #			LOC	B	C	E
Q1		2SC1675L	NPN		B-3	0.00NB Off	0.00 NB Off	0.00 NB Off
						1.77NB On	7.67 NB On	1.06NB On
Q2		2SC1675L	NPN		C-2	0.00NB Off	0.00 NB Off	0.00NB Off
						0.71NB On	2.09 NB On	0.00NB On
Q3		2SC945	NPN		C-3	0.00NB Off	0.00NB Off	0.00NB Off
						2.09NB On	7.76 NB On	1.45NB On
Q4		2SC945	NPN		B-2	0.00NB Off	8.01 NB Off	0.01NB Off
						0.02NB On	8.01 NB On	1.06NB On
Q5		2SC945	NPN		C-3	0.00NB Off	7.37 NB Off	0.01NB Off
						0.01NB On	7.37 NB On	0.03NB On
Q6		2SA733	PNP		C-2	7.36NB Off	0.00 NB Off	8.01NB Off
						7.36NB On	0.00 NB On	8.01NB On
Q7		2SC945	NPN		C-2	0.00NB Off	0.00 NB Off	0.00NB Off
						0.00NB On	0.01 NB On	0.00NB On
Q8		2SC1674	NPN		D-2	1.18 AM RX	6.93 AM RX	0.48AM RX
						0.02 AM TX	0.03 AM TX	2.44AM TX
						1.18FM RX	6.93FM RX	0.48FM RX
						0.01FM TX	0.02FM TX	2.44FM TX
						1.30SSB RX	7.60 SSB RX	2.38SSB RX

						0.01SSB TX	0.02 SSB TX	2.44SSB TX
Q9		2SC1675	NPN		D-3	0.71AM / FM RX	3.04AM / FM RX	0.00AM / FM RX
						0.01AM / FM TX	0.03AM / FM TX	0.00AM / FM TX
						0.82 SSB RX	0.03 SSB RX	0.00SSB RX
						0.81SSB TX	0.02 SSB TX	0.00SSB TX
Q10		2SC1675	NPN		D-4	3.03AM /FM RX	5.76AM / FM RX	2.26AM / FM RX
						0.02AM / FM TX	0.02AM / FM TX	0.01AM / FM TX
						0.03SSB RX	8.02 SSB RX	0.00SSB RX
						0.02SSB TX	0.02 SSB TX	0.01SSB TX
Q11		2SC1675L	NPN		D-4	2.26AM / FM RX	5.49AM / FM RX	1.52AM / FM RX
						0.01AM / FM TX	0.02AM / FM TX	0.01AM / FM TX
						0.00 SSB RX	8.02 SSB RX	0.01SSB RX
						0.01 SSB TX	0.02 SSB TX	0.01SSB TX
Q12		2SA733	PNP		B-4	8.02NB Off	0.00 NB Off	8.06NB Off
						7.35NB On	8.01 NB On	8.06NB On
Q13		2SC945	NPN		B-4	0.00AM / FM RX	-0.25AM / FM RX	0.00AM / FM RX
						0.01AM / FM TX	-0.24AM / FM TX	0.00AM / FM TX
						0.71 SSB RX	0.01 SSB RX	0.00 SSB RX
						0.71 SSB TX	0.01 SSB TX	0.00SSB TX
Q14		2SC945	NPN		B-4	0.70AM / FM RX	0.01AM / FM RX	0.00AM / FM RX
						0.71AM / FM TX	0.02AM / FM TX	0.00AM / FM TX

						0.01 SSB RX	0.11 SSB RX	0.00 SSB RX
						0.01SSB TX	0.01 SSB TX	0.00SSB TX
Q15		2SC945	NPN		E-4	0.01AM / FM RX	0.02AM / FM RX	0.00AM / FM RX
						0.01AM / FM TX	0.01AM / FM TX	0.00AM / FM TX
						0.70 SSB RX	0.01 SSB RX	0.00 SSB RX
						0.71SSB TX	0.01 SSB TX	0.00SSB TX
Q16		2SC945	NPN		E-5	1.26AM / FM RX	5.04AM / FM RX	0.68AM / FM RX
						1.26AM / FM TX	5.05AM / FM TX	0.68AM / FM TX
						1.26 SSB RX	5.01 SSB RX	0.68 SSB RX
						1.26SSB TX	5.01 SSB TX	0.68SSB TX
Q17		2SC945	NPN		B-2	0.00AM / FM RX	0-0.01AM / FM RX	0.00AM / FM RX
						0.76 SSB TX	0.02 SSB TX	0.00SSB TX
Q18		2SC1674	NPN		C-2	2.15 AM RX	7.73 AM RX	1.41AM RX
						0.02 AM TX	0.03 AM TX	0.01AM TX
						2.15 FM RX	7.73 FM RX	1.41FM RX
						0.03 FM TX	0.08 FM TX	0.01FM TX
						2.16 SSB RX	7.74 SSB RX	1.41 SSB RX
						0.01 SSB TX	0.02 SSB TX	0.01SSB TX
Q19		J310	FET		D-3	0.03AM / SSB RX	7.95AM / SSB RX	1.89AM / SSB RX
						0.01AM / SSB TX	0.02AM / SSB TX	0.03AM / SSB TX
						0.00 FM RX	7.95 FM RX	1.90FM RX

						0.01 FM TX	0.07 FM TX	0.07FM TX
Q20		2SC1674	NPN		D-4	0.95 AM RX	0.24 AM RX	0.23AM RX
						3.41 AM TX	3.02 AM TX	7.34AM TX
						0.95 FM RX	0.24 FM RX	0.23 FM RX
						1.66 FM TX	1.19 FM TX	7.35FM TX
						1.60 SSB RX	6.69 SSB RX	0.85 SSB RX
						3.40 SSB TX 3.42 With MOD	7.11 SSB TX 7.13 With MOD	7.34 SSB TX 7.36 With MOD
Q21		2SC1675	NPN		D-4	0.22AM / FM RX	1.74AM / FM RX	0.00AM / FM RX
						0.02AM / FM TX	0.03AM / FM TX	0.00AM / FM TX
						0.73 SSB RX	3.43 SSB RX	0.00 SSB RX
						0.01 SSB TX 0.03 With MOD	0.02 SSB TX 0.04 With MOD	0.00 SSB TX
Q22		2SC1675	NPN		D-4	1.74AM / FM RX	0.93AM / FM RX	0.92AM / FM RX
						0.03AM / FM TX	0.40AM / FM TX	0.02AM / FM TX
						3.43 SSB RX	6.52 SSB RX	2.66 SSB RX
						0.02 SSB TX 0.04 With MOD	7.09 SSB TX 7.16 With MOD	0.01 SSB TX 0.03 With MOD
Q23		2SC1906	NPN		D-4	3.92AM / FM RX	7.78AM / FM RX	0.23AM / FM RX
						0.02AM / FM TX	0.02AM / FM TX	0.02AM / FM TX
						2.65 SSB RX	6.10 SSB RX	1.90 SSB RX
						0.01 SSB TX 0.02 With MOD	0.02 SSB TX 0.04 With MOD	0.01 SSB TX 0.03 With MOD
Q24		2SC945	NPN		D-2	0.70 AM RX	0.01 AM RX	0.00AM RX

						0.71 AM TX	0.02 AM TX	0.00AM TX
						0.01 FM RX	0.18 FM RX	0.00FM RX
						0.02 FM TX	0.05 FM TX	0.00FM TX
						0.01 SSB RX	0.01 SSB RX	0.00 SSB RX
						0.01 SSB TX 0.03 With MOD	0.02 SSB TX 0.20 With MOD	0.00 SSB TX
TR25		2SA733	PNP		D-1	ANL 8.01 AM RX ON 6.72 OFF	ANL 0.16 AM RX ON 7.38 OFF	ANL 8.05 AM RX ON 7.38 OFF
						ANL 8.02 AM TX ON 6.73 OFF	ANL 0.22 AM TX ON 7.38 OFF	ANL 8.06 AM TX ON 7.39 OFF
						ANL 0.01 FM RX ON 0.01 OFF	ANL 0.01 FM RX ON 0.01 OFF	ANL 0.01 FM RX ON 0.01 OFF
						ANL 0.02 FM TX ON 0.02 OFF	ANL 0.02 FM TX ON 0.02 OFF	ANL 0.02 FM TX ON 0.02 OFF
						ANL 0.01 SSB RX ON 0.01 OFF	ANL 0.01 SSB RX ON 0.01 OFF	ANL 0.01 SSB RX ON 0.01 OFF
						ANL 0.02 SSB TX ON 0.02 OFF	ANL 0.01 SSB TX ON 0.01 OFF	ANL 0.01 SSB TX ON 0.01 OFF
Q26		2SC945	NPN		D-1	AM / FM / SSB RX 2.82	AM / FM / SSB RX 7.19	AM / FM / SSB RX 2.28
						AM / FM / SSB TX 2.84	AM / FM / SSB TX 7.20	AM / FM / SSB TX 2.29
Q27		2SC1675	NPN		C-5	AM / FM / SSB RX 3.44	AM / FM / SSB RX 5.93	AM / FM / SSB RX 2.70
						AM / FM / SSB TX 3.45	AM / FM / SSB TX 5.94	AM / FM / SSB TX 2.71

Q28		2SC1675	NPN		D-4	AM / FM / SSB RX 0.72	AM / FM / SSB RX 4.36	AM / FM / SSB RX 0.00
						AM / FM / SSB TX 0.72	AM / FM / SSB TX 4.37	AM / FM / SSB TX 0.00
Q29		2SC1675	NPN		E-6	0.01 AM RX	7.95 AM RX	0.00AM RX
						0.02 AM TX	7.96 AM TX	0.00AM TX
						0.75 FM RX	0.02 FM RX	0.00FM RX
						0.79 FM TX	0.07 FM TX	0.00FM TX
						0.01 SSB RX	7.94 SSB RX	0.00 SSB RX
						0.01 SSB TX	7.95 SSB TX	0.00SSB TX
Q30		2SC945	NPN		F-1	0.71AM / FM RX	0.02AM / FM RX	0.00AM / FM RX
						0.72AM / FM TX	0.03AM / FM TX	0.00AM / FM TX
						0.01 SSB RX	2.95 SSB RX	0.00 SSB RX
						0.01 SSB TX 0.03 With MOD	2.89 SSB TX 2.91 With MOD	0.00
Q31		2SA733	PNP		B-3	8.02 AM RX	0.11 AM RX	8.06AM RX
						8.02 AM TX	-0.34 AM TX	8.06AM TX
						8.02 FM RX	0.11 FM RX	8.06FM RX
						8.02 FM TX	-0.39 FM TX	8.06FM TX
						8.02 SSB RX	-0.11 SSB RX	8.06 SSB RX
						8.02 SSB TX 6.95 With MOD	-0.43 SSB TX 5.46 With MOD	8.05 SSB TX 7.57 With MOD
Q32		2SA945	NPN		F-6	AM / FM / SSB RX 0.71	AM / FM / SSB RX 0.01	AM / FM / SSB RX 0.00

						AM / FM / SSB TX 0.01 0.50 With MOD	AM / FM / SSB TX 0.01	AM / FM / SSB TX 0.00
Q33		2SC945	NPN		E-6	AM / FM / SSB RX 0.24	AM / FM / SSB RX 0.25	AM / FM / SSB RX 0.00
						AM / FM / SSB TX 0.57 0.58 SSB MOD	AM / FM / SSB TX 0.72 0.74 SSB MOD	AM / FM / SSB TX 0.00
Q34		2SC945	NPN		F-6	AM / FM / SSB RX 0.00	AM / FM / SSB RX 1.32	AM / FM / SSB RX 0.00
						AM / FM / SSB TX 0.00 0.01 SSB MOD	AM / FM / SSB TX 0.01 0.94 AM/SSB MOD	AM / FM / SSB TX 0.00
Q35		2SA733	PNP		C-5	AM / FM / SSB RX 8.02R.B. Off	AM / FM / SSB RX 3.05R.B. Off	AM / FM / SSB RX 8.06R.B. Off
						AM / FM / SSB TX 8.03R.B. Off	AM / FM / SSB TX -0.70R.B. Off	AM / FM / SSB TX 8.07R.B. On
						AM / FM / SSB RX 7.41R.B. On	AM / FM / SSB RX 8.05R.B. On	AM / FM / SSB RX 8.06R.B. On
						AM / FM / SSB TX 7.42R.B. On	AM / FM / SSB TX 8.06R.B. On	AM / FM / SSB TX 8.07R.B. On
Q36		2SC945	NPN		C-6	AM / FM / SSB RX 0.01	AM / FM / SSB RX 8.03	AM / FM / SSB RX 0.01
						AM / FM / SSB TX 0.02	AM / FM / SSB TX 8.04	AM / FM / SSB TX 0.35
Q37		2SA1282	PNP		D-6	AM / FM / SSB RX 7.36	AM / FM / SSB RX 0.02	AM / FM / SSB RX 8.06
						AM / FM / SSB TX 8.05	AM / FM / SSB TX 8.04	AM / FM / SSB TX 0.35
Q38		2SA1282	PNP		C-6	8.02AM RX	0.00AM RX	8.06AM RX
						7.27AM TX	7.95AM TX	8.05AM TX
						8.02 FM/SSB RX	0.00 FM/SSB RX	8.06 FM/SSB RX

						7.28 FM/SSB TX	7.96 FM/SSB TX	8.04FM/SSB TX
Q39		2SC945	NPN		A-2	AM / FM / SSB RX 0.63	AM / FM / SSB RX 0.05	AM / FM / SSB RX 0.00
						AM / FM / SSB TX 0.01	AM / FM / SSB TX 8.04	AM / FM / SSB TX 0.00
Q40		2SA1282	PNP		A-1	AM / FM / SSB RX 7.54	AM / FM / SSB RX 0.28	AM / FM / SSB RX 8.05
						AM / FM / SSB TX 7.35	AM / FM / SSB TX 8.04	AM / FM / SSB TX 8.06
Q41		2SC945	NPN		B-1	AM / FM / SSB RX 0.00	AM / FM / SSB RX 0.29	AM / FM / SSB RX 0.00
						AM / FM / SSB TX 0.01	AM / FM / SSB TX 3.15	AM / FM / SSB TX 0.00
						0.70 CW Mode RX	0.01 CW Mode RX	0.00CW Mode RX
						0.71 CW Mode TX	0.02 CW Mode TX	0.00CW Mode TX
Q42		2SC945	NPN		B-1	AM / FM / SSB RX 0.77	AM / FM / SSB RX 1.65	AM / FM / SSB RX 0.15
						AM / FM / SSB TX 0.78	AM / FM / SSB TX 1.65	AM / FM / SSB TX 0.16
Q43		2SC1675	NPN		B-3	0.00AM / FM RX	8.04AM / FM RX	5.06AM / FM RX
						0.01AM / FM TX	8.04AM / FM TX	5.05AM / FM TX
						0.00 SSB RX	8.04 SSB RX	0.30 SSB RX
						0.01 SSB TX 0.07 With MOD	8.04 SSB TX 5.60 With MOD	0.30 SSB TX 1.05 With MOD
Q44		2SC1675	NPN		B-6	0.02AM / FM RX	0.03AM / FM RX	0.01AM / FM RX
						2.12AM / FM TX	4.56AM / FM TX	1.41AM / FM TX
						2.10 SSB RX	4.54 SSB RX	1.38 SSB RX

						2.12 SSB TX	4.57 SSB TX	1.40 SSB TX
Q45		2SA733	PNP		B-6	AM / FM / SSB RX 8.04	AM / FM / SSB RX 0.01	AM / FM / SSB RX 0.00
						AM / FM / SSB TX 8.05	AM / FM / SSB TX 0.02	AM / FM / SSB TX 0.01
						8.04 CW Mode RX	0.00 CW Mode RX	8.04CW Mode RX
						4.91 CW Mode TX	5.54 CW Mode TX	5.58CW Mode TX
Q46		2SC2312	NPN		B-6	0.00AM / FM RX	4.15AM / FM RX	0.00AM / FM RX
						0.68AM / FM TX	3.80AM / FM TX	0.00AM / FM TX
						0.00 SSB RX	13.25 SSB RX	0.00 SSB RX
						0.68 SSB TX 0.71 With MOD	12.60 SSB TX 15.11 With MOD	0.00
Q47		2SC2312	NPN		A-6	0.00AM / FM RX	4.15AM / FM RX	0.00AM / FM RX
						0.58AM / FM TX	3.80AM / FM TX	0.00AM / FM TX
						0.00 SSB RX	13.25 SSB RX	0.00 SSB RX
						0.68 SSB TX 0.71 With MOD	12.60 SSB TX 15.11 With MOD	0.00
Q48		2SC2166	NPN		B-4	0.00AM / FM RX	4.15AM / FM RX	0.00AM / FM RX
						0.74AM / FM TX	3.88AM / FM TX	0.00AM / FM TX
						0.00 SSB RX	13.25 SSB RX	0.00 SSB RX
						0.74 SSB TX	12.75 SSB TX	0.00
Q49		2SC2314	NPN		B-4	0.00AM / FM RX	0.00AM / FM RX	0.00AM / FM RX
						1.25 AM / FM TX	8.30AM / FM TX	0.70AM / FM TX

						0.00 SSB RX	0.00 SSB RX	0.00 SSB RX
						1.28 SSB TX 1.30 With MOD	7.95 SSB TX 8.06 With MOD	0.57 SSB TX 0.59 With MOD
Q50		2SC1906	NPN		B-4	0.00AM / FM RX	0.00AM / FM RX	0.00AM / FM RX
						1.41AM / FM TX	7.95AM / FM TX	0.71AM / FM TX
						0.00 SSB RX	0.00 SSB RX	0.00 SSB RX
						1.45 SSB TX	7.95 SSB TX 7.97 With MOD	0.66 SSB TX 0.69 With MOD
Q51		2SB754	PNP		B-4	13.31AM / FM RX	4.29 AM / FM RX	13.79AM / FM RX
						12.74AM / FM TX	3.43AM / FM TX	13.57AM / FM TX
						13.25 SSB RX	13.25 SSB RX	13.79 SSB RX
						12.80 SSB TX 12.15 With MOD	12.80 SSB TX 12.13 With MOD	13.66 SSB TX 13.39 With MOD
Q52		2SC945	NPN		B-4	4.03AM / FM RX	13.30AM / FM RX	4.10AM / FM RX
						4.03AM / FM TX	12.15AM / FM TX	3.48AM / FM TX
						12.27 SSB RX	12.63 SSB RX	12.85 SSB RX
						11.75 SSB TX 11.23 With MOD	12.30 SSB TX 11.52 With MOD	12.55 SSB TX 11.79 With MOD
Q53		2SA473	PNP		B-4	13.30AM / FM RX	4.29AM / FM RX	13.31AM / FM RX
						12.15AM / FM TX	3.43AM / FM TX	12.74AM / FM TX
						12.63 SSB RX	13.25 SSB RX	13.25 SSB RX
						12.30 SSB TX 11.52 With MOD	12.80 SSB TX 12.13 With MOD	12.80 SSB TX 12.15 With MOD
Q54		2SC945	NPN		B-4	0.00 AM / FM RX	13.30AM / FM RX	0.00AM / FM RX

						0.02 AM / FM TX	12.18AM / FM TX	0.00AM / FM TX
						0.73 SSB RX	0.05 SSB RX	0.00 SSB RX
						0.73 SSB TX 0.75 With MOD	0.05 SSB TX 0.07 With MOD	0.00 SSB TX
Q55		2SC945	NPN		B-4	0.63AM / FM RX	8.05AM / FM RX	0.53 AM / FM RX
						0.64 AM / FM TX	8.05AM / FM TX	0.43AM / FM TX
						0.63 SSB RX	8.05 SSB RX	1.65 SSB RX
						0.63 SSB TX 0.63 With MOD	8.05 SSB TX 6.90 With MOD	0.63 SSB TX 0.63 With MOD
Q56		2SC945	NPN		B-4	0.71AM / FM RX	0.01AM / FM RX	0.00AM / FM RX
						0.72 AM / FM TX	0.02AM / FM TX	0.00AM / FM TX
						0.71 SSB RX	0.01SSB RX	0.00 SSB RX
						0.71 SSB TX 0.73 With MOD	0.01 SSB TX 0.03 With MOD	0.00 SSB TX
Q57		2SC945	NPN		B-4	0.69 AM RX	0.02 AM RX	0.00 AM RX
						0.70 AM TX	0.03 AM TX	0.00 AM TX
						0.00 FM RX	0.71 FM RX	0.00 FM RX
						0.02 FM TX	0.72 FM TX	0.00 FM TX
						0.00 SSB RX	0.71 SSB RX	0.00 SSB RX
						0.01 SSB TX 0.03 With MOD	0.72 SSB TX 0.73 With MOD	0.00 SSB TX
Q58		2SC945	NPN		B-4	0.01 AM RX	0.01 AM RX	0.01 AM RX
						0.02 AM TX	0.02 AM TX	0.02 AM TX
						1.02 FM RX	4.32 FM RX	0.38 FM RX

	1.03 FM TX	4.32 FM TX	0.40FM TX
	0.01 SSB RX	0.01 SSB RX	0.01 SSB RX
	0.01 SSB RX	0.01 SSB RX	0.01 SSB RX

RCI SECRETS

Just want to toss a couple radio mods and secrets to You,and if any are fit to print-then please do so!!!

#1-RCI-2950>> **R247** should be a 4.7k ohm resistor...the factory accidentally put in 47k ohm in some units...this will hurt LSB performance if not corrected....

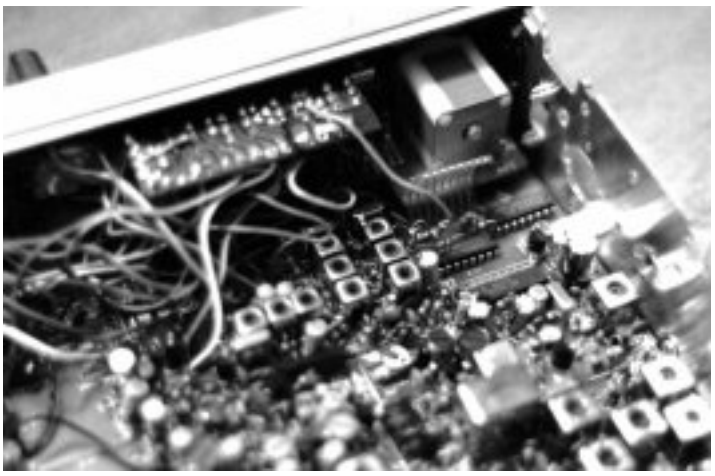
#2-RCI-2950>> **R78** is a 2.2k ohm resistor...changing this to a 6.8k 1/4 watt resistor will improve receiver performance in all modes,and help with the RF gain control operation as well

#3-RCI-2950>> **R291** is the A.M. modulation limiter...removing this will boost A.M. only,and will not affect or cause SSB overmodulation...

#4-RCI-2950>> To allow clarifier to slide in transmit and receive...Remove D59 and R197,take a 5" piece of INSULATED wire and strip both ends,connect one end to the LEFT hole of the removed R197,connect other end to the far right hole of the unused 4 hole box located to the right of Q33 and right behind D75...solder these 2 connections carefully!!!

#6-Galaxy Rigs (models with the EPT360014B boards)>>To boost A.M. modulation,do NOT cut or remove TR-32!!!This can adversely affect SSB,causing overmodulation and severe splatter!!!!The proper way to boost A.M.,is cut one end of R249,and remove TR53 from the board..this will really boost the A.M.,but has NO affect on SSB..

#7-Galaxy Rigs>> A certain Service Manual(I will not name it as to prevent any lawsuits!!),incorrectly lists the proper alignment cans for A.M. and SSB center frequency operation...Can L19 is the A.M. RX freq. adjustment,L20 is USB adjustment,and L21 is for LSB...turning the wrong cans in that cluster of tuning cans will prove to make for a REAL BAD DAY!!!!!!!



RANGER RCI-2950

Extended Frequency Modification: On microprocessor board locate the double two pin headers and shunt near the center of the board. Move the shunt jumper to the other two-pin header right next to the original position. The new range of frequencies is 26.000-29.700Mhz.

D87 & D111 are responsible for FM deviation. 10uF was installed across R308 for more deviation.

J54 was used as of a source for a transmit B+ signal that was routed through a small choke and then to the output SO-239 connector to supply the amplifier with a multiplexed RF/keying signal.

A 5V dip relay was used and the coil powered from the anode of D107 to allow a parallel combination of 3300uF and 47/2W resistor to be switched into series with the two final output transistors in the AM mode only. This produced an AM swing from 100mW to about 4.5W

COMPARED

There is a big difference between the RCI 2990/Galaxy Saturn Turbo and the Galaxy Saturn.

The Galaxy Saturn is a Galaxy DX-88 in a box with 2 meters and a power supply. The frequency stabily in the Galaxy Saturn, as with most other Galaxies, isn't the best.

The Galaxy Saturn _Turbo_ and the RCI-2990 are the same radio, albeit the different name and the Galaxy Saturn Turbo comes with CB band enabled.

I have a Turbo and my neighbor has a Saturn, and in my opinion the Turbo/2990 is much, much more radio.

The Galaxy DX-11B is much like the Turbo/2990, with more echo controls on the front.

The Galaxy DX-22B is also like the Turbo, with no linear after it (so maybe 30-40 watts or so out, versus 120+ out of the Turbo).

AGAIN

> I was looking at the am det mod upgrade for the 2950... The radio I am working on already has 1N60 diodes for d35-d34 , is this a mod that was done at the factory?
>
> The bullten should be rewrighten to say what #diodes are there now and what they should be replaced with.....
>
> The problem that is manifesting itself as AM distorion (and TX bleed) is caused by the lack of bandwith control due to the fact of the cheap Xtal filter they use...
>
> I improved the Am on my set by simply puting in a 0.02 Mfd NPO cap at the AM det output diode to ground... This narrows the bandwith improves the S/NR and cuts some of the high freq audio distortion out and provides smoothing and harmonic reduction from the AM det....
>
> I further improved both the AM an SSB RX (and TX Bleed) by changing the Xtal IF filter... This mod will also incress AGC cut back from sig on other ch and improve S/NR and sen on all bands....
>
> With these mods, realginment and installing a cascade RF RX amp makes the RCI 2950 Rx decent.....

REPAIR TRICKS

FRONT END PROTECTION DIODES

These diodes go out when the radio is subject to an extremly strong input signal. If the radio doesn't recieve or quits recieving after you unkey, **check D21 & D22**. These ones are 1N914 or 1N4148. They cost very few.

: Need Help.. My Galaxy's receive is almost gone! I still get some rec. but it's fading.
: It worked fine until a nearby radio keyed and then?
: Any sugestions?

On the RCI 2950 you would need to check D21 & D22. On the Galaxy Saturn after comparing the two schematics it appears to be D33 and possibly R263 and R142. I would check these for any burning or for function.

FREQUENCY SELECTION

Frequency selection doesn't work properly. Locate R611 which is a 47 Ko resistor located on the vertical CPU board on trace side. Change out with a 10 K quater watt resistor.

COMMON FAULTS

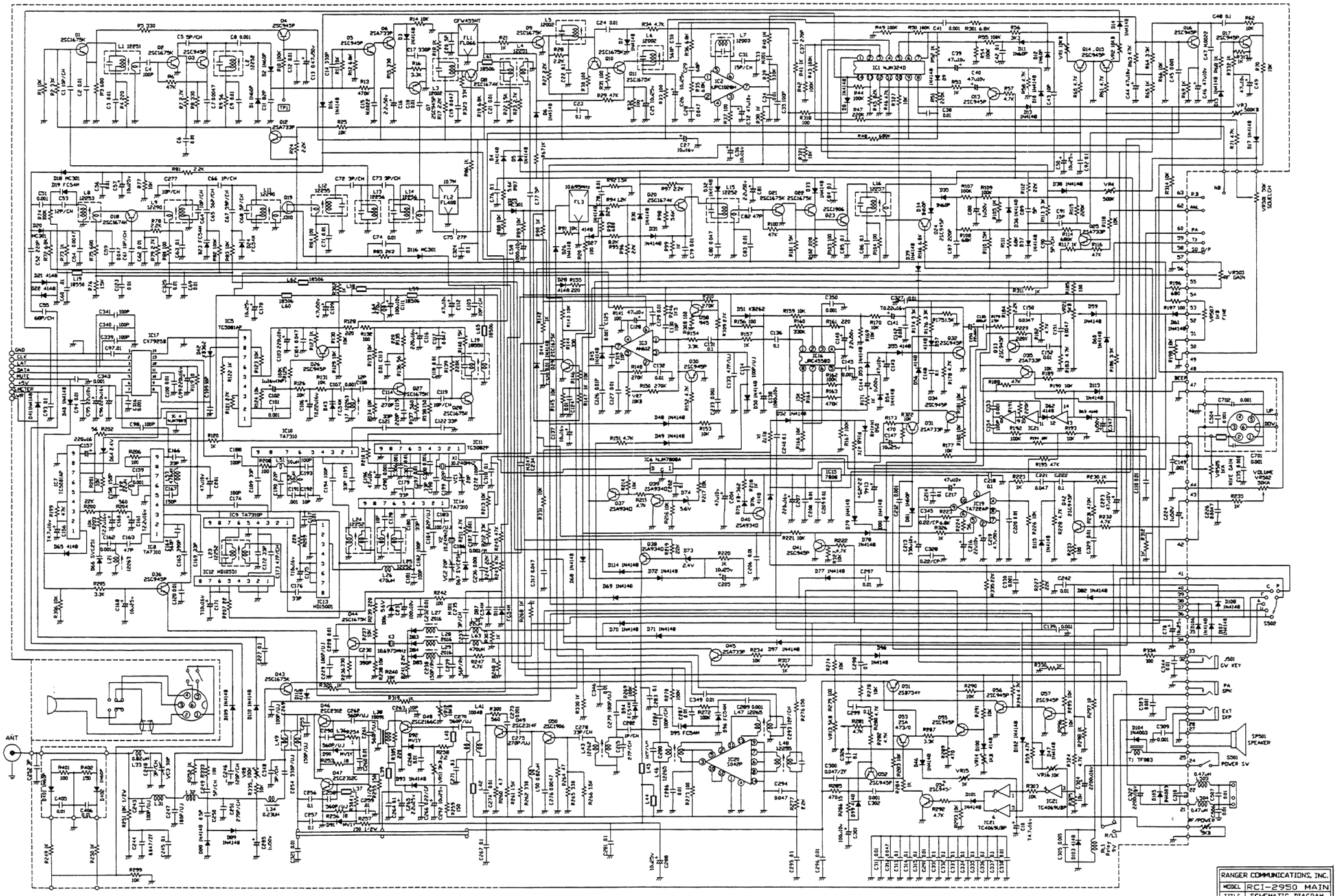
Older 2950's with batter backup will discarge the battery if the power source is removed and the radio is left in the "ON" position. This causes corruption in the memory circuits and in the microprocessor. This can cause the failure to turn on.... lights on... and nothing else.

Also found other faults:

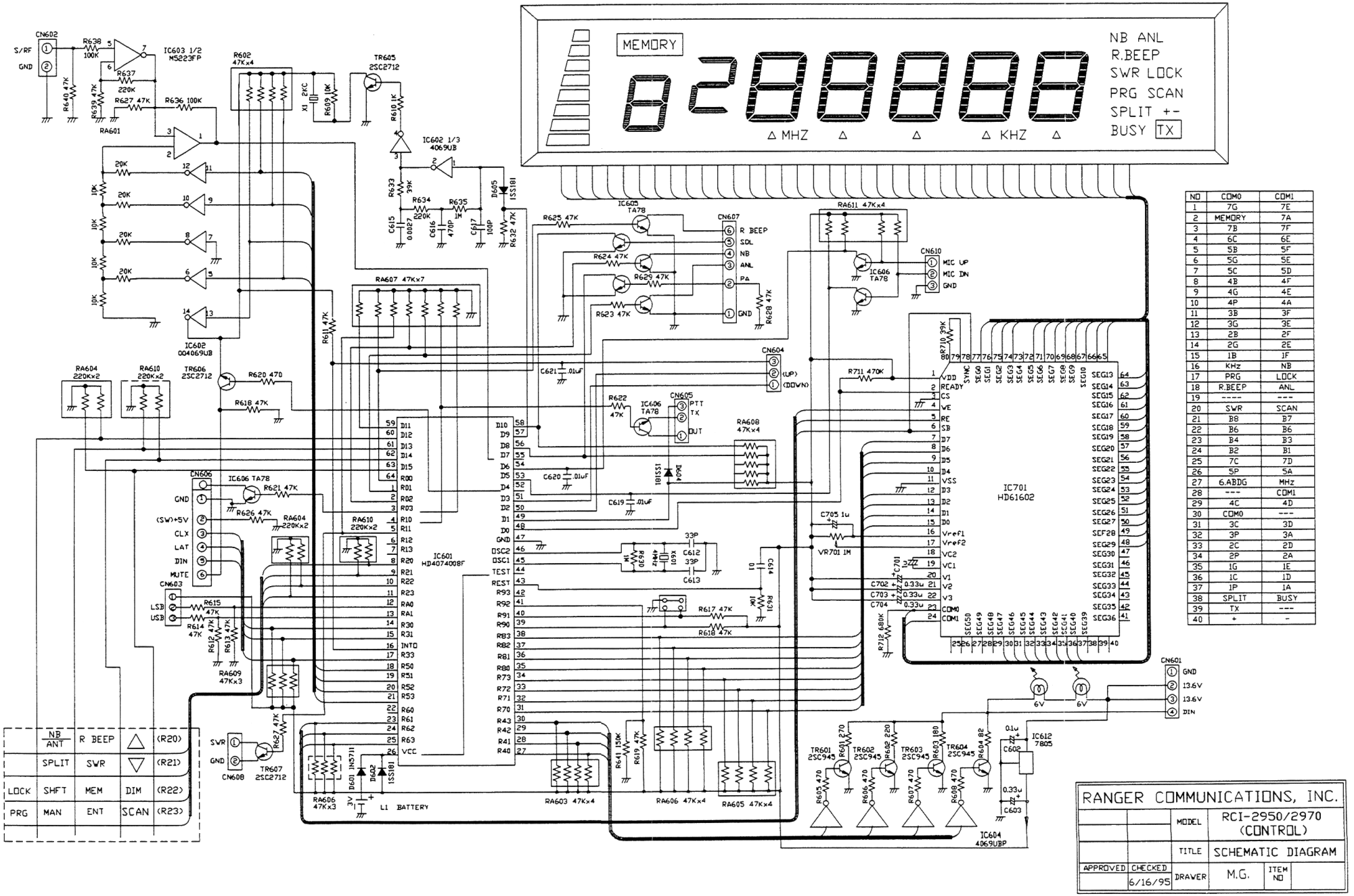
· The 8 volt regulator that is on the left side of the radio (speaker side up, front closest to you) the regulator favors the front of the radio....anyhow... I have seen 3 or 4 radios that had the turn on with no receive or transmit. The cause: cold solder joint on the regulator, this could be caused by the stressing of the chassis during mobile installation or dropping, bumping of the radio. The cure: remove old solder from regulator and resolder. Don't attempt to remove the regulator from the chassis, it's attached there for a reason... heatsink....

One other fault:
· Warbaling on ssb.... Be sure to use the proper power cord that came with the radio... don't use the radio shack substitution. The wire guage is smaller and thus won't be able to pass enough current thru the wires. This causes the warbaling effect on ssb. Also try turning down the mic gain on ssb when running a power mic.

· Wire the radio backwards (reverse polarity) usually causes the power regulator for AM to short out. This will give the radio a 40 Watt carrier with no modulation. This is not to be done intentionally.... just letting you know what the radio is able to do without power control.



RANGER COMMUNICATIONS, INC.	
MODEL	RCI-2950 MAIN
TITLE	SCHEMATIC DIAGRAM
CHECKED	6/16/95 DRAWER MC
APPROVED	ITEM NO D-1333



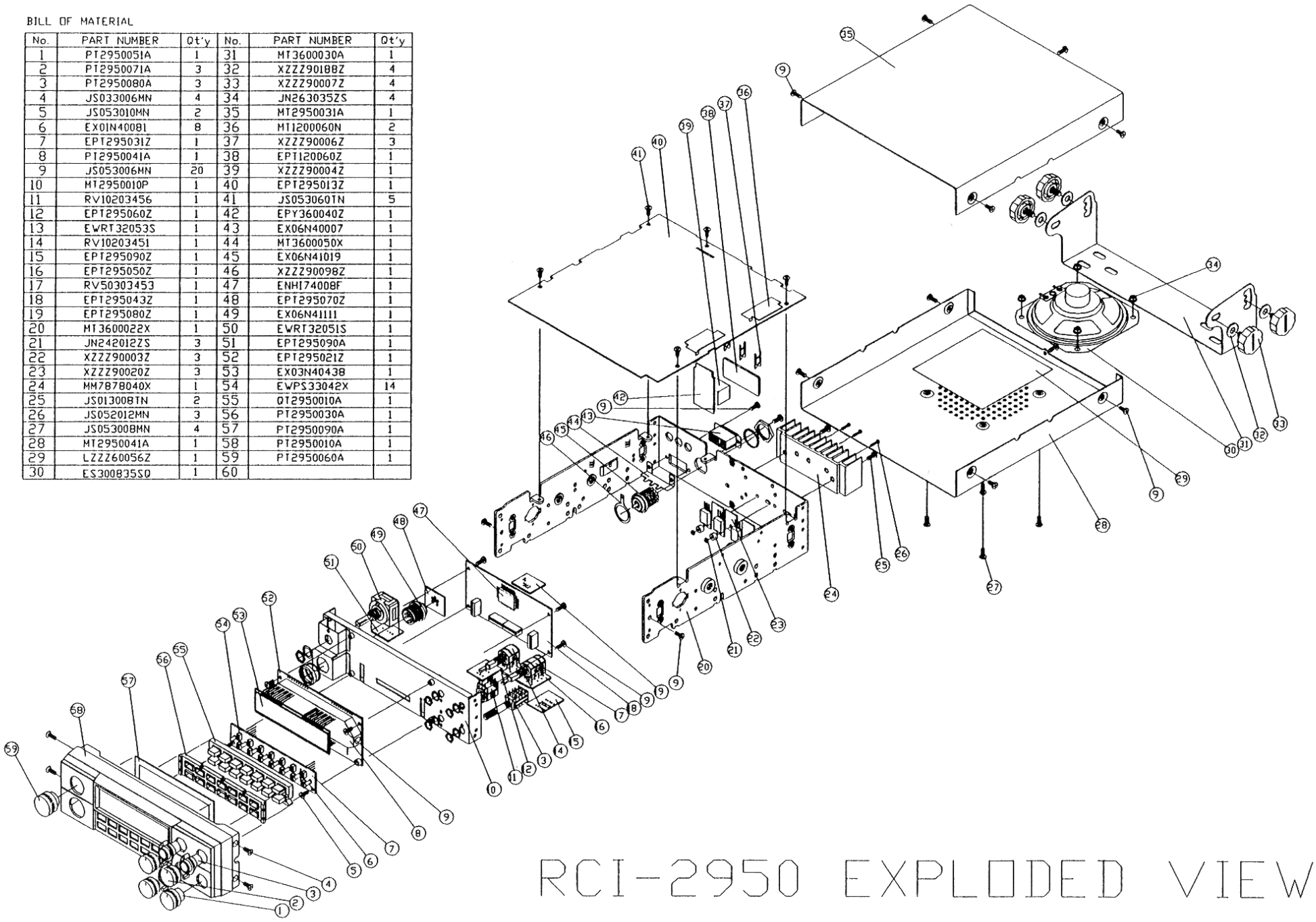
NB ANT	R BEEP	△	(R20)
SPLIT	SWR	▽	(R21)
LOCK SHFT	MEM	DIM	(R22)
PRG	MAN	ENT	SCAN (R23)

NO	COM0	COM1
1	7G	7E
2	MEMORY	7A
3	7B	7F
4	6C	6E
5	5B	5F
6	5G	5E
7	5C	5D
8	4B	4F
9	4G	4E
10	4P	4A
11	3B	3F
12	3G	3E
13	2B	2F
14	2G	2E
15	1B	1F
16	KHz	NB
17	PRG	LOCK
18	R.BEEP	ANL
19	----	---
20	SWR	SCAN
21	B8	B7
22	B6	B6
23	B4	B3
24	B2	B1
25	7C	7D
26	5P	5A
27	6.ABDG	MHz
28	---	COM1
29	4C	4D
30	COM0	---
31	3C	3D
32	3P	3A
33	2C	2D
34	2P	2A
35	1G	1E
36	1C	1D
37	1P	1A
38	SPLIT	BUSY
39	TX	---
40	+	-

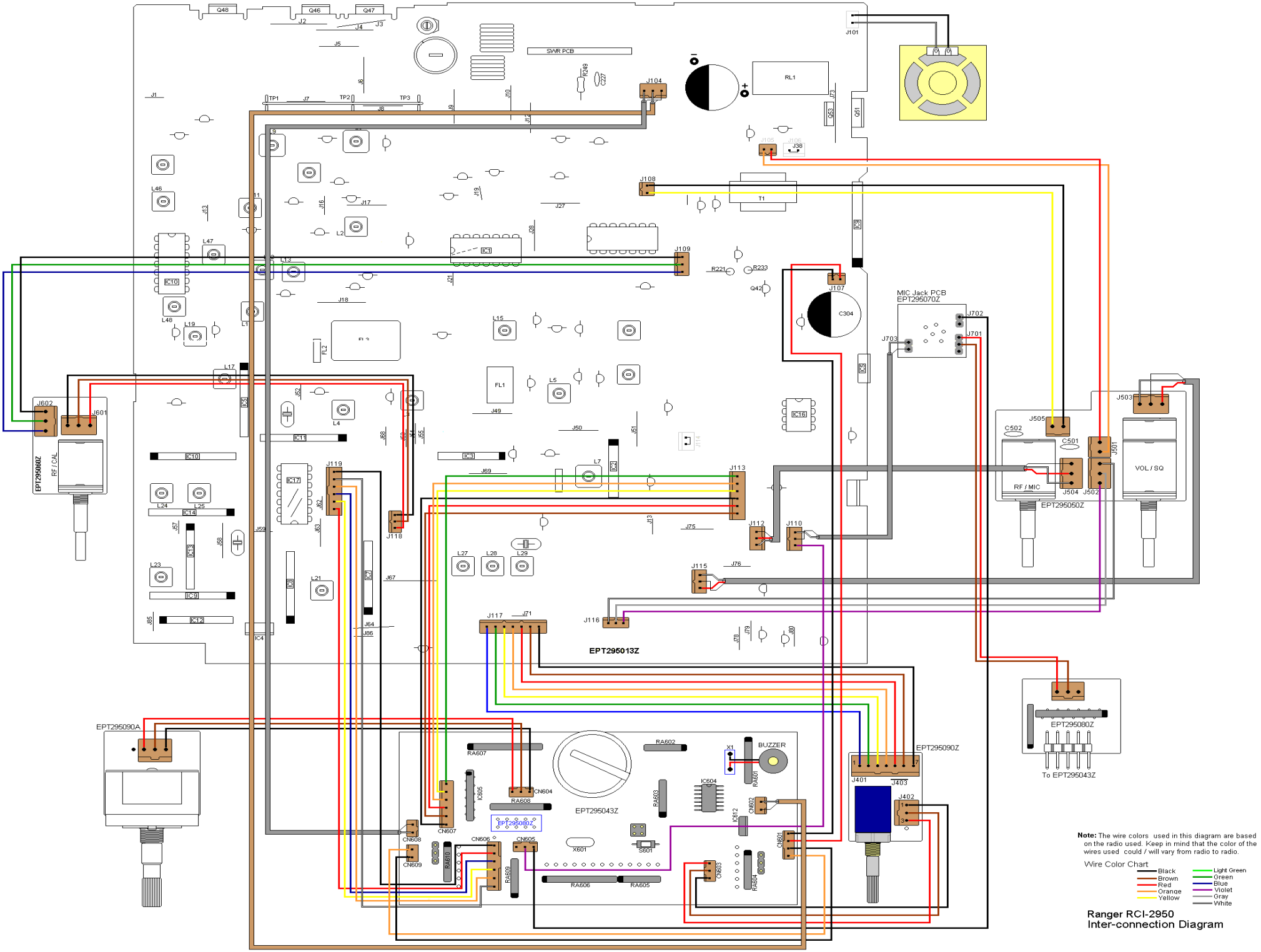
RANGER COMMUNICATIONS, INC.			
		MODEL	RCI-2950/2970 (CONTROL)
		TITLE	SCHEMATIC DIAGRAM
APPROVED	CHECKED	DRAWER	M.G.
	6/16/95		ITEM NO

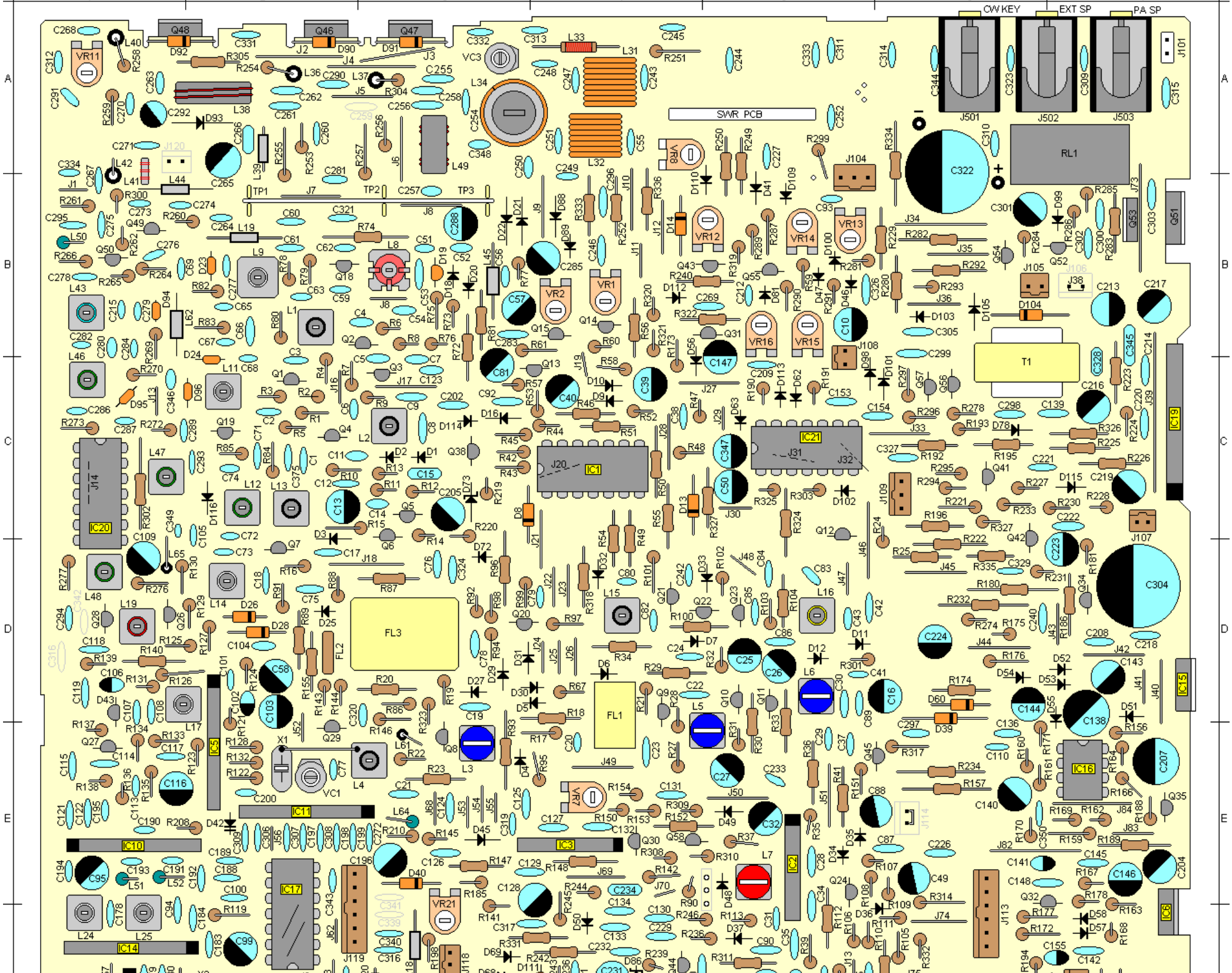
BILL OF MATERIAL

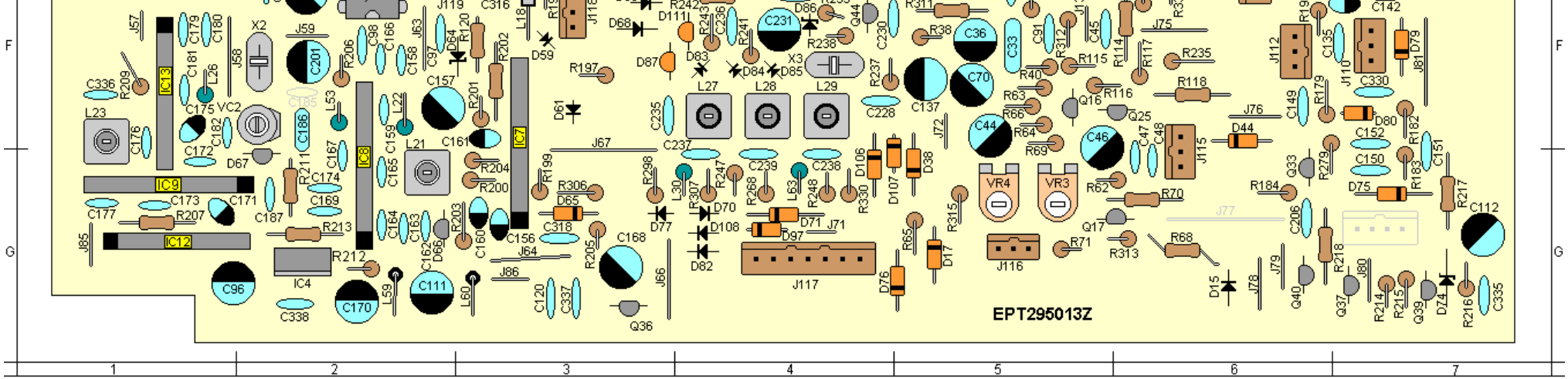
No.	PART NUMBER	Qt'y	No.	PART NUMBER	Qt'y
1	PT2950051A	1	31	MT3600030A	1
2	PT2950071A	3	32	XZZZ90188Z	4
3	PT2950080A	3	33	XZZZ90007Z	4
4	JS033006MN	4	34	JN263035ZS	4
5	JS053010MN	2	35	MT2950031A	1
6	EX01N40081	8	36	MT1200060N	2
7	EPT295031Z	1	37	XZZZ90006Z	3
8	PT2950041A	1	38	EPT120060Z	1
9	JS053006MN	20	39	XZZZ90004Z	1
10	MT2950010P	1	40	EPT295013Z	1
11	RV10203456	1	41	JS053060TN	5
12	EPT295060Z	1	42	EPY360040Z	1
13	EWRT32053S	1	43	EX06N40007	1
14	RV10203451	1	44	MT3600050X	1
15	EPT295090Z	1	45	EX06N41019	1
16	EPT295050Z	1	46	XZZZ90098Z	1
17	RV50303453	1	47	ENHI74008F	1
18	EPT295043Z	1	48	EPT295070Z	1
19	EPT295080Z	1	49	EX06N41111	1
20	MT3600022X	1	50	EWRT32051S	1
21	JN242012ZS	3	51	EPT295090A	1
22	XZZZ90003Z	3	52	EPT295021Z	1
23	XZZZ90020Z	3	53	EX03N40438	1
24	MM7878040X	1	54	EWPS33042X	14
25	JS01300BTN	2	55	QT2950010A	1
26	JS052012MN	3	56	PT2950030A	1
27	JS05300BMN	4	57	PT2950090A	1
28	MT2950041A	1	58	PT2950010A	1
29	LZZZ60056Z	1	59	PT2950060A	1
30	ES300835S0	1	60		



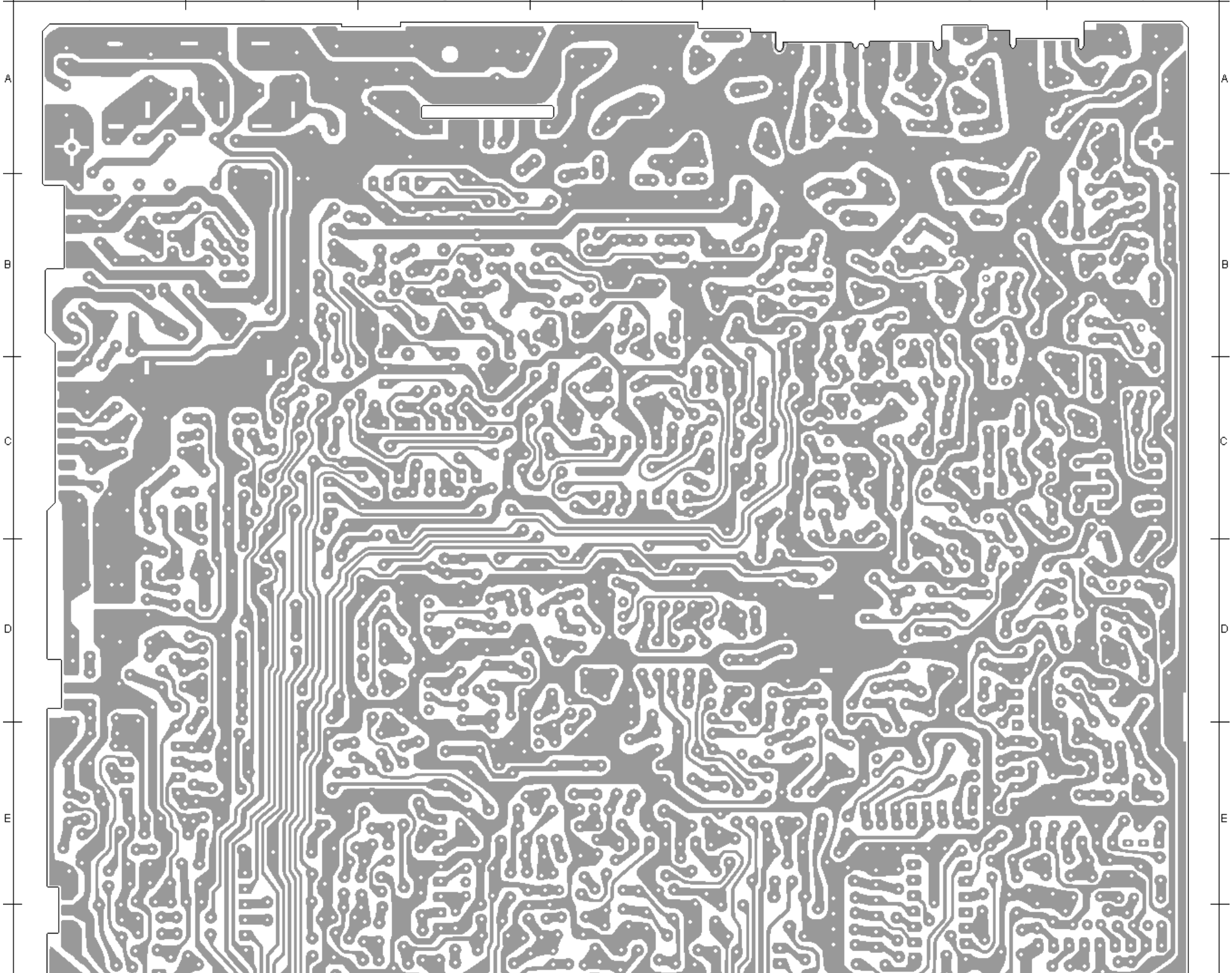
RCI-2950 EXPLODED VIEW


EPT295013Z
EPT295090A
EPT295080Z
EPT295090Z
EPT295050Z
EPT295043Z
MIC Jack PCB
EPT295070Z
SWR PCB
RL1
T1
BUZZER
VOL / SQ
RF / MIC
RF / CAL
To EPT295043Z
Note: The wire colors used in this diagram are based on the radio used. Keep in mind that the color of the wires used could / will vary from radio to radio.
Wire Color Chart
Black
Brown
Red
Orange
Yellow
Light Green
Green
Blue
Violet
Gray
White
Ranger RCI-2950
Inter-connection Diagram


CW KEY
EXT SP
PA SP
SWR PCB
J501
J502
J503
RL1
T1
IC1
IC2
IC3
IC5
IC6
IC10
IC11
IC14
IC15
IC16
IC17
IC19
IC20
IC21
FL1
FL2
FL3
VC1
VC3
X1
Q48
Q46
Q47
Q49
Q50
Q51
Q52
Q53
Q54
J1
J2
J3
J4
J5
J6
J7
J8
J9
J10
J11
J12
J13
J14
J20
J21
J31
J32
TP1
TP2
TP3



RANGER RCI-2950
EPT295013Z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A
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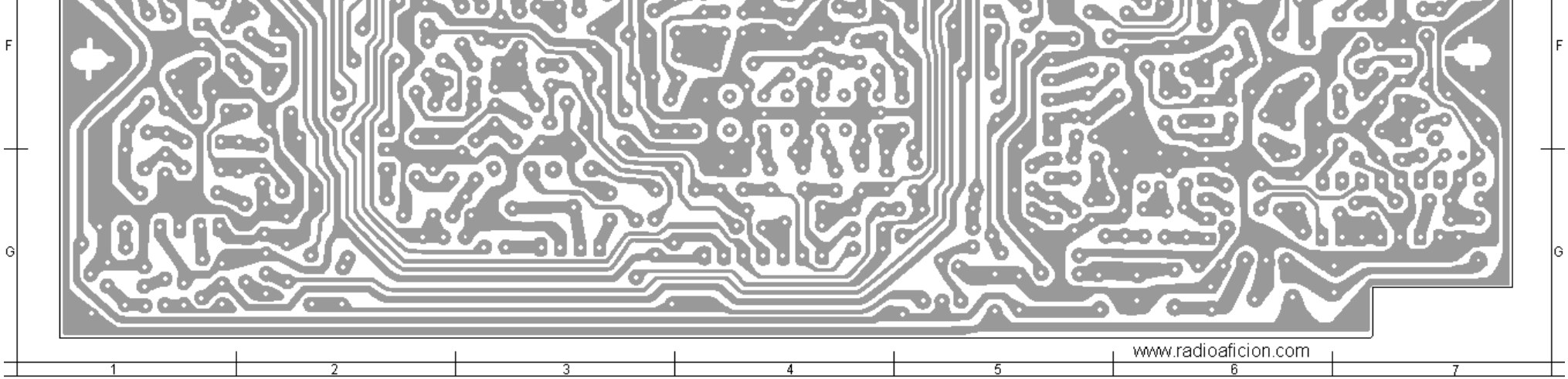
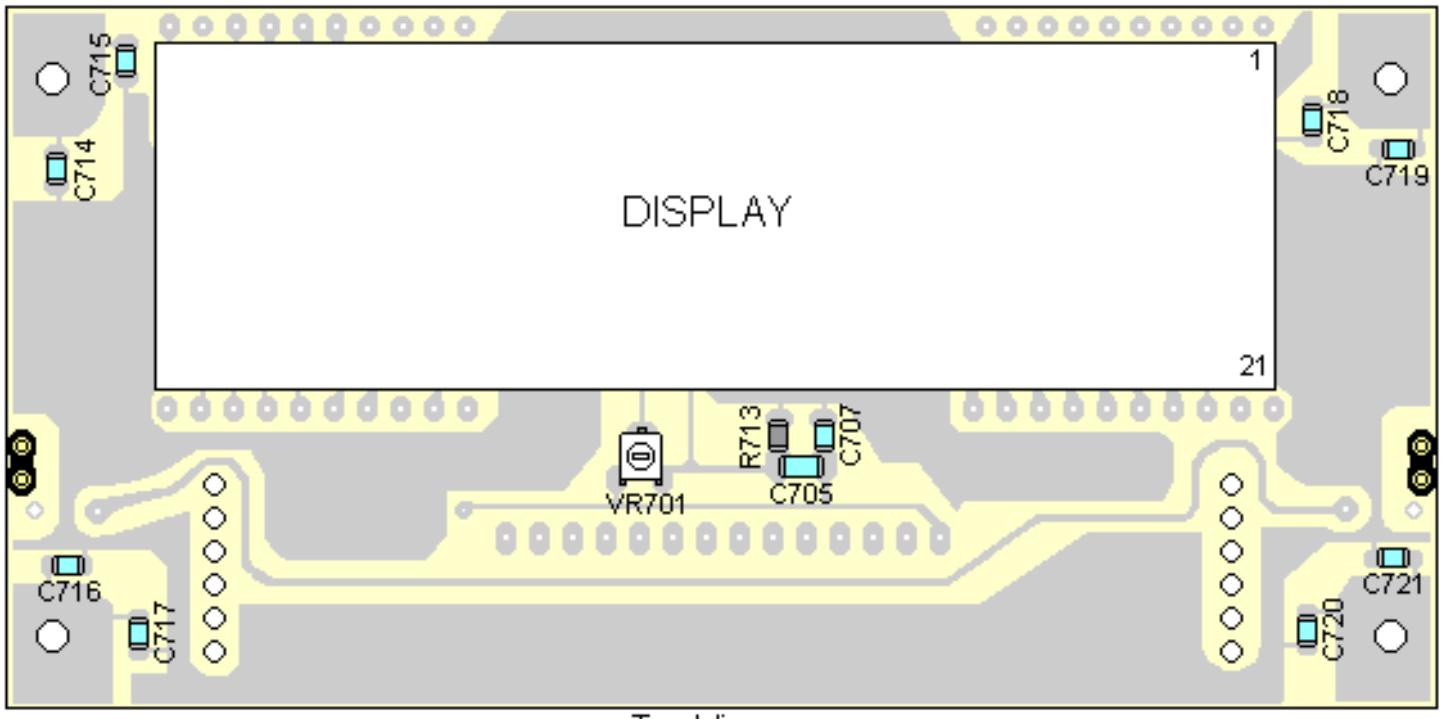


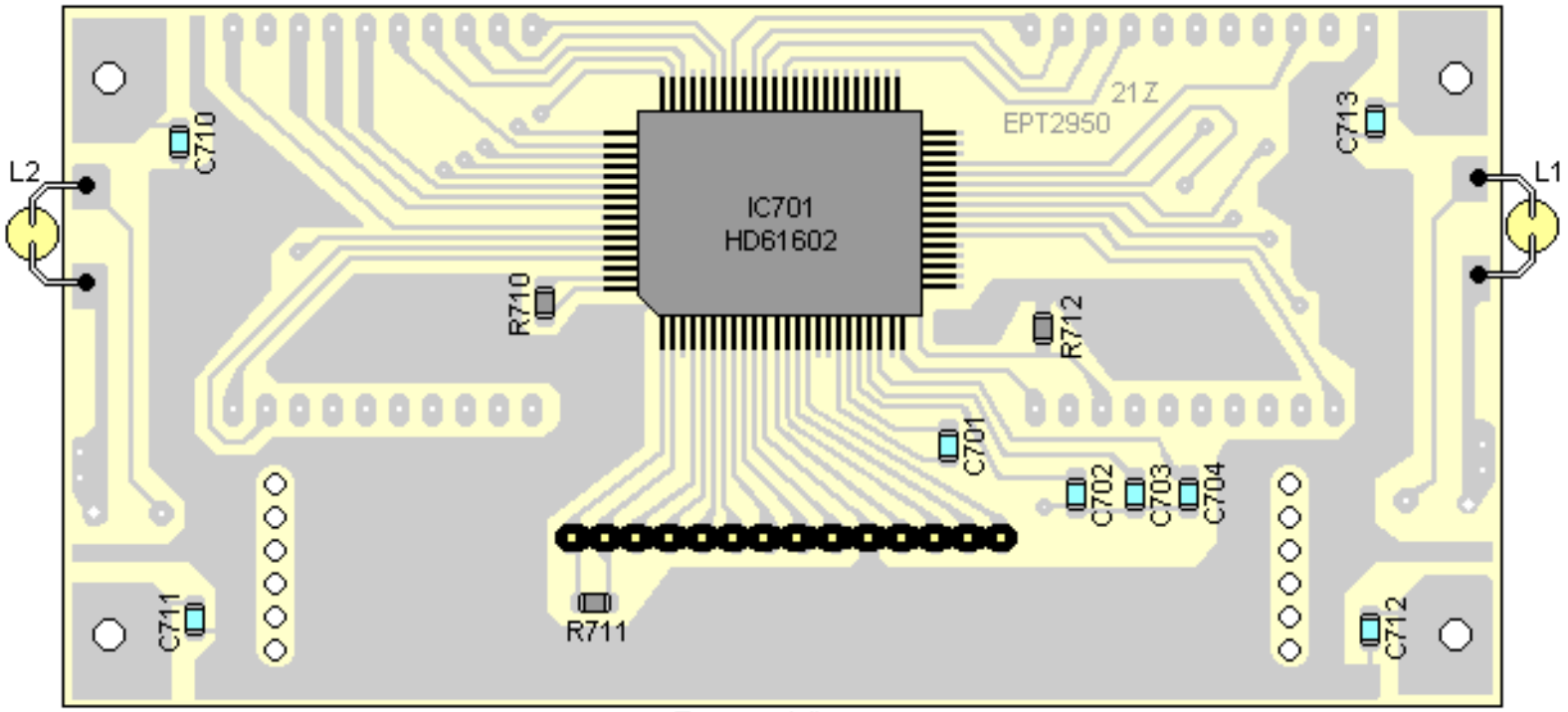
Ranger RCI2950 Main PCB
EPT295013Z

Ranger RCI 2950 LCD P.C. BOARD EPT2950217

Trace Layout



Top View



Bottom View

EPT295021Z LCD P.C.B.

RESISTORS

Ref#	Description	MFR. Part No.
R710	39K .1 W CHIP	ROY013934Z
R711	470K .1W, CHIP	ROY014744Z
R712	680 K .1 W	ROY016844Z

CAPACITORS

Ref#	Description	MFR. Part No.
C701	1uF 16WV M, TANTALUM	CTY161056Z
C702	.33uF 35WV M, TANTALUM	CTY353346Z
C703	.33uF 35WV M, TANTALUM	CTY353346Z
C704	.33uF 35WV M, TANTALUM	CTY353346Z
C705	1uF 16WV M, TANTALUM	CTY161056Z
C707	.01uF, 50WV, Z, Z5V, MONO.	CK1103AB7U
C710	.1uF, 25WV, Z, Y5V, MONO.	CK2104AB7V
C711	.1uF, 25WV, Z, Y5V, MONO.	CK2104AB7V
C712	.1uF, 25WV, Z, Y5V, MONO.	CK2104AB7V
C713	.1uF, 25WV, Z, Y5V, MONO.	CK2104AB7V
C714	.1uF, 25WV, Z, Y5V, MONO.	CK2104AB7V
C715	.1uF, 25WV, Z, Y5V, MONO.	CK2104AB7V
C716	.1uF, 25WV, Z, Y5V, MONO.	CK2104AB7V
C717	.1uF, 25WV, Z, Y5V, MONO.	CK2104AB7V
C718	.1uF, 25WV, Z, Y5V, MONO.	CK2104AB7V

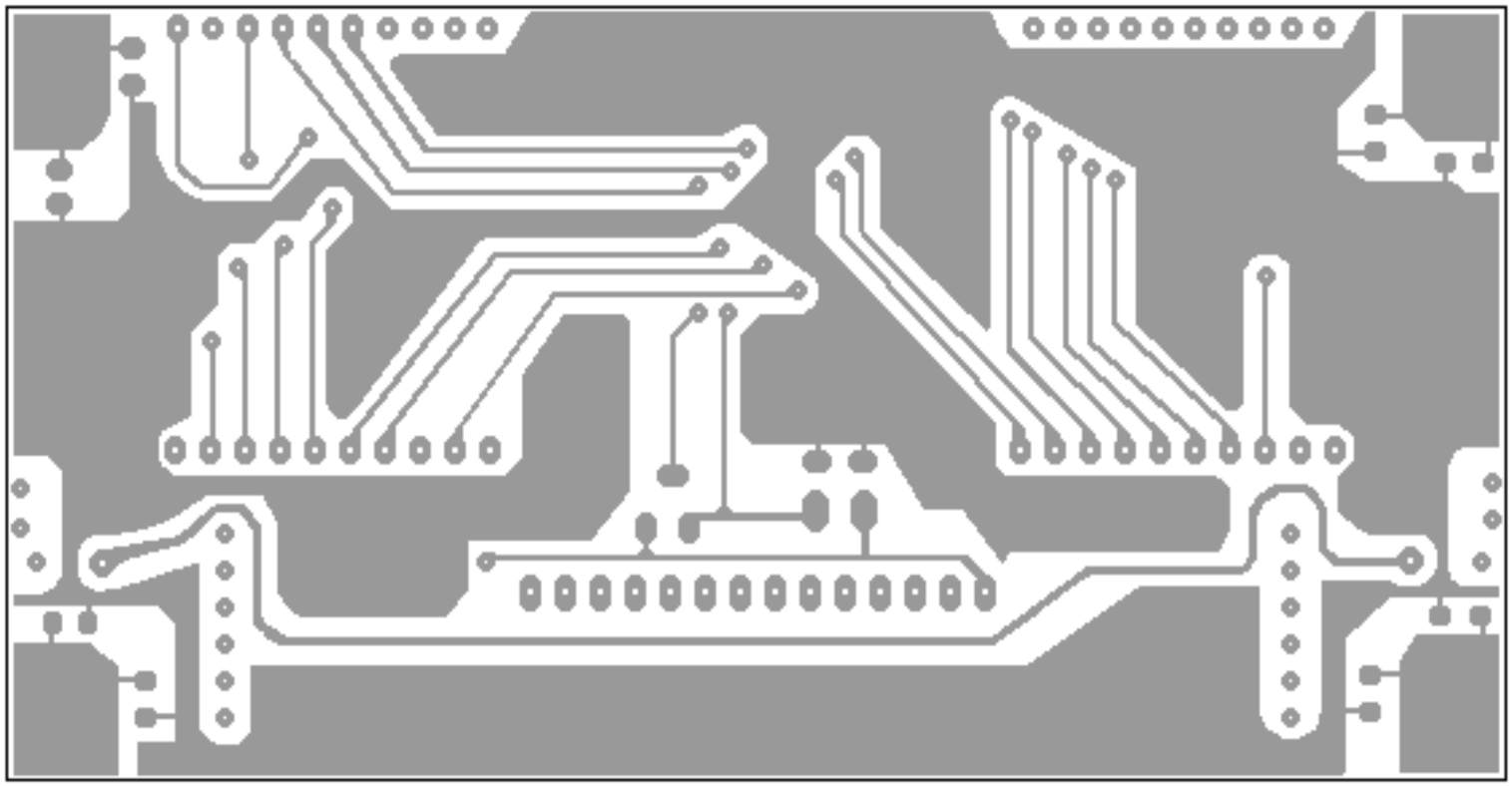
C719	.1uF, 25WV, Z, Y5V, MONO.	CK2104AB7V
C720	.1uF, 25WV, Z, Y5V, MONO.	CK2104AB7V
C721	.1uF, 25WV, Z, Y5V, MONO.	CK2104AB7V

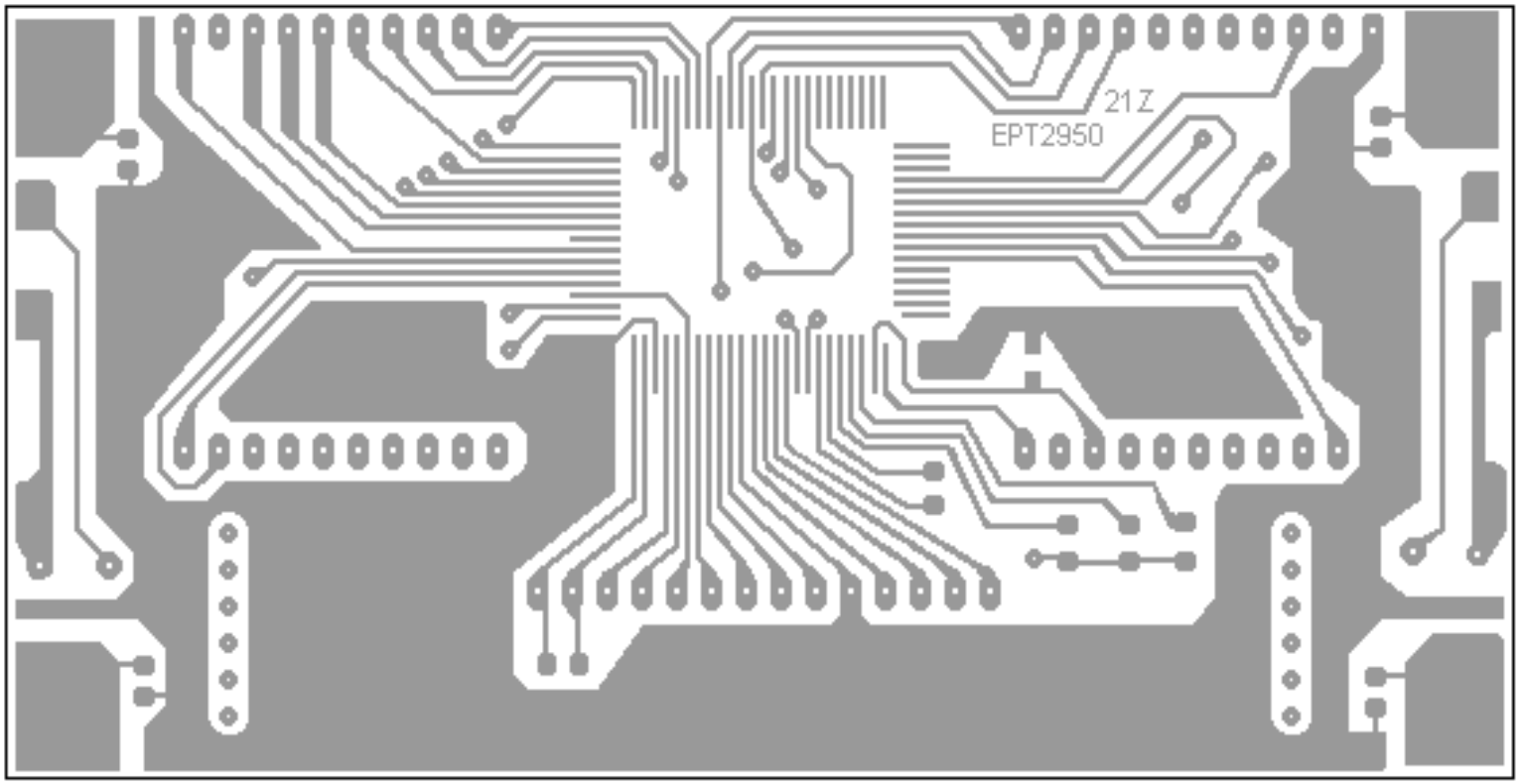
Ref#	Description	MFR. Part No.
IC701	IC HD61602R	ENH161602R

Misc.

Ref#	Description	MFR. Part No.
-	RESISTOR, 1 M SEM I-FIXED	RE10500102
-	LCD DISPLAY	EX03N40438
-	LAMP, 5V .08A	EX01 N40080
-	IS SOCKET 2P	EX07N48442
-	PCB CONN. SOCK. 14P L= 21.8mm	EX07N48438

LCD P.C. BOARD EPT2950217 Trace Layout



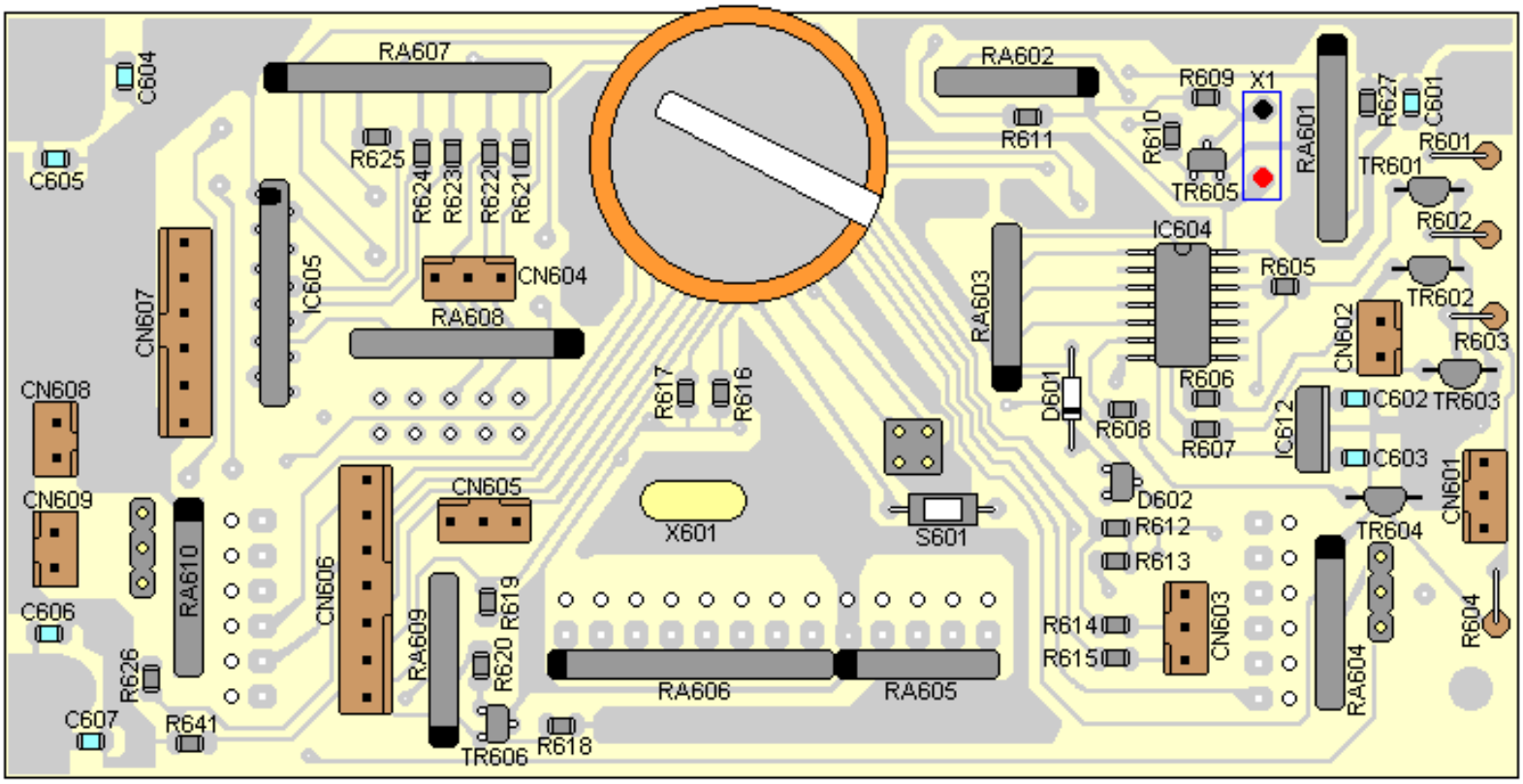


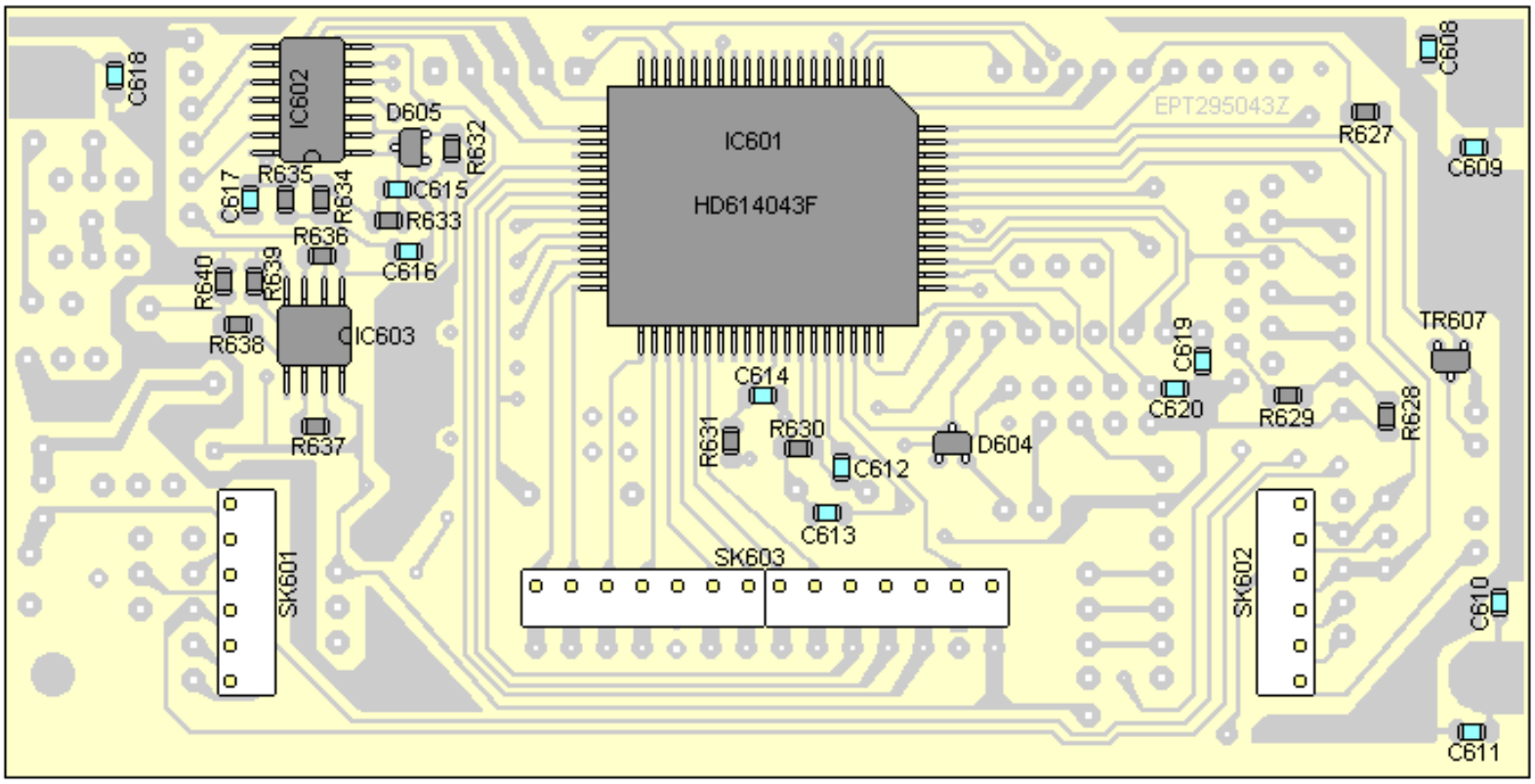
EPT295021Z LCD P.C.B.

EPT295021Z LCD P.C.B.

Ranger RCI 2950 CPU PCB EPT295043Z

Trace Layout





Ranger RCI-2950
CPU PCB EPT295043Z

RESISTORS

Ref#	Description	MFR. Part No.
R601	270ohm 1/4W (U) TYPE, CARBON	RCU142714Z
R602	220ohm 1/4W (U) TYPE, CARBON	RCU142214Z
R603	180ohm 1/4W (U) TYPE, CARBON	RCU141814Z
R604	82ohm 1/4W (U) TYPE, CARBON	RCU148204Z
R605	470ohm .1 W CHIP	RCY014714Z
R606	470ohm .1W CHIP	RCY014714Z
R607	470ohm .1W CHIP	RCY014714Z
R608	470ohm .1 W CHIP	RCY014714Z
R609	10ohm .1 W, CHIP	RCY011034Z
R610	1ohm .1 W CHIP	RCY011024Z
R611	47K, 0.1W CHIP	RCY014734Z
R612	47K, 0AW CHIP	RCY014734Z
R613	47K, 0.1W CHIP	RCY014734Z
R614	47K, 0.1 W CHIP	RCY014734Z
R615	47K, 0.1W CHIP	RCY014734Z
R617	47K, 0.1W CHIP	RCY014734Z
R618	47K, 0.1 W CHIP	RCY014734Z
R619	47K,.0.1W CHIP	RCY014734Z
R620	470ohm .1W CHIP	RCY014714Z
R621	47K 0.1W CHIP	RCY014734Z
R622	47K 0.1 W CHIP	RCY014734Z
R623	47K 0.1W CHIP	RCY014734Z
R624	47K 0.1 W CHIP	RCY014734Z

R625	47K 0.1W CHIP	RCY014734Z
R626	4.7K 0.1 W CHIP	RCY014724Z
R627	47K 0.1W CHIP	RCY014734Z
R628	47K 0.1 W CHIP	RCY014734Z
R629	47K 0.1W. CHIP	RCY014734Z
R630	RESISTOR, 1MEG, 0.1 W, CHIP	RCY011054Z
R631	10ohm .1 W CHIP	RCY011034Z
R632	47K 0.1 W CHIP	RCY014734Z
R633	39K 0.1 W CHIP	RCY013934Z
R634	RESISTOR, 220K 0.1 W CHIP	RCY012244Z
R635	RESISTOR, 1MEG 0.1W CHIP	RCY011054Z
R636	RESISTOR, 100K 0.1W CHIP	RCY011044Z
R637	RESISTOR, 220K 0.1W CHIP	RCY012244Z
R638	RESISTOR, 100K 0.1W CHIP	RCY011044Z
R639	RESISTOR, 47K 0.1W CHIP	RCY014734Z
R640	RESISTOR, 47K 0.1W CHIP	RCY014734Z
R641	RESISTOR, 47K 0.1W CHIP	RCY014734Z
R642	RESISTOR, 47K 0.1W CHIP	RCY014734Z
R643	RESISTOR, 47K 0.1W CHIP	RCY014734Z
R644	RESISTOR, 47K 0.1W CHIP	RCY014734Z
R645	RESISTOR, 47K 0.1W CHIP	RCY014734Z
R646	RESISTOR, 47K O.1W CHIP	RCY014734Z
R647	RESISTOR, 47K O.1W CHIP	RCY014734Z
R648	RESISTOR, 47K 0.1W CHIP	RCY014734Z
R649	RESISTOR, 47K 0.1W CHIP	RCY014734Z

R650	RESISTOR, 47K 0.1W CHIP	RCY014734Z
R651	RESISTOR, 47K 0.1W CHIP	RCY014734Z
R652	RESISTOR, 47 K 0.1W CHIP	RCY014734Z
R653	RESISTOR, 47 K 0.1W CHIP	RCY014734Z
R654	RESISTOR, 47 K 0.1W CHIP	RCY014734Z
R655	RESISTOR, 47 K 0.1W CHIP	RCY014734Z
R656	RESISTOR, 47 K 0.1W CHIP	RCY014734Z
R657	RESISTOR, 47 K 0.1W CHIP	RCY014734Z
R658	RESISTOR, 47 K 0.1W CHIP	RCY014734Z
R659	RESISTOR, 47 K 0.1W CHIP	RCY014734Z
R660	RESISTOR, 47 K 0.1W CHIP	RCY014734Z
R661	RESISTOR, 47 K 0.1W CHIP	RCY014734Z
8662	RESISTOR, 47 K 0.1W CHIP	RCY014734Z

ARRAY RESISTORS

Ref#	Description	MFR. Part No.
RA601	RESISTOR ARRAY, 10K/20K 6P	RCS0670023
RA602	RESISTOR ARRAY, 47K 5P	RCS0570009
RA603	RESISTOR ARRAY, 47K 5P	RCS0570009
RA604	RESISTOR ARRAY, 220K 5P	RCS0570022
RA605	RESISTOR ARRAY, 47K 5P	RCS0570009
RA606	RESISTOR ARRAY, 220K 9P	RCS0970021
RA607	RESISTOR ARRAY, 47K 9P	RCS0970015
RA608	RESISTOR ARRAY, 47K 7P	RCS0770020
RA609	RESISTOR ARRAY, 47K 5P	RCS0570009
RA610	RESISTOR ARRAY, 220K 5P	RCS0570022

RA611	RESISTOR ARRAY, 47K 5P	RCS0570009

CAPACITORS

Ref#	Description	MFR. Part No.
C601	.01uF 50WV K Z5U, MONO.	CK1103AB7U
C602	.1uF 35WV M, TANTALUM	CTY351046Z
C603	.33uF 35WV M, TANTALUM	CTY353346Z
C604	.01uF 50WV KZ5U, MONO.	CK1103A87U
C605	.01uF 50WV KZ5U, MONO.	CK1103AB7U
C606	.01uF 50WV K Z5U, MONO.	CK1103AB7U
C607	.01uF 50WV K Z5 U, MONO.	CK1103AB7U
C608	.01uF 50WV KZ5U, MONO.	CK1103AB7U
C609	.01uF 50WV K Z5 U, MONO.	CK1103AB7U
C610	.01uF 50WV K Z5U, MONO.	CK1103A87U
C611	.01uF 50WV K Z5 U, MONl0.	CK1103A87U
C612	33PF 50WV J CH, MONO CHIP	CK1330AB4A
C613	33PF 50WV J CH, MONO CHIP	CK1330AB4A
C614	.1uF 50WV Z Y5V, MONO.	CK2104AB7V
C615	.0027uF 50WV Z Y5V, MONO.	CK1272AB5R
C616	470PF 50WV K SL, MONO. CHIP	CK1471AB5L
C617	100PF 50WV K SL, MONO CHIP	CK1101AB5L
C618	.01uF 50WV K Z5U, MONO.	CK1103AB7U

Integrated Circuits

Ref#	Description	MFR. Part No.
IC601	IC HD4074008F	ENH174008F

IC602	IC TC4069UBF	ENTA04069F
IC603	IC M5223FP	ENMI05223F
IC604	IC TC4069UBF	ENTA04069F
IC605	IC TA78	TZTA00078Z
IC606	IC TA78	TZTA00078Z
IC612	IC 7805	ENSS07805Z

TRANSISTORS

Ref#	Description	MFR. Part No.
TR601	TRANSISTOR 2SC945P	T2SC00945P
TR602	TRANSISTOR 2SC945P	T2SC00945P
TR603	TRANSISTOR 2SC945P	T2SC00945P
TR604	TRANSISTOR 2SC945P	T2SC00945P
-	TRANSISTOR 2SA1162GR	T2SA01162G
TR605	TRANSISTOR 2SC2712	T2SC02712G
TR606	TRANSISTOR 2SC2712	T2SC02712G
TR607	TRANSISTOR 2SC2712	T2SC02712G

DIODES

REF#	DESCRIPTION	PART#
D601	DIODE 1N5711	ED1N05711Z
D602	DIODE 1SS181	EDSS00181Z
D604	DIODE 1SS181	EDSS00181Z
D605	DIODE 1SS181	EDSS00181Z

Resonator

REF#	DESCRIPTION	PART#

X601	RESONATOR, 4MHZ, CERAMIC	EX14N46510

Switch

REF#	DESCRIPTION	PART#
S601	TACT SW	EWPS33042X

Buzzer

REF#	DESCRIPTION	PART#
-	BUZZER RKM35-4A	EX14N46511

Battery

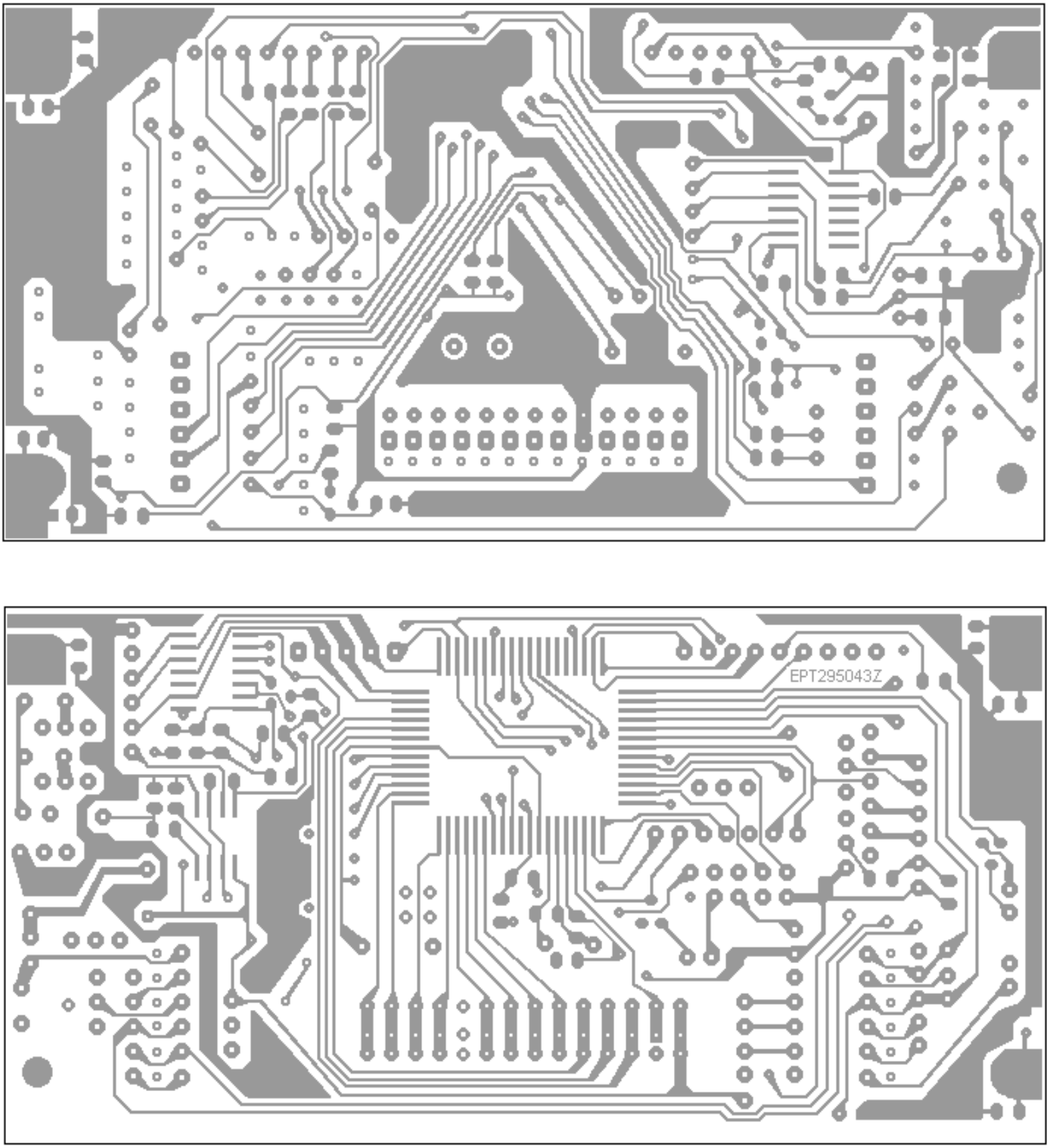
REF#	DESCRIPTION	PART#
L1	BATTERY LITHIUM, 3V 170maH	EX08N41405

Connectors

REF#	DESCRIPTION	PART#
-	PCB CONNECTOR SOCKET 6P	EX07N41266
-	PCB CONNECTOR SOCKET 4P	EX07N41250
-	PCB CONNECTOR SOCKET 3P	EX07N41216
CN602	PCB CONNECTOR SOCKET 2P	EX07N41226
CN608	PCB CONNECTOR SOCKET 2P	EX07N41226
CN609	PCB CONNECTOR SOCKET 2P	EX07N41226
-	PCB CONNECTOR SOCKET 3P	EX07N48244
-	PCB CONNECTOR SOCKET 4P	EX07N48440
-	PCB CONNECTOR HOUSING 7P	EX07N48011
-	PCB CONNECTOR HOUSING 6P	EX07N48010
-	PCB CONNECTOR SOCKET 10P	EX07N48416

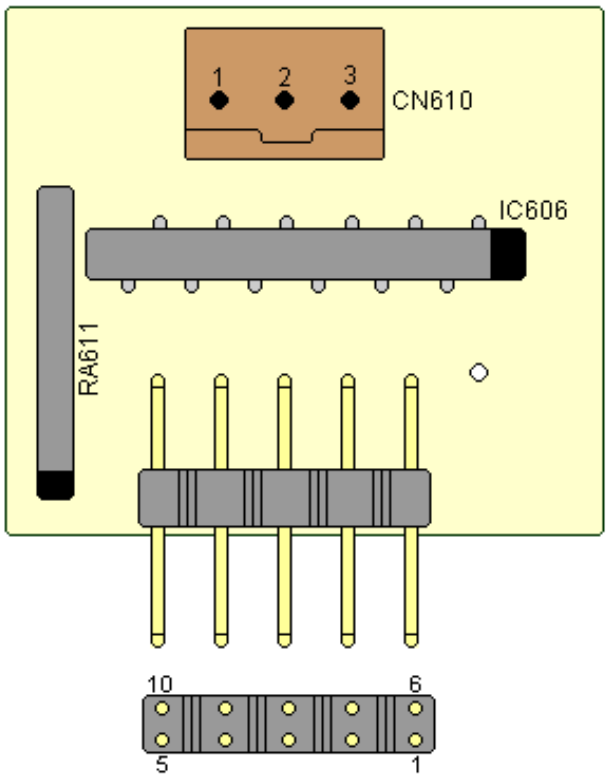
-	SHORT PIN 2P	EX07N48151

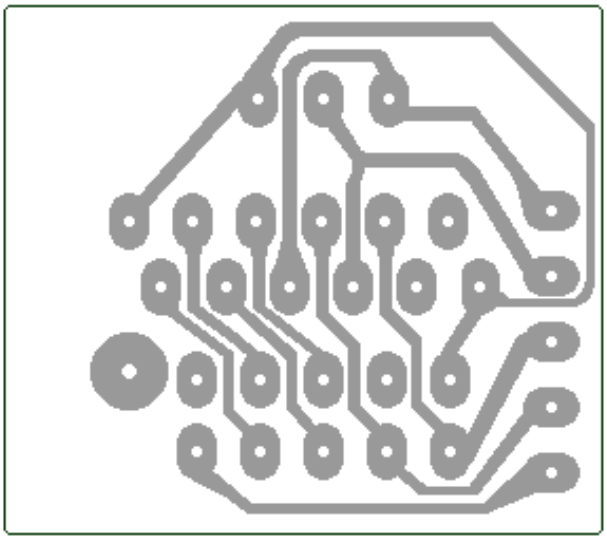
CPU PCB EPT295043Z Trace Layout



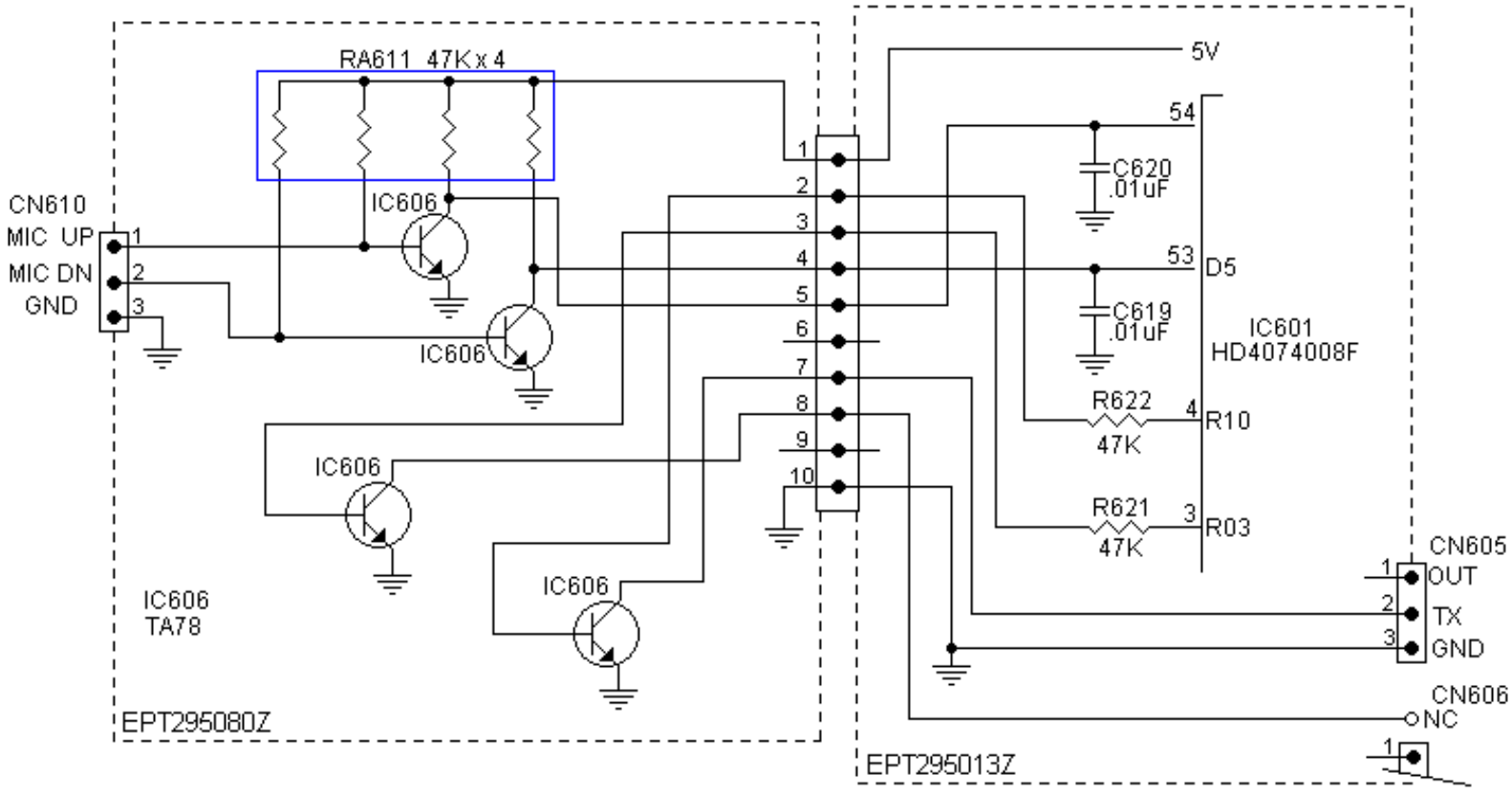
Ranger RCI-2950
CPU PCB EPT295043Z

Ranger RCI-2950 **MIC UP/DW PCB** (EPT295080Z)

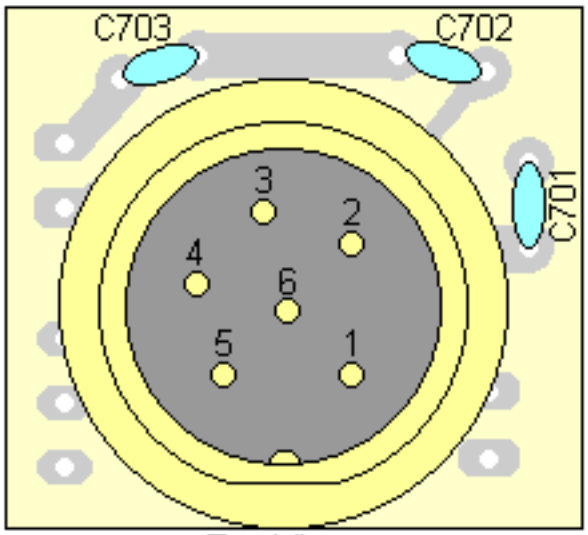




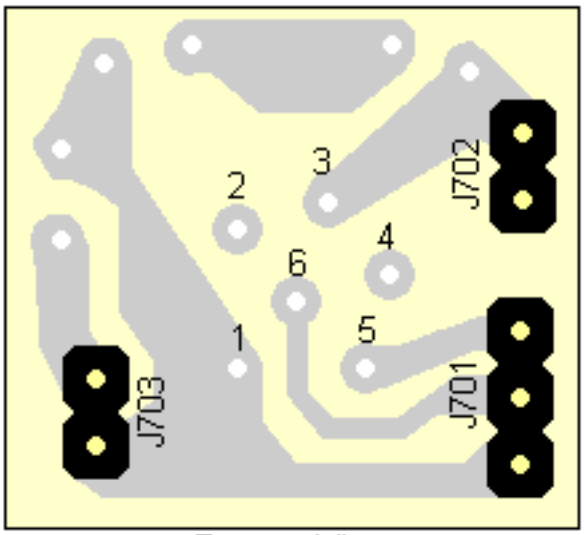
RCI-2950
MIC UP/DW EPT295080Z



Ranger RCI 2950 MIC JACK P.C. BOARD EPT295070Z

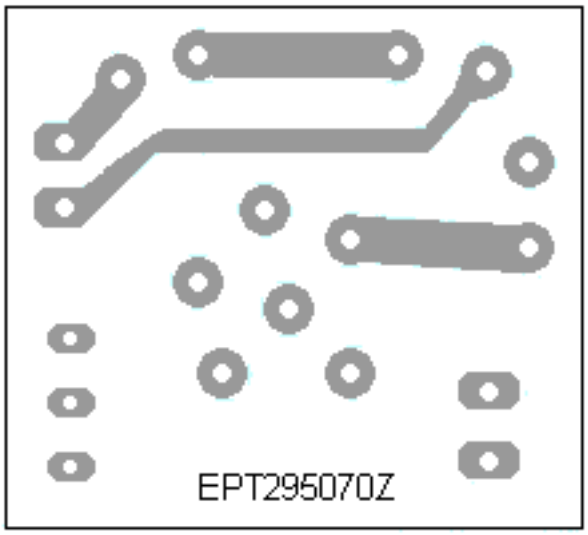


Top View

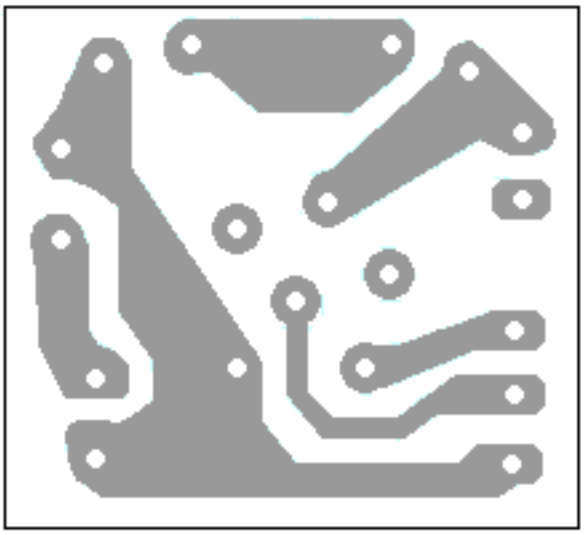


Bottom View

RCI-2950
MIC Jack PCB EPT295070Z



Top View


Bottom View

RCI-2950
MIC Jack PCB EPT295070Z

CERAMIC CAPACITORS

Ref#	Description	MFR. Part No.

C701	.001uF 50WV Z SL, CERAMIC	CC0501027L
C702	.001uF 50WV Z SL, CERAMIC	CC0501027L
C703	.001uF 50WV Z SL, CERAMIC	CC0501027L

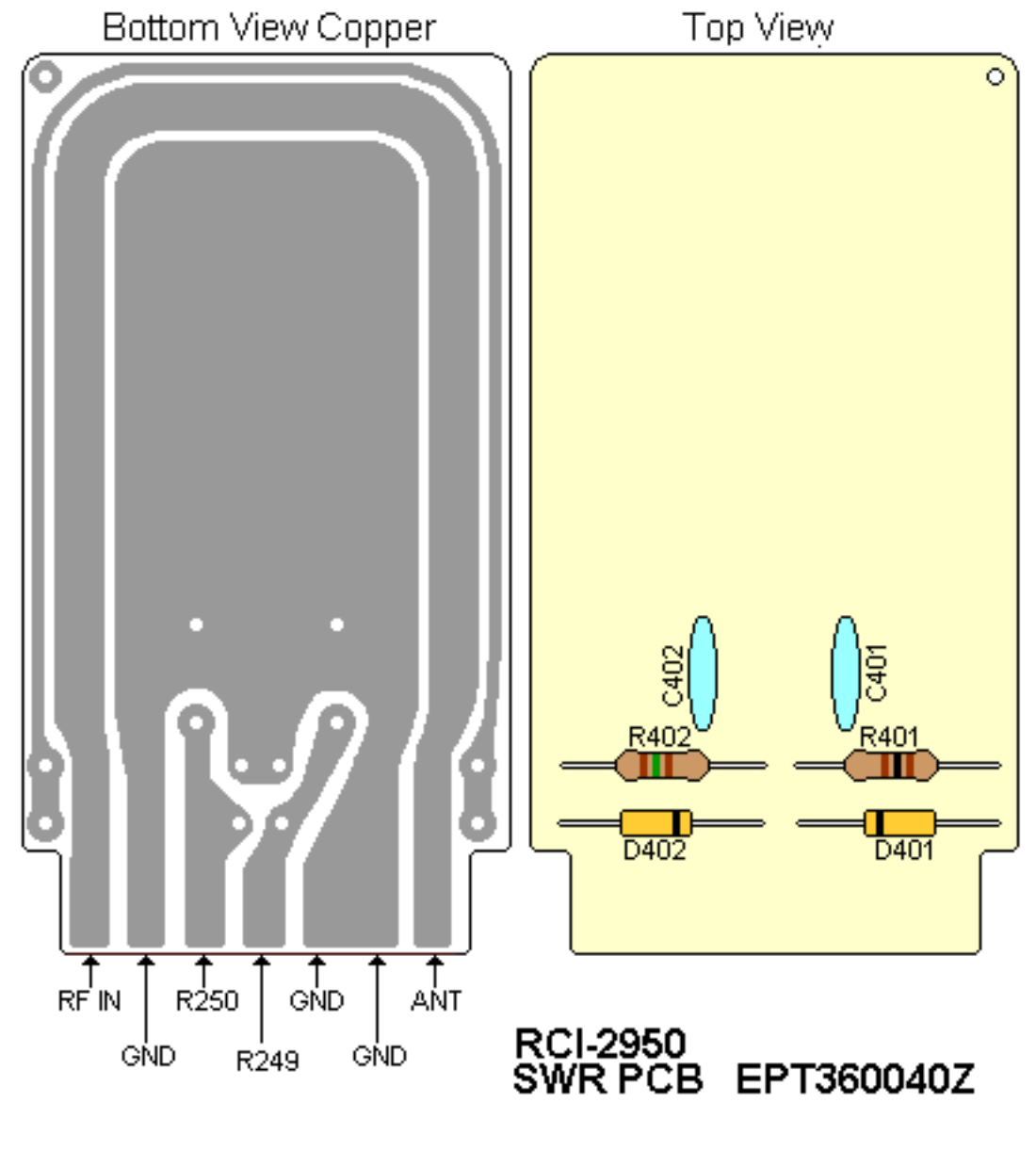
CONNECTORS

Ref#	Description	MFR. Part No.
J701	PCB CONNECTOR SOCKET 3P	EX07N48244
J702	PCB CONNECTOR SOCKET 2P	EX07N48152
J703	PCB CONNECTOR SOCKET 2P	EX07N48152
	MIC JACK 6P	EX06N41111

Ranger RCI-2950

VSWR PCB (EPT360040Z)

Schematic Diagram



Resistors

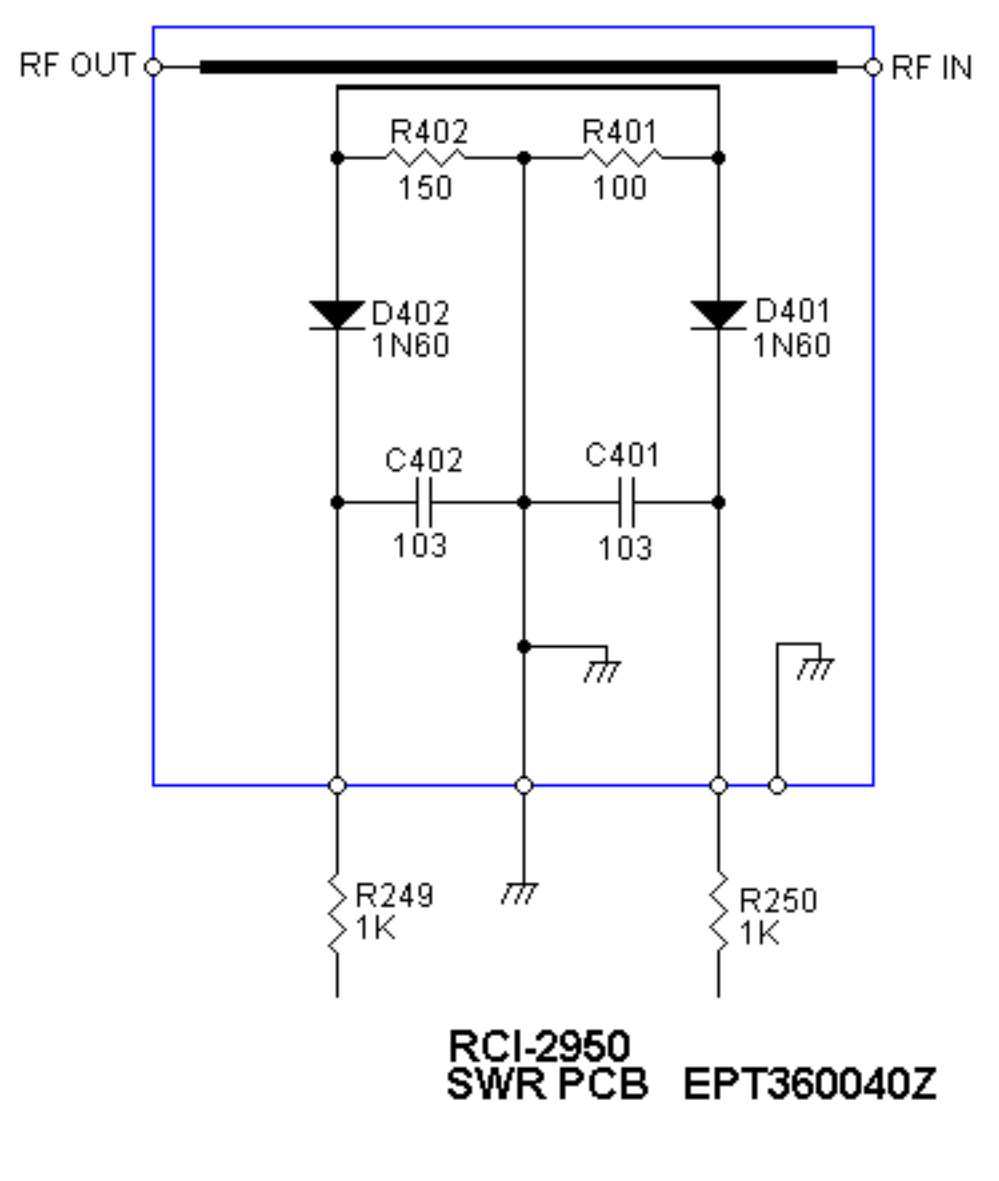
Ref#	Description	MFR. Part No.
R401	100ohm 1/4W (P) TYPE	RCP141014Z
R402	150 OHM 1/4W (P) TYPE	RCP141514Z

Capacitors

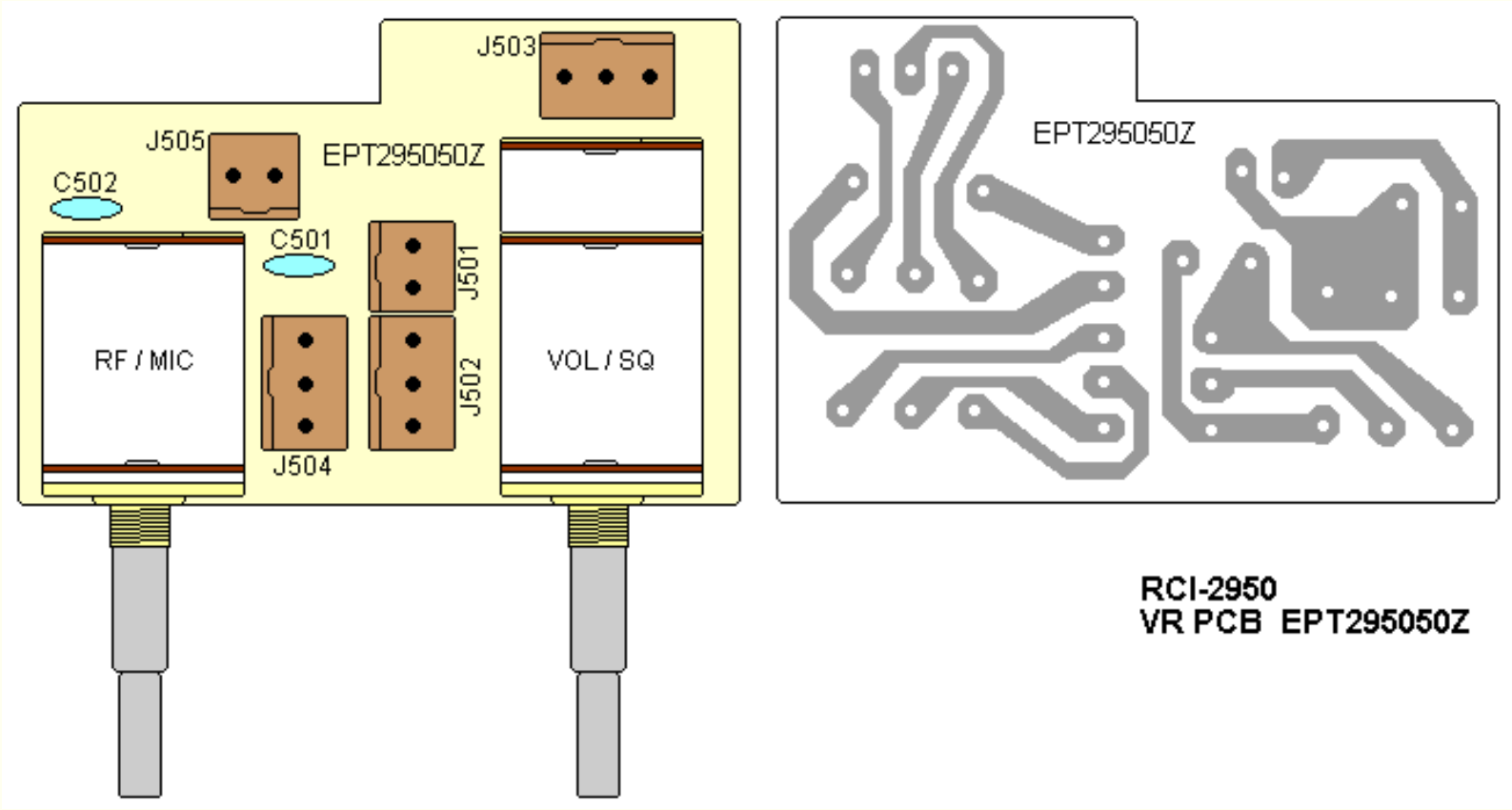
Ref#	Description	MFR. Part No.
C405	.01uF 50WV Z SL, CERAMIC	CCO501037L
C406	.01uF 50WV Z SL, CERAMIC	CC0501037L

Ranger RCI-2950

RCI-2950 VSWR P.C. BOARD EPT360040Z
Schematic Diagram



Ranger RCI-2950 VR PCB RF/Mic Gain / Vol / SQ PCB (EPT295050Z)



Capacitors

Ref#	Description	MFR. Part No.
C501	.001uF 50WV Z SL, CERAMIC	CC0501027L
C505	.001uF 50WV Z SL, CERAMIC	CC0501027L

Potentiometers

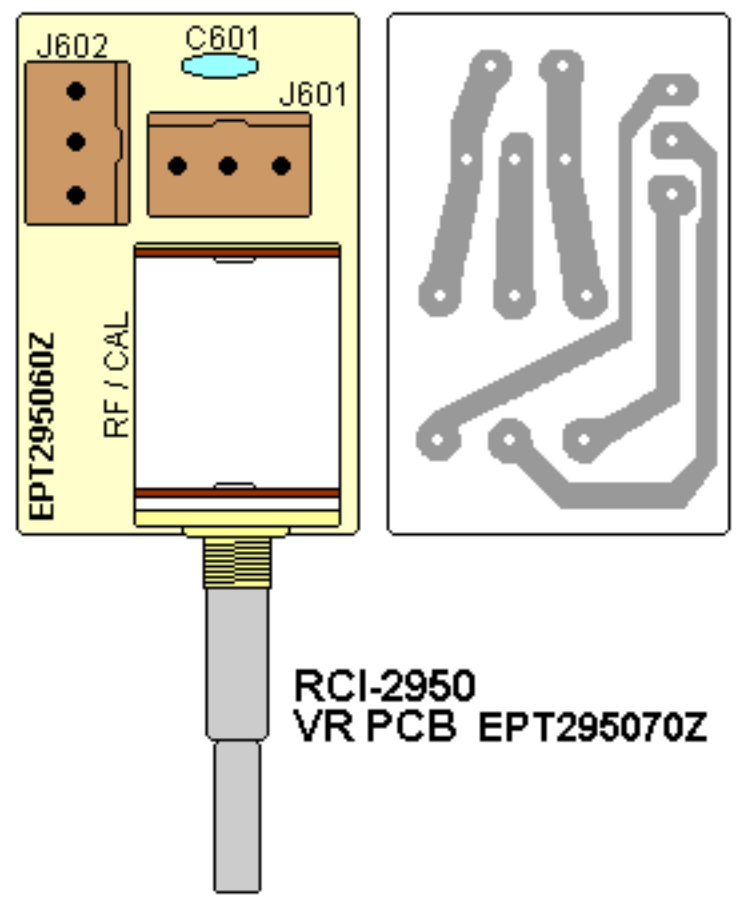
Ref#	Description	MFR. Part No.
RF/MIC	VR 1KA-5KB	RV10203451
VOL/SQ	VR 5OKB-50KA	RV50303453

Connectors

Ref#	Description	MFR. Part No.

J501	PCB CONNECTOR SOCKET 2P	EX07N41226
J502	PCB CONNECTOR SOCKET 2P	EX07N41226
J503	PCB CONNECTOR SOCKET 3P	EX07N41216
J504	PCB CONNECTOR SOCKET 3P	EX07N41216
J505	PCB CONNECTOR SOCKET 2P	EX07N41226

Ranger RCI-2950 **RCI-2950 VR (B) PCB** (EPT295060Z)



Capacitors

Ref#	Description	MFR. Part No.
C601	.001 OF 50WV Z SL, CERAMIC	CCO501027L

Potentiometers

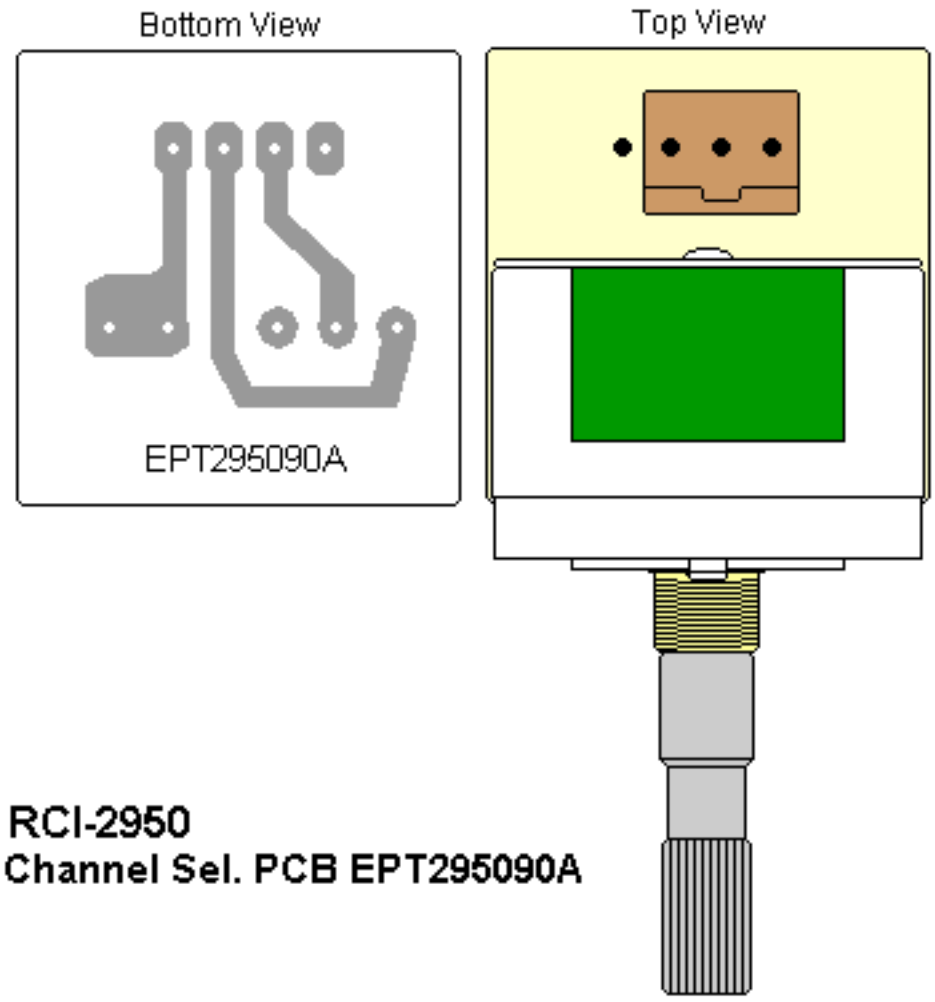
Ref#	Description	MFR. Part No.
RF/CAL	VR 1KB-20KB	RV10203456

Connectors

Ref#	Description	MFR. Part No.

J601	PCB CONN. SOCKET 3P	EX07N41216
J602	PCB CONN. SOCKET 3P	EX07N41216

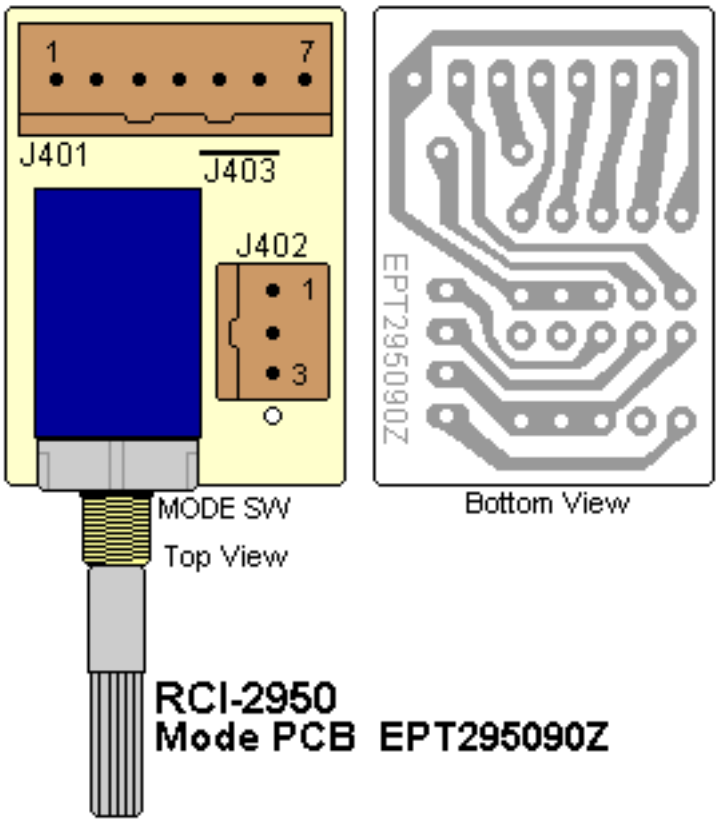
Ranger RCI 2950 CH/SW P.C. BOARD EPT295090A



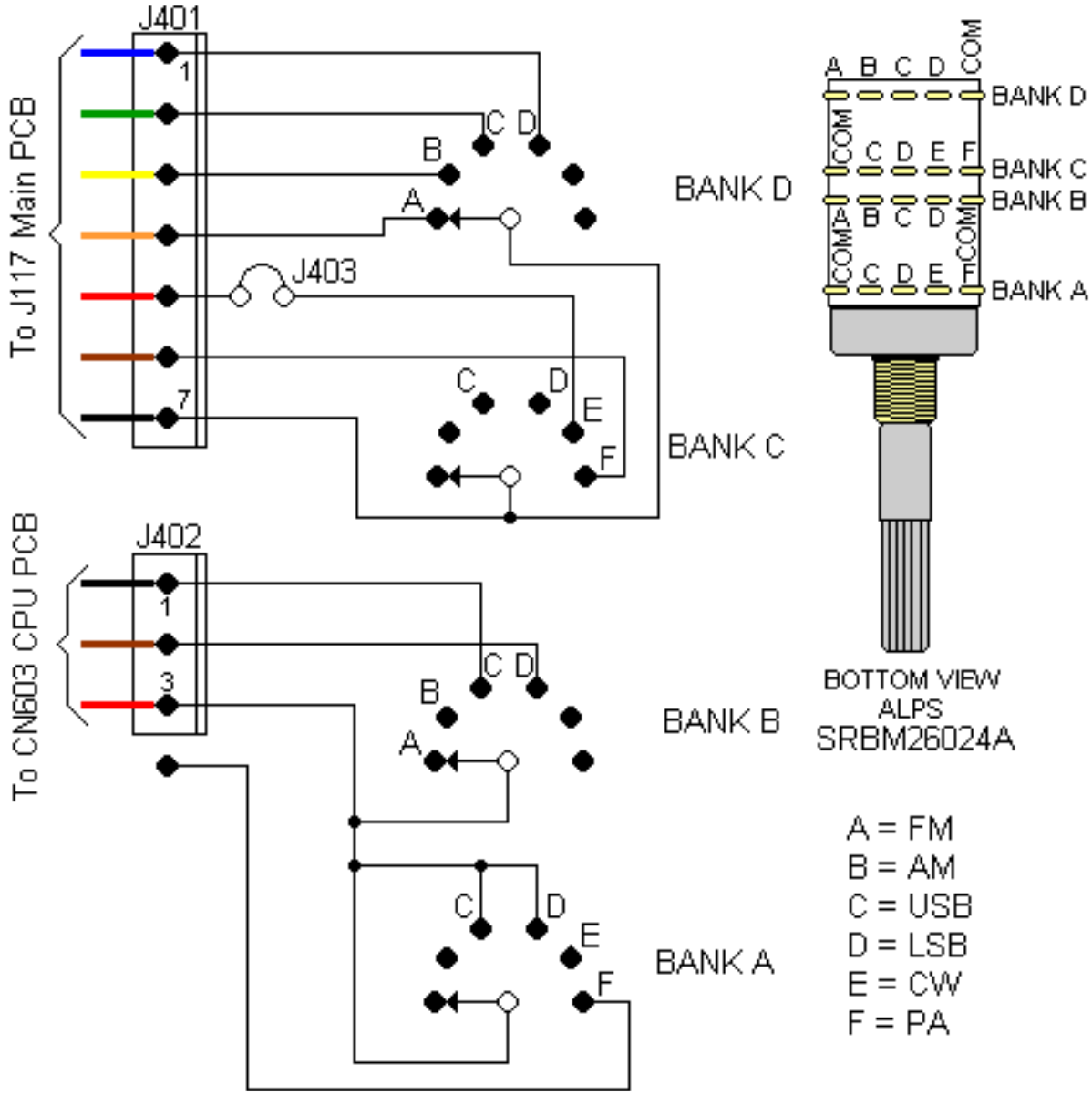
Ref#	Description	MFR. Part No.
	ROTARY SW, GPS-688	EWRT32051S
	PCB CONN. SOCKET, 3P	EX07N41216

Ranger RCI 2950 MODE P.C. BOARD EPT295090Z

Schematic Diagram



Ref#	Description	MFR. Part No.
	ROTARY SW, 6N	EWRT32053S
	PCB CONN. SOCKET, 3P	EX07N41216
	PCB CONN. SOCKET, 7P	EX07N41261
J403	JUMPER WIRE 7x6x7mm	WX01070706

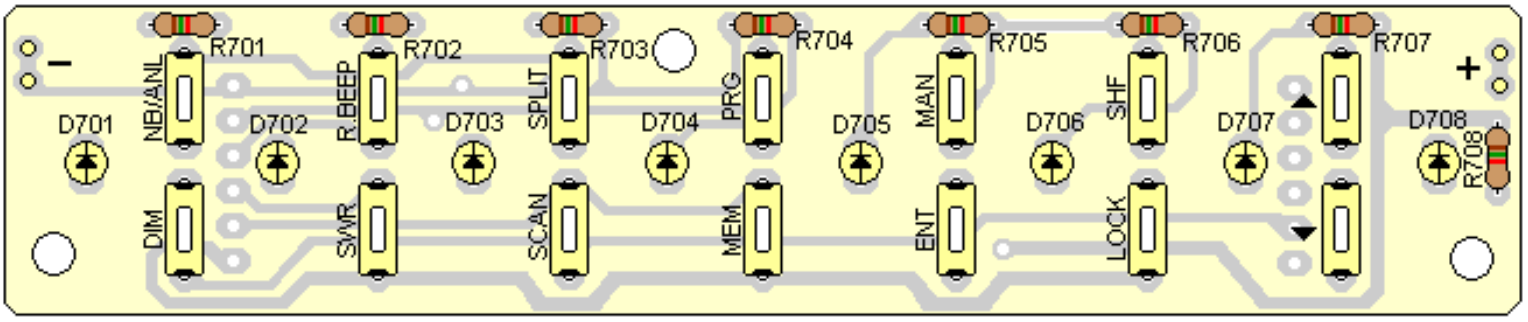


Galaxy DX Radios DX2527
Mode Switch PCB EPT295090Z

EPT295031Z Push Switch PCBEPT295031Z

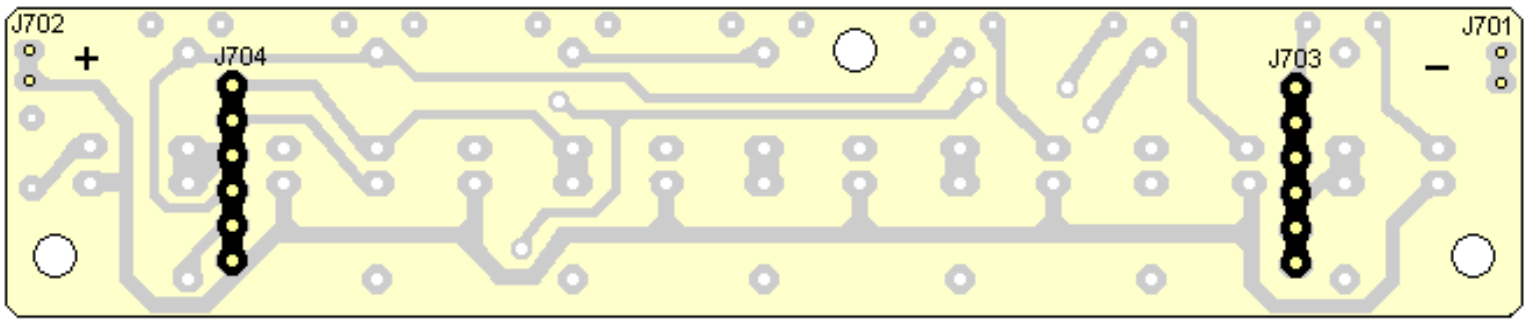
Trace Layout

Schematic Diagram



Top View

RCI-2950
Pushbuttom Swith PCB EPT295031Z



Bottom View

RCI-2950
Pushbuttom Swith PCB EPT295031Z

CARBON FIXED RESISTORS

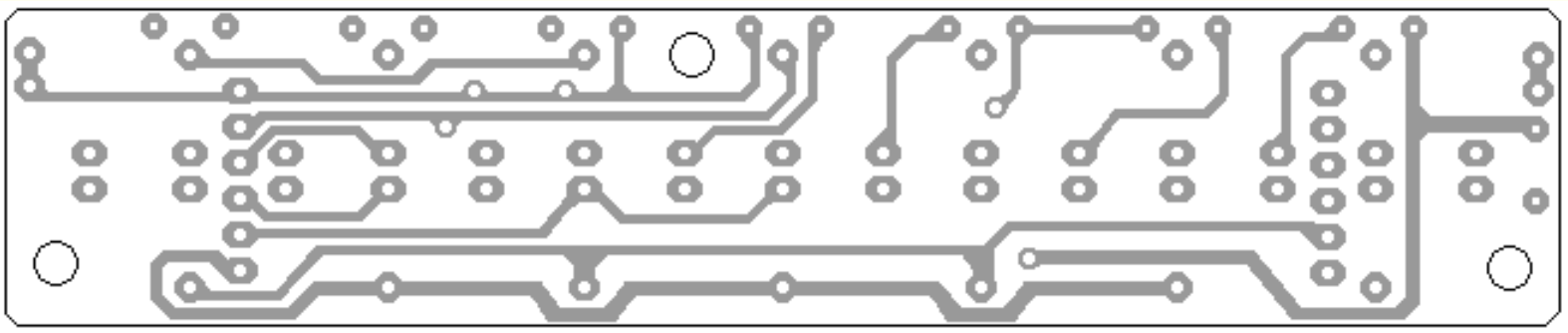
Ref#	Description	MFR. Part No.
	1.5K 1/16W(P) TYPE	RCP161524Z

Misc.

Ref#	Description	MFR. Part No.
	TACT SW	EWPS33042X
	IC PIN	EX07N48414
	LED YELLOW	EX01N40081

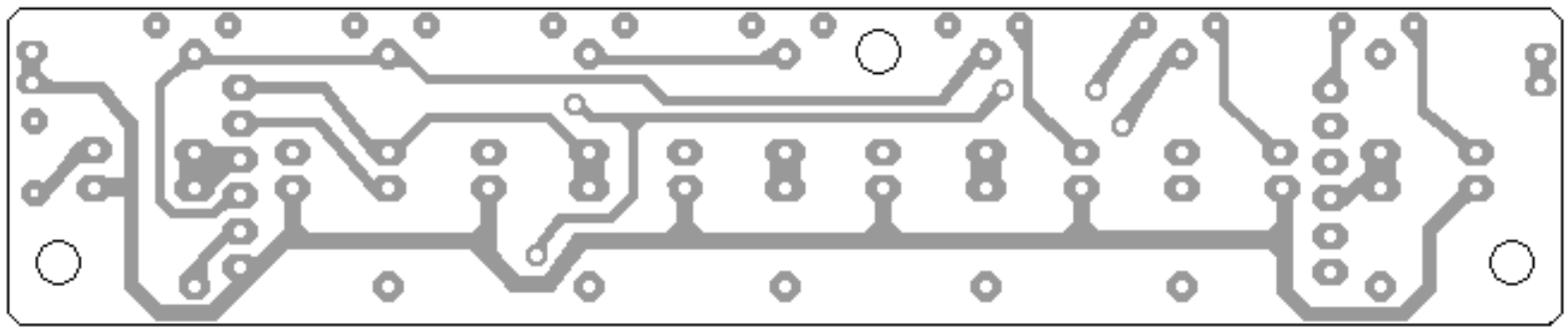
	PCB CONN. SOCK. 6P L= 21.8mm	EX07N48441

Ranger RCI 2950 EPT295031Z Push Switch PCBEPT295031Z Trace Layout



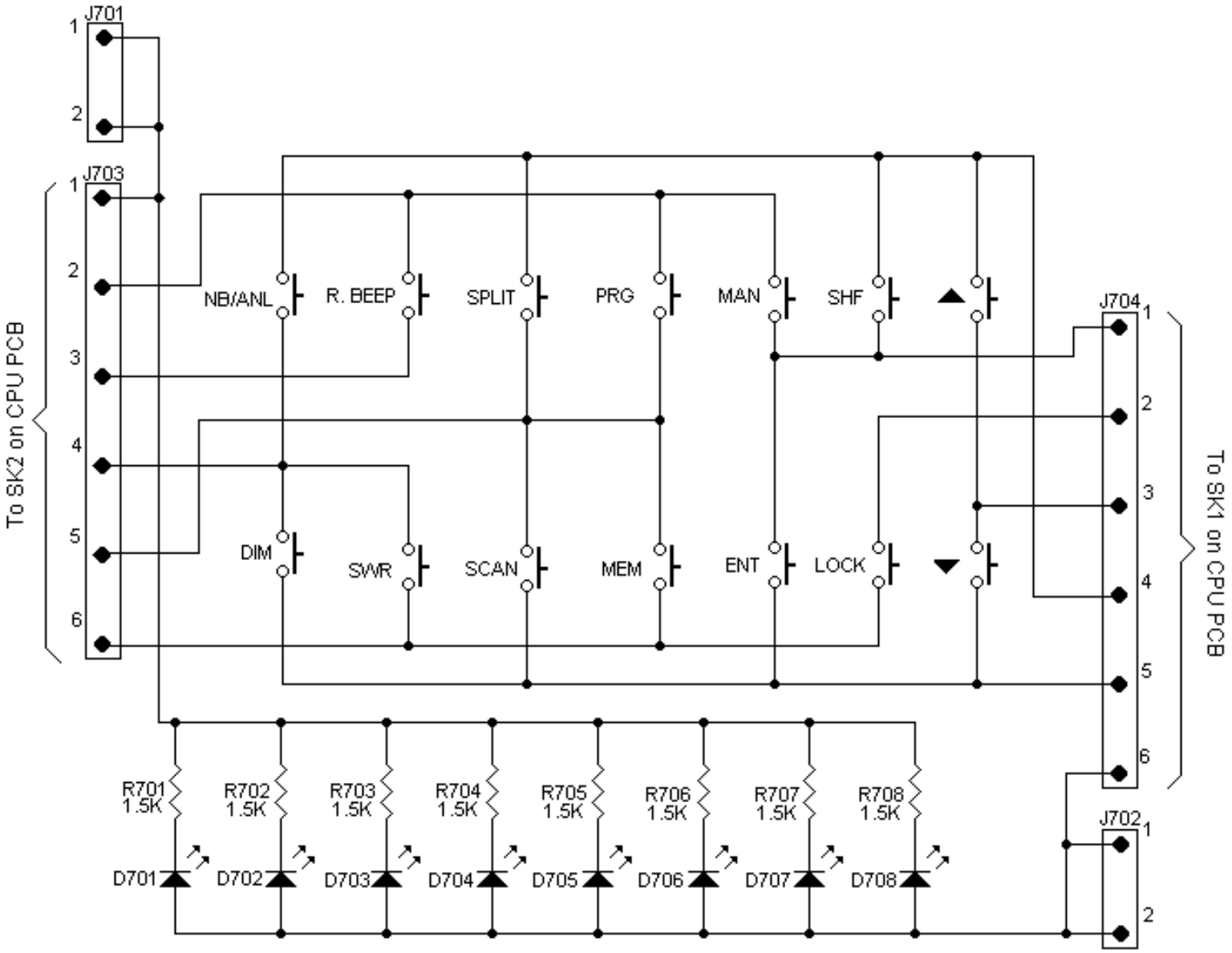
Top View

RCI-2950
Pushbuttom Swith PCB EPT295031Z



Bottom View

RCI-2950
Pushbuttom Swith PCB EPT295031Z



RCI-2950

Pushbuttom Swith PCB EPT295031Z

RCI 2950 PARTS LISTS Capacitors

Main PCB (EPT295013Z)
Trimmer Capacitors

Ref#	Bd Loc	Description	MFR. Part No.
VC1		CAPACITOR, 20P, TRIMMER	CV050200AZ
VC2		CAPACITOR, 20P, TRIMMER	CV050200AZ
VC3		CAPACITOR, 30P, TRIMMER	CV050300AZ

Capacitors

Ref#	Bd Loc	Description	MFR. Part No.
C1		5PF 50WV J CH, CERAMIC	CC0501004A
C2		.01uF 50WV Z SL, CERAMIC	CC0501037L
C3		.01uF 50WV Z SL, CERAMIC	CC0501037L
C4		100PF 50WV K SL, CERAMIC	CC0501015L
C5		5PF 50WV C CH, CERAMIC	CC0500501A
C6		.01uF 50WV Z SL, CERAMIC	CC0501037L
C7		.047uF 50WV Z SL, CERAMIC	CC0504737L
C8		.001uF 50WV Z SL, CERAMIC	CC0501027L
C9		.01uF 50WV Z SL, CERAMIC	CC0501037L
C10		4.7uF 16WV M, TANTALUM	CT0164756Z
C11		82PF 50WV J SL, CERAMIC	CC0508204L
C12		.01uF 50WV Z SL, CERAMIC	CC0501037L

C13		.47uF 50WV Z, ELECTROLYTIC	CE0504747Z
C14		330PF 50WV K SL, CERAMIC	CC0503315L
C15		.0022uF 50WV K, MYLAR	CM0502225Z
C16		2.2uF 5OWV Z, ELECTROLYTIC	CE0502257Z
C17		330PF 50WV K SL, CERAMIC	CC0503315L
C18		.01uF 50WV Z SL, CERAMIC	CC0501037L
C19		.047uF 50WV Z SL, CERAMIC	CC0504737L
C20		5PF 50WV C SL. CERAMIC	CC0500501L
C21		.01uF 50WV Z SL, CERAMIC	CC0501037L
C22		.1UF 50WV Z SL, CERAMIC	CCO501047L
C23		.1uF 50WV Z SL, CERAMIC	CC0501047L
C24		.01uF50WV Z SL, CERAMIC	CC0501037L
C25		10uF 25WV Z, ELECTROLYTIC	CE0251067Z
C27		10uF 25WV Z, ELECTROLYTIC	CE0251067Z
C28		.047uF50WV Z SL, CERAMIC	CC0504737L
C29		68PF 50WV J SL, CERAMIC	CC0506804L
C30		560PF 50WV K SL, CERAMIC	CC0505615L
C31		15PF 50WV J CH, CERAMIC	CC0501504A
C32		47uF 10WV Z, ELECTROLYTIC	CE0104767Z
C33		.001uF 50WV K, MYLAR	CM0501025Z
C34		.01uF 50WV Z SL, CERAMIC	CC0501037L

C35		100PF 50WV K SL, CERAMIC	CC0501015L
C36		10uF 25WV Z, ELECTROLYTIC	CE0251067Z
C37		270PF 50WV K SL, CERAMIC	CC0502715L
C38		.01uF50WV Z SL, CERAMIC	CC0501037L
C39		47uF 10WV Z, ELECTROLYTIC	CE0104767Z
C40		47uF 10WV Z, ELECTROLYTIC	CE0104767Z
C41		.001uF 50WV Z SL, CERAMIC	CC0501027L
C42		.1uF 50WV Z SL, CERAMIC	CC0501047L
C43		10PF 50WV J SL, CERAMIC	CC0501004L
C44		47uF 10WV Z, ELECTROLYTIC	CE0104767Z
C45		.001uF 50WV Z SL, CERAMIC	CC0501027L
C46		47uF 10WV Z, ELECTROLYTIC	CE0104767Z
C47		.022uF 50WV K, MYLAR	CM0502235Z
C48		.1uF 50WV Z SL, CERAMIC	CC0501047L
C49		47uF 10WV Z, ELECTROLYTIC	CE0104767Z
C50		10uF 25WV Z, ELECTROLYTIC	CE0251067Z
C51		.001uF 50WV Z SL, CERAMIC	CC0501027L
C52		220PF 5CWV K SL, CERAMIC	CC0502215L
C53		12PF 50WV J CH, CERAMIC	CC0501204A
C54		.047UF 50WV Z SL, CERAMIC	CC0504727L
C55		68PF 50WV J CH, CERAMIC	CC0506804A

C56		.01uF 50WV Z SL, CERAMIC	CC0501037L
C57		10uF 25WV Z, ELECTROLYTIC	CE0251067Z
C58		1000uF 10WV Z, ELECTROLYTIC	CE0101087Z
C59		.047uF 50WV Z SL, CERAMIC	CC0504737L
C60		.01uF 50WV Z SL, CERAMIC	CC0501037L
C61		5PF 50WV J CH, CERAMIC	CC0501004A
C63		.1uF 50WV Z SL, CERAMIC	CC0501047L
C65		56PF 50WV J CH, CERAMIC	CC0503304A
C66		1 PF 50WV C CH, CERAMIC	CC0500101A
C67		39PF 50WV J CH, CERAMIC	CC0503904A
C68		5PF 50WV C CH, CERAMIC	CC0500501A
C69		.01uF 50WV Z SL, CERAMIC	CC0501037L
C70		10uF 25WV Z, ELECTROLYTIC	CE0251067Z
C71		.01uF 50WV Z SL, CERAMIC	CC0501037L
C72		3PF 50WV C CH, CERAMIC	CC0500301A
C73		3PF 50WV C CH, CERAMIC	CC0500301A
C74		.01uF50EV Z SL, CERAMIC	CC0501037L
C75		27PF 50WV J SL, CERAMIC	CC0502704L
C76		.1uF 50WV Z SL, CERAMIC	CC0501047L
C77		5PF 50WV C SL, CERAMIC	CC0500501L
C78		.01 UF50WV Z SL, CERAMIC	CC0501037L

C79		.01 UF50WV Z SL, CERAMIC	CC0501037L
C80		.047uF 50WV Z SL, CERAMIC	CC0504737L
C81		2.2uF 50WV Z, ELECTROLYTIC	CE0502257Z
C82		47PF 50WV J SL, CERAMIC	CC0504704L
C83		.01uF 50WV Z SL, CERAMIC	CC0501037L
C84		.1uF 50WV Z SL, CERAMIC	CC0501047L
C85		.1uF 50WV Z SL, CERAMIC	CC0501047L
C86		.1uF 50WV Z SL, CERAMIC	CC0501047L
C87		220PF 50WV K SL, CERAMIC	CC0502215L
C88		1uF 50WV Z, ELECTROLYTIC	CE0501057Z
C89		5PF 50WV C SL, CERAMIC	CC0500501 L
C90		5PF 50WV C CH, CERAMIC	CC0500501A
C91		15PF 50WV J SL, CERAMIC	CC0501504L
C92		1uF 50WV Z SL, CERAMIC	CC0501047L
C93		1uF 50WV Z SL, CERAMIC	CC0501047L
C94		.01uF 50WV Z SL, CERAMIC	CC0501037L
C95		22uF 10WV Z, ELECTROLYTIC	CE01022677
C96		220uF 16WV Z, ELECTROLYTIC	CE0162277~
C97		.01uF 50WV Z SL, CERAMIC	CC0501037L
C98		100PF 50WV K SL, CERAMIC	CC0501015L
C99		220uF 16WV Z, ELECTROLYTIC	CE0162277Z

C100		.01uF50WV Z SL, CERAMIC	CC0501037L
C101		.001uF 50WV Z SL, CERAMIC	CC0501027L
C102		1uF 16WV NP, ELECTROLYTIC	CE0161056N
C103		220uF 10WV Z, ELECTROLYTIC	CE0102277Z
C104		.047uF 50WV Z SL, CERAMIC	CC0504737L
C105		5PF 50WV J CH, CERAMIC	CC0501004A
C106		.22uF 16WV M, TANTALUM	CT0162246Z
C107		.001uF 50WV Z SL, CERAMIC	CC0501027L
C108		12PF 50WV J SL, CERAMIC	CC0501204L
C109		4.7uF 50WV Z, ELECTROLYTIC	CE0504757Z
C110		.01uF 50WV Z SL, CERAMIC	CC0501037L
C111		100uF 10WV Z, ELECTROLYTIC	CE0101077Z
C112		47uF 10WV Z, ELECTROLYTIC	CE0104767Z
C113		.01uF 50WV Z SL, CERAMIC	CC0501037L
C114		270PF 50WV K SL, CERAMIC	CC0502715L
C115		220PF 50WV K SL, CERAMIC	CC0502215L
C116		220uF 16WV Z, ELECTROLYTIC	CE0162277Z
C117		.047uF 50WV Z SL, CERAMIC	CC0504737L
C118		.01uF 50WV Z SL, CERAMIC	CC0501037L
C119		5PF 50WV J CH, CERAMIC	CC0501004A
C120		.01uF 50WV Z SL, CERAMIC	CC0501037L

C121		33PF 50WV J SL, CERAMIC	CC0503304L
C122		33PF 50WV J SL, CERAMIC	CC0503304L
C123		.01uF 50WV Z SL, CERAMIC	CC0501037L
C124		.01uF 50WV Z SL, CERAMIC	CC0501037L
C125		.001uF 50WV Z SL, CERAMIC	CC0501027L
C126		.01uF 50WV Z SL, CERAMIC	CC0501037L
C127		.01uF 50WV Z SL, CERAMIC	CC0501037L
C128		47uF 10WV Z, ELECTROLYTIC	CE0104767Z
C129		.01uF 50WV Z SL, CERAMIC	CC0501037L
C130		10PF 50WV J SL, CERAMIC	CC0501004L
C131		.1uF 50WV Z SL, CERAMIC	CC0501047L
C132		.01uF 50WV Z SL, CERAMIC	CC0501037L
C133		47PF 50WV J UJ, CERAMIC	CC0504704G
C134		100PF 50WV K UJ, CERAMIC	CC0501015G
C135		.001uF 50WV Z SL, CERAMIC	CC0501027L
C136		.1uF 50WV Z SL, CERAMIC	CC0501047L
C137		10uF 25WV Z, ELECTROLYTIC	CE0251067Z
C138		1000uF 10WV Z, ELECTROLYTIC	CE0101087Z
C139		.001uF 50WV Z SL, CERAMIC	CC0501027L
C140		2.2uF 50WV Z, ELECTROYLTIC	CE0502257Z
C141		.22uF 16WV M, TANTALUM	CT0162246Z

C142		.001uF 50WV Z SL, CERAMIC	CC0501027L
C143		47uF 10WV Z, ELECTROLYTIC	CE0104767Z
C144		1uF 50WV Z, ELECTROLYTIC	CE0501057Z
C145		.001uF 50WV Z SL, CERAMIC	CC0501027L
C146		2.2uF 50WV Z, ELECTROLYTIC	CE0502257Z
C147		10uF 25WV Z, ELECTROLYTIC	CE0251067Z
C148		.1uF 50WV Z SL, CERAMIC	CC0501047L
C149		.001uF 50WV Z SL, CERAMIC	CC0501027L
C150		.47uF 50WV Z SL, CERAMIC	CC0504727L
C151		.47uF 50WV Z SL, CERAMIC	CC0504727L
C152		.01uF50WV Z SL, CERAMIC	CC0501037L
C153		.001uF 50WV Z SL, CERAMIC	CC0501027L
C154		100PF 50WV K SL, CERAMIC	CC0501015L
C155		.22uF 16WV M, TANTALUM	CT0162246Z
C156		4.7uF 16WV M, TANTALUM	CT0164756Z
C157		220uF 16WV Z, ELECTROLYTIC	CE0162277Z
C158		150PF 50WV K SL, CERAMIC	CC0501515L
C159		.001uF 50WV Z SL, CERAMIC	CC0501027L
C160		.22uF 16WV M, TANTALUM	CT0162246Z
C161		2.2uF 16WV M, TANTALUM	CT0162256Z
C162		.001uF 50WV Z SL, CERAMIC	CC0501027L

C163		47PF 50WV J SL, CERAMIC	CCO504704L
C164		560PF 50WV K SL, CERAMIC	CC0505615L
C165		390PF 50WV K SL, CERAMIC	CC0503915L
C166		33PF 50WV J SL, CERAMIC	CC0503304L
C167		150PF 50WV K SL, CERAMIC	CC0501515L
C168		10uF 25WV Z, ELECTROLYTIC	CE0251067Z
C169		33PF 50WV J SL, CERAMIC	CC0503304L
C170		10uF 25WV Z, ELECTROLYTIC	CE0251067Z
C171		10uF 16WV M, TANTALUM	CT0161066Z
C172		33PF 50WV J SL, CERAMIC	CC0503304L
C173		47PF 50WV J CH, CERAWMIC	CC0504704A
C174		100PF 50VVV K SL, CERAMIC	CC0501015L
C175		10uF 16WV M, TANTALUM	CT0161066Z
C176		33PF 50WV J SL, CERAMIC	CC0503304L
C177		.01uF 50WV Z SL, CERAMIC	CC0501037L
C178		10PF 50WV J SL, CERAMIC	CC0501004L
C179		33PF 50WV J SL, CERAMIC	CC0503304L
C180		33PF 50WV J SL, CERAMIC	CC0503304L
C181		100PF 50WV K SL, CERAMIC	CC0501015L
C182		100PF 50WV K SL, CERAMIC	CCO501015L
C183		100PF 50WV K UJ, CERAMIC	CC0501015G

C184		82PF 50WV J UJ, CERAMIC	CC0508204G
C186		.001uF 50WV K, MYLAR	CM0501025Z
C187		.001uF 50WV Z SL, CERAMIC	CC0501027L
C188		100PF 50VVV K SL, CERAMIC	CC0501015L
C189		33PF 50WV J SL, CERAMIC	CC0503304L
C190		22PF 50WV J SL, CERAMIC	CC0502204L
C191		.001uF 50WV Z SL, CERAMIC	CC0501027L
C192		10PF 50WV J SL, CERAMIC	CC0501004L
C193		100PF 50WV K SL, CERAMIC	CC0501015L
C194		100PF 50WV K SL, CERAMIC	CC0501015L
C195		33PF 50WV J SL, CERAMIC	CC0503304L
C196		47uF 10WV Z, ELECTROLYTIC	CE0104767Z
C197		.01uF 50WV Z SL, CERAMIC	CC0501037L
C198		33PF 50WVG J SL, CERAMIC	CC0503304L
C199		22PF 50WV J SL, CERAMIC	CC0502204L
C200		.001uF 50WV Z SL, CERAMIC	CC0501027L
C201		47uF 10WV Z, ELECTROLYTIC	CE0104767Z
C202		.1uF 50WV Z SL, CERAMIC	CC0501047L
C205		10uF 25WV Z, ELECTROLYTIC	CE0251067Z
C206		.01uF 50WV Z SL, CERAMIC	CC0501037L
C207		220uF 16WV Z, ELECTROLYTIC	CE0162277Z

C208		.01uF 50WV Z SL, CERAMIC	CC0501037L
C209		.01uF 50WV Z SL, CERAMIC	CC0501037L
C212		.001uF 50WV Z SL, CERAMIC	CC0501027L
C214		.1uF 50WV Z SL, CERAMIC	CC0501047L
C215		27PF 50WV J CH, CERAMIC	CC0502704A
C216		22uF 10WV Z, ELECTROLYTIC	CE0102267Z
C218		.1uF 50WV Z SL, CERAMIC	CC0501047L
C219		4.7uF 50WV Z, ELECTROLYTIC	CE0504757Z
C220		.01uF 50WV Z SL, CERAMIC	CC0501037L
C221		.047uF 50WV Z SL, CERAMIC	CC0504727L
C222		.1uF 50WV Z SL, CERAMIC	CC0501047L
C223		47uF 10WV Z, ELECTROLYTIC	CE0104767Z
C223		.1uF 50WVZ SL, CERAMIC	CC0501047L
C224		1uF 50WV Z, ELECTROLYTIC	CE0501057Z
C226		.047uF 50WV Z SL, CERAMIC	CC0504727L
C228		.01uF 50WV Z SL, CERAMIC	CC0501037L
C229		150PF 60WV K SL, CERAMIC	CC0501515L
C230		270PF 50WV K SL, CERAMIC	CC0502715L
C231		100uF 10WV Z, ELECTROLYTIC	CE0101077Z
C232		.01uF 50WV Z SL, CERAMIC	CCO501037L
C233		.001uF 50WV Z SL, CERAMIC	CC0501027L

C234		.047uF 50WV M K, MYLAR	CM0504735Z
C235		.001uF 50WV K, MYLAR	CM0501025Z
C236		.001uF 50WV Z SL, CERAMIC	CC0501027L
C237		5PF 50WV C CH, CERAMIC	CC0500501A
C238		150PF 50WV K RH, CERAMIC	CC0501515D
C239		56PF 50WV J RH, CERAMIC	CC0505604D
C240		.1uF 50WV Z SL, CERAMIC	CC0501047L
C242		.01uF 50EV Z SL, CERAMIC	CC0501037L
C243		100PF 50WV K UJ, CERAMIC	CC0501015G
C244		.047uF 50WV Z SL, CERAMIC	CC0504737L
C245		.1uF 50WV Z SL, CERAMIC	CC0501047L
C246		120PF 50WV K CH, CERAMIC	CC0501215A
C247		180PF 50WV K UJ, CERAMIC	CC0501815G
C248		3PF 50WV C CH, CERAMIC	CC0500301A
C249		5PF 50WV C CH, CERAMIC	CC0500501A
C250		.5PF 50WV C SL, CERAMIC	CC0500591L
C251		270PF 50WV K CH, CERAMIC	CC0502715A
C252		3PF 50WV C CH, CERAMIC	CC0500301A
C254		330PF 50WV K UJ, CERAMIC	CC0503315G
C255		150PF 50WV K UJ, CERAMIC	CC0501515G
C256		.1uF 50WV Z SL, CERAMIC	CC0501047L

C257		.1uF 50WV Z SL, CERAMIC	CC0501047L
C258		560PF 50WV K UJ, CERAMIC	CC0505615G
C259		.01uF 50EV Z SL, CERAMIC	CC0501037L
C260		.01uF 50EV Z SL, CERAMIC	CC0501037L
C261		560PF 50WV K UJ, CERAMIC	CC0505615G
C262		560PF 50WV K UJ, CERAMIC	CC0505615G
C263		10PF 50WV J SL, CERAMIC	CC0501004L
C264		.1uF 50WV Z SL, CERAMIC	CC0501047L
C265		2.2uF 50WV Z, ELECTROLYTIC	CE0502257Z
C266		.22uF 50WV, CHIP	CH0502246Z
C267		.1uF 50WV Z SL, CERAMIC	CC0501047L
C268		.01uF 50EV Z SL, CERAMIC	CC0501037L
C269		100PF 50WV K UJ, CERAMIC	CC0501015G
C270		560PF 50WV K UJ, CERAMIC	CC0505615G
C271		.1uF 50WV Z SL, CERAMIC	CC0501047L
C272		100PF 50WV K SL, CERAMIC	CC0501015L
C273		.001uF 50WV Z SL, CERAMIC	CC0501027L
C274		.01uF 50WV Z SL, CERAMIC	CC0501037L
C275		270PF 50WV K UJ, CERAMIC	CC0502715G
C276		.047uFm50WV Z SL, CERAMIC	CC0504727L
C277		5PF 50WV J CH, CERAMIC	CC0501004A

C278		33PF 50WV J CH, CERAMIC	CC0503304A
C279		180PF 50WV K UJ, CERAMIC	CC0501815G
C280		12PF 50WV J CH, CERAMIC	CC0501204A
C281		.1uF 50WV Z SL, CERAMIC	CC0501047L
C284		100PF 50WV J CH, CERAMIC	CCO501015A
C285		1uF 50WV Z, ELECTROLYTIC	CE0501057Z
C286		.01uF 50WV Z SL, CERAMIC	CC0501037L
C287		.01uF50WV Z SL, CERAMIC	CC0501037L
C288		10uF 25WV Z, ELECTROLYTIC	CE0251067Z
C289		.001uF 50WV Z SL, CERAMIC	CC0501027L
C290		560PF 50WV K UJ, CERAMIC	CC0505615G
C291		.01uF 50WV Z SL. CERAMIC	CC0501037L
C292		10uF 25WVZ, ELECTROLYTIC	CE0251067Z
C293		12PF 50WV J CH, CERAMIC	CC0501204A
C294		.47uF 50WV Z SL, CERAMIC	CC0504737L
C295		.1uF 50WV Z SL, CERAMIC	CC0501047L
C296		.01uF 50WV Z SL, CERAMIC	CC0501037L
C297		.01uF 50WV Z SL, CERAMIC	CC0501037L
C298		.1uF 50WV Z SL, CERAMIC	CC0501047L
C299		.1uF 50WV Z SL, CERAMIC	CC0501047L
C300		.047uF 50WV Z SL, CERAMIC	CC0504737L

C301		100uF 10WV Z, ELECTROLYTIC	CE0101077Z
C302		.001uF 50WV Z SL, CERAMIC	CC0501027L
C303		.047uF 50WV Z SL, CERAMIC	CC0504737L
C304		2200uF 16WV Z, ELECTROLYTIC	CE0162287Z
C305		.01uF 50WV Z SL, CERAMIC	CC0501037L
C306		.001uF 50WV Z SL, CERAMIC	CC0501027L
C307		.01uF 50WV Z SL, CERAMIC	CC0501037L
C308		.01uF 50WV Z SL, CERAMIC	CC0501037L
C309		.001uF 50WV Z SL, CERAMIC	CC0501027L
C310		.1uF 50WV Z SL, CERAMIC	CC0501047L
C311		.01uF 50WV Z SL. CERAMIC	CC0501037L
C312		.047uF 50WV Z SL, CERAMIC	CC0504737L
C313		.1uF 50WV Z SL, CERAMIC	CC0501047L
C314		.1uF 50WV Z SL, CERAMIC	CC0501047L
C316		.001uF 50WV Z SL, CERAMIC	CC0501027L
C317		.047uF 50WV Z SL. CERAMIC	CC0504737L
C319		10PF 50WV J SL, CERAMIC	CC0501004L
C320		.01uF 50WV Z SL, CERAMIC	CC0501037L
C321		.01uF 50WV Z SL, CERAMIC	CC0501037L
C322		2200uF 16WV Z, ELECTROLYTIC	CE0162287Z
C323		.001 PF 50WV Z SL, CERAMIC	CC0501027L

C324		.1UF 50WV Z SL. CERAMIC	CC0501047L
C325		.01uF 50WV Z SL. CERAMIC	CC0501037L
C326		.1UF 50WV Z SL, CERAMIC	CC0501047L
C327		.01uF 50WV Z SL. CERAMIC	CC0501037L
C328		.22uF 50WV, CHIP	CH0502246Z
C329		.01uF 50WV Z SL, CERAMIC	CC0501037L
C330		.001uF 50WV Z SL, CERAMIC	CC0501027L
C331		.1UF 50WV Z SL, CERAMIC	CC0501047L
C332		.1uF 50WV Z SL, CERAMIC	CC0501047L
C333		.1uF 50WV Z SL, CERAMIC	CC0501047L
C334		.1uF 50WV Z SL, CERAMIC	CC0501047L
C335		.1uF 50WV Z SL, CERAMIC	CC0501047L
C336		.1uF 50WV Z SL, CERAMIC	CC0501047L
C337		.1uF 50WV Z SL, CERAMIC	CC0501047L
C338		.01uF 50WV Z SL, CERAMIC	CC0501037L
C339		100PF 50WV KSL, CERAMIC	CC0501015L
C340		.01uF 50WV Z SL, CERAMAIC	CC0501037L
C341		100PF 50WV K SL, CERAMIC	CC0501015L
C343		.001uF 50WV Z SL, CERAMIC	CC0501027L
C345		.22uF 50WV, CHIP	CH0502246Z
C347		1uF 50WV Z, ELECTROLYTIC	CE0501057Z

C348		3PF 50WV C CH, CERAMIC	CC050030 IA
C349		.01uF 50WV Z SL, CERAMIC	CC0501037L

RCI 2950 PARTS LISTS Coils, Transformers, Crystals, Filters

Main PCB (EPT295013Z)

Filters

Ref#	Bd Loc	Description	MFR. Part No.
FL1		FILTER, CFW455HT, CERAMIC	EFCFW455HT
FL2		FILTER, SEF 10.7 MX, CERAMIC	EFCFE107MX
FL3		FILTER, 10.695 MHZ, CRYSTAL	EFX8106952

Crystals

Ref#	Bd Loc	Description	MFR. Part No.
X1		10.240 MHZ, CRYSTAL	EYCAB10240
X2		10.240 MHZ, CRYSTAL	EYCAB10240
X3		10.6975 MHZ, CRYSTAL	EYCAE10697

Inductors

Ref#	Bd Loc	Description	MFR. Part No.
L1		IFT M199CC-P14097F	ECIFT12251
L2		IFT 199CC-PI498N	ECIFT12252
L3		IFT 7MC-7172ABN	ECIFT12002
L4		IFT M199CC-P14097F	ECIFT12251
L5		IFT 7MC-7172ABN	ECIFT12002
L6		IFT 7MC-7172ABN	ECIFT12002

L7		IFT 7MC-7174Y	ECIFT12003
L8		M199CNFP1499N	ECIFT12253
L9		IFT 199CN-P1549N	ECIFT12290
L11		IFT 199CN-P1549N	ECIFT12290
L12		IFT M199CC-P1501A	ECIFT12255
L13		IFT 199CC-Pl 502N	ECIFT12256
L14		IFT 199CC-P1502N	ECIFT12256
L15		IFT 199CC-P1498N	ECIFT12252
L16		IFT M199CC-P1503A	ECIFT12257
L17		IFT 292CN-Pl 121Z	ECIFT12263
L18		COIL, BEAD F PH= 12.5MM	ECBAD18550
L19		COIL, BEAD F PH= 12.5MM	ECBAD18550
L19		IFT M199CC-PI504N	ECIFT12258
L21		IFT 292CN-Pl 121Z	ECIFF12263
L22		COIL, CHOKE 22 UH (P TYPE)	ECCHK16070
L23		IFT 199CC-P1498N	ECIFT12252
L24		IFT 199CC-P1498N	ECIFT12252
L25		IFT 199CC-PI498N	ECIFT12252
L26		COIL, CHOKE 470 UH (P TYPE)	ECCHK16096
L27		IFT 113CN-63442	ECIFT12016
L28		IFT 113CN-63442	ECIFT12016

L29		IFT 113CN-63442	ECIFT12016
L30		COIL, CHOKE 22 UH (P TYPE)	ECCHK16070
L33		COIL, CHOKE .82 UH	ECCHK16082
L34		COIL, RF .23UH	ECRFZ10001
L36		COIL, BEAD D SU-B-172D	ECBAD18504
L37		COIL, BEAD D SU-B-172D	ECBAD18504
L38		COIL, RF .23UH	ECRFZ10091
L39		COIL, BEAD F SU-B-172E	ECBAD18506
L40		COIL, BEAD D SU-B-172D	ECBAD18504
L41		COIL, TOROIDAL SUTR-398	ECRFZ10048
L42		COIL, BEAD F SU-B-172E	ECBAD18506
L43		IFT 292CN-Pl 117AQ	ECIFT12262
L44		COIL, BEAD F PH= 12.5MM	ECBAD18550
L45		COIL, BEAD F PH= 12.5MM	ECBAD18550
L46		IFT 292CN-Pl 125R	ECIFT12265
L47		IFT 292CN-Pl 125R	ECIFT12265
L48		IFT M199CC-P1501A	ECIFT12255
L49		COIL. CHOKE (BIG ROUND)	ECCHK16151
L50		COIL, CHOKE .82 UH	ECCHK16082
L51		COIL, CHOKE 10 CHIP) TYPE	ECCHK16088
L52		COIL, CHOKE 10 CHIP) TYPE	ECCHK16088

L53		COIL, CHOKE 470 UH (P TYPE)	ECCHK16096
L59		COIL, BEAD F SU-B-172E	ECBAD18506
L60		COIL, BEAD F SU-B-172E	ECBAD18506
L61		COIL, BEAD F SU-B-172E	ECBAD18506
L62		COIL, BEAD E PH= 10MM	ECBAD18526
L63		COIL, CHOKE 470 UH (P TYPE)	ECCHK16096
L65		COIL, BEAD F SU-B-172E	ECBAD18506
L131		COIL, SPRING .8x6x8.5t	ECSPG18075
L132		COIL, SPRING .8x6.5x7.5t	ECSPR18003
L503		COIL, CHOKE.47 UH (P TYPE)	ECCHK16000
L504		COIL, CHOKE.47 UH (P TYPE)	ECCHK16000
J52		COIL, CHOKE 470 UH (P TYPE)	ECCHK16096
T1		COIL, CHOKE EI-19 TF-083	ECCHK16004

Main PCB (EPT295013Z)
Variable Resistors

Ref#	Bd Loc	Description	MFR. Part No.
VR1		10K 3P, SEMI FIXED	RE10300078
VR2		10K 3P, SEMI FIXED	RE10300078
VR3		500K 3P, SEMI FIXED	RE50400080
VR4		500K 3P, SEMI FIXED	RE50400080
VR7		10K 3P, SEMI FIXED	RE10300078
VR8		100K 3P, SEMI FIXED	RE10400079
VR11		3K 3P, SEMI FIXED	RE30200076
VR12		10K 3P, SEMI FIXED	RE10300078
VR13		5K 3P, SEMI FIXED	RE50200077
VR14		1K 3P, SEMI FIXED	RE10200072
VR15		1K 3P, SEMI FIXED	RE10200072
VR16		10K 3P, SEMI FIXED	RE10300078
VR21		5K 3P, SEMI FIXED	RE50200077

Resistors

Ref#	Bd Loc	Description	MFR. Part No.
R1		10K 1/4W (U) TYPE	RCU141034Z
R2		33K 1/4W (U) TYPE	RCU143334Z

R3		680ohm 1/4W (U) TYPE	RCU146814Z
R4		220ohm 1/4W (U) TYPE	RCU142214Z
R5		330ohm 1/4W (U) TYPE	RCU143314Z
R6		47K 1/4W (U) TYPE	RCU144734Z
R7		2.2 K 1/4W (U) TYPE	RCU142224Z
R8		330ohm 1/4W (U) TYPE	RCU143314Z
R9		56ohm 1/4W (U) TYPE	RCU145604Z
R10		100K 1/4W (U) TYPE	RCU141044Z
R11		10K 1/4W (U) TYPE	RCU141034Z
R12		6.8 K 1/4W (U) TYPE	RCU146824Z
R13		470K 1/4W (U) TYPE	RCU144744Z
R14		10K 1/4W (U) TYPE	RCU141034Z
R15		330ohm 1/4W (U) TYPE	RCU143314Z
R16		2.7 K 1/4W (U) TYPE	RCU142724Z
R17		1.8 K 1/4W (U) TYPE	RCU141824Z
R18		1 K 1/4W (U) TYPE	RCM141024A
R19		6.8 K 1/4W (U) TYPE	RCU146824Z
R20		100ohm 1/4W (U) TYPE	RCM141014A
R21		1 K 1/4W (U) TYPE	RCU141024Z
R22		1.5K 1/4W (U) TYPE	RCU141524Z
R23		2.7K 1/4W (U TYPE	RCM142724A

R24		1.5K 1/4W (U) TYPE	RCU141524Z
R25		10K 1/4W (U) TYPE	RCM141034A
R27		1.8 K 1/4W (U) TYPE	RCU141824Z
R28		1.8 K 1/4W (U) TYPE	RCU141824Z
R29		47K 1/4W (U) TYPE	RCM144734A
R30		100ohm 1/4W (U) TYPE	RCM141014A
R31		100ohm 1/4W (U) TYPE	RCU141014Z
R32		100ohm 1/4W (U) TYPE	RCU141014Z
R33		100ohm 1/4W (U) TYPE	RCM141014A
R34		4.7K 1/4W (U) TYPE	RCM144724A
R35		6.8K 1/4W (U) TYPE	RCU146824Z
R36		6.8K 1/4W (U) TYPE	RCM146824A
R37		100ohm 1/4W (U) TYPE	RCU141014Z
R38		1K 1/4W (U) TYPE	RCU141024Z
R39		330K 1/4W (U) TYPE	RCU143344Z
R40		1 M 1/4W (U) TYPE	RCU141054Z
R41		6.8K 1/4W (U) TYPE	RCM146824A
R42		100K 1/4W (U) TYPE	RCU141044Z
R43		100K 1/4W (U) TYPE	RCU141044Z
R44		100K 1/4W (U) TYPE	RCU141044Z
R45		82K 1/4W (U) TYPE	RCU148234Z

R46		47K 1/4W (U) TYPE	RCM 144734A
R47		220K 1/4W (U) TYPE	RCU142244Z
R48		680K 1/4W (U) TYPE	RCU146844Z
R49		100K 1/4W (U) TYPE	RCM 141044A
R50		100 K1/4W (U) TYPE	RCM141044B
R51		220K 1/4W (U) TYPE	RCM142244A
R52		1 K, 1/4W (U) TYPE	RCU141024Z
R53		1 K, 1/4W (U) TYPE	RCU141024Z
R54		100K 1/4W (U) TYPE	RCM141044A
R55		100K 1/4W (U) TYPE	RCM141044A
R56		3.3K 1/4W (U) TYPE	RCM143324A
R57		3.3K 1/4W (U) TYPE	RCU143324Z
R58		3.3K 1/4W (U) TY PE	RCU143324Z
R59		47K 1/4W (U) TYPE	RCU144734Z
R60		3.3K 1/4W (U) TYPE	RCU143324Z
R61		3.3K 1/4W (U) TYPE	RCU143324Z
R62		10K 1/4W (U) TYPE	RCU141034Z
R63		47K 1/4W (U) TYPE	RCU144734Z
R64		2.7K 1/4W (U) TYPE	RCU142724Z
R65		1 K, 1/4W (U) TYPE	RCU141024Z
R66		10K 1/4W (U) TYPE	RCU141034Z

R67		1K, 1/4W (U) TYPE	RCU474157Z
R68		1K 1/4W (U) TYPE	RCM141024A
R69		1K, 1/4W (U) TYPE	RCU141024Z
R70		10K 1/4W (U) TYPE	RCM141034A
R71		47K 1/4W (U) TYPE	RCU144734Z
R72		6.8K 1/4W (U) TYPE	RCM146824A
R73		1K, 1/4W (U) TYPE	RCU141024Z
R74		100K 1/4W (P) TYPE	RCP141044Z
R75		680ohm 1/4W (U) TYPE	RCU146814Z
R76		1.5K 1/4W (U) TYPE	RCU141524Z
R77		10K 1/4W (U) TYPE	RCU141034Z
R78		2.8K 1/4W (U) TYPE	RCU142224Z
R79		2.7K 1/4W(UO TYPE	RCU142724Z
R80		100ohm 1/4W (U) TYPE	RCU141014Z
R81		2.2K 1/4W (U) TYPE	RCM142224A
R82		100K 1/4W (U) TYPE	RCU141044Z
R84		100ohm 1/4W (U) TYPE	RCU141014Z
R85		1.8K 1/4W (U) TYPE	RCU141824Z
R86		1 K 1/4W (U) TYPE	RCU141024Z
R87		5.6K 1/4W (U) TYPE	RCM145624A
R88		10K 1/4W (U) TYPE	RCU141034Z

R89		10K 1/4W (U) TYPE	RCM141034A
R90		1K 1/4W (U) TYPE	RCU141024Z
R91		10K 1/4W (U) TYPE	RCU141034Z
R92		1.5K 1/4W (U) TYPE	RCU141524Z
R93		680ohm 1/4W (U) TYPE	RCM146814B
R94		1.2K, 1/4W (U) TYPE	RCU141224Z
R95		8.2K 1/4W (U) TYPE	RCU148224Z
R96		22K 1/4W (U) TYPE	RCM142234B
R97		1.8K 1/4W (U) TYPE	RCU141824Z
R98		5.6K 1/4W (U) TYPE	RCU145624Z
R99		1K 1/4W (U) TYPE	RCU141024Z
R100		47K 1/4W (U) TYPE	RCM144734A
R101		1.5K 1/4W (U) TYPE	RCU141524Z
R102		220ohm 1/4W (U) TYPE	RCU142214Z
R103		100ohm 1/4W (U) TYPE	RCU141014Z
R104		100ohm 1/4W (U) TYPE	RCM141014A
R105		1M 1/4W (U) TYPE	RCU141054Z
R106		6.8K 1/4W (U) TYPE	RCU146824Z
R107		100K 1/4W (U) TYPE	RCU141044Z
R108		68K 1/4W (U) TYPE	RCU146834Z
R709		100K 1/4W (U) TYPE	RCU141044Z

R110		1.5M 1/4W (U) TYPE	RCU141554Z
R111		68K 1/4W (U) TYPE	RCU146834Z
R712		22K 1/4W (U) TYPE	RCM142234A
R113		2.7K 1/4W (U) TYPE	RCU142724Z
R114		680K 1/4W (U) TYPE	RCM146844A
R115		220K 1/4W (U) TYPE	RCU142244Z
R116		47K 1/4W (U) TYPE	RCU144734Z
R117		1K 1/4W (U) TYPE	RCU141024Z
R118		10K 1/4W (U) TYPE	RCM141034A
R119		10ohm 1/4W (U) TYPE	RCU141004Z
R120		1K 1/4W (U) TYPE	RCU141024Z
R121		27K 1/4W (U) TYPE	RCU142734Z
R722		1K 1/4W (U) TYPE	RCU141024Z
R123		10K 1/4W (U) TYPE	RCU141034Z
R124		10K 1/4W (U) TYPE	RCU141034Z
R725		100K 1/4W (U) TYPE	RCU141044Z
R126		10K 1/4W (U) TYPE	RCU141034Z
R127		1K 1/4W (U) TYPE	RCU141024Z
R128		220ohm 1/4W (U) TYPE	RCU142214Z
R129		10K 1/4W (U) TYPE	RCU141034Z
R730		10K 1/4W (U) TYPE	RCU141034Z

R131		10K 1/4W (U) TYPE	RCU141034Z
R132		100ohm 1/4W (U) TYPE	RCU141014Z
R133		10K 1/4W (U) TYPE	RCU141034Z
R134		10K 1/4W (U) TYPE	RCU141034Z
R135		220C21/4W (U) TYPE	RCU142214Z
R136		56ohm 1/4W (U) TYPE	RCU145604Z
R137		560ohm 1/4W (U) TYPE	RCU145614Z
R138		150ohm 1/4W (U) TYPE	RCU141514Z
R139		220K 1/4W (U) TYPE	RCU142244Z
R140		1.5K 1/4W (U) TYPE	RCM141524A
R141		100ohm 1/4W (U) TYPE	RCU141014Z
R142		1K 1/4W (U)TYPE	RCU141024Z
R143		10K 1/4W (U) TYPE	RCU141034Z
R144		330ohm 1/4W (U) TYPE	RCU143314Z
R145		10K 1/4W (U) TYPE	RCU141034Z
R146		10K 1/4W (U) TYPE	RCU141034Z
R147		1K 1/4W (U) TYPE	RCM141024A
R148		270K 1/4W (U)TYPE	RCM142744A
R150		270K 1/4W (U) TYPE	RCU142274Z
R151		3.3K 1/4W (U) TYPE	RCU143324Z
R152		4.7K 1/4W (U) TYPE	RCM144724A

R153		10K 1/4W (U) TYPE	RCU141034Z
R154		3.3K 1/4W (U) TYPE	RCU143324Z
R155		220ohm 1/4W (U) TYPE	RCM142214A
R156		100ohm 1/4W (U) TYPE	RCU141014Z
R757		1K 1/4W (P) TYPE	RCP141024Z
R159		10K 1/4W (U) TYPE	RCU141034Z
R160		330K 1/4W (U) TYPE	RCU143344Z
R161		220ohm 1/4W (U) TYPE	RCU142214Z
R162		100K 1/4W (U) TYPE	RCU141044Z
R163		470K 1/4W (U) TYPE	RCU144744Z
R164		15K 1/4W (U) TYPE	RCU141534Z
R166		10K 1/4W (U) TYPE	RCU141034Z
R167		100K 1/4W (U) TYPE	RCU141044Z
R168		47K 1/4W (U) TYPE	RCU144734Z
R169		10K 1/4W (U) TYPE	RCU141034Z
R170		10K 1/4W (U) TYPE	RCU141034Z
R171		1K, 1/4W (U) TYPE	RCU141024Z
R172		1K, 1/4W (U) TYPE	RCU141024Z
R173		47ohm 1/4W (U) TYPE	RCU144714Z
R174		3.3K 1/4W (U) TYPE	RCM143324A
R175		1.5K, 1/4W (U) TYPE	RCU141524Z

R176		2.7K 1/4W (U) TYPE	RCU142724Z
R177		10K 1/4W (U) TYPE	RCU141034Z
R178		3.3K 1/4W (U) TYPE	RCU143324Z
R179		1.5M 1/4W (U) TYPE	RCU141554Z
R180		10K 1/4W (P) TYPE	RCP252034Z
R181		10K 1/4W (U) TYPE	RCU141034Z
R182		3.3K 1/4W (U) TYPE	RCU143324Z
R183		3.3K 1/4W (U) TYPE	RCU143324Z
R184		1.8K 1/4W (U) TYPE	RCU141824Z
R185		100ohm 1/4W (U) TYPE	RCU141014Z
R186		3.3K 1/4W (U) TYPE	RCM143324A
R788		47K 1/4W (U) TYPE	RCU144734Z
R189		10K 1/4W (U) TYPE	RCM141034B
R190		10K 1/4W (U) TYPE	RCU141034Z
R191		220K 1/4W (U) TYPE	RCU142244Z
R192		100K 1/4W (U) TYPE	RCM141044A
R193		10K 1/4W (U) TYPE	RCU141034Z
R194		10K 1/4W (U) TYPE	RCU141034Z
R195		47K 1/4W (U) TYPE	RCM144734A
R196		680ohm 1/4W (U) TYPE	RCM146814A
R197		100ohm 1/4W (U) TYPE	RCU141014Z

R198		1.8K 1/4W (U) TYPE	RCU141824Z
R199		47K 1/4W (U) TYPE	RCU144734Z
R200		22K 1/4W (U) TYPE	RCU142234Z
R201		10K 1/4W (U) TYPE	RCU141034Z
R202		56ohm 1/4W (U)TYPE	RCM145604A
R203		10K 1/4W (U) TYPE	RCU141034Z
R204		560ohm 1/4W (U) TYPE	RCU145614Z
R205		2.7K 1/4W (U) TYPE	RCU142724Z
R206		100ohm 1/4W (U) TYPE	RCU141014Z
R207		22ohm 1/4W (U) TYPE	RCM142204A
R208		100ohm 1/4W (U) TYPE	RCU141014Z
R209		22ohm 1/4W (U) TYPE	RCU142204Z
R210		1K 1/4W (U)TYPE	RCU141024Z
R211		4.7K 1/4W (U) TYPE	RCU144724Z
R212		33K 1/4W (U) TYPE	RCU143334Z
R213		10K 1/4W (U) TYPE	RCM141034A
R214		10K 1/4W (U) TYPE	RCU141034Z
R215		3.3K 1/4W (U) TYPE	RCU143324Z
R216		10K 1/4W (U) TYPE	RCU141034Z
R217		10K 1/4W (U) TYPE	RCM141034A
R218		1 K 1/4W (U) TYPE	RCM141024A

R219		22K 1/4W (U) TYPE	RCU142234Z
R220		1K 1/4W (U) TYPE	RCU141024Z
R221		10K 1/4W (U) TYPE	RCU141034Z
R222		4.7K 1/4W (U) TYPE	RCM144724B
R223		6.8K 1/4W (U) TYPE	RCM146824A
R224		56ohm 1/4W (U) TYPE	RCU145604Z
R225		1K 1/4W (U) TYPE	RCM141024A
R226		10K 1/4W (U) TYPE	RCM141034A
R227		22K 1/4W (U) TYPE	RCU142234Z
R228		3.3K 1/4W (U) TYPE	RCU143324Z
R229		220K 1/4W (U) TYPE	RCU142244Z
R230		1K 1/4W (U) TYPE	RCU141024Z
R231		470K 1/4W (U) TYPE	RCU144744Z
R232		4.7K 1/4W (P) TYPE	RCP144724Z
R233		100ohm 1/4W (U) TYPE	RCU141014Z
R234		10K 1/4W (P) TYPE	RCP141034Z
R235		10K 1/4W (U) TYPE	RCU141034Z
R236		330ohm 1/4W (U) TYPE	RCU143314Z
R237		10K 1/4W (U) TYPE	RCU141034Z
R238		10K 1/4W (U) TYPE	RCU141034Z
R239		220ohm 1/4W (U) TYPE	RCU145614Z

R240		10K 1/4W (U) TYPE	RCM141034A
R241		1.8K 1/4W (U) TYPE	RCU141824Z
R242		100ohm 1/4W (U) TYPE	RCM141014A
R243		47K 1/4W (U) TYPE	RCU144734Z
R244		22K 1/4W (U) TYPE	RCU142234Z
R245		47K 1/4W (U) TYPE	RCU144734Z
R247		4.7K 1/4W (U) TYPE	RCU144724Z
R248		1K 1/4W (U) TYPE	RCU141024Z
R250		1K 1/4W (U)TYPE	RCM141024A
R251		10K 1/4W (P) TYPE	RCP121034Z
R252		1K 1/4W (U) TYPE	RCM141024A
R253		18ohm 1/4W (U) TYPE	RCU141804Z
R254		1ohm 1/4W (P) TYPE	RCP141094Z
R255		150ohm 1/2W (P)	RCP121514Z
R256		18ohm 1/4W (U) TYPE	RCU141804Z
R257		150ohm 1/2W (P) TYPE	RCP121514Z
R258		2.2ohm 1/4W (P) TYPE	RCP142294Z
R259		150ohm 1/4W (U) TYPE	RCU141514Z
R260		4.7ohm 1/4W (U) TYPE	RCU144794Z
R261		1.5K 1/4W (U) TYPE	RCU141524Z
R262		330ohm 1/4W (U) TYPE	RCU143314Z

R264		47ohm 1/4W (U) TYPE	RCU144704Z
R265		330ohm 1/4W (U) TYPE	RCU143314Z
R266		1.5K 1/4W (U) TYPE	RCU141524Z
R268		1 K 1/4W (U) TYPE	RCU141024Z
R269		100K 1/4W (U) TYPE	RCU141044Z
R270		100K 1/4W (U) TYPE	RCU141044Z
R272		100K 1/4W (U) TYPE	RCU141044Z
R273		100ohm 1/4W (U) TYPE	RCU141014Z
R274		10K 1/4W (U) TYPE	RCU141034Z
R276		150ohm 1/4W (U) TYPE	RCU141514Z
R277		1.8K 1/4W (U) TYPE	RCU141824Z
R278		10K 1/4W (U) TYPE	RCU141034Z
R279		100ohm 1/4W (U) TYPE	RCM141014A
R280		4.7K 1/4W (U) TYPE	RCM144724A
R281		4.7K 1/4W (U) TYPE	RCU144724Z
R282		4.7K 1/4W (P) TYPE	RCP144724Z
R283		10K 1/4W (U) TYPE	RCM141034A
R284		1K, 1/4W (U) TYPE	RCU141024Z
R285		470ohm 1/4W (U) TYPE	RCU144714Z
R286		15ohm 1/4W (U) TYPE	RCU141504Z
R287		2.7K 1/4W (U) TYPE	RCU142724Z

R289		470ohm 1/4W (U) TYPE	RCU144714Z
R290		10K 1/4W (U) TYPE	RCU141034Z
R291		10K 1/4W (U) TYPE	RCU141034Z
R292		4.7K 1/4W (U) TYPE	RCM144724B
R293		10K 1/4W (U) TYPE	RCU141034Z
R294		4.7K 1/4W (U) TYPE	RCU144724Z
R295		10K 1/4W (U) TYPE	RCU141034Z
R296		10K 1/4W (U) TYPE	RCU141034Z
R297		10ohm 1/4W (U) TYPE	RCU141004Z
R298		1K 1/4W (U) TYPE	RCU141024Z
R299		10K 1/4W(U) TYPE	RCU141034Z
R300		560ohm 1/4W (U) TYPE	RCU145614Z
R301		6.8K 1/4W (U) TYPE	RCU146824Z
R302		1K 1/4W (P) TYPE	RCP141024Z
R303		10K 1/4W (U) TYPE	RCU141034Z
R304		1ohm 1/4W (P) TYPE	RCP141094Z
R305		220ohm 1/4W (U) TYPE	RCM142214
R306		10K 1/4W (U) TYPE	RCU141034Z
R307		1K 1/4W (U) TYPE	RCU141024Z
R308		100ohm 1/4W (U) TYPE	RCU141014Z
R309		27K 1/4W (U) TYPE	RCU142734Z

R310		270K 1/4W (U) TYPE	RCU142274Z
R311		1 K 1/4W (U) TYPE	RCM141024
R312		1 K, 1/4W (U) TYPE	RCU141024Z
R313		1 K, 1/4W (U) TYPE	RCU141024Z
R314		10K 1/4W (U) TYPE	RCU141034Z
R315		22K 1/4W (U) TYPE	RCU142234Z
R317		1K, 1/4W (U)TYPE	RCU141024Z
R318		100ohm 1/4W (U) TYPE	RCM141014
R319		1K, 1/4W (U)TYPE	RCU141024
R321		10K 1/4W (U) TYPE	RCU141034
R322		100K 1/4W (U) TYPE	RCM141044A
R323		33K 1/4W (U) TYPE	RCU143334Z
R324		4.7K 1/4W (U) TYPE	RCM144724A
R325		10K 1/4W (U) TYPE	RCU141034Z
R326		1K 1/4W (U) TYPE	RCM141024A
R327		10K 1/4W (U) TYPE	RCU141034Z
R330		1K 1/4W (U) TYPE	RCU141024Z
R331		10K 1/4W (U) TYPE	RCM141034A
R332		1K 1/4W (U) TYPE	RCU141024Z
R334		100ohm 1/4W (U) TYPE	RCM141014B
R335		10K 1/4W (U) TYPE	RCU141034Z

R336		10K 1/4W (U) TYPE	RCM141034A

Main PCB (EPT295013Z)
Integrated Circuits

Ref#	Bd Loc	Description	MFR. Part No.
IC1		I.C. NJM324D	ENJR00324D
IC2		I.C. UPC1028H	ENNE01028H
IC3		I.C. AN612	ENMA00612Z
IC4		I.C. NJM7805	ENJR07805Z
IC5		I.C. TC5081AP	ENTA05081A
IC6		I.C. NJM7808A	ENJR07808A
IC7		I.C. TC5081AP	ENTA05081A
IC8		I.C. TA731 0P	ENTA07310P
IC9		I.C. TA7310P	ENTA07310P
IC10		I.C. TA7310P	ENTA07310P
IC11		I.C. TC5082P	ENTA05082P
IC12		I.C. HD10551	ENH110551Z
IC13		I.C. HD10551	ENH110551Z
IC14		I.C. TA7310P	ENTA07310P
IC15		I.C. NJM7808A	ENJR07808A
IC16		I.C. JRC4558D	ENJR04558D
IC17		I.C. CX7925B	ENS0079258

IC19		I.C. TA7222AP	ENTA07222A
IC21		I.C. TC4069UBP	ENTA04069U

Transistors

Ref#	Bd Loc	Description	MFR. Part No.
Q1		2SC1675K	T2SC01675K
Q2		2SC1675K	T2SC01675K
Q3		2SC945P	TRSC00945P
Q4		2SC945P	TRSC00945P
Q5		2SC945P	TRSC00945P
Q6		2SA733P	T2SA00733P
Q7		2SC945P	TRSC00945P
Q8		2SC1674K	T2SC01674K
Q9		2SC1675K	T2SC01675K
Q10		2SC1675K	T2SC01675K
Q11		2SC1675K	T2SC01675K
Q12		2SA733P	T2SA00733P
Q13		2SC945P	TRS000945P
Q14		2SC945P	TRSC00945P
Q15		2SC945P	TRSC00945P
Q16		2SC945P	TRSC00945P

Q17		2SC945P	TRSC00945P
Q18		2SC1674K	T2SC01674K
Q19		J310	EZZJ00310Z
Q20		2SC1674K	T2SC01674K
Q21		2SC1675K	T2SC01675K
Q22		2SC1675K	T2SC01675K
Q23		2SC1906	T2SC01906Z
Q24		2SC945P	TRSC00945P
Q25		2SA733P	T2SA00733P
Q26		2SC945P	TRSC00945P
Q27		2SC1675K	T2SC01675K
Q28		2SC1675K	T2SC01675K
Q29		2SC1675K	T2SC01675K
Q30		2SC945P	TRSC00945P
Q31		2SA733P	T2SA00733P
Q32		2SC945P	TRSC00945P
Q33		2SC945P	TRSCO0945P
Q34		2SC945P	TRSC00945P
Q35		2SA733P	T2SA00733P
Q36		2SC945P	TRSC00945P
Q37		2SA9340	T2SA009340

Q38		2SA9340	T2SA009340
Q39		2SC945P	TRSC00945P
Q40		2SA9340	T2SA009340
Q41		2SC945P	TRSC00945P
Q42		2SC945P	TRSC00945P
Q43		2SC1675K	T2SC01675K
Q44		2SC1675K	T2SC01675K
Q45		2SA733P	T2SA00733P
Q46		2SC2312	T2SC02312C
Q47		2SC2312	T2SC02312C
Q48		2SC2166C	T2SC02166C
Q49		2SC2314F	T2SC02314F
Q50		2SC1906	T2SC01906Z
Q51		2SB754Y	T2SB00754Y
Q53		2SA473/0	T2SA004730
Q52		2SC945P	TRSC00945P
Q54		2SC945P	TRSC00945P
Q55		2SC945P	TRSC00945P
Q56		2SC945P	TRSC00945P
Q57		2SC945P	TRSC00945P
Q58		2SC945P	TRSC00945P

Main PCB (EPT295013Z)
Diodes

Ref#	Bd Loc	Description	MFR. Part No.
D1		DIODE 1N60P	ED1N00060P
D2		DIODE 1N60P	ED1N00060P
D3		DIODE 1N4148	ED1N04148Z
D4		DIODE 1N4148	ED1N04148Z
D5		DIODE 1N4148	ED1N04148Z
D6		DIODE 1N4148	ED1N04148Z
D7		DIODE 1N4148	ED1N04148Z
D8		DIODE 1N4148	E01N04148Z
D9		DIODE 1N4148	ED1N04148Z
D10		DIODE 1N4148	ED1N04148Z
D11		DIODE 1N60P	ED1N00060P
D12		DIODE 1N60P	ED1N00060P
D13		DIODE 1N4148	ED1N04148Z
D14		DIODE 1N4148	ED1N04148Z
D15		DIODE 1N4148	ED1N04148Z
D16		DIODE 1N4148	ED1N04148Z
D17		DIODE 1N4148	ED1N04148Z

D18		DIODE MC301	EDMC00301Z
D19		DIODE FC54M	EDECO0054M
D20		DIODE MC301	EOMC00301Z
D21		DIODE 1N4148	E01N04148Z
D22		DIODE 1N4148	E01N04148Z
D23		DIODE FC54M	EDECO0054M
D24		DIODE FC54M	EDECO0054M
D25		DIODE MC301	EDMC00301Z
D26		DIODE 1N4148	ED1N04148Z
D27		DIODE 1N4148	ED1N04148Z
D28		DIODE 1N4148	ED1N04148Z
D29		DIODE 1N4148	ED1N04148Z
D30		DIODE 1N4148	ED1N04148Z
D31		DIODE 1N4148	ED1N04148Z
D32		DIODE 1N4148	ED1N04148Z
D33		DIODE 1N4148	ED1N04148Z
D34		DIODE 1N60P	ED1NO0060P
D35		DIODE 1N60P	E01NO0060P
D36		DIODE 1N4148	ED1N04148Z
D37		DIODE 1N4148	E01N04148Z
D38		DIODE 1N4148	ED1N04148Z

D38		DIODE 1N4148	ED1N04148Z
D39		DIODE 1N4148	ED1N04148Z
D40		DIODE 1N4148	ED1N04148Z
D41		DIODE 1N4148	ED1N04148Z
D42		DIODE KB362	EDKB00362Z
D43		DIODE FC54M	EDECO0054M
D44		DIODE 1N4148	ED1N04148Z
D45		DIODE 1N4148	E01N04148Z
D46		DIODE 1N4148	ED1N04148Z
D47		DIODE 1N4148	ED1N04148Z
D48		DIODE 1N4148	ED1N04148Z
D49		DIODE 1N4148	ED1N04148Z
050		DIODE 1N4148	ED1N04148Z
D51		DIODE KB262	EDKB00262Z
D52		DIODE 1N4148	ED1N04148Z
D53		DIODE 1N4148	ED1N04148Z
D54		DIODE 1N4148	ED1N04148Z
D55		DIODE 1N4148	ED1N04148Z
D56		DIODE 1N4148	ED1N04148Z
D57		DIODE 1N4148	ED1N04148Z
D58		DIODE 1N4148	ED1N04148Z

D59		DIODE 1N4148	ED1N04148Z
D60		DIODE 1N4148	ED1N04148Z
D61		DIODE 1N4148	ED1N04148Z
D62		DIODE 1N4148	ED1N04148Z
063		DIODE 1N4148	ED1N04148Z
D64		DIODE 1N4148	ED1N04148Z
D65		DIODE 1N4148	ED1N04148Z
D66		DIODE SVC251	EDSV00251Z
D67		DIODE SVC251	EDSV00251Z
D68		DIODE 1N4148	ED1N04148Z
D69		DIODE 1N4148	ED1N04148Z
D70		DIODE 1N4148	ED1N04148Z
D71		DIODE 1N4148	E01N04148Z
D72		DIODE 1N4148	ED1N04148Z
D73		DIODE, .5W 2.4V, ZENER	EDZD05249Z
D74		DIODE, .5W 5.6V, ZENER	EDZD05249Z
D75		DIODE KS362	EDKB00362Z
D76		DIODE 1N4148	ED1N04148Z
D77		DIODE 1N4148	ED1N04148Z
D78		DIODE 1N4148	ED1N04148Z
D79		DIODE 1N4148	ED1N04148Z

D80		DIODE 1N4148	ED1N04148Z
D81		DIODE 1N60P	EDlNO0060P
082		DIODE 1N4148	ED1N04148Z
D83		DIODE 1N4148	ED1N04148Z
D84		DIODE 1N4148	ED1N04148Z
085		DIODE 1N4148	ED1N04148Z
D86		DIODE, .5W 5.6V. ZENER	EDZD05569Z
D87		DIODE FC54M	EDECO0054M
D88		DIODE 1N4148	ED1N04148Z
D89		DIODE 1N4148	ED1N04148Z
D90		DIODE MV1Y	EDMV00001Y
D91		DIODE MV1Y	EDMV00001Y
D92		DIODE MV1Y	EDMV00001Y
D93		DIODE 1N4148	EDIN04148Z
D94		DIODE FC54M	EDECO0054M
D95		DIODE FC54M	EDECO0054M
D96		DIODE FC54M	EDECO0054M
D97		DIODE 1N4148	ED1N04148Z
D98		DIODE 1N4148	ED1N04148Z
D99		DIODE 1N4148	ED1N04148Z
D100		DIODE 1N4148	ED1N04148Z

D101		DIODE 1N4148	ED1N04148Z
D102		DIODE 1N4148	ED1N04148Z
D103		DIODE 1N4148	ED1N04148Z
D104		DIODE 1N4003	ED1N04003Z
D105		DIODE 1N4003	ED1N04003Z
D106		DIODE 1N4148	ED1N04148Z
D107		DIODE 1N4148	ED1N04148Z
D108		DIODE 1N4148	ED1N04148Z
D109		DIODE 1N4148	E01N04148Z
D110		DIODE 1N4148	E01N04148Z
D111		DIODE FC54M	EDECO0054M
D112		DIODE 1N4148	ED1N04148Z
D113		DIODE 1N4148	ED1N04148Z
D116		DIODE MC301	EDMC00301

Connectors

Ref#	Bd Loc	Description	MFR. Part No.
J101		PCB CONN. SOCKET 2P L= 17.8	EX07N48185
J104		PCB CONNECTOR SOCKET 3P	EX07N41216
J105		PCB CONNECTOR SOCKET 2P	EX07N41226
J107		PCB CONNECTOR SOCKET 2P	EX07N41226
J108		PCB CONNECTOR SOCKET 2P	EX07N41226
J109		PCB CONNECTOR SOCKET 3P	EX07N41216
J110		PCB CONNECTOR SOCKET 3P	EX07N41216
J112		PCB CONNECTOR SOCKET 3P	EX07N41216
J113		PCB CONNECTOR SOCKET 6P	EX07N41266
J115		PCB CONNECTOR SOCKET 3P	EX07N41216
J116		PCB CONNECTOR SOCKET 3P	EX07N41216
J117		PCB CONNECTOR SOCKET 7P	EX07N41261
J118		PCB CONNECTOR SOCKET 3P	EX07N41216
J119		PCB CONNECTOR SOCKET 6P	EX07N41266
J501		EARPHONE JACK	EXO6N41045

J502		EARPHONE JACK	EXO6N41045
J503		EARPHONE JACK	EX06N41045

Jumper Wires

Ref#	Bd Loc	Description	MFR. Part No.
J1		JUMPER WIRE 7x5x7mm	WX01070705
J2		JUMPER WIRE 7x13x7mm	WX01070713
J3		JUMPER WIRE 7x13x7mm	WX01070713
J5		JUMPER WIRE 7x10x7mm	WX01070710
J6		JUMPERWIRE 7x10x7mm	WX01070710
J7		JUMPER WIRE 7x10x7mm	WX01070710
J8		JUMPER WIRE 7x6x7mm	WX01070706
J9		JUMPER WIRE 7x10x7mm	WX01070710
J10		JUMPER WIRE 7x10x7mm	WX01070710
J12		JUMPER WIRE 7x9x7mm	WX01070709
J13		JUMPER WIRE 7x5x7mm	WX01070705
J14		JUMPER WIRE 7x7x7mm	WX01070707
J16		JUMPER WIRE 7x5x7mm	WX01070705
J17		JUMPER WIRE 7x10x7mm	WX01070710

J18		JUMPER WIRE 7x13x7mm	WX01070713
J19		JUMPER WIRE 7x4x7mm	WX01070704
J20		JUMPER WIRE 7x6x7mm	WX01070706
J21		JUMPER WIRE 7x10x7mm	WX01070710
J22		JUMPER WIRE 7x6x7mm	WX01070706
J23		JUMPER WIRE 7x6x7mm	WX01070706
J24		JUMPER WIRE 7x6x7mm	WX01070706
J25		JUMPER WIRE 7x6x7mm	WX01070706
J26		JUMPER WIRE 7x6x7mm	WX01070706
J27		JUMPER WIRE 7x10x7mm	WX01070710
J28		JUMPER WIRE 7x9x7mm	WX01070709
J29		JUMPER WIRE 7x4x7mm	WX01070704
J30		JUMPER WIRE 7x5x7mm	WX01070705
J31		JUMPER WIRE 7x7x7mm	WX01070707
J32		JUMPER WIRE 7x6x7mm	WX01070706
J33		JUMPER WIRE 7x10x7mm	WX01070710
J34		JUMPER WIRE 7x10x7mm	WX01070710
J36		JUMPER WIRE 7x9x7mm	WX01070709
J38		JUMPER WIRE 7x3x7mm	WX01070703

J39		JUMPER WIRE 7x27x7mm	WX01070727
J40		JUMPER WIRE 7x10x7mm	WX01070710
J41		JUMPER WIRE 7x5x7mm	WX01070705
J42		JUMPER WIRE 7x10x7mm	WX01070710
J43		JUMPER WIRE 7x9x7mm	WX01070709
J44		JUMPER WIRE 7x10x7mm	WX01070710
J45		JUMPER WIRE 7x10x7mm	WX01070710
J46		JUMPER WIRE 7x13x7mm	WX01070713
J47		JUMPER WIRE 7x5x7mm	WX01070705
J48		JUMPER WIRE 7x5x7mm	WX01070705
J49		JUMPER WIRE 7x10x7mm	WX01070710
J50		JUMPER WIRE 7x10x7mm	WX01070710
J51		JUMPER WIRE 7x10x7mm	WX01070710
J53		JUMPER WIRE 7x5x7mm	WX01070705
J54		JUMPER WIRE 7x6x7mm	WX01070706
J55		JUMPER WIRE 7x5x7mm	WX01070705
J57		JUMPER WIRE 7x4x7mm	WX01070704
J58		JUMPER WIRE 7x10x7mm	WX01070710
J59		JUMPER WIRE 7x5x7mm	WX01070705

J60		JUMPER WIRE 7x6x7mm	WX01070706
J61		JUMPER WIRE 7x6x7mm	WX01070706
J62		JUMPER WIRE 7x4x7mm	WX01070704
J63		JUMPER WIRE 7x8x7mm	WX01070708
J64		JUMPER WIRE 7x10x7mm	WX01070710
J66		JUMPER WIRE 7x10x7mm	WX01070710
J67		JUMPER WIRE 7x14x7mm	WX01070714
J68		JUMPER WIRE 7x6x7mm	WX01070706
J69		JUMPER WIRE 7x10x7mm	WX01070710
J70		JUMPER WIRE 7x5x7mm	WX01070705
J71		JUMPER WIRE 7x4x7mm	WX01070704
J72		JUMPER WIRE 7x5x7mm	WX01070705
J73		JUMPER WIRE 7x5x7mm	WX01070705
J74		JUMPER WIRE 7x10x7mm	WX01070710
J75		JUMPER WIRE 7x8x7mm	WX01070708
J76		JUMPER WIRE 7x7x7mm	WX01070707
J78		JUMPER WIRE 7x7x7mm	WX01070707
J79		JUMPER WIRE 7x6x7mm	WX01070706
J80		JUMPER WIRE 7x6x7mm	WX01070706

J81		JUMPER WIRE 7x13x7mm	WX01070713
J82		JUMPER WIRE 7x15x7mm	WX01070715
J83		JUMPER WIRE 7x7x7mm	WX01070707
J84		JUMPER WIRE 7x14x7mm	WX01070714
J86		JUMPER WIRE 7x5x7mm	WX01070705
J114		JUMPER WIRE 7x3x7mm	WX01070703
J322		JUMPER WIRE 7x5x7mm	WX01070705
ANT		JUMPER WIRE 7x50x7mm	WX01070750

RCI-2950 CHASSIS PARTS

Ref#	Description	MFR. Part No.
-	SPEAKER, 3W 8 OHM, 31/2"	ES300835SQ
-	FUSE, 7A, 16V	EX02N40210
-	DC CORD W/FUSE SOCKET	WA0012185A
-	DC SOCKET, 3P	EX06N40007
-	ANT JACK	EX06 N41019
-	MICROPHONEASSY	EX04N40620
SP	WIRE CONN. HOUSING, 2P	EX07N48041
J105	WIRE CONN. HOUSING, 2-2P	EX07N48391
J108	WIRE CONN. HOUSING, 2-2P	EX07N48391
J109	WIRE CONN. HOUSING, 3-3P	EX07N48389
J112	WIRE CONN. HOUSING, 3-3P	EX07N48389
J113	WIRE CONN. HOUSING, 6P	EX07N48396
J115	WIRE CONN. HOUSING, 3-3P	EX07N48389
J116	WIRE CONN. HOUSING, 3-3P	EX07N48389
J117	WIRE CONN, HOUSING, 7P	EX07N48387
J119	WIRE CONN. HOUSING, 3-3P	EX07N48389
J501	WIRE CONN. HOUSING, 2-2P	EX07N48391

J502	WIRE CONN. HOUSING, 3-3P	EX07N48389
J503	WIRE CONN. HOUSING, 3-3P	EX07N48389
J504	WIRE CONN. HOUSING, 3-3P	EX07N48389
J508	WIRE CONN. HOUSING, 2-2P	EX07N48391
J602	WIRE CONN. HOUSING, 3-3P	EX07N48389
J601	WIRE CONN. HOUSING, 3-3P	EX07N48389
J701	WIRE CONN. HOUSING, 2-3-2-3P	EX07N48397
J702	WIRE CONN. HOUSING, 2-3-2-3P	EX07N48397
J703	WIRE CONN. HOUSING, 2-3-2-3P	EX07N48397
-	WIRE CONN. HOUSING 2-4-2P	EX07N48398
-	WIRE CONN. HOUSING 3-2-2P	EX07N48394

RELAY

Ref#	Bd Loc	Description	MFR. Part No.
RL1		RELAY 9V	EX05N40802

Ref#	Description	MFR. Part No.
-	FRONT PANEL, BLACK	PT29S0010A
-	REFRACTOR PLATE (KEY)	PT2950030A
-	REFRACTOR PLATE (LCD)	FIT2950041A

-	KNOB, BLACK	PT2950051A
-	KNOB, BLACK	PT2950060A
-	INNER KNOB, BLACK	PT2950071A
-	OUTER KNOB, BLACK	PT2950080A
-	LCD WINDOW	PT2950090A
-	PVC BAG SHIELD PLATE A	PT1200020A
-	FRONT PANEL, BLACK	PT2950010B
-	FRONT PANEL, BLACK	PT2950010C
-	FRONT PANEL, BLACK	PT2950010D
-	FRONT CHASSIS	MT2950010P
-	SPACE KING	MT2950020E
-	D SPRING A #6600	MT3600080T
-	D SPRING 8 #7800	MT3600090T
-	D SPRING D #8500	MT3600100T
-	HANDLER, BLACK	MT3600030A
-	TOP HOUSING, BLACK	MT2950031A
-	BOTTOM HOUSING, BLACK	MT2950041A
-	SET CHASSIS	MT3600022X
-	SOCKET HOLDER	MT360005OX
-	SHIELD PLATE (A)	MT120006ON
-	HEAT SINK, BLACK	MM787804OX

-	PC.B BRACKET	MT3600010S
-	SHIELD PLATE	MT2710060X
-	TOP HOUSING	MT2950031B
-	RUBBER KEY	QT2950010A
-	MIC PLATE	BT2100020A
-	MIC PLATE	BT2100020D
-	MIC PLATE	STOSSBO10B
-	SHIELD CLOTH 10x88x.3t	LZZZ60001Z
-	SHIELD CLOTH 90x9Ox.18t	LZZZ60056Z
-	QC LABEL	177761009Z
-	SER NO. LABEL	LZZZ61155Z
-	LCD SPONGE RUBBER 108x25x1T	XZZ290205Z
-	CLAMP	GZZZ50000Z
-	SILICA GEL	GZZZ50010Z
-	BEEP SPONGE 22x1.5t	XZZZ90206Z
-	FOAM 14x16x20mm	XZZZ90004Z
-	PCB STOPPER	XZZZ90006Z
-	INSULATING PLATE	XZZZ9002OZ
-	INSULATING RING	XZZZ90003Z
-	ANT/M IC SOLD. PLATE 16x21x.5t	XZZZ90098Z
-	SPONGE 15x30xl It	XZZZ90021Z

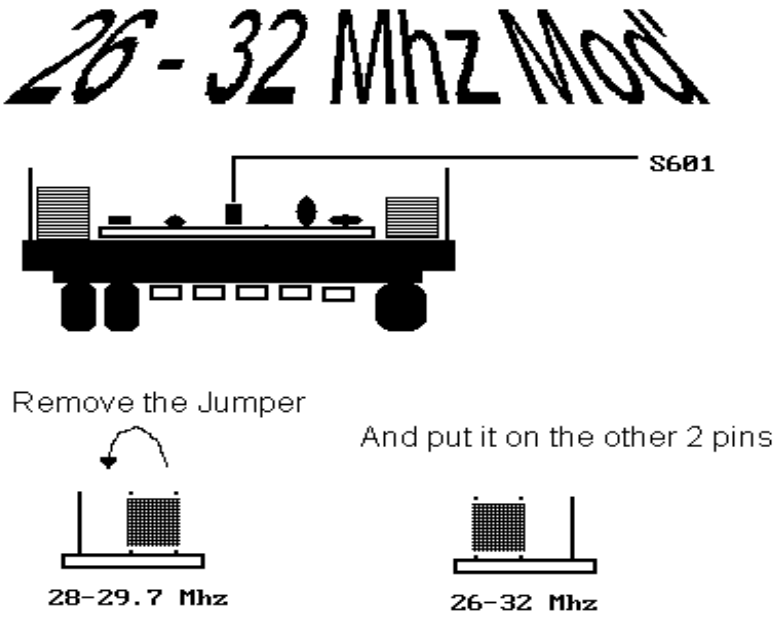
-	SOLD. PLATE	XZZZ90002Z
-	LCD PCB SHIELD PLATE 35x8x2t	XZZZ90187Z
-	RCI MIC PLATE	BT6300041A
-	LAMP REFRACTOR LABEL 28x11	LZZZ61278Z
-	TOP REFRACTOR LABEL 25x8	LZZZ61277Z
-	LCD REFRACTOR LABEL 100x11	LZZZ61276Z
-	POLYLON (TOP)	UPT360001A
-	POLYLON (BOTTOM)	UPT360001B
B754Y	SCREW, M2.Ox0.4px10 FAN HEAD	JS052010MN
TR46	SCREW, M2.Ox0.4px12 PAN HEAD	JS052012MN
TR47	SCREW, M2.Ox0.4px12 PAN HEAD	JS052012MN
TR48	SCREW, M2.Ox0.4px12 FAN HEAD	JS052012MN
-	FRONT PANEL (4) SCREW M3.0x0.5px6, FLAT HEAD	JS033006MN
-	DC SOCKET (2), SET CHASSIS(12) LCD &CPU PCB (6) SCREW M3. Ox0.5px6, PAN HEAD TA7222(1)	JS053006MN
-	SCREW, M3.Ox0.5px6 (PVC) ROUND HEAD	JS013006MY
-	MAIN PCB (5) SCREW, T3x6-2 PAN HEAD	JS053006TN
-	HEAT SINK SCREW, T3x8-2 ROUND HEAD	JS013008TN
-	SPEAKER (4) SCREW M3.0x0.5px8 PAN HEAD	JS053008MN
-	T7808 KEY PCB (2) SCREW M3.Ox0.5px10 PAN HEAD	JS053010MN
-	R7808(1) KEY PCB (2) SCREW M3.0x0.5px10 PAN HEAD	JS053010MN
-	C7808x2 SCREW M2.0x0.4px8 PAN HEAD	JS052008MN

-	SPEAKER (4) NUT WIWASHER	JN263035ZS
-	2SC2312 (3) NUT	JN242012ZS
-	INSULATING RING	XZZZ90072Z
-	MOUNTING SCREW M5.Ox0.8x11 BLACK	XZZZ90007Z
-	MICROPHONE STOPPER	XZZZ90008Z
-	SCREW 5x10-1 STEEL	JS015010WH
-	SCREW 3.5x8-2	JS013508TH
-	OUTSIDE TOOTH WASHER 5.5x10x0.3	JW315510CN
-	INSIDE TOOTH WASHER 4x8x0.3	JW324008CN
-	FIBER WASHER 4.9x15x1T	XZZZ90188Z

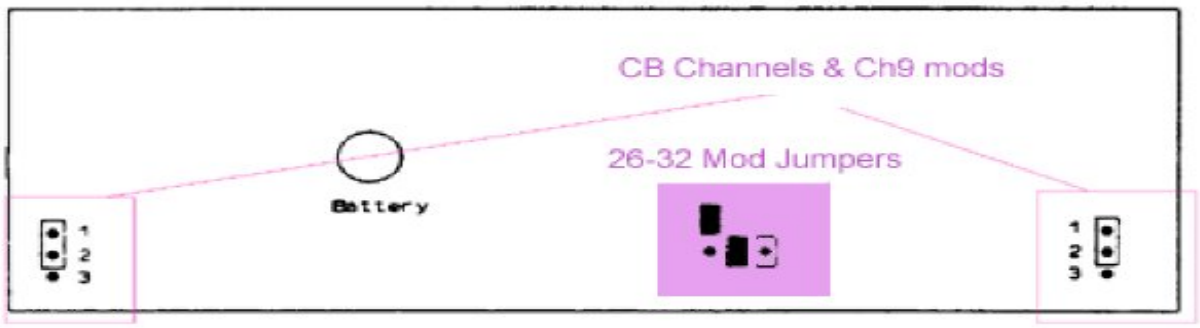
MODIFY YOUR RCI FOR 26 Mhz -32 Mhz OPERATION

The RCI was designed to be a wide range tranceiver. It is really. With a nice little modification you can expand this rig from 26 Mhz to 32 Mhz.

All you have to do is to locate a black jumper onto the LCD electric board. This jumper is called S601. Just move it to the other position.



Don't forget to re-program your scanning lower frequancy and scanning upper frequency with these new limits otherwise you will not be able to reach the limit frequencies.



FREQUENCY MODIFICATION ON NEW VERSIONS

Remove the bottom cover to gain access to the small PC board immediately behind the front panel. There will be a set of jumpers marked "J1" and "J2". Move the jumper from the top two pins to the bottom two pins. Frequency coverage will now be expanded to 26mhz-29.7mhz.

Press the "MAN" button to switch between CB operation and normal operation.

Press the "SHF" button while in CB mode to switch between CB channel readout and frequency readout.

Press the "ENT" button while in CB mode for instand channel 9.

*NOTE: The battery and the CPU reset have been eliminated in the newer versions, the new system uses memory capacitors for memory backup

IF YOU FILL BOTH PINS J1 AND J2 ON THE NEW VERSION OF THE RANGER 2950 YOU WILL GET 26.000-32.000 JUST LIKE THE OLD VERSION.THE SAME FOR THE 2970. TRY IT IF YOU HAVEN'T YET.

Extra notes

In the early versions, there are two black plugs located near the center of the PC board on the rear of the LCD display. Remove the right-hand plug for coverage down to 26.0000 MHz. The other plug was just hanging on one pin; use it to short the two left-hand pins for coverage from 29.7000 to 32.0000 MHz. If for some reason either or both ranges do not come up, press the white reset button next to the right-hand plug.

For some odd reason, later models were distributed with both plugs missing- possibly to keep some folks from monitoring above 29.7000 MHz- so the radios came ready to operate from 26.0000 to 29.6999 MHz ! For replacement shorting plugs/ obtain Radio Shack #276-1512 (10 count for S1.39}, or equivalents from your local electronic store.

Next, notice the two black shorting plugs on the FAR right-hand and left-hand sides of the same PC board; first, the left plug. You'll notice the plug shorting pins 1 and 2; use the plug to short pins 2 and 3. Press LOCK, which will result in a 40 channel eleven meter readout. Press LOCK again and the frequency of the channel is displayed. Press MAN to revert back to normal VFO. NOTE: frequency LOCK function is lost and SHF (shift) won't work after this change is made; see switch mod following.

Over to the right plug: again, this plug will be shorting pins 1 and 2; use it to short pins 2 and 3. Press R.BEEP to get instant Channel 9. Press R.BEEP again and the frequency of channel 9 will be displayed {27.0650) Press MAN to revert back to VFO status. NOTE the "roger beep" function is lost after this change; see switch mod following.

The above frequency modifications SHOULD NOT BE USED WITHIN THE U.S. except in dire emergencies or for MARS/CAP functions with proper license/permits, although radio hobbyists can MONITOR activities outside the Amateur band such as the range above 29.700 Mhz

*** Frequency Modification ***

Remove the bottom cover to gain access to the small PC board immediately behind the front panel. There will be a set of jumpers marked "J1" and "J2". Move the jumper from the top two pins to the bottom two pins. Frequency coverage will now be expanded to 26mhz-29.7mhz.

Press the "MAN" button to switch between CB operation and normal operation.
Press the "SHF" button while in CB mode to switch between CB channel readout and frequency readout. Press the "ENT" button while in CB mode for instand channel 9.

*NOTE: The battery and the CPU reset have been eliminated in the newer versions, the new system uses memory capacitors for memory backup

EXPAND YOUR RCI TO 25 MHZ AND 33 MHZ

There is a trick to expand your RCI over the factory programmed limits. Yes, I agree that it's not a very clean mod but it works great. So what _

This trick is to change the X2 crystal (Quartz) that is a 10,240 Mhz value one. You can experiment quartz from 9 Mhz to 12 Mhz (It'll depend on what you have). This modification will increase the coverage of your RCI from 25 Mhz to 33 Mhz if you make all the quartz switches. Be carefull, the frequency that will be indicated by the LCD screen won't be true of course. You will need a separate frequency counter.

May I suggest unsoldering the original crystal and replace with a mounting slot. It'll then be easier to exchange crystals quickly when needed.

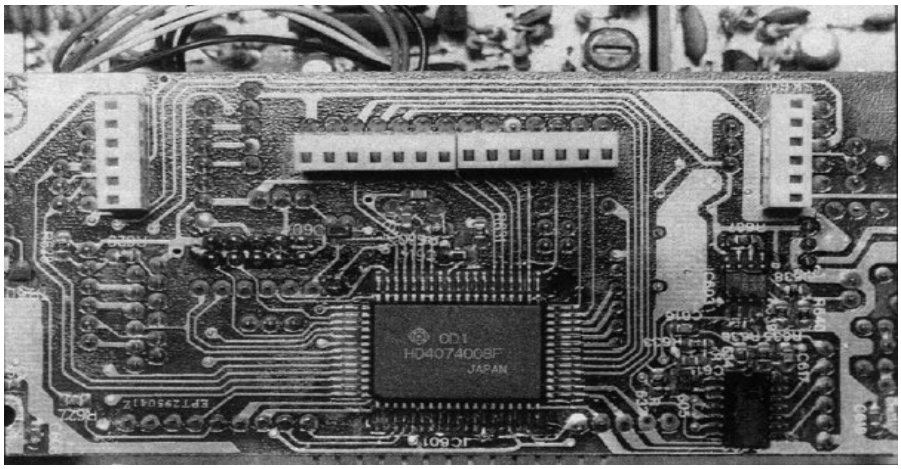
DO NOT TOUCH TO THE OTHER crystals. It would cause problems.

HAM TO CB MODE MODIFICATION

Very often, the RCI is sold as a HAM rig. But it was designed and developped on CB principals. All the experts will tell you that the RCI contains the same components as all major CB TXs. So what ? Is it a CB or a HAM tranceiver ?

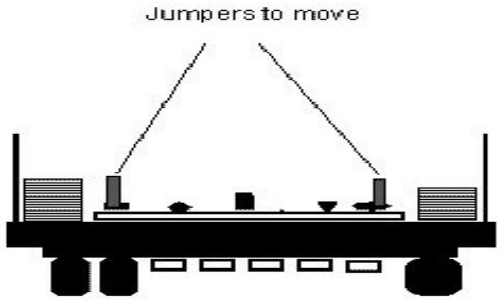
The short reply is : BOTH. The RCI developing team thought it ham **AND** CB. The microcontroler board has the capabilities of indicating channels or frequencies. The channel mode has just been inactivated by a jumper. Let's get a rid of this limitation.

The jumper is located on the LCD board. On the left side of this board, around the components R626 and RA610, you cannot miss the jumper. Take it off and place it in the other position. You have just activated the channel mode. The " Lock " key will control whether you are in channel mode or in frequency mode.



A CHANNEL 9 EMERGENCY KEY ?

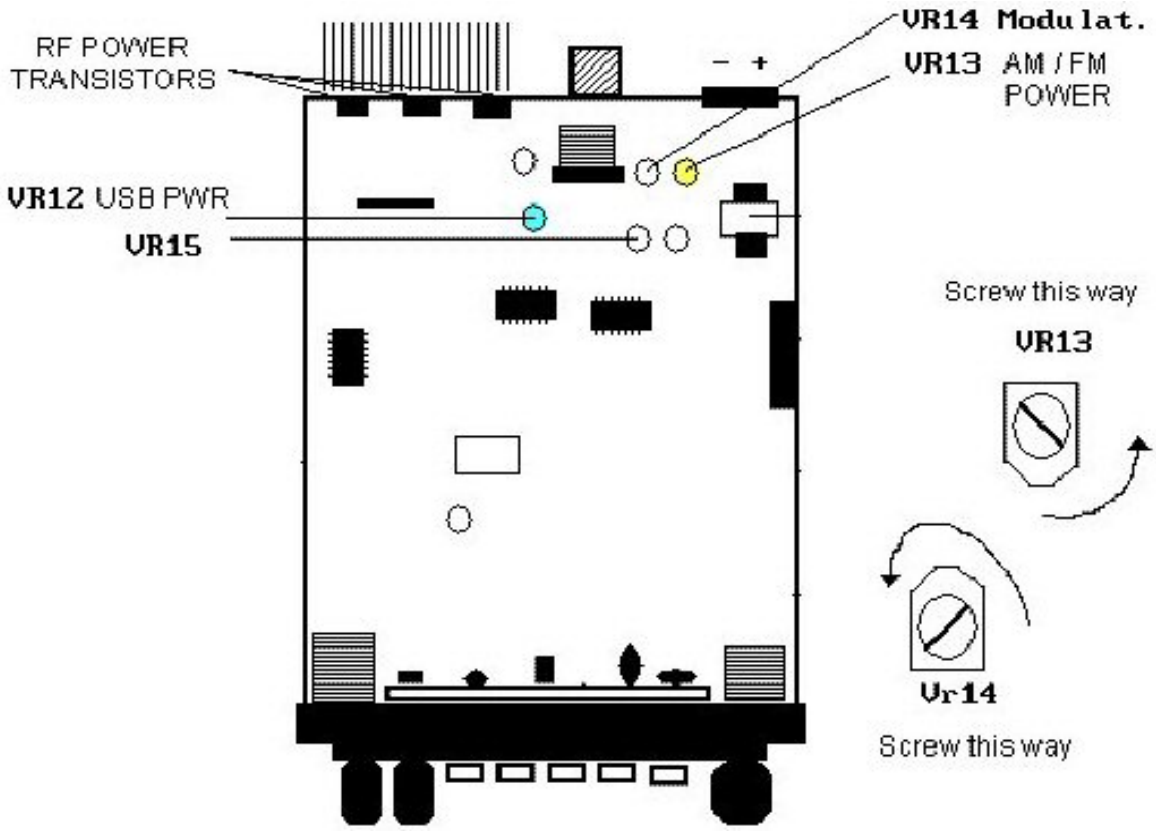
Yes, you have one in you RCI. In the same way you modified the previous jumper, you will find a second jumper on the RIGHT side of the LDC board . Take it off and place it in the other position. You have just enabled a channel 9 emergency key. This key is now the old " R-Beep ". Yeah... _ Who said that the RCI was not a CB rig ?



POWER MODS

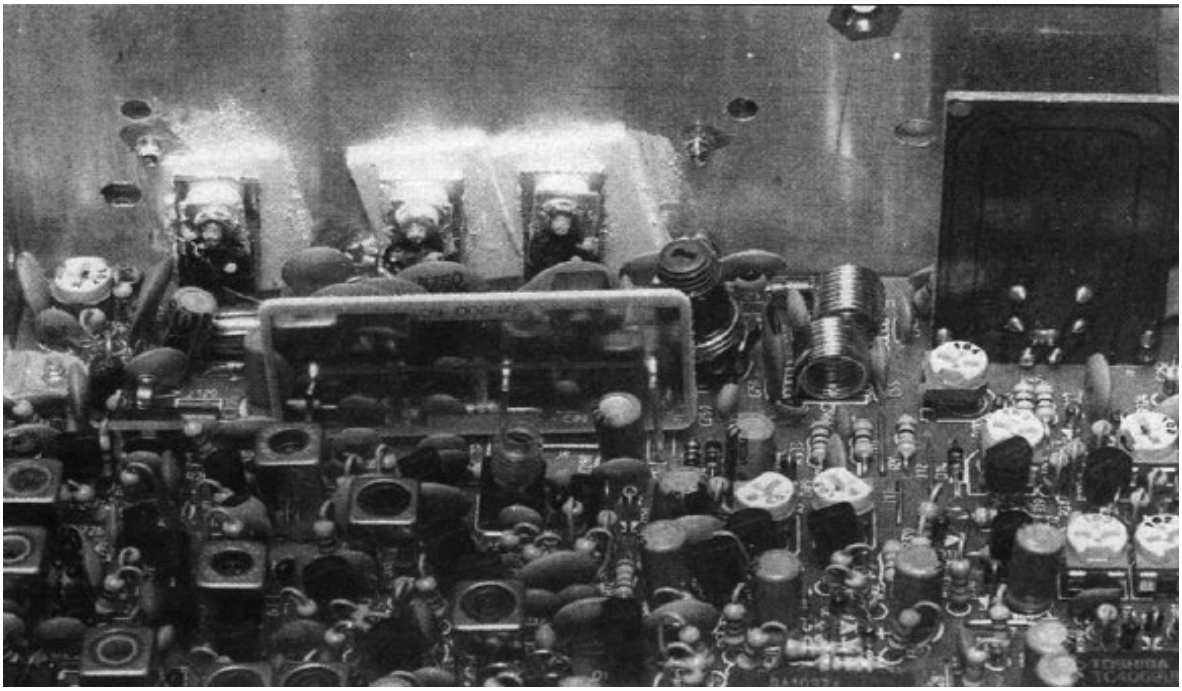
INCREASE YOUR POWER ! ! ! ! !

You can boost your output power in both AM/FM and USB which are driven separately. Have a look at this drawing.

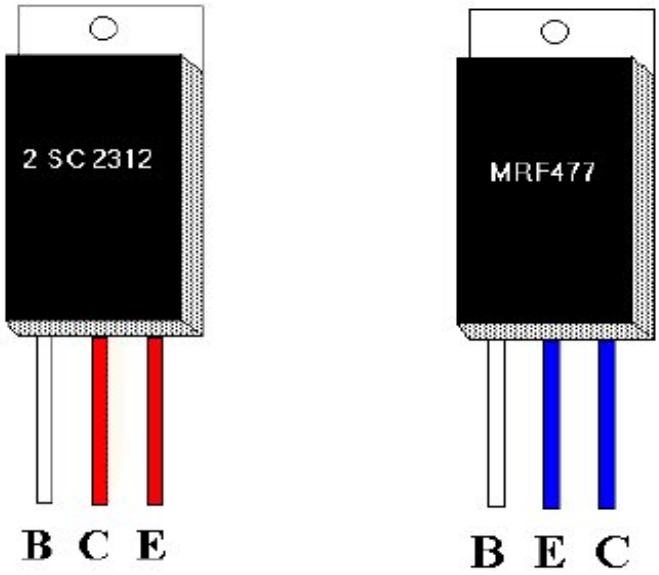


You can go further by replacing the two final transistors. Two 2SC2312 by 2 **MRF477**. Be carefull, these two do not have the same wiring. You will have to cross the pins. (A new modification should be replacing the MRF477by MRF 497 which is more powerful)

Another trick that could be used to boost a bit is to replace **R281** (4,7 K) by a **2,2 K** value and re-adjust VRs for AM and USB. This boosts the power up to 20 wats AM / 30 Watts USB. Be carefull this is an extreme mod _ May be illegal in your country. Check the law beforehand.



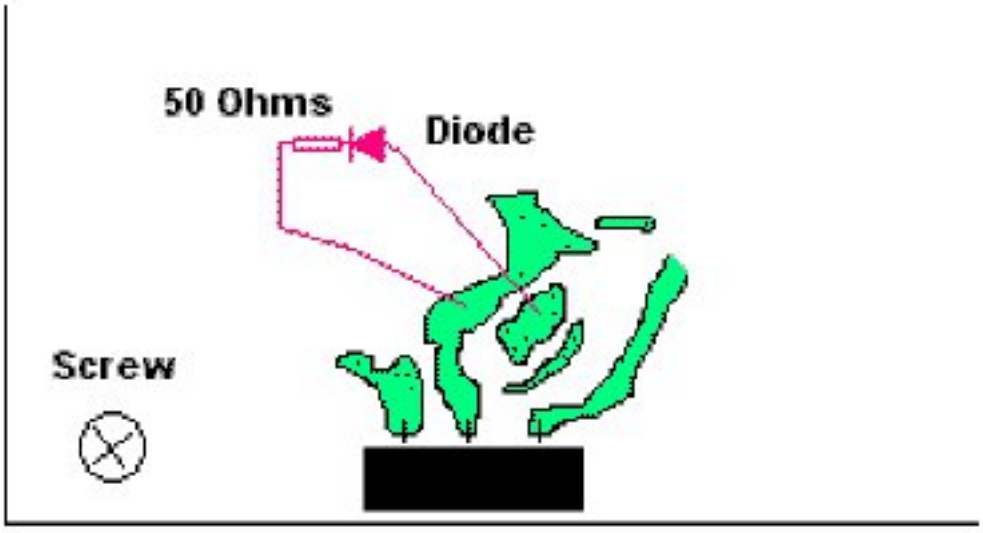
Differences between 2SC2312 and MRF477



HEAVY SWINGER MOD

HEAVY SWINGER MOD (MODULATION)

Locate **Q51** which is a 2SB754. This part should be subbed out with a 2SB688 but doesn't have to be. The 2SB688 is a heavier duty and higher wattage transistor. To do this mod, you will need a 1N914 diode and a 50 ohms resistor. Hook up as drawing shows. This will give you super modulation at whatever power range you want.



TUNE-UP

2950 TUNE UP/MOD

To increase heat dissapation and durability and a decrease of transmit voltage drop change **Q-51** to an ECG37 or equiv.

To prevent overheating and increase audio Quality & low pwr swing change **Q53** to a 2SA473

To improve low power swing on AM locate **R178** and change to a 3k ohm.The resesitor you just removed save for the next step.(4.7k)

Locate **R194** (10k ohm) replace with the 4.7k resistor from previous step.

Locate **R281** (4.7k ohm) replace with the 10k resistor from the previous step.

For increased output on SSB and AM locate **C270** and parallel with a 470pF-1kv ceramic disc capacitor.

Replace all plastic insulators with mica insulators on all transistors. Use a liberal amount of heat sink compound.

For improved modulation remove **Q32**, which is the modulation limiter.

UPGRADING AM DETECTION

Change **D34** & **D35** that are 1N60's by ECG583 or SK9975. This mod will enhance the radio performance.
Some version already have 1N60 diodes for d35-d34. The problem that is manifesting itself as AM distorion (and TX bleed) is caused by the lack of bandwith control due to the fact of the cheap Xtal filter they use...

I improved the Am on my set by simply puting in a 0.002 Mfd NPO cap at the AM det output diode to ground...This narrows the bandwith improves the S/NR and cuts some of the high freq audio distortion out and provides smoothing and harmonic reduction from the AM det....

I further improved both the AM an SSB RX (and TX Bleed) by changing the Xtal IF filter... This mod will also increase AGC cut back from sig on other ch and improve S/NR and sen on all bands....

With these mods, realignment and installing a cascade RF RX amp makes the RCI 2950 Rx decent.....

INCREASE AUDIO

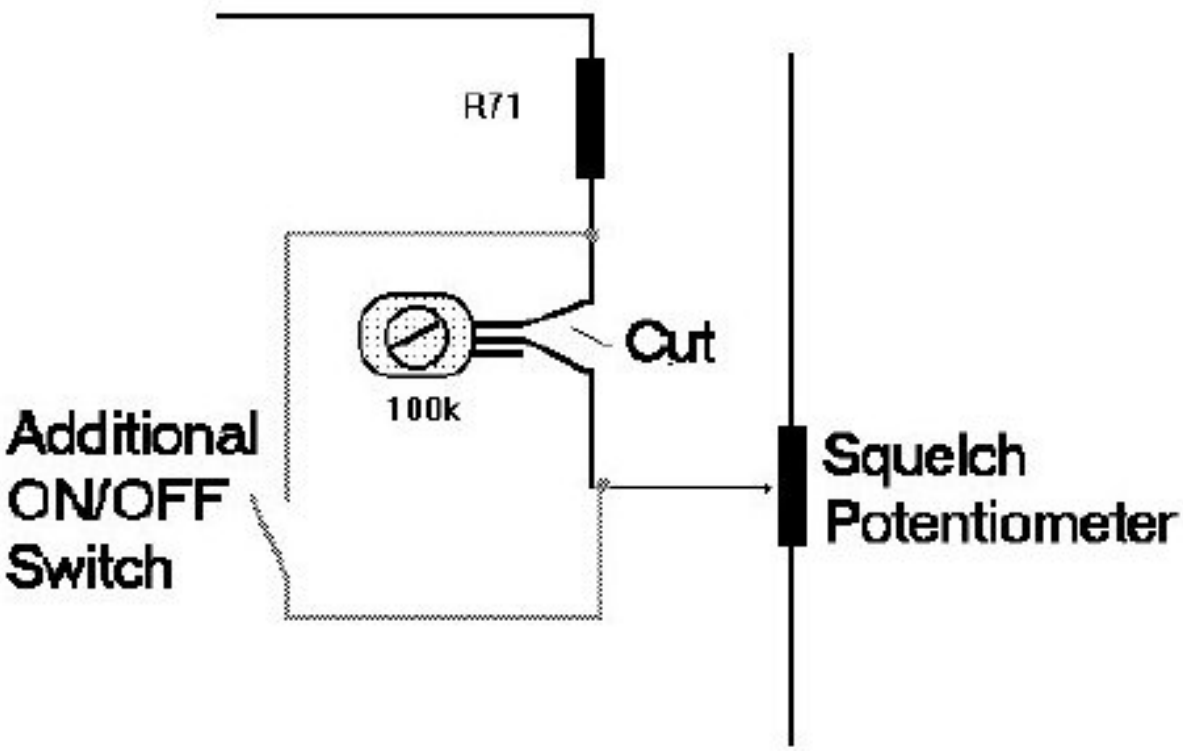
My audio got slightly softer, you have to pull out **tr53** , it is not marked on the board, it is between **vr 12** and **vr 14**. also **r 291** take out!

This is the modulatuion limiter

AUTO SQUELCH

ADD AN AUTOMATIC SQUELCH TO YOUR RIG

All you need is a VR of 100 K and a **simple switch button**. Follow the diagram's instructions to build this option.



How to setup the AutoSq Option:
- Switch to FM mode
- Set the Squelch potentiometer to minium
- Open the additional switch button and adjust VR 100Ko so that the squelch just breaks

That's all....

BATTERY PROBLEMS

Careful: Latest versions of RCI do not have a lithium battery anymore.

If you run your 2950 as a base on a power supply the internal 3v battery will drain much faster or if you use it mobile and let the ignition switch turn the radio off and on then the battery will be dead in a very short time. So the next time you open the radio to replace the battery, solder the leads of a 2AA or 2AAA battery holder (either one will equal 3 volts) to the battery contacts (!!! observe correct polarity!!!) Then using a piece of double side tape place the battery holder in an out of the way place. This way when the batteries do go dead you can replace them fast and easily with common batteries.

LITHIUM BATTERY UPDATES/UPGRADES

This seems to have been one sore spot with the 2950. A common replacement is the Ray-O-Vac BR2325TZ-1 Radio Shack's version is listed as #23-d168. If one gets tired of replacing the battery after the warrant runs out, here's a couple of "fixes" for longer battery life and battery elimination!

a. Battery replacement: document all memory channels, then remove ALL power from the radio. Remove the covers, knobs and front panel from the radio to allow the display and boards to easily lay forward, allowing easy access to the battery. CAREFULLY remove the lithium battery, noting the correct battery polarities" Next, solder the leads of a 9 volt snap connector (Radio Shack #270-325 or equiv.) to the proper points on the board, red to +, black to **-**.

Install two "AA" alkaline batteries in a mating holder (Radio Shack #270-382) and snap to the installed 9 volt connector. Carefully swing the display and board assembly back into place and install the four chassis screws. Power the radio up and check all functions. If normal, insulate the batteries and use nylon wire ties to secure them to a wire bundle. Reassemble the radio. Now the memories and functions of the radio should last much longer, and replacements are a "snap"! NOTE; this upgrade has been in use with several radios for over a year with never a failure or replacement!

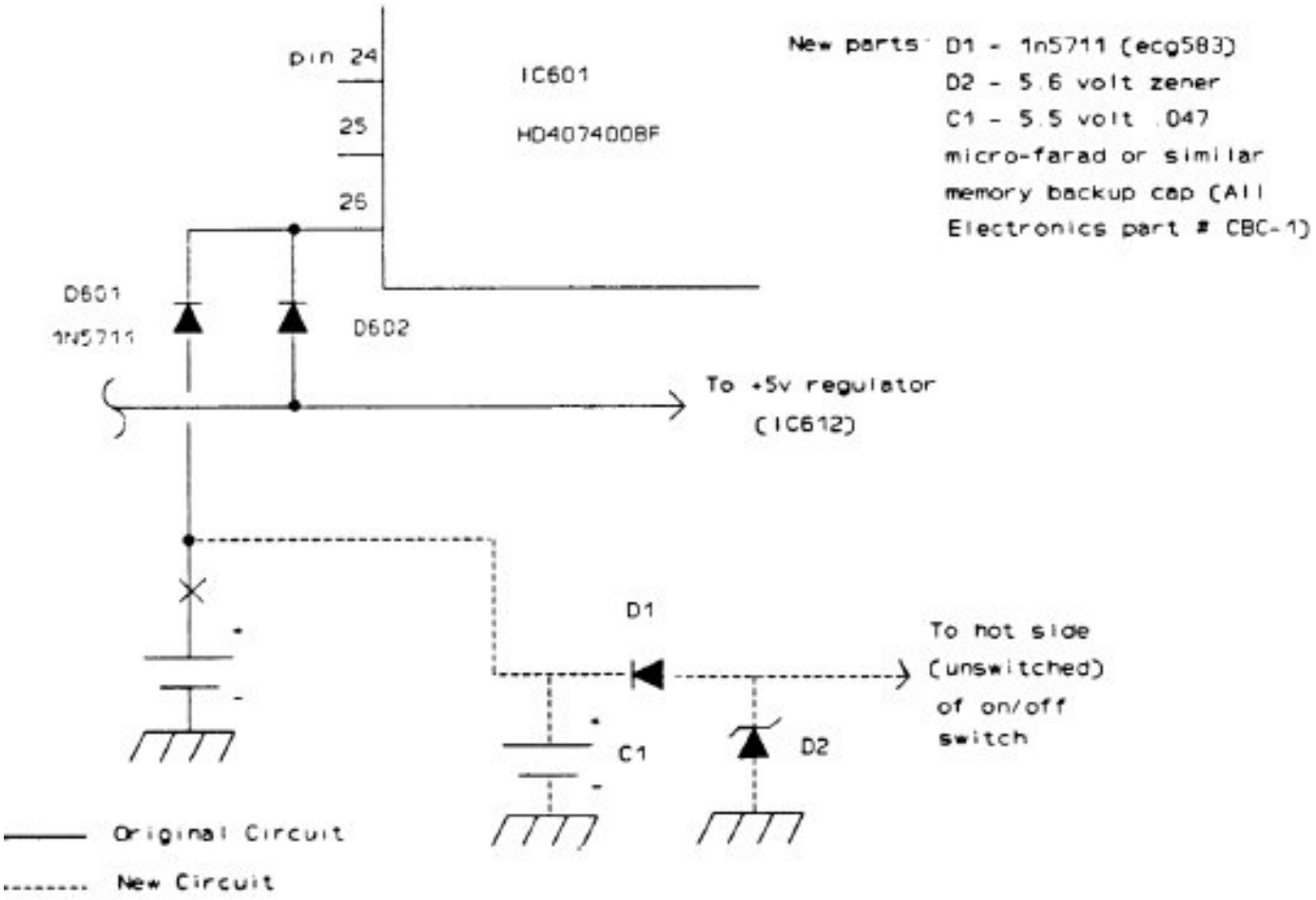
b. Battery elimination: while not tested at this time, the circuit described in this upgrade was adapted from the Realistic HTX-1 00 schematic and should function well with careful assembly.
Other memory caps to try would be from Hosfelt Electronics, part #15-343-2 (.1 F 5.5 volts), #90-155 (.22F 5.5 volts) or #15-363 (1.OF 5.5 volts). See the " Sources" section for parts house's addresses.

The above circuit can be built on a small piece of pert board and installed near the rear of the display board. To install:

a. remove the battery

b. tie in the new circuit (5.5 volt output) to where the positive side of where
battery was soldered

c. for 13.8 volt input, tie in other end of new circuit to the hot side, or unswitched side of the on/off switch



CLARIFIER MOD

There is a mod that you did not include that I personally could not do without. The mod is to unlock the clarifier. There is also another mod to prevent distortion from front end overload from very strong signals.

Here is how you do those mods:

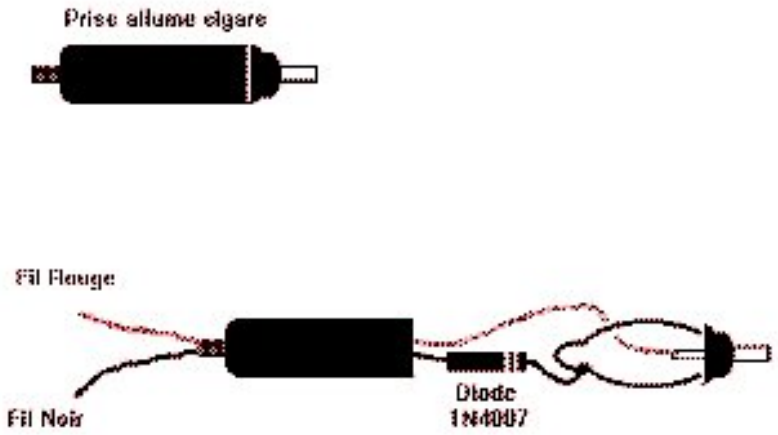
When you modify the clarifier it will not track on the display (it will give you about 1.5 Khz shift either way) but you will find it useful in CB mode because the frequency cannot be adjusted. It is also usful when using the rig mobile. You don't have to keep pushing the SHIFT key.

First, locate the wire harness that runs from the clarifier pot to the circuit board. Just in front of where it plugs into the board you will see **R-197** (this resistor usually has wax on it). Clip the top of the resistor. Now get a 6" peice of wire and solder it to the stub of wire sticking out of the board (not to the top of the resistor itself). Connect the other end of the wire to **pin 3 of IC6**, pin 3 is the leg closest to the front of the radio. IC6 is is the 7808A regulator on the mike plug side of the unit case twards the front of the radio. Next locate **D-59**, just to the left of the clarifier harness. It is a 1N4148 diode. Cut the wire part of this diode to disable it. If realignment is necessary use L27 for AM, L28 for LSB and L29 for USB.

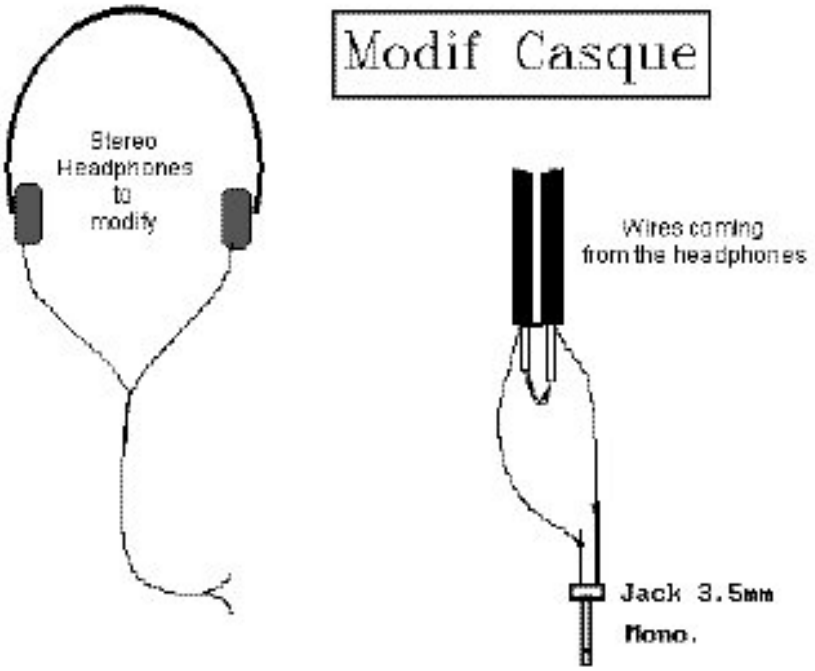
That's it.

If you have any problems with close stations being garbled sounding, its because of front-end overload. To reduce it find **R-49** in the middle of the board (100K resistor) Change it to a 33K resistor and it should help. I hope this might be helpful to you.

INSTALL MY RCI ON THE CAR'S LIGHTER



ADAPTATION OF STEREO HEADPHONES



LCD & LEDS

THE BACK LITE DISPLAY FOR THE 2950

In this mod. You will remove the filament bulbs and replace them with a low voltage light emitting diode .

Advantages of this mod. Are full controlthrough all four setting of your dim control.

This makes the voltage reg. Run cooler for that part of the radio. You can customize the colour of the back light instead of buy those other Slip covers for the filament bulbs .

This mod will also make the light emitting diodes that are under the touch Controls brighter ,as they run of the same supply.

The mod

Remove the front part of the radio and the board that has the display too so you can get right at those bulbs.

If you look at the board you will notice a + and **-** .

This is were the supply is coming from for the old bulbs . Remove the old bulbs . Now get some small wire and make it so you have a + and **-** at each side of that board .either that you will have to cut traces. What you are trying to do is make the bulbs independent of each other. Anyways back to the mod , so now you have a + and **-** wire for each new kind of bulb.

Now you will have to select a light emitting diode that runs on less power than the supply on that board puts out. Once you have done this you will have to select a resistor i picked a 10 k at one quarter of a watt .that seemed to match the diodes i used. This will differ each kind of light emitting diode selected .

Dont try to install the lite diodes in the same place as the filament bulbs this will defeat the purpose. When you install the diodes you only need one resistor for each side light emitting diodes are polarized they have a negative and positive hook them up backwards and they do not light up So when you are all done you should have full control on the dim.

If one lite diode blows the other stays going ,this willnot happen because of the resistor that is in line on each lite . The power reg for this supply should run cool no heat better performance i did my personal set one year ago in green lite and it still looks and runs fine .

Pretty simple mod i know it is alot cheaper than buyiny those little filament Bulbs .i for gotten to tell you light emitting diodes last longer than the Other.

From
Rick vanluven
Kingston ontario canada

DISPLAY CONTRAST MOD

First :

I had a problem with my RCI2950, once in a while the contrast dropped to almost zero. I tried to find the problem and after a while I had the idea that the contrast reference control on the display driver chip was sensitive and instable.

Due to this I came to the decision to put a little more load on the reference input of the display driver.

This was done by soldering a 1 mega ohm resistor to the middle contact of the contrast potentiometer and the display board ground.

In order to make this modification you need too do the following proceeder.

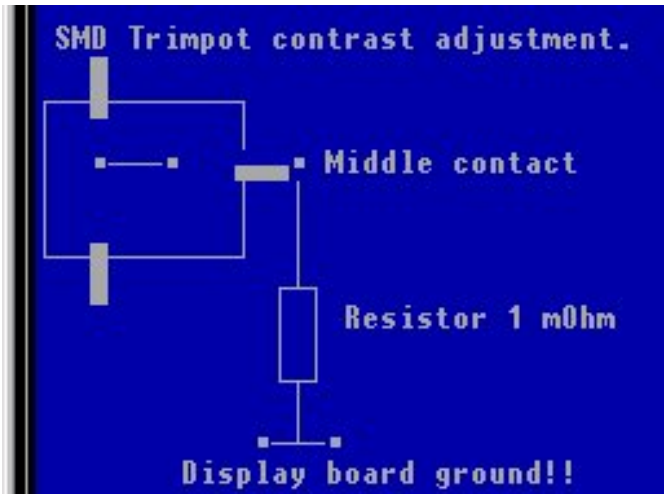
Remove the top and bottom cover from your RCI 2950. Carefully remove all the knobs from the front panel, loosen the four counter sunk phillips screws holding the face plate.

Remove face plate.

Loosen the two lowest two phillips screws. (these screws holding the push button circuit board) Remove the push button board extremely carefully by pulling this board in a parallel way toward you. Make sure you pull this board parallel, there are extremely long contacts.

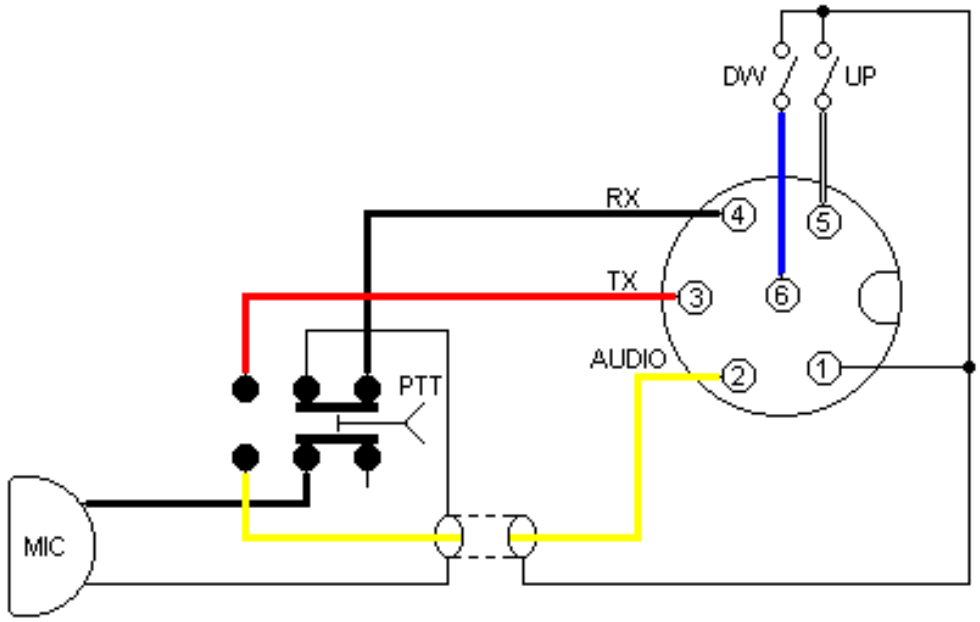
The contrast adjustment trimpot is in the centre of the display board and will be visual if the push button board has being removed.

The trim pot is a SMD (surface mounted) component and resistor should be soldered carefully.



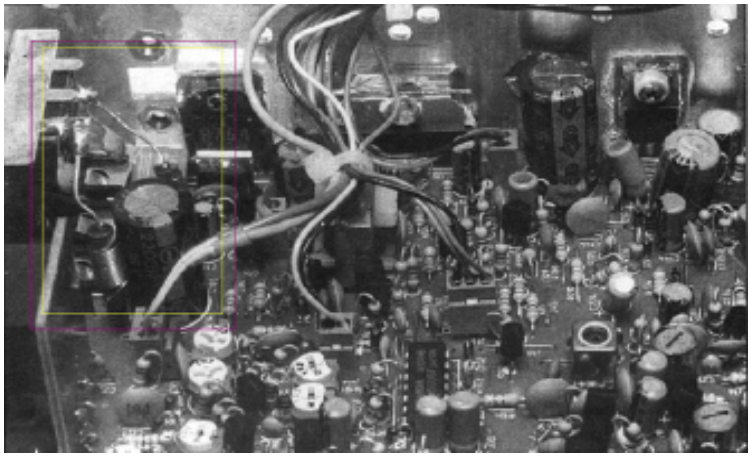
This modification solved my problem for the time being.

RCI-2950 MIKE Wiring

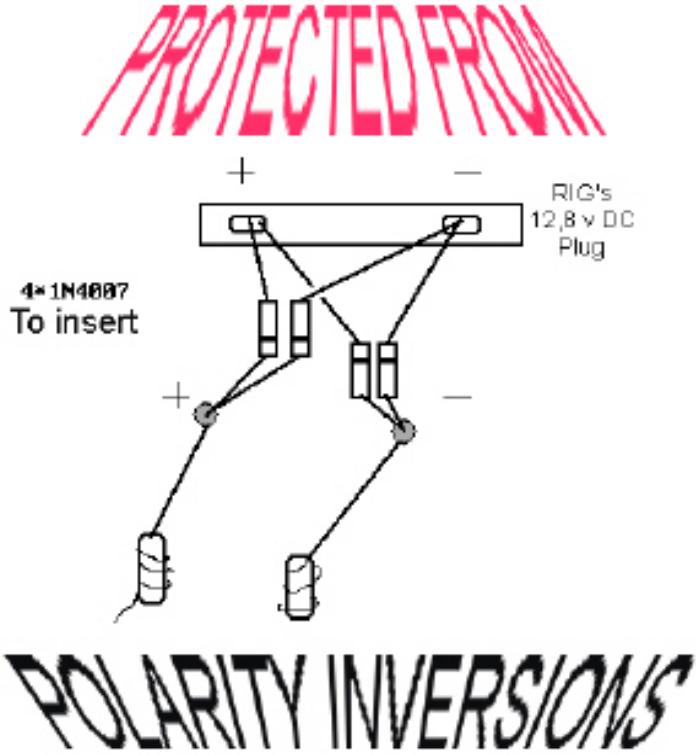
Standart wiring: 1. Ground Shield 2. Audio Yellow 3. Transmit Red 4. Receive Black 5. Channel. Up White 6. Channel. Down Blue	**TURNER 4-WIRE** 1. Ground Shield 2. Audio White 3. Transmit Black 4. Receive N/C 5. CH. UP N/C 6. CH. Down N/C	**TURNER 4-WIRE** 1. Ground Shield 2. Audio White 3. Transmit Black 4. Receive N/C 5. CH. UP N/C 6. CH. Down N/C
TURNER 6-WIRE 1. Ground Shield & Red 2. Audio White 3. Transmit Blue 4. Receive N/C 5. CH. UP N/C 6. CH. Down N/C	**ASTATIC 4-WIRE** 1. Ground Shield 2. Audio White 3. Transmit Red 4. Receive N/C 5. CH. UP N/C 6. CH. Down N/C	**ASTATIC 6-WIRE** 1. Ground Shield & Blue 2. Audio White 3. Transmit Red 4. Receive N/C 5. CH. UP N/C 6. CH. Down N/C
Sadelta: 1-Shield 2-White 3-Brown 4-Green 5-N/C 6-N/C		

PROTECT YOUR MOBILE RIG FROM POLARITY INVERSIONS

Yes you can ! This mod will let you reverse polarity on your set with no risks at all. Even more, it'll work as if nothing had happened. I'm sure some of you are going to bet with their friends. I did _



All you need (is love) is 4 diodes of the series 1N400x (1N4003 for instance). Insert them in the 12,5 V DC line as shown is the drawing. That `s all. Have fun and kick away one of the most frequent problem of troubleshooting in CB.



MOD FOR FASTER SCAN SPEED ...

First take the radio's top and bottom covers off then remove all the dials off the front face plate then take out the screws that hold the front face plate. Now you're looking at the lcd and button printed circuit board, remove the lcd printed circuit board .Now you should see the main proseser board. Lay the radio so that the solder side of the big main board is solder side downso that you can see the components. Now look at the board that has the proseser on it. If you look at the back side of the board (proseser board) where the battery goes you should see a blue rectangular shaped resonater marked 2.00g or 2.000 or 2000 kc that also would have a x1 or x2 etc number on the board near it that is also listed in the service manual as a resonator/crystal.

If you change the value of this part (remove it and replace it with a crystal) with a value of 8mhz will make the proseser run faster in turn giving you faster up\down on your mic, faster scan speed, faster memory scan, a shorter rodger beep sounds like or similar to 2510. My self when I experimented with my own radio I ran into trouble when I used a crystall with a value of 14mhz

- 14mhz (works but locks up the radio from time to time)

- 12mhz (was preaty much the same but didn't lock it up as much)

- 10mhz (worked fine but I wanted to run with 8mhz just to make sure)(the radio worked good in all mods all the time)

- 8mhz (would be what I would recomend not as fast as the others but is a lot more stable for daily usage and is a lot faster than stock

CAUTION:

BE SURE WHEN DOING THIS MOD YOU ARE CAREFUL NOT TO DAMAGE THE CIRCUIT BOARD AS MOST OF IT IS SURFACE MOUNT THE TRACES DAMAGE VERY EASILY

THE RESONATER IS STANDERD SIZE OF A CRYSTALL REMOVE THE RESONATER AND REPLACE IT WITH A CRYSTALL WITH WIRE LEADS NOT THE STANDARED PLUG IN TYPE AS THEY WONT FIT

My method of desoldering the resonater was with a solder sucker with a heated tip.

Where to get crystalls? old pc/xt/at motherboards from computers otherwise you will pay about $10cdn for them.

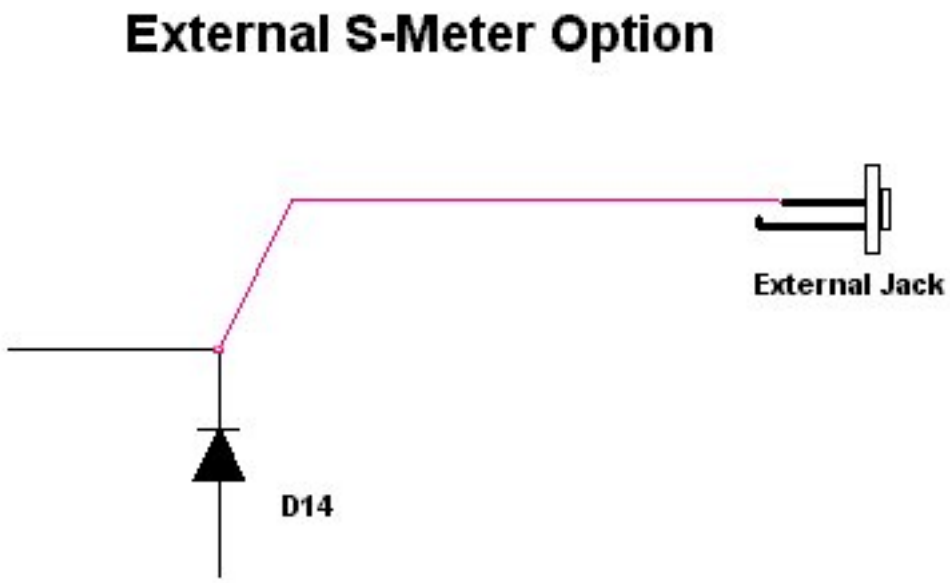
To assemble radio just do the reverse of the dissasembly

I found a two lead 9.6Mhz crystal that does work. The problem I found with this mod is that when I turn the 2950 off, then on, it resets the memory which is very anoying. What I did to resolve this was to wire both the 4Mhz and the 9.6Mhz at the same time. I put a SPST switch in the circut for the 4Mhz (original component). When I switch the 4Mhz out of the circut, the Scan is faster. When I switch the 4Mhz back into the circut, it slows the scan back to original, and makes the rig shut off correctly and turn back on with all the memory intact.

EXTERNAL S-METER

The RCI does not have any external plug to use a S-Meter. With this mod, you can add one. If you compare most of the base rig which have this option, you can see that everything is around VR1 & VR2 squelch components.

Ths signal you need to catch for the external meter is present on the cathode of the diode D14. All you have to do is to add a female jack 3,5 plug to the back of the rig. You will put a wire from **D14 cathode** to the central pole of the jack plug.



TALK BACK MODIFICATION

· Well here go's The talk back is done by cliping one end of D-78. or you can wire a spdt switch to switch on and off!

· A common way to obtain talk-back on the 2950 is to lift one leg of the diode marked D-78. Many times, a switch is installed to create a switchable talk-back. This is probably not the only way to enable the talk-back feature, but it's an easy way. To disable the talk-back, make sure there's a 1N914 type diode in the D-78 position. If that doesn't work, trace the D-78 circuit to make sure nobody performed the mod by cutting a trace on the solder side of the board. To locate D-78, remove the covers. Orient the radio with the speaker side up, and the display facing you. In the upper right quadrant, you'll see IC-14 (the audio IC) mounted to the chassis. You'll also see T-1 to the left of IC-14. D-78 is toward the front of the radio a bit from T-1. I hope this helps and good luck..

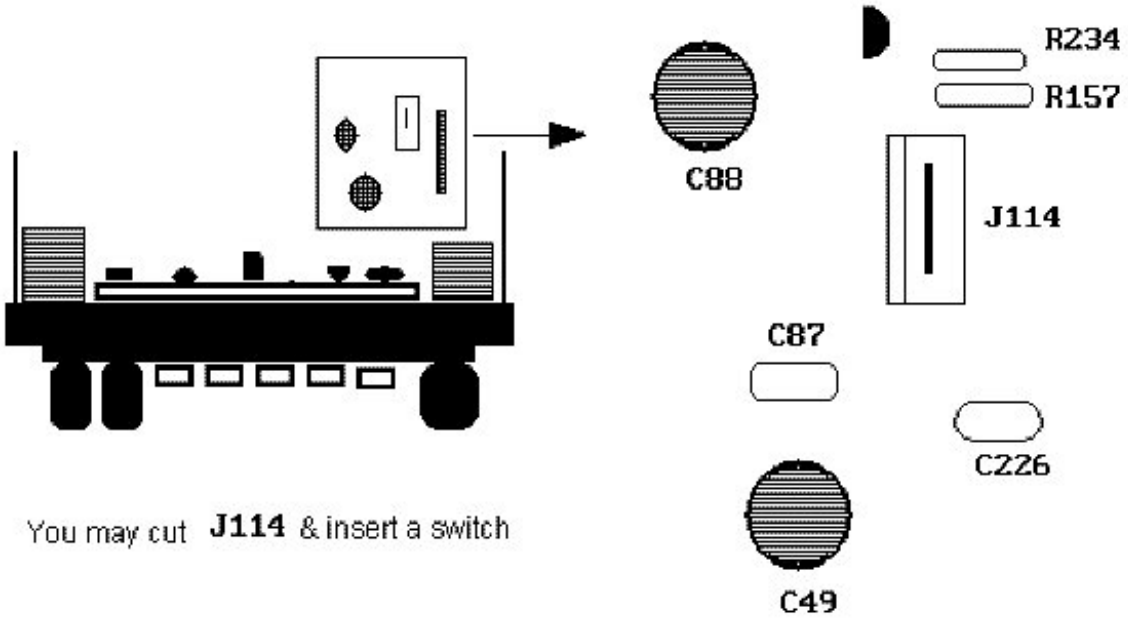
· The removal of D-78 will indeed provide a talk-back, but it will be very scratchy and distorted. Try it this way instead:

1. Cut D-78 . Wire a SPST switch in series with D-78 to make it switchable.
2. Replace D-115 with a .0047uF disc cap.

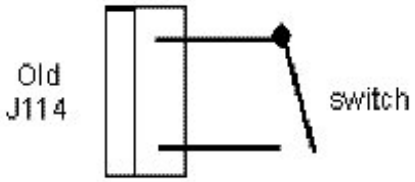
You will now have a clear and natural sounding talkback guaranteed to make you smile!

TONE MODIFICATION

You need to listen with confort ? Add a tone capability to your RCI. Very simple.



You may cut **J114** & insert a switch

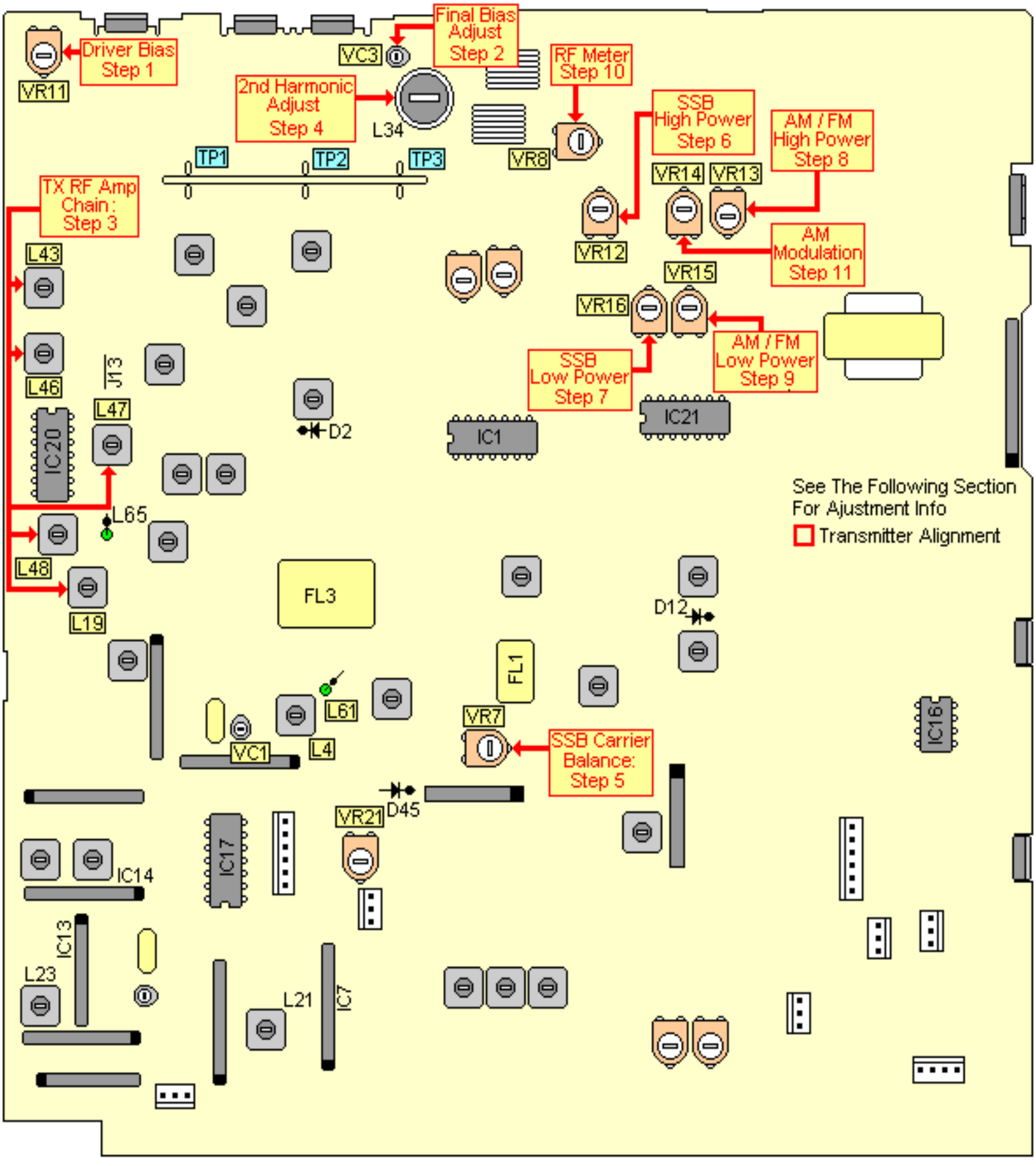


RCI 2950 *TX Alignment* TX Alignment Locations

SETTINGS	CONNECTION	ADJUST	ADJUST FOR
Remove TP1, TP2, TP3 Jumper PCB.			
DRIVER BIAS: Set mode to LSB Mic Gain to minimum	Connect DC Ammeter between TP9 and TP8.	**VR11**	In TX adjust for 50-75mA.
FINAL BIAS: Set mode to LSB Mic Gain to minimum	Connect DC Ammeter between TP9 and TP7.	**N/A**	In TX check for 160-180mA.
Replace TP1, TP2, TP3 Jumper PCB.			
Mode LSB Frequency to 28.000MHz Adjust VR14 fully counterclockwise. Adjust VR12 fully counterclockwise. Set generator for 30mV RMS, 1KHz sinewave.	Connect an audio generator to (pin 2) and ground (pin 1) of Mic connector. Connect a wattmeter and 50ohm dummy load to the antenna connector. Set wattmeter for 30W scale.	**Mic Gain**	Key the transmitter and slowly increase Mic Gain until you obtain about 10W.
		L19, L48 L47, L46, L43, VC3	Adjust for maximum reading on wattmeter. Reduce RF gain if necessary to maintain about 10 to 15W on wattmeter.
Increase Mic gain to maximum (fully clockwise).	Same as above.	**L34**	Adjust for maximum output power
SSB CARRIER BALANCE: Set mode to USB MIKE GAIN to minimum.	Same as above.	**VR7**	Key TX; adjust for minimum carrier on scope or wattmeter. If necessary readjust for best balance of sideband suppression between LSB & USB
SSB HIGH PWR: With Mic gain still a maximum on LSB Set RF PWR control on radio to minimum.	Same as above.	**VR12**	Key the transmitter and adjust for 28W.
SSB LOW PWR: With Mic gain still a maximum on LSB Set RF PWR control on radio to minimum.	Same as above.	**VR16**	Key the transmitter and adjust for 10W.
AM POWER HIGH: Set RF PWR control on radio to maximum Put mode selector on AM. Mic Gain to minimum	Connect a wattmeter and 50ohm dummy load to the antenna connector. Set wattmeter for 30W scale.	**VR13**	Key transmitter with no modulation applied and adjust for 10W.
AM POWER LOW: Set RF PWR control on radio to minimum. Mic Gain to minimum	Connect a wattmeter and 50ohm dummy load to the antenna connector. Set wattmeter for 30W scale.	**VR15**	Key transmitter with no modulation applied and adjust for 2W.
RF METER: Set RF PWR control on radio to maximum. Mic Gain to minimum.	Connect a wattmeter and 50ohm dummy load to the antenna connector. Set wattmeter for 30W scale.	**VR8**	Adjust so panel meter agrees with Wattmeter.
AMC: Mode to AM Set generator for 30mV RMS, 1KHz sinewave. With Mic gain at maximum	Same as above.	**VR14**	Adjust for 100% modulation. Use modulation meter or oscilloscope with RF sampler.
FM DEVIATION: Put mode selector on FM	Key transmitter and check for 4kHz deviation ± 0.5 kHz. Use deviation meter or service monitor.	**N/A**	Simply check for sufficient transmit audio. **There is no deviation adjustment provided in this radio.**

Ranger RCI-2950

Alignment Locations TX



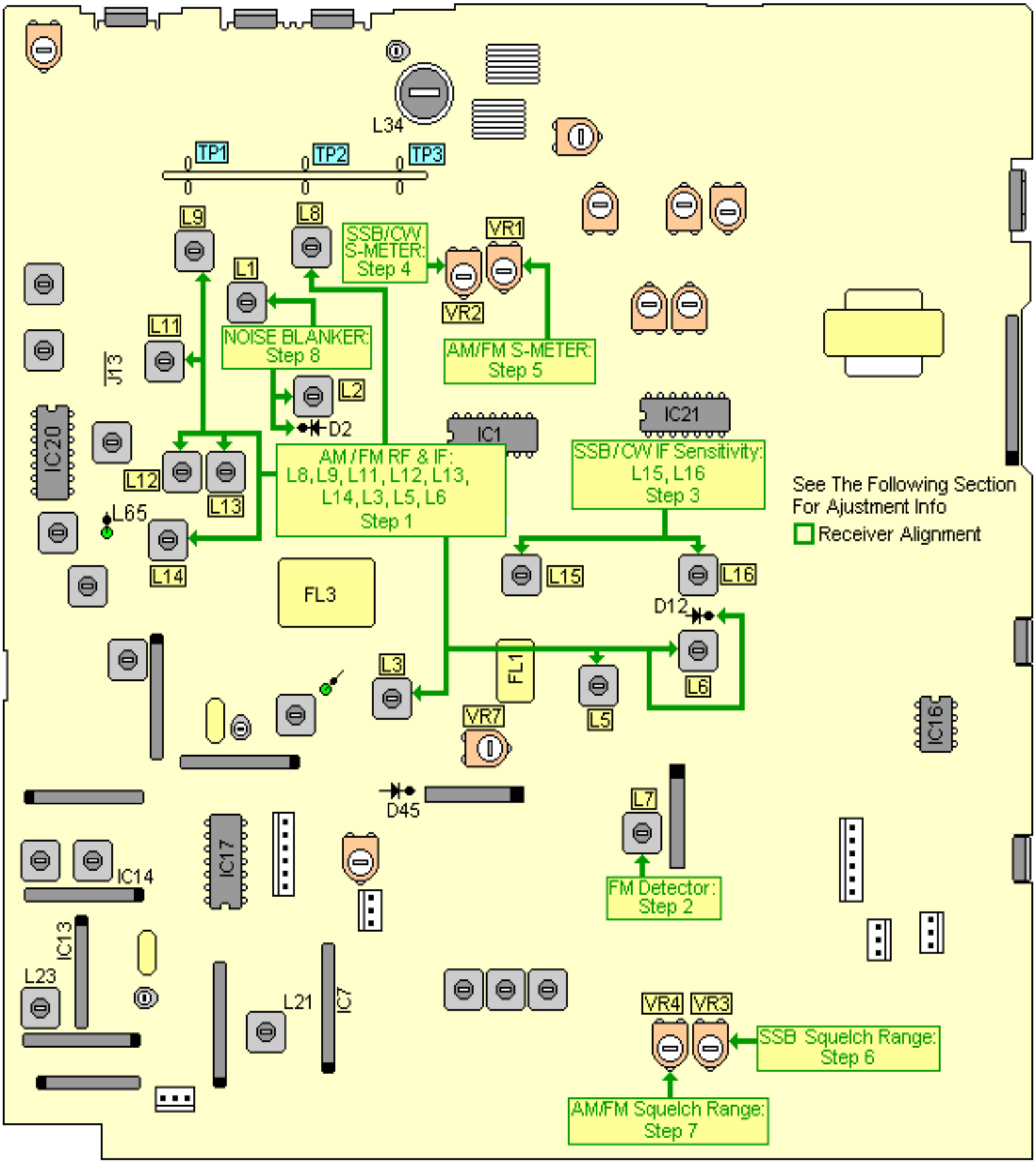
RCI 2950 *RX Alignment*

RX Alignment Locations

SETTINGS	CONNECTION	ADJUST	ADJUST FOR
AM/FM RF & IF SENSITIVITY: Put mode selector on FM, RF gain fully clockwise, Clarifier at 12 o'clock, frequency at 28.0300 MHz.	Connect an FM signal generator to the antenna connector. Set modulation for ±3 kHz, output level at 0.5uV. Connect a SINAD meter to the external speaker jack, volume control at about 10 o'clock. Connect an oscilloscope with a X10 probe to the **Cathode of D12**. Set sweep selector for 1uS per division and vertical input selector for 10mV per division.	**L8**	Adjust for best SINAD reading and least distorted waveform on scope. Do not try tuning this coil for maximum, as this will result in degraded receiver performance.
		L9, L11 L12, L13 L14, L4 L3, L5 and L6	Adjust for maximum on scope. Reduce generator level if necessary, so as not to exceed vertical height on scope.
		L5 L6	Adjust for best SINAD
FM DETECTOR: Mode FM. Set FM RF Generator to 26.965 MHz 0.5uV deviated 3 KHz with 1KHz audio tone. Reduce VOLUME as required.		**L7**	Adjust for maximum audio output.
SSB IF SENSITIVITY: Put mode selector on LSB.	Signal generator to 28.0290 MHz, modulation off, output level at .5uV. Adjust Clarifier for best SINAD reading. Connect oscilloscope same as above.	**L15 L16**	Adjust for maximum on scope.
SSB S-METER: Set mode to USB. Increase RF Generator output to 26.966 MHz100uV (-67 dBm) unmodulated. Set Squelch fully counterclockwise.	RF Generator to ANT Jack	**VR2**	Adjust for “S-9” meter reading.
AM/FM S-METER: Set mode to AM. RF Generator output to 100uV unmodulated. Set Squelch fully counterclockwise.	Same as above	**VR1**	Adjust for “S-9” meter reading.
AM/FM SQUELCH RANGE: Increase RF Generator output to 10mV. Set Squelch Control fully clockwise.	Same as above	**VR3**	Adjust to the squelch just closes.
SSB SQUELCH RANGE: Set mode to USB.	Same as above	**VR4**	Adjust to the squelch just closes.
NOISE BLANKER: Set radio to 26.975MHz Set mode to AM. Set RF generator output to 26.965MHz at 1000uV unmodulated. Set NOISE BLANKER switch to “ON”.	Connect DC Voltmeter to TP1 **(Cathode of D2)**	**L1, L2**	Adjust for maximum DC voltage.

Ranger RCI-2950

Alignment Locations RX



Ranger RCI-2950 PLL Alignment

PLL Alignment Locations

SETTINGS	CONNECTION	ADJUST	ADJUST FOR
Remove TP1, TP2, TP3 Jumper PCB.			
VCO & OSC: Frequency: 28.0000 MHz MIC Gain: Fully counter-clockwise RF Power. Fully clockwise RF Gain: Fully clockwise Clarifier: 12 o'clock Vol : Comfortable level Squelch: Fully counter-clockwise Mode selector - AM	Disconnect shorting board from test points TP1, TP2 and TP3 Connect Freq. Counter to L61	**VC1**	Adjust for reading of 10.240MHz ± 10Hz.
	Connect Oscilloscope to L61	**L4**	Adjust for Max.
	Connect a Freq. Counter to L65	**VC2**	Adjust for 17.305MHz ±10Hz.
	Connect a Freq. Counter to L65	**VR21**	Key Transmitter and adjust for 17.305MHz ±10Hz.
	Connect Voltmeter to IC7 Pin3	**L21**	Adjust for 1.2VDC ±.1VDC.
	Connect Voltmeter to J13	**L17**	Adjust for 2.0VDC ±.1VDC.
	Connect Oscilloscope to L65	**L19**	Adjust for Max.
	Connect Freq. Counter to IC13 pin8	**L23**	Very carefully adjust for 11.350MHz ±10Hz.
	Connect Oscilloscope to IC17 pin13	**L24** **L25**	Very carefully adjust and for best waveform
AM TX OSC: Same as above	Connect a frequency counter to cathode of D45	**L27**	Key transmitter and adjust for 10.6950 MHz ±10Hz.
USB TX OSC: Adjust VR7 fully clockwise. Put mode selector on USB.	Leave frequency counter connected to D45	**L29**	Key transmitter and adjust for 10.6925 MHz ±10Hz.
LSB TX OSC: Put mode selector in LSB. After adjustment return VR7 to approximate middle of rotation.	Leave frequency counter connected to D45	**L28**	Key transmitter and adjust for 10.6975 MHz ±10Hz.
Replace TP1, TP2, TP3 Jumper PCB.			

Ranger RCI-2950

Alignment Locations PLL