TABLE OF CONTENTS

1.0 GENERAL

Model	CX-4400 / CX-4400 HP
Frequency Range	28.245-29.585MHz.
Emission Modes	AM/FM (A3/F3)
Frequency Control	Phase Lock Loop (PLL) synthesizer.
Frequency Tolerance	± 0.001 %.
Frequency Stability	± 0.005 %.
Operating Temperature Range	-30°C to +50°C.
Microphone	Dynamic PTT 500Ω
Input Voltage	13.8V DC
Current Drain : Transmit (AM full mod.)	< 5.0 A.
Current Drain : Receiver (Squelched)	≤ 0.25A.
(Max. audio output)	< 0.5A.
Antenna Connector	50 Ohms
Dimensions	7 7/8"(W) x 9 1/4"(D) x 2 3/8 (H)
Weight	5.0 lb.

1.1 TRANSMITTER

RF Power Output (AM/FM) : CX-4400	1W(L); 3.5W(M); 7W(H)
: CX-4400 HP	1W(L); 3.5W(M); 10W(H)
RF Transmit Modes	AM/FM.
AM Modulation	High and low level Class B, Amplitude Modulation.
Spurious Emissions	Better than -50 dB.
Audio Frequency Response	300 to 2500 Hz
Antenna Impedance	50 Ohms.
Output Indicators	Meter shows relative RF output power and receive signal. Transmit LED glows red when transmitter is in operation.

1.2 RECEIVER

Sensitivity For 10dB S/N (AM)	< 1 μV.
Sensitivity For 20dB S/N (FM)	< 1 μV.
IF Frequency	AM : 10.695 MHz 1st IF, 455 KHz 2nd IF.
Image Rejection	> 50 dB.
Adjacent Channel Selectivity	> -55 dB.
RF Gain Control	> 30 dB adjustable for optimum signal reception.
Automatic Gain Control (AGC) Figure Of Merit	50 mV for 10 dB Change in Audio Output.
Squelch	Adjustable; threshold less than 0.5 μV.
Noise Blanker	RF type.
Audio Output Power	2.5W@ 10% Distortion
Audio Frequency Response	300 to 2500 Hz.
Built-in Speaker	8 Ohms, 5 Watts
External Speaker (Not Supplied)	8 Ohms; disables internal speaker when connected.

(SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE)

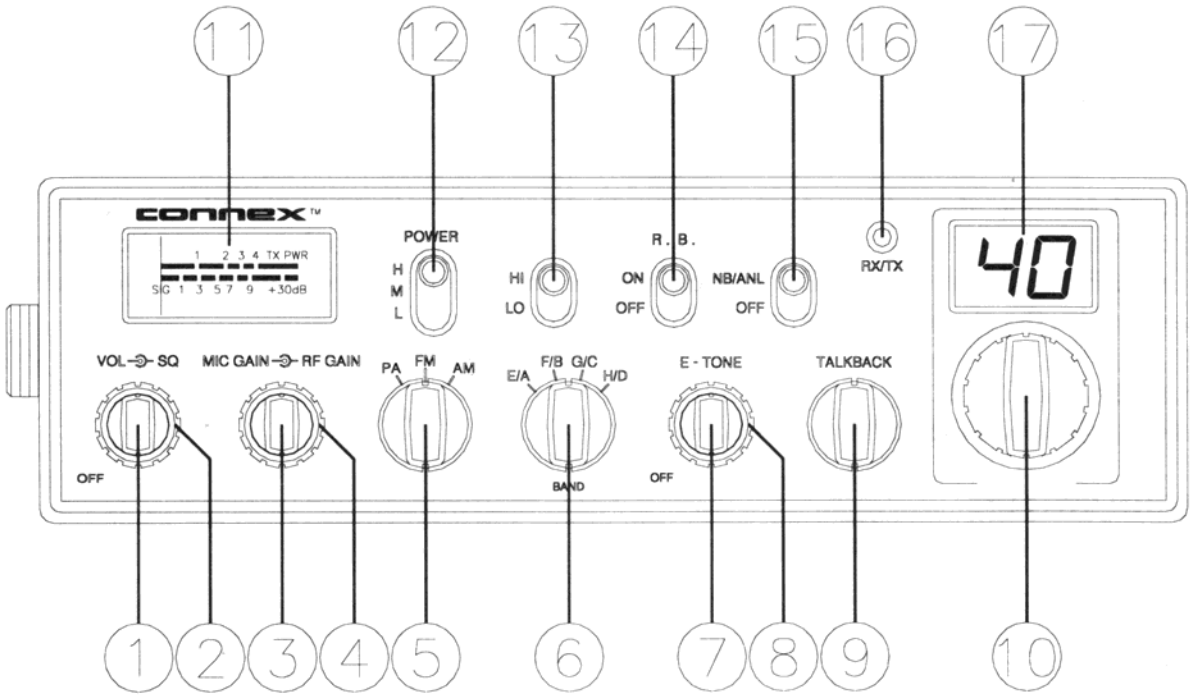


Figure 2-1 Front Panel

2.0 INTRODUCTION

This section explains the basic operating procedures for the CX-4400 / CX-4400 HP mobile transceiver.

2.1 CONTROL AND CONNECTIONS

2.1.1 FRONT PANEL

Refer to the above Figure 2-1 for the location of the following controls.

1. ON/OFF VOLUME CONTROL

This knob controls the volume and the power to the radio. To turn the radio on, rotate the knob clockwise. Turning the knob further will increase the volume of the receiver.

2. SQUELCH CONTROL

This switch is used to eliminate background noise being heard through the receiver which can be disturbing when no transmissions are being received. To use this feature of your radio, gently turn the switch counterclockwise until the switch will not turn further. Then turn the switch clockwise until the background noise is just eliminated. If you turn the switch too far in a clockwise direction, you may not be able to hear weak transmissions.

3. MIC GAIN CONTROL
Adjusts the microphone gain in the transmit and PA modes. This controls the gain to the extent that full talk power is available several inches away from the microphone. In the Public Address (PA) mode, the control functions as the volume control.

4. RF GAIN CONTROL
This control is used to reduce the gain of the amplifier under strong signal conditions.

5. MODE SWITCH
This control allows you to select one of the following operating modes : PA/FM/AM.

In the PA position, the radio acts as a public address amplifier. Your voice will come out of the speaker that is plugged into the PA. SP. jack on the rear panel. The radio does not operate when you are in the PA mode. In the FM/AM position, the PA function is disabled and the unit will transmit and receive on the speaker that is connected to the radio.

6. BAND SELECTOR
This switch is used to select the band of operation (A-H).

7. ECHO SWITCH
This control is used for echo effect.

8. TONE CONTROL
This control is used to control the intervals of echo sound.

9. TALKBACK/OFF CONTROL
Adjust this knob for desired volume of Talkback. This is used to monitor your own voice. For example, you could use this feature to compare different microphones.

10. CHANNEL SELECTOR
This control is used to select a desired transmit and receive channel.

11. FRONT PANEL METER
The Front Panel Meter allows the user to monitor signal strength and RF output power.

12. RF POWER SWITCH
This switch is used to select the high (H), medium (M) or low (L) transmitting power.

13. BAND SWITCH
This switch selects HI or LO band of operation

14. ROGER BEEP SWITCH
When the Roger Beep is on, the radio transmits an audio tone at the end of your transmission to indicate that transmission has ended. As a courtesy to others, use the Roger Beep only when necessary.

15. NB/ANL/OFF SWITCH
In the NB/ANL position, the RF Noise Blanker and the Automatic Noise Limiter in the audio circuits are also activated. The Noise Blanker is very effective in eliminating repetitive impulse noise such as ignition interference.

16. TX/RX LED

The red LED indicates the unit is in the transmit mode. The green LED indicates the unit is in receive mode.

17. CHANNEL DISPLAY

The channel display indicates the current selected channel.

2.1.2 REAR PANEL

Figure 2-2 represent the location of the following connections :

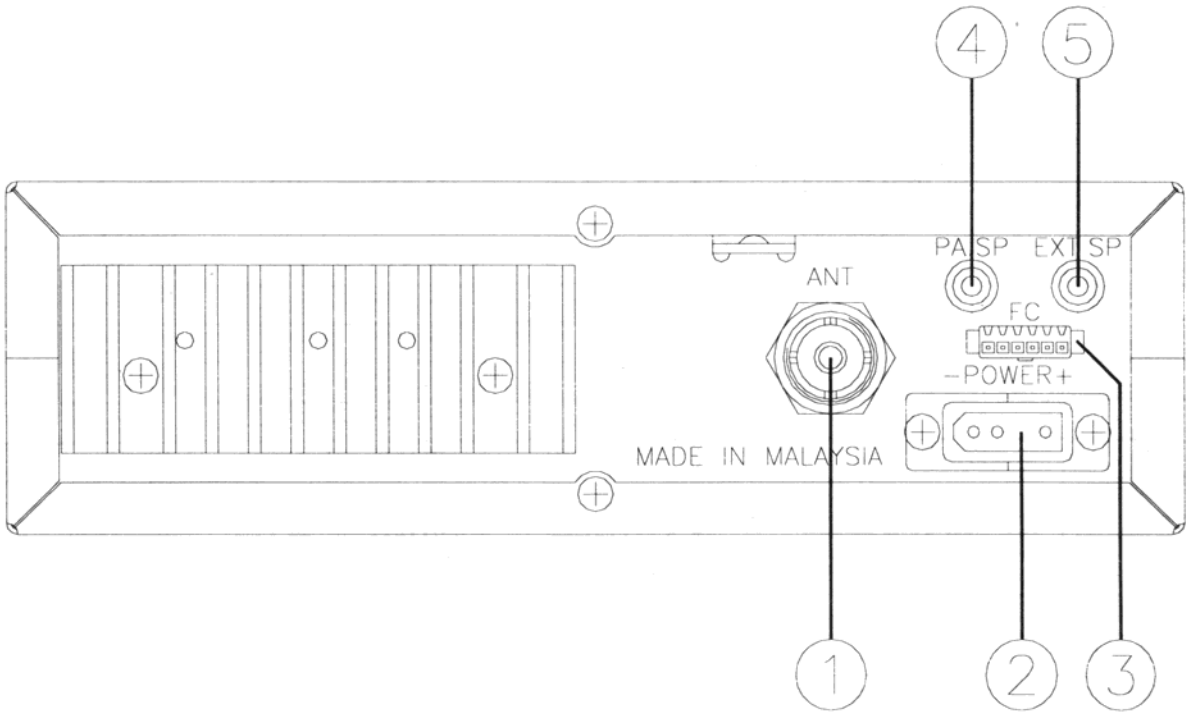


Figure 2-2 Rear Panel

1. ANTENNA

This jack accepts 50 ohms coaxial cable with a PL- 259 type plug.

2. POWER

This connector accepts 13.8V DC power cable with built-in fuse. The power cord provided with the radio has a black and red wire. The black goes to negative and the red goes to positive.

3. F.C.

This connector is used for an external frequency counter which indicates the frequency of the selected channel.

4. PA. SP.

This jack is for PA operation. Before operating, you must first connect a PA speaker (8 ohms, 4W) to this jack.

5. EXT. SP.

This jack accepts 4 to 8 ohms, 5 watts external speaker. When the external speaker is connected to this jack, the built-in speaker will be disabled.

2.1.3 FREQUENCY CHART

CHANNEL	A BAND(MHz)	B BAND (MHz)	C BAND (MHz)	D BAND (MHz)
1	29.145	28.315	28.765	29.215
2	29.155	28.325	28.775	29.225
3	29.165	28.335	28.784	29.235
4	29.185	28.355	28.805	29.255
5	29.195	28.365	28.815	29.265
6	29.205	28.375	28.825	29.275
7	29.215	28.385	28.835	29.285
8	29.235	28.405	28.855	29.305
9	29.245	28.415	28.865	29.315
10	29.255	28.425	28.875	29.325
11	29.265	28.435	28.885	29.335
12	29.285	28.445	28.905	29.355
13	29.295	28.465	28.915	29.365
14	29.305	28.475	28.925	29.375
15	29.315	28.485	28.935	29.385
16	29.335	28.505	28.955	29.405
17	29.345	28.515	28.965	29.415
18	29.355	28.525	28.975	29.425
19	29.365	28.535	28.985	29.435
20	29.385	28.555	29.005	29.455
21	29.395	28.565	29.015	29.465
22	29.405	28.575	29.025	29.475
23	29.435	28.605	29.055	29.505
24	29.415	28.585	29.035	29.485
25	29.425	28.595	29.045	29.495
26	29.445	28.615	29.065	29.515
27	29.455	28.625	29.075	29.525
28	29.465	28.635	29.085	29535
29	29.475	28.645	29.095	29.545
30	29.485	28.655	29.105	29.555
31	29.495	28.665	29.115	29.565
32	29.505	28.675	29.125	29.575
33	29.515	28.685	29.135	29.585
34	29.525	28.695	29.145	29.595
35	29.535	28.705	29.155	29.605
36	29.545	28.715	29.165	29.615
37	29.555	28.725	29.175	29.625
38	29.565	28.735	29.185	29.635
39	29.575	28.745	29.195	29.645
40	29.585	28.755	29.205	29.655

FREQUENCY CHART

CHANNEL	E BAND (MHz)	F BAND (MHz)	G BAND (MHz)	H BAND (MHz)
1	28.245	28.695	29.145	28.315
2	29.255	28.705	29.155	28.325
3	28.265	28.715	29.165	28.335
4	28.285	28.735	29.185	28.355
5	28.285	28.745	29.195	28.365
6	28.295	28.755	29.205	28.375
7	28.305	28.765	29.215	28.385
8	28.315	28.785	29.235	28.405
9	28.335	28.795	29.245	28.415
10	28.345	28.805	29.255	28.425
11	28.355	28.815	29.265	28.435
12	28.365	28.835	29.285	28.455
13	28.395	28.845	29.295	28.465
14	28.405	28.855	29.305	28.475
15	28.415	28.865	29.315	28.485
16	28.435	28.885	29.335	28.505
17	28.445	28.895	29.345	28.515
18	28.455	28.905	29.355	28.525
19	28.465	28.915	29.365	28.535
20	28.485	28.935	29.385	28.555
21	28.495	28.945	29.395	28.565
22	28.505	28.955	29.405	28.575
23	28.535	28.985	29.435	28.605
24	28.515	28.965	29.415	28.585
25	28.525	28.975	29.425	28.595
26	28.545	28.995	29.445	28.615
27	28.565	29.005	29.455	28.625
28	28.575	29.015	29.465	28.635
29	28.585	29.025	29.475	28.645
30	28.595	29.035	29.485	28.655
31	28.605	29.045	29.495	28.665
32	28.615	29.055	29.505	28.675
33	28.625	29.065	29.515	28.685
34	28.635	29.075	29.525	28.695
35	28.705	29.085	29.535	28.705
36	28.645	29.095	29.545	28.715
37	28.655	29.105	29.555	28.725
38	28.675	29.115	29.565	28.735
39	28.745	29.125	29.575	28.745
40	28.755	29.135	29.585	28.755

2.2 MICROPHONE

The receiver and transmitter are controlled by the push-to-talk switch on the microphone. Press the switch and the transmitter is activated, release switch to receive. When transmitting, hold the microphone two inches from the mouth and speak clearly in a normal voice. The radio comes complete with a low impedance (500 ohm) dynamic microphone.

2.3 OPERATION

2.3.1 PROCEDURE TO RECEIVE

1. Be sure that power source, microphone and antenna are connected to the proper connectors before going to the next step.

2. Turn unit on by running **VOL.** knob clockwise on transceiver.

3. Set the **VOL.** to a comfortable listening level.

4. Set the **MODE** switch to the desired mode.

5. Listen to the background noise from the speaker. Turn the **SQ** knob slowly clockwise until the noise just disappears. Leave the control at this setting. This **SQ** is now properly adjusted. The receiver will remain quiet until a signal is actually received. Do not advance the control too far or some of weaker signals will not be heard.

6. Set the **CHANNEL** selector switch to the desired channel.

7. Set the **RF GAIN** control fully clockwise for maximum receive gain.

2.3.2 PROCEDURE TO TRANSMIT

1. Select the desired channel of transmission

2. Set the **MIC GAIN** control fully clockwise.

3. If the channel is clear, depress the push-to-talk switch on the microphone and speak in a normal voice.

2.4 ALTERNATE MICROPHONES AND INSTALLATION

For best results, the user should select a low impedance dynamic type microphone or a transistorized microphone. Transistorized type microphones have a low output impedance characteristic. The microphones must be provided with a four-lead cable. The audio conductor and its shielded lead comprise two of the leads. The third lead is for transmit control and the fourth is for receive control. The microphone should provide the functions shown in schematic below (Figure 2-3).

4 WIRE MIC CABLE

Pin Number	Mic Cable Lead
1	Audio Shield
2	Audio Lead
3	Transmit Control
4	Receive Control

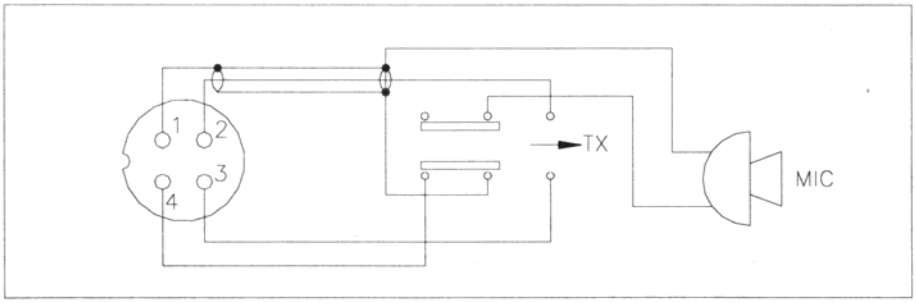


Figure 2-3 Transceiver Microphone Schematic

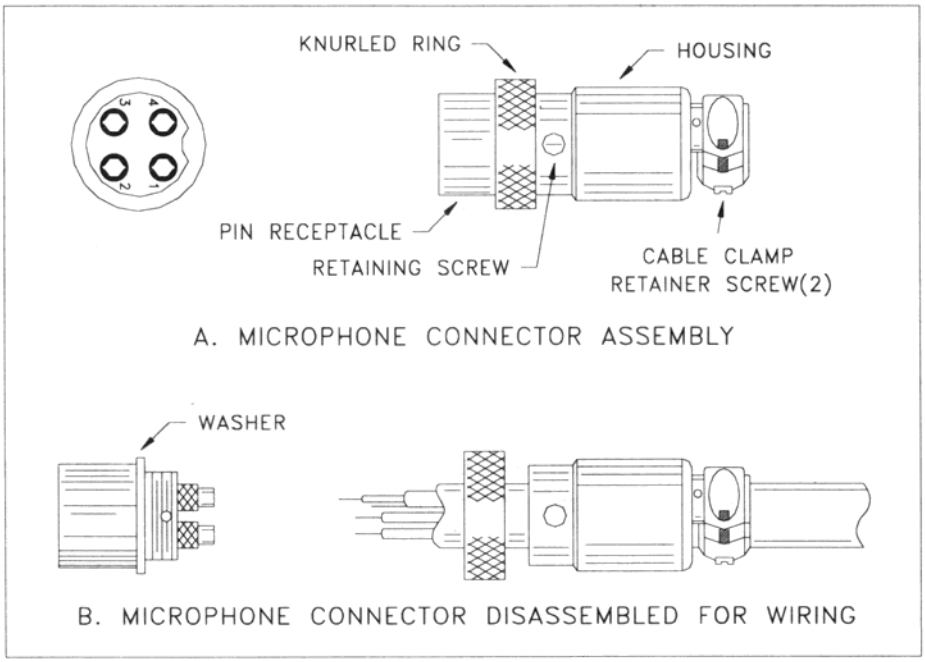


Figure 2-4 Microphone Plug Wiring

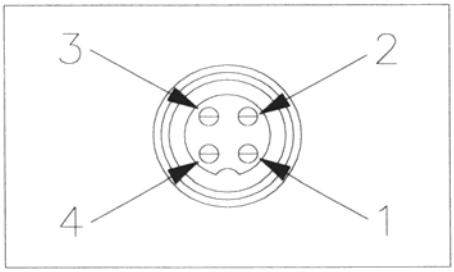


Figure 2-5 Microphone plug pin numbers viewed from rear of pin receptacle.

3.0 INTRODUCTION

This section explains the technical theory of operation for the CX-4400 / CX-4400 HP mobile transceiver.

3.1 PLL CIRCUIT

The Phase Lock Loop (PLL) circuit is responsible for developing the receiver's first local oscillator signal and the transmitter's exciter signal. The PLL circuit consists primarily of IC2, IC3, IC4, IC5 Q25, Q27, Q28, Q29 and Q61. The PLL circuit is programmed by the user's rotary channel switch GPS-0501. The switch allows GPS-0501 to communicate the correct binary data information to the programmable divider inside of IC3. IC3 then controls the VCO (Voltage Controlled Oscillator), to oscillate on the correct frequency. This signal is fed either into the receiver's first mixer (for receive operation) or the transmitter's mixer (for transmit operation).

3.2 RECEIVER CIRCUIT

The incoming receive signal come into the radio via the antenna and into the front end pre-amp consisting of Q17. The RF signal is fed into the mixer circuit of the Q18 & Q19 and then into the AM IF section of the receiver (depending on the mode of operation). The signal is then detected by either the AM detector or product detector and then fed to the audio amplifier section of the receiver and finally out to the speaker.

3.3 TRANSMITTER MODULATION CIRCUIT

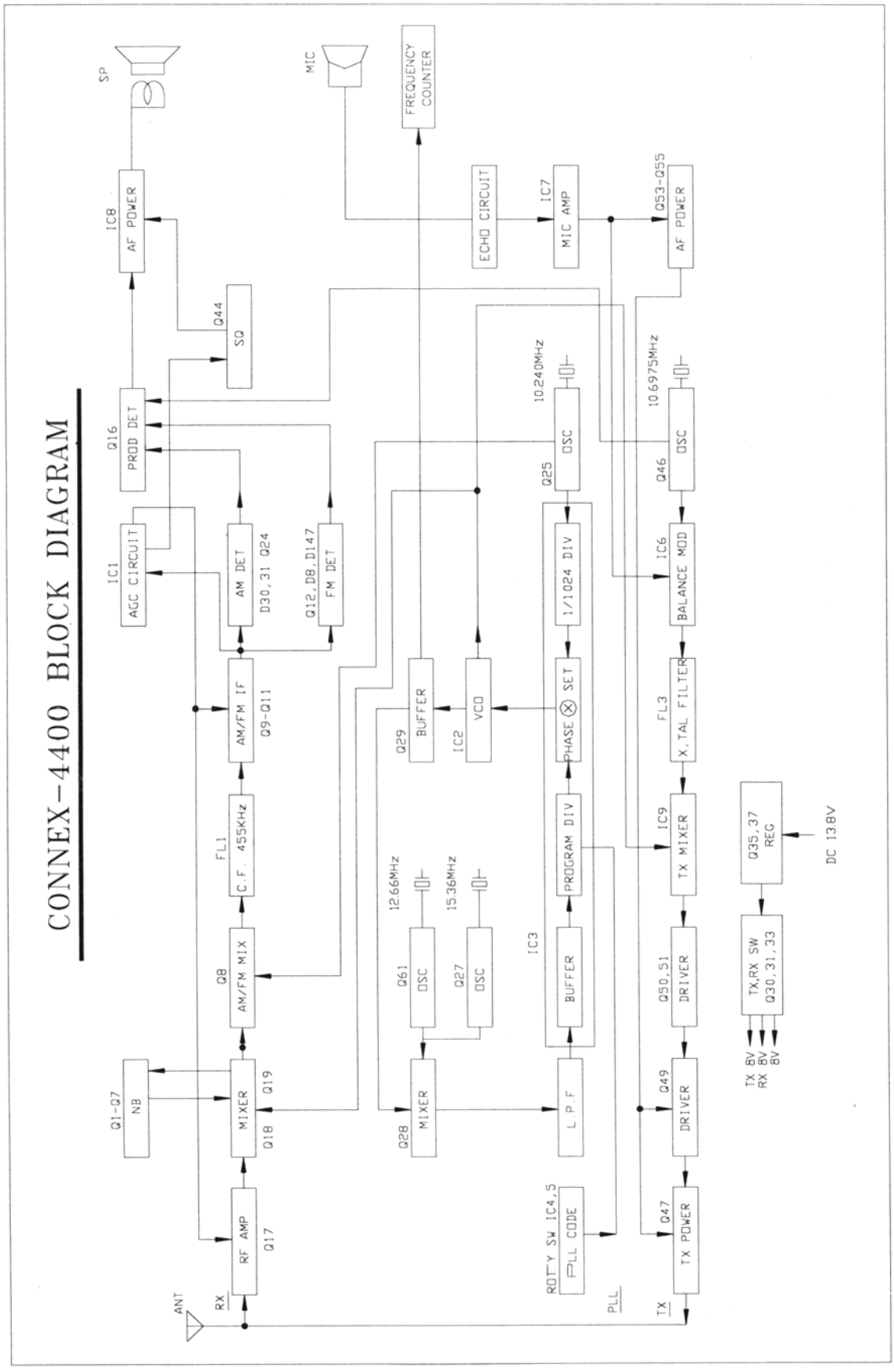
(i) The transmitter modulation circuit modulates the low level RF signal from the PLL exciter circuit with the user's audio voice signal from the microphone. The audio from the microphone is then amplified and fed into the transmit amplifier circuit.

(ii) If the transceiver is in the AM mode, the AF power amplifier modulates the last RF amplifier which produces a true amplitude modulated RF signal.

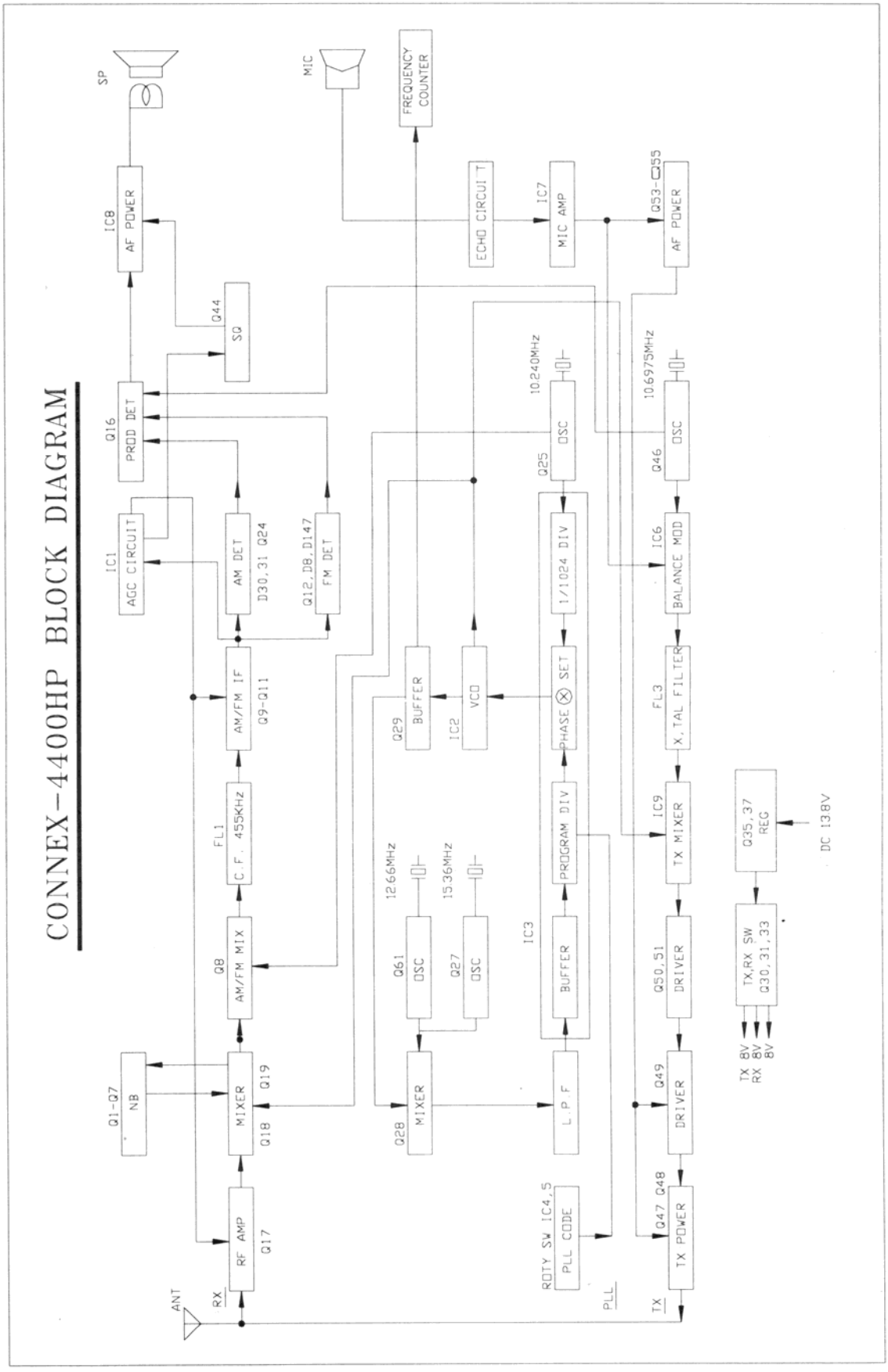
3.4 TRANSMITTER AMPLIFIER CIRCUIT

The transmitter takes the basic exciter signal from the TX mixer and amplifies it through a series of amplifiers consisting of Q50, Q51, Q49, Q47 and Q48 (only for CX-4400 HP) where it is sent out to the antenna connector.

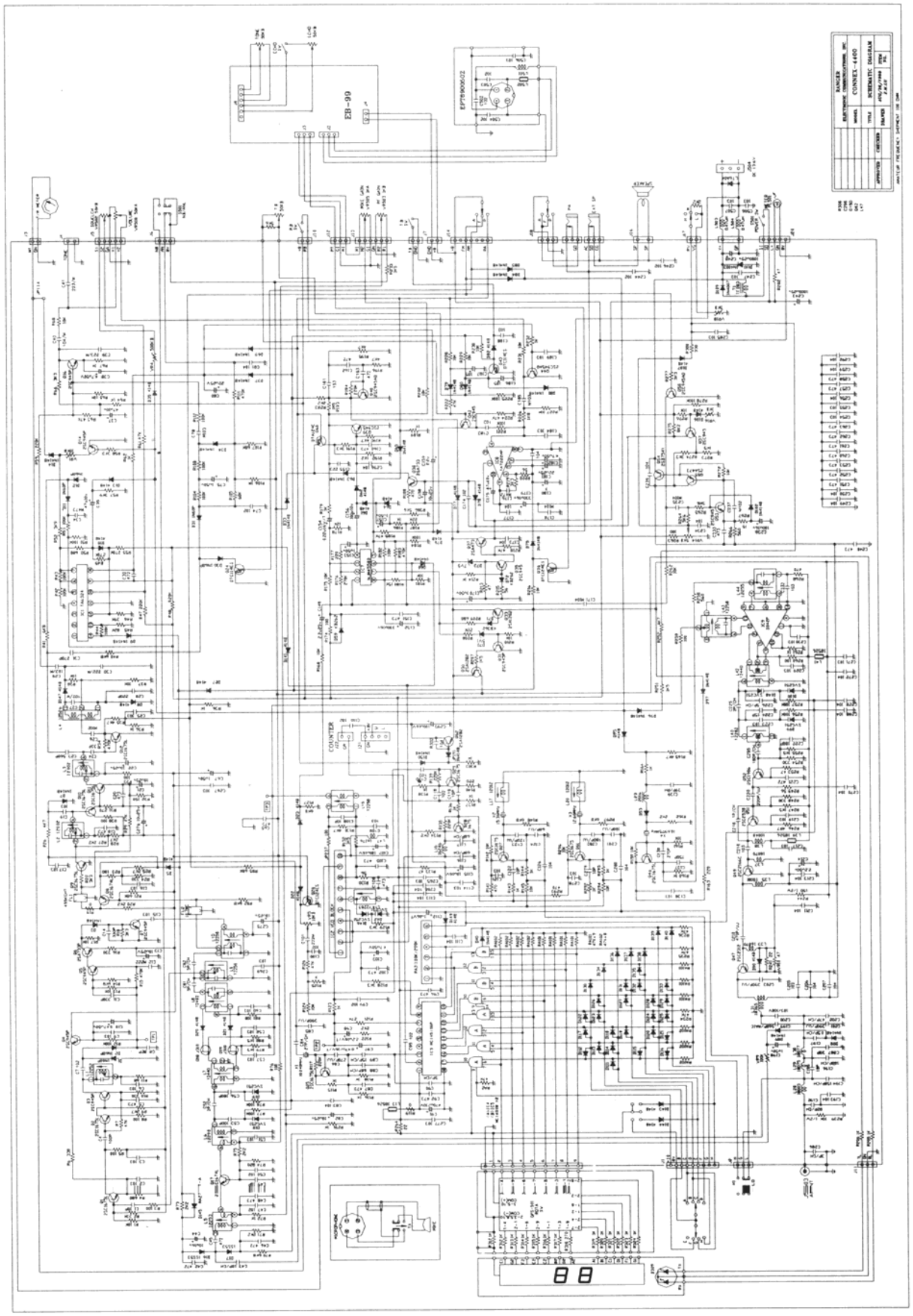
CX-4400 BLOCK DIAGRAM



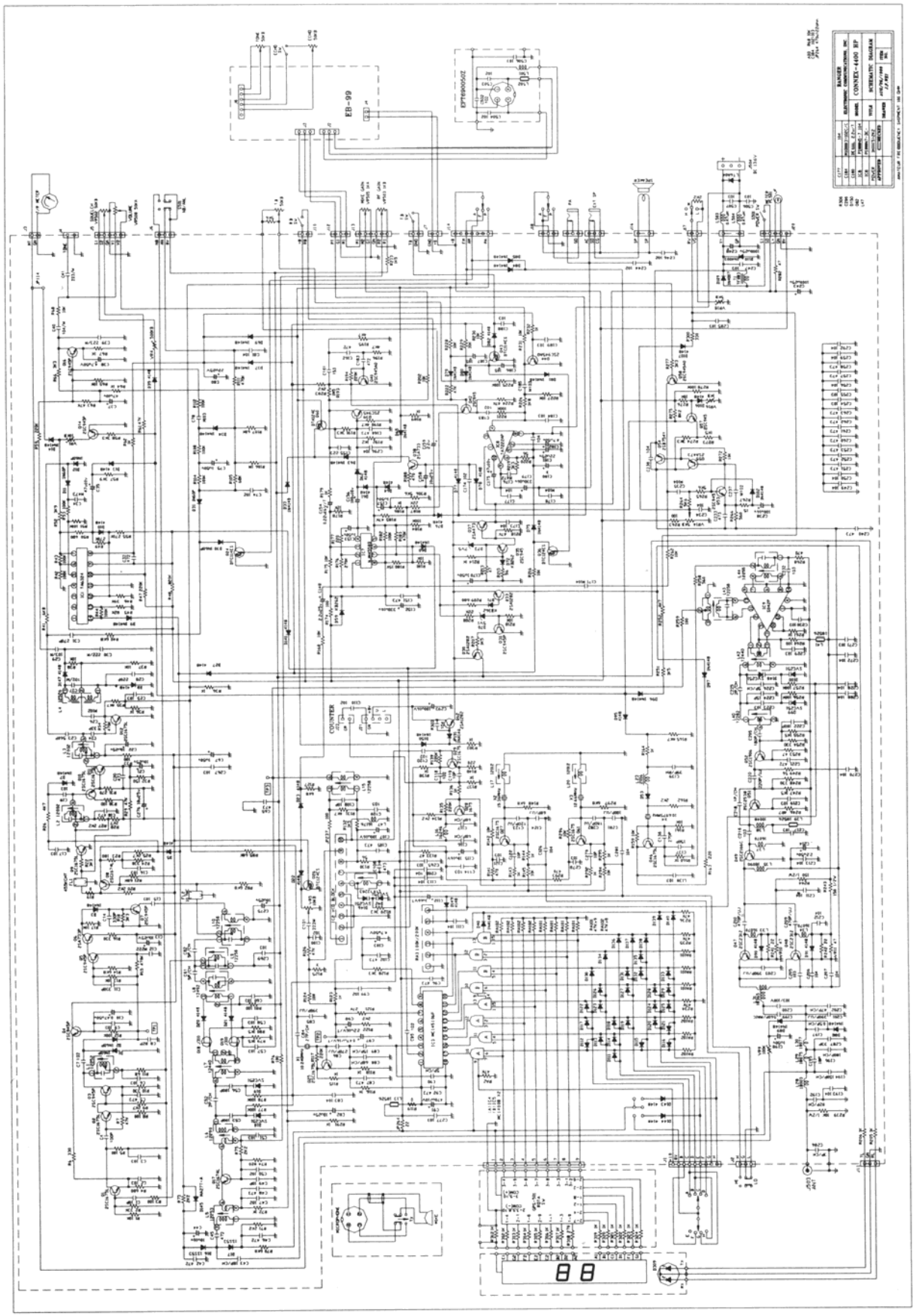
CX-4400 HP BLOCK DIAGRAM



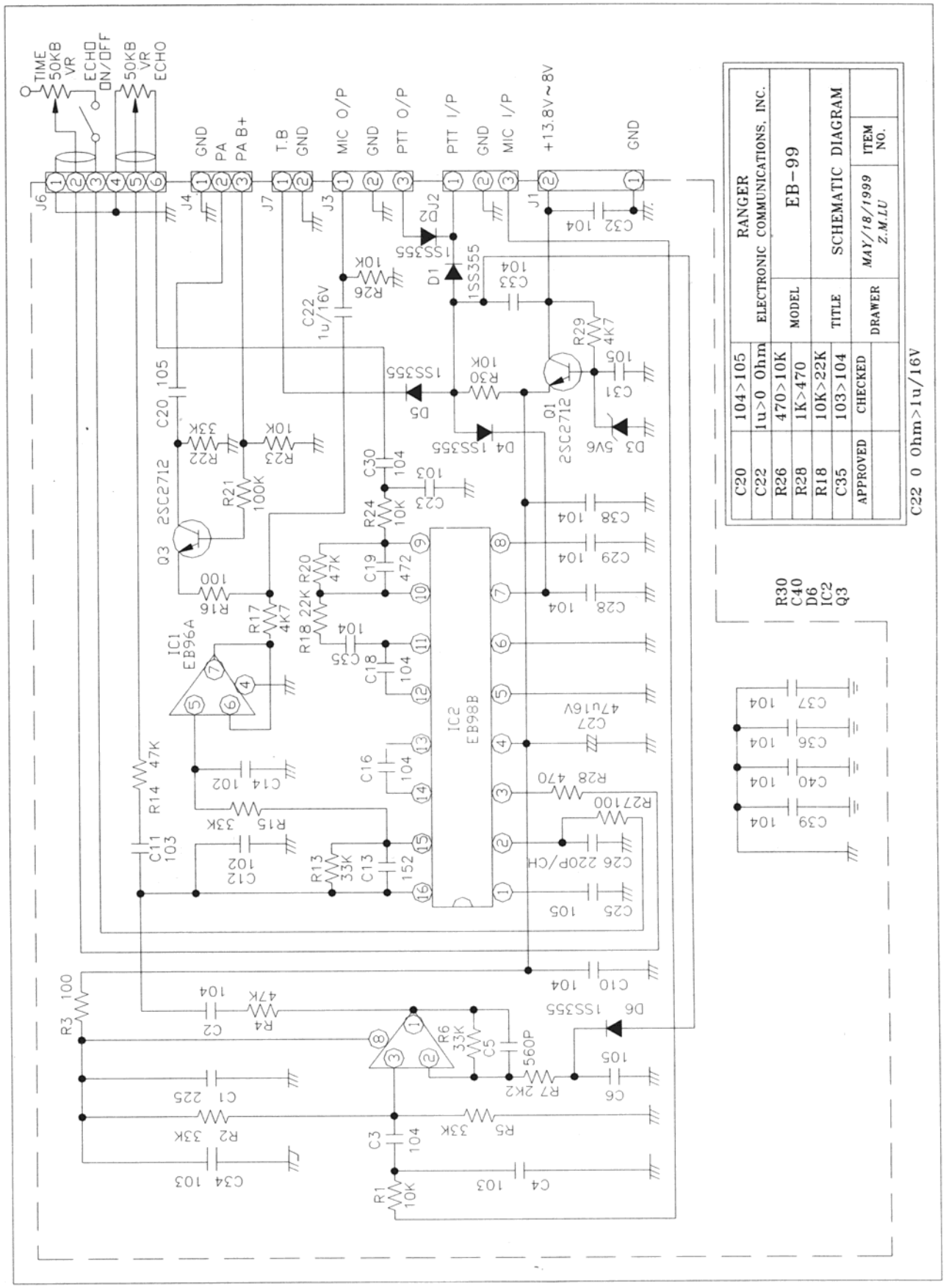
CX-4400 SCHEMATIC DIAGRAM



CX-4400 HP SCHEMATIC DIAGRAM



CX-4400/CX-4400 HP EB-99 SCHEMATIC DIAGRAM



4.0 REQUIRED TEST EQUIPMENT

① DC Power Supply (13.8VDC, 10A)
② RF Watt meter (25~60 MHz, 50W)
③ Multimeter (Digital)
④ Automatic Modulation Meter
⑤ Audio Signal Generator
⑥ Frequency Counter (100 MHz)
⑦ RF Signal Generator (100 MHz)
⑧ Automatic Distortion Meter
⑨ Oscilloscope (50 MHz)
⑩ Sinad Meter

4.1 ALIGNMENT PROCEDURES

This transceiver has been aligned at the factory and does not require any adjustments at installation. The required test equipment listed are used for the test setup or alignment shown in Figure 4-1 Transmitter Test Setup and Figure 4-2 Receiver Test Setup. These test setup are used in part or total during the following adjustments and refer to Figure 4-3 for adjustment location.

4.1.1 PLL ALIGNMENT

ITEM	U.U.T. SETTING	ADJUST POINT	MEASUREMENT
VCO Voltage	Set radio to G BAND, CH 40 AM RX mode. Connect Voltage meter to TP2. Connect Oscilloscope to TP3	L14 L15	6.5 VDC ± 0.1 Maximum Output and Balance (HI Frequency & LO Frequency)
AM Frequency	Set radio to G Band, CH 40 AM RX mode. Set radio to E Band, CH 1 AM RX mode. Connect Frequency counter to TP3	L17 L20	18.890 MHz ± 20Hz 17.5500MHz ± 20Hz
TX Frequency	Set radio to G Band, CH 1 AM TX mode. Connect Frequency counter to TP3	VR7	18.8900MHz ± 20Hz
AM OSC	Set radio to G Band, CH 1 AM TX. mode. Connect Frequency Counter to TP5.	L23	10.6950 MHz ± 20Hz

4.1.2 TRANSMITTER ALIGNMENT

ITEM	U.U.T. SETTING	ADJUST POINT	MEASUREMENT
TX Power	Set radio to F Band, CH 19 AM TX mode. Connect RF power meter to antenna jack. Set POWER switch to H position. Set E-TONE to OFF position	L40,L42, L43,L44 L40,L42	Power Max. Spurious emission Min. Balance Power between HI frequency and LO frequency.
AM TX Power	Set radio to F Band, CH 19 AM TX mode. MOD OFF Set POWER switch to L position.	VR14 VR18	7.5W (CX-4400) 10W (CX-4400HP) 1W (CX-4400 / CX-4400 HP)
RF Power Meter	Set radio to F Band, CH 19 AM TX mode.	VR9	Adjust RF Power meter needle until it is in-between the green bar on TX PWR scale.
AM Modulation	Set radio to F Band, CH 19 AM TX mode. Set Mic Gain fully clockwise. AF signal 30 mV, 1 KHz to microphone.	VR16	95%
FM Deviation	Set radio to F Band, CH 19 FM TX mode. Set Mic Gain fully clockwise. AF signal 30 mV, 1 KHz to microphone.	VR5	4 KHz

4.1.3 RECEIVER ALIGNMENT

ITEM	SETTINGS	ADJUST POINT	MEASUREMENT
AM Sensitivity	Set radio to F Band, CH 19 AM RX mode. Set RF Gain fully clockwise. Set SQ fully counter clockwise. Set VOL. control at 12 o'clock. Set NB-ANL/OFF switch to OFF position. Connect RF SG to antenna jack Frequency 28.915 MHz, 1μV, 30% Mod. Change radio to E Band, CH1 AM RX mode RF SG setting 28.245 MHz. Set radio to G Band, CH40 AM RX mode RF SG setting 29.585 MHz.	L2,3,5,6,7, 8,9,10 L5,L6 L5,L6	Audio output > 2V S/N > 10 dB. For Balance between HI frequency and LO frequency.
FM Sensitivity	Set radio to F Band, CH 19 FM RX mode. Set MODE switch to FM mode. RF SG setting 28.915 MHz., 0.5uV, 3K Mod.	L4	Audio output Max. S/N > 20 dB.
NB Adjust	Set radio to F Band, CH 19 AM RX mode RF SG setting 28.915 MHz,100uV, OFF Mod. Set NB-ANL/OFF switch to NB/ANL position. Connect Voltmeter to TP1.	L1	DC voltage to max. (>2.0V)
AM Squelch	Set radio to F Band, CH 19 AM RX mode Set SQ control fully clockwise Set RF Gain control fully clockwise RF SG setting 28.915 MHz, 1 mV, 30% Mod.	VR4	Adjust very slowly until squelch just open
AM S/RF Meter	Set radio to Band, CH 19 AM mode Set RF Gain control fully clockwise RF SG setting 28.915 MHz, 100μV, 30% Mod.	VR1	Meter needle to S9 on the S scale

Figure 4-1 Transmitter test setup

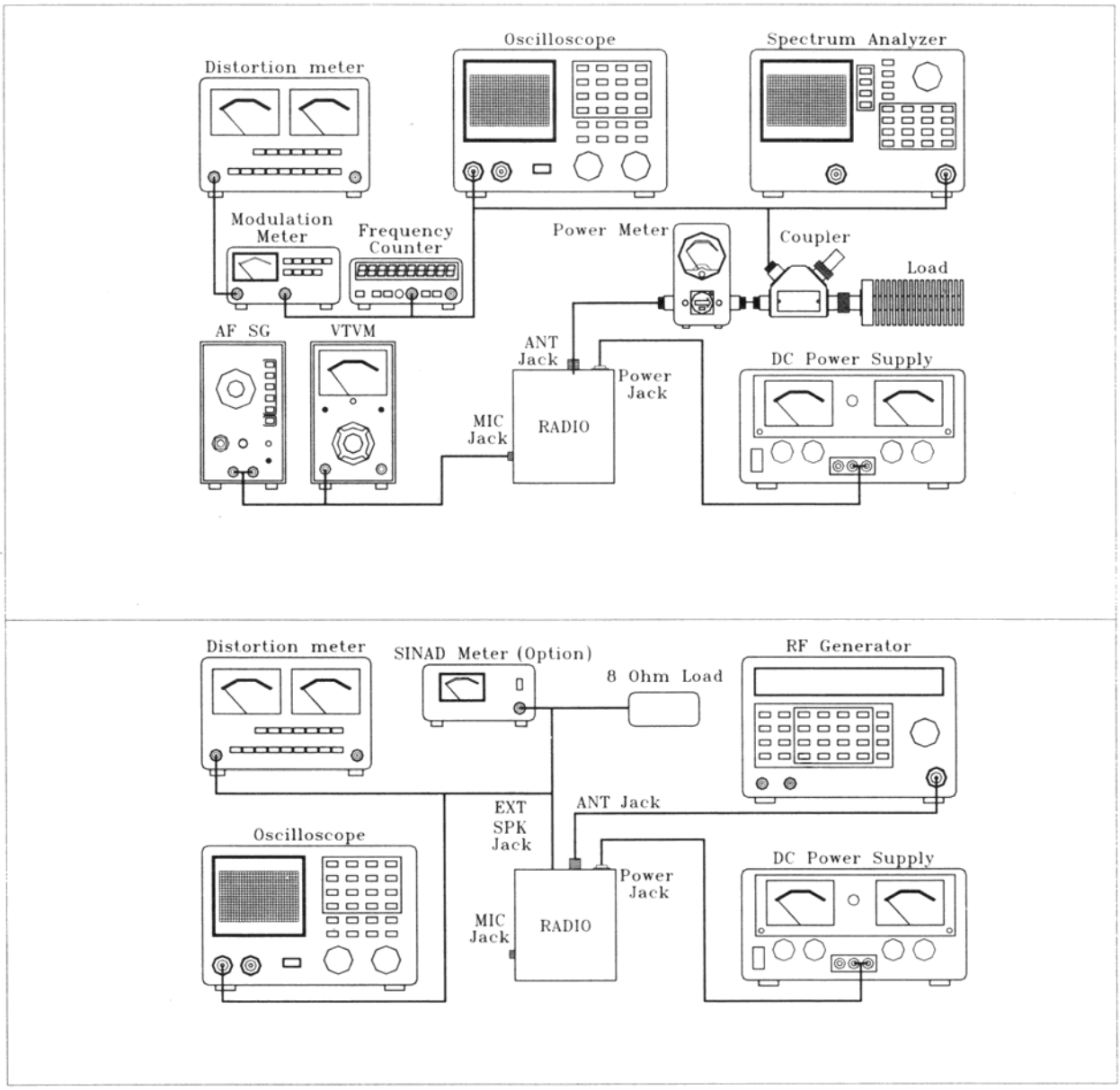


Figure 4-2 Receiver test setup

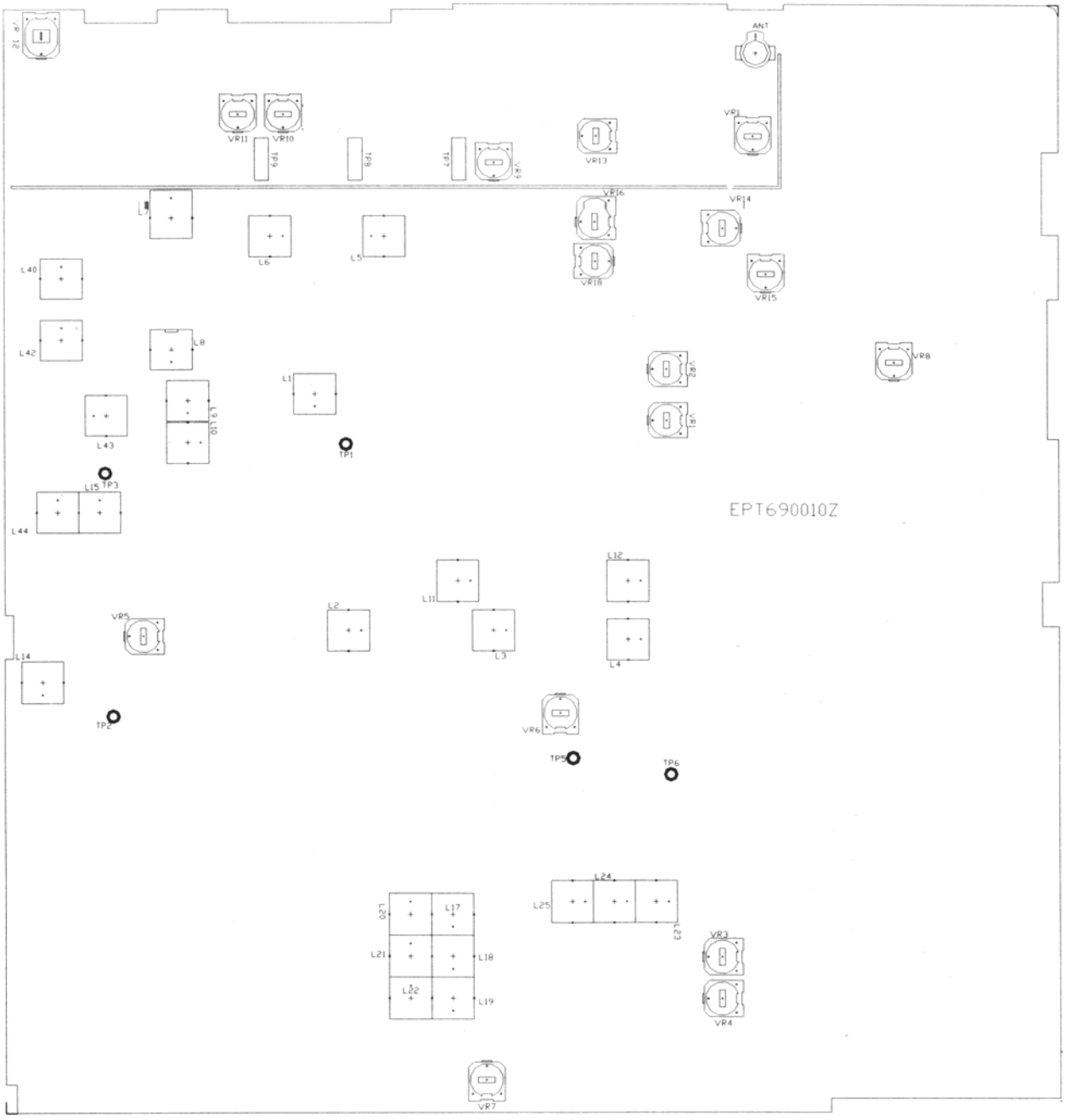


Figure 4-3 Main PCB Adjustment Location

5.0 PRECAUTIONS

The inherent quality of the solid-state components used in this transceiver will provide many years of continuous use. Taking the following precautions will prevent damage to the transceiver.

(i) Never key the transmitter unless an antenna or suitable dummy load is connected to the antenna receptacle.

(ii) Ensure that the input voltage does not exceed 16 VDC or fall below 11 VDC.

(iii) During alignment, do not transmit for more than 10 seconds at a time. Transmitting over long periods can cause heat built-up and cause transmitter damage.

5.1 PERIODIC INSPECTION

This unit is aligned at the factory to deliver maximum performance. However, continued performance cannot be expected without periodic inspection and maintenance. Important points to be checked regularly are as follows;

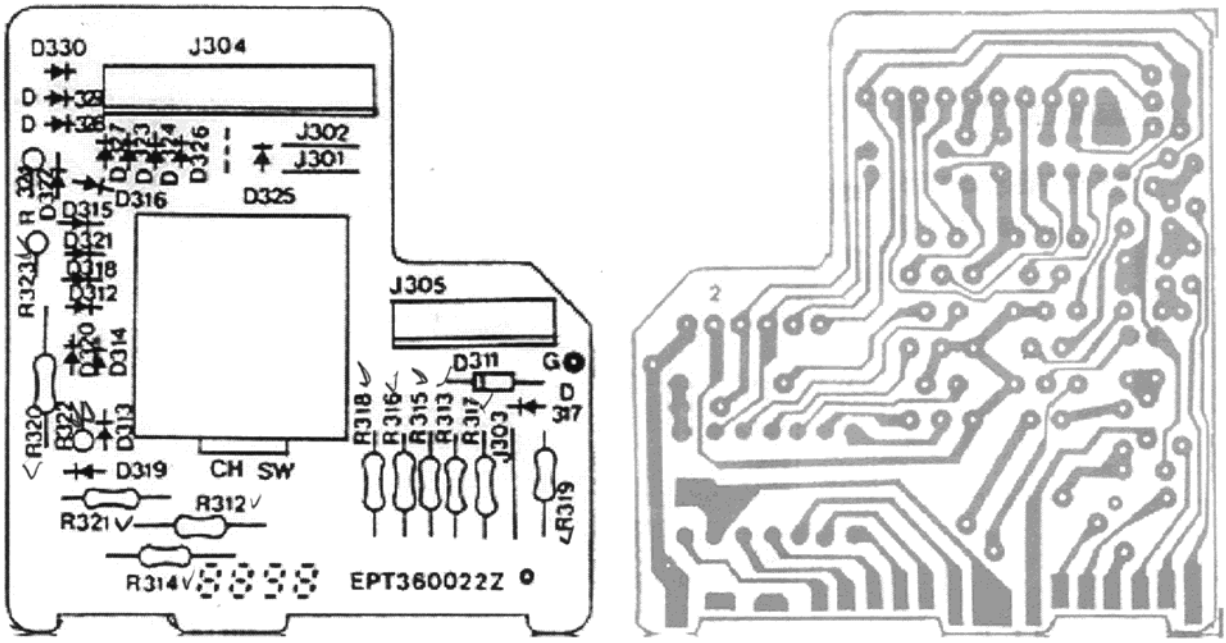
Check Item	Action
Whip antenna (option)	If cracked or broken, replace it.
Coaxial cable	If sheath is cracked, seal with vinyl tape. If immersed with water, install new coaxial cable.
Coaxial & power plug connections	If loosened, reconnect. If corroded, clean contacts.
Battery connection	If corroded, clean power terminals.
Ground terminal	If corroded, clean terminal.

5.2 FUSE REPLACEMENT

To protect the equipment from serious damage, a fuse is provided on the power supply lines. The fuse protect against over voltage / reverse polarity of the vehicle's mains or internal fault of the equipment. If the fuse has blown, first find out the cause of the trouble before replacing it. A fuse rated for more than the transceivers requirement should not be used, since it may permanently damage the equipment. Damage due to over fusing is not covered by the warranty.

6.0 GENERAL

Information on most electrical and mechanical parts is included in the parts list. The reference designators are in alphanumeric order.

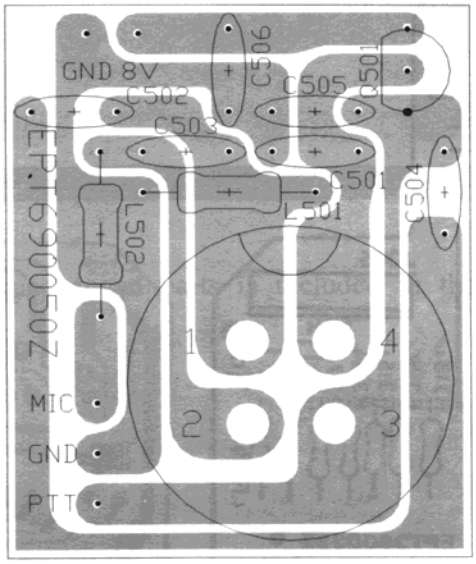


PART LIST :

CX-4400/4400 HP ROTARY SW P.C.B

ITEM	REFERENCE NUMBER	RANGER PART NUMBER	DESCRIPTION
1		EPT360022Z	ROTATRY SW PCB
2	R322,323,324	RCU141024Z	1K OHM 1/4 W
3	R315	RCM144714A	470 OHM 1/4 W
4	R313,316,317,319,321, 318	RCM141024A	1K OHM 1/4 W
5	R312,314,320	RCM141024B	1K OHM 1/4 W
6	CH SW	EWRT32000S	GPS-0501
7	J304	EX07N40014	PCB CONN/S
8	D312,313,314,323,324, 326,J305	WX01070703	JUMPER WIRE
9	D315,316,325	WX01070705	JUMPER WIRE
10	J302	WX01070708	JUMPER WIRE
11	D311,J303	WX01070710	JUMPER WIRE

REMARK :
LEFT : COMPONENT SIDE
RIGHT : COPPER SIDE (BLUE)

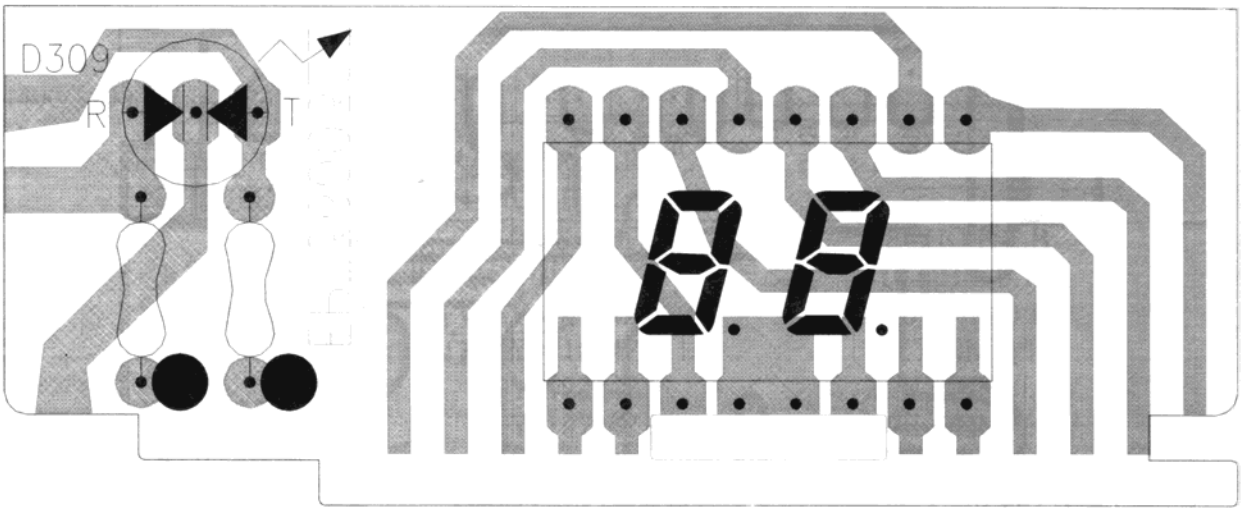


PART LIST :

CX-4400/4400 HP MIC P.C.B

ITEM	REFERENCE NUMBER	RANGER PART NUMBER	DESCRIPTION
1		EPT690050Z	MIC PCB
2	C502,C503,C504	CC0501027L	0.001uF 50WV
3	L501	ECCHK16001	CHOKE COIL 5.6uH
4	L502	ECBAD18526	BEAD COIL
5	MIC PCB	EX06N41020	MIC JACK
6	MIC/GND/PTT	EX07N48903	WIRE CONN/H 3P

REMARK :
COPPER SIDE (BLUE)

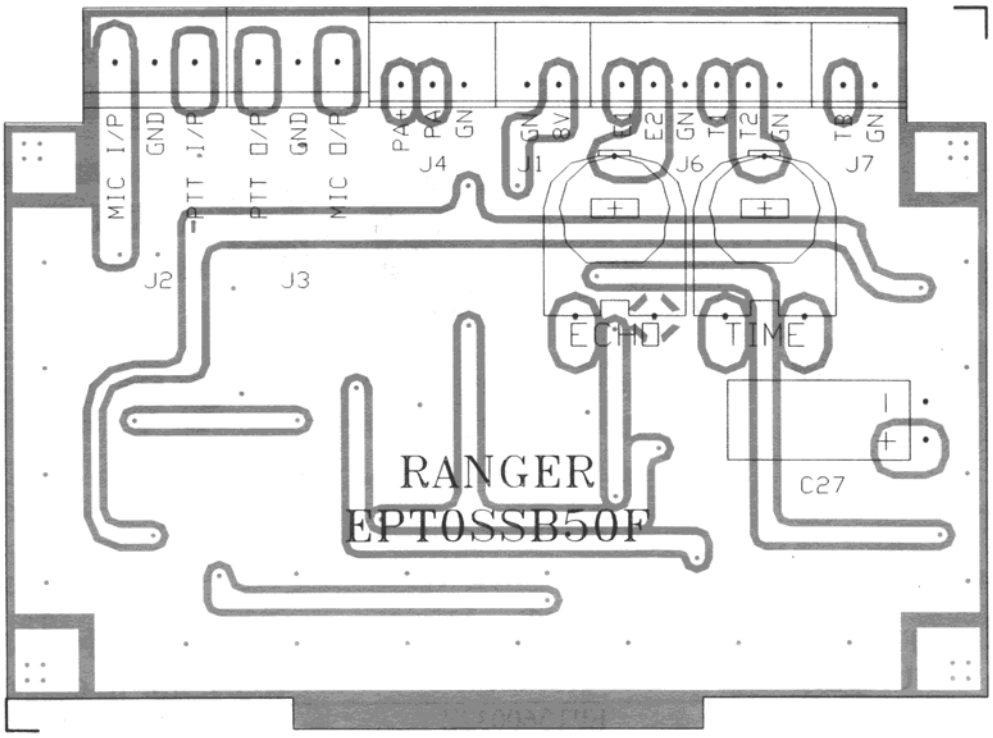


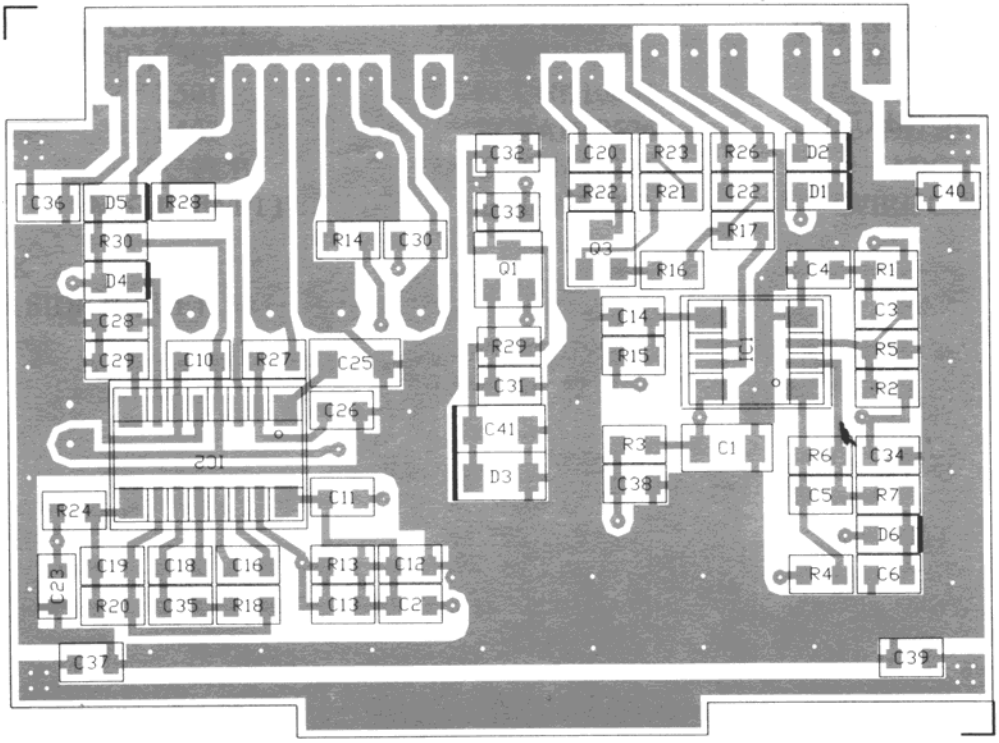
PART LIST :

CX-4400/4400 HP LED DISPLAY P.C.B

ITEM	REFERENCE NUMBER	RANGER PART NUMBER	DESCRIPTION
1		EPT360032Z	LED DISPLAY P.C.B
2	LED DISPLAY PCB	EX03N40419	LED DISPLAY (RED)
3	D309 (T/R)	EX01N40004	LED (RED &GREEN)

REMARK:
COPPER SIDE (BLUE)


MIC I/P
GND
PTT I/P
PTT O/P
GND
MIC O/P
PA+
PA-
GN
GN
8V
E1
E2
GN
T1
T2
GN
T0
GN
J4
J1
J6
J7
J2
J3
ECHO
TIME
C27
RANGER
EPT0SSB50F

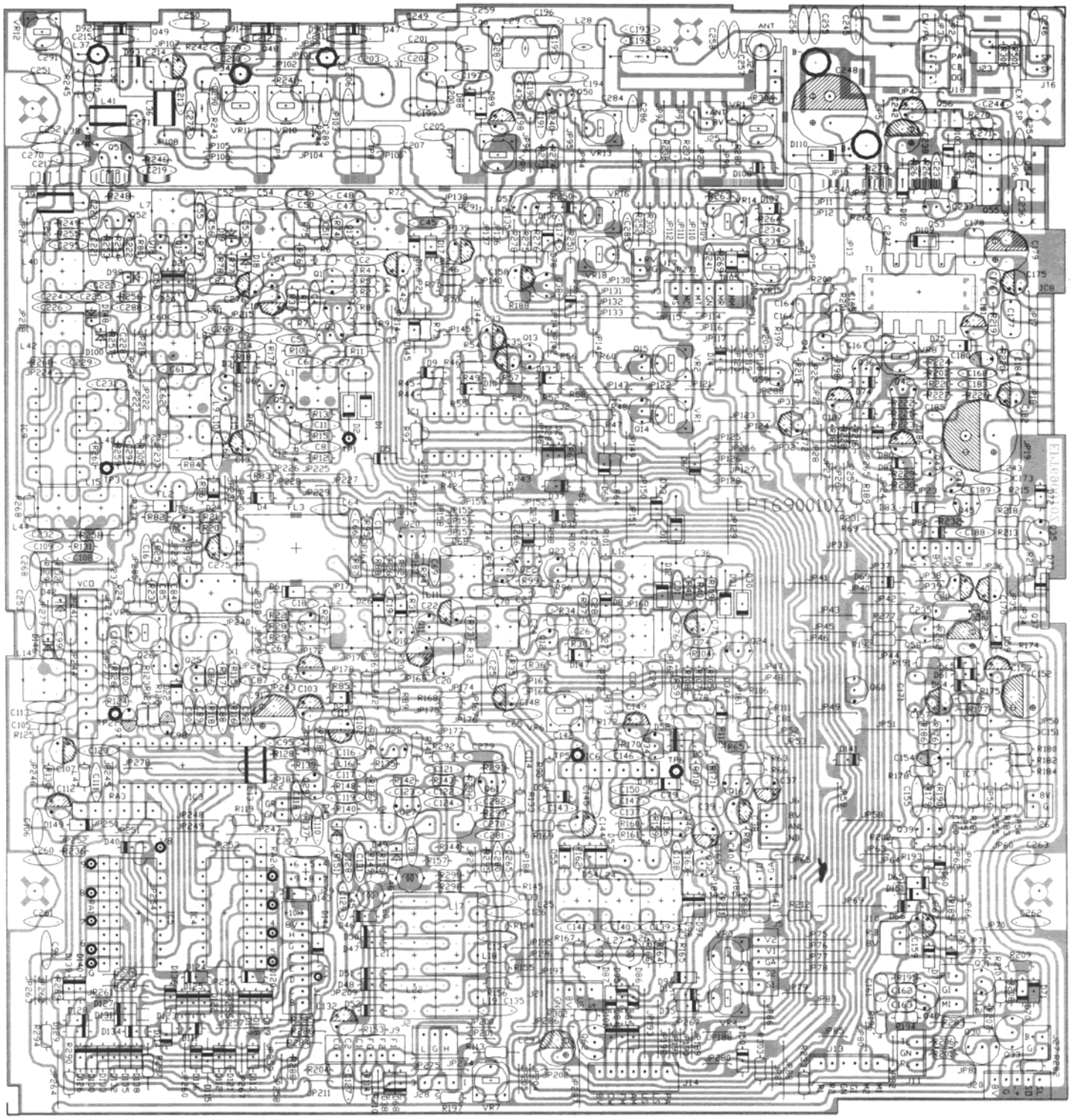

C32
C20
R23
R26
D2
C36
D5
R28
C33
R22
R21
C22
D1
C40
R30
R14
C30
Q1
Q3
R17
R16
C4
R1
D4
C14
C3
C28
R29
R15
IC1
R5
C29
C10
R27
C25
C31
R2
C26
C41
R3
C1
R6
C34
ZD1
D3
C38
C5
R7
R24
C11
D6
C19
C18
C16
R13
C12
R4
C6
C23
R20
C35
R18
C13
C2
C37
C39

PART LIST :

CX-4400/4400 HP ECHO P.C.B (EB-99)

ITEM	REFERENCE NUMBER	RANGER PART NUMBER	DESCRIPTION
1		EPT0SSB50F	ECHO P.C.B.
2	R3,R16	RCY011014Z	10 OHM 0.1W
3	R28	RCY014714Z	470 OHM 0.1W
4	R27	RCY011024Z	1K OHM 0.1W
5	R7	RCY012224Z	2.2K OHM 0.1W
6	R17,R29	RCY014724Z	4.7K OHM 0.1W
7	R1,23,24,30,26	RCY011034Z	10K OHM 0.1W
8	R18	RCY012234Z	22K OHM 0.1W
9	R2,R5,R6,R13,R15,R22	RCY013334Z	33K OHM 0.1W
10	R14,R20,R4	RCY014734Z	47K OHM 0.1W
11	R21	RCY011044Z	100K OHM 0.1W
12	C26	CK1331AB5A	330PF 50WV
13	C5	CK1561AB5A	560P 50WV
14	C12,C14	CK1102AB7L	0.001uF 50WV
15	C4,11,23,34	CK2103AB7R	0.01uF 25WV
16	C2,C3,C10,C16,C28, C29,C30,C32,C33, C36,C37,C38,C39, C40,C18,C35	CK2104AB7R	0.1uF 25WV
17	C6,C31,C20,C22	CK510AB7R	1uF 16WV
18	C13	CK1152AB7R	0.0015uF 50WV
19	C19	CK1472AB6U	.0047uF 50WV
20	C25	CK5105ZZ7R	1uF 16WV
21	C1	CK5225AA7R	2.2uF 16WV
22	IC1	YNJR04558M	IC NJM4558M 8PIN
23	IC2	YNES56033S	IC ES56033S 16PIN
24	Q1,Q3	TY2SC2712G	TR 2SC2712GR
25	D1,D2,D4,D5,D6	EDSS00355Y	DIODE 1SS355
26	D3	EDZD05569Y	ZENER DIODE 5.6V
27	C27	CE0164767Z	47uF 16WV
28	J3	EX07N41216	PCB CONN/S 3P
29	J2	EX07N41227	PCB CONN/S 3P
30	J1	EX07N48223	PCB CONN/S 2P

REMARK:
TOP : COMPONENT SIDE (WHITE)
BOTTOM : COPPER SIDE (BLUE)



CX-4400/4400 HP MAIN PCB.

REMARK:

SOLDER SIDE (WHITE)

PART LIST
CX-4400 MAIN PCB

REFERENCE NUMBER	RANGER PART NO.	DESCRIPTION
	EPT690010Z	MAIN P.C.B
R246	RCP164794Z	4.7 Ω 1/16W
R267	RCP161504Z	15 Ω 1/16W
R241	RCP162204Z	22 Ω 1/16W
R133,213,253,282, VR10	RCP164704Z	47 Ω 1/16W
R130,215,220	RCP165604Z	56 Ω 1/16W
R11	RCP166804Z	68 Ω 1/16W
R3,5,8,30,33,76,81, 259,260,263,JP237	RCP161014Z	100 Ω 1/16W
R32,249	RCP161514Z	150 Ω 1/16W
R23	RCP161814Z	180 Ω 1/16W
R140,163,177	RCP162214Z	220 Ω 1/16W
R31	RCP162714Z	270 Ω 1/16W
R6,10,16,24,248,254, 300	RCP163314Z	330 Ω 1/16W
R141,188,268,293	RCP164714Z	470 Ω 1/16W
R258,266	RCP165614Z	560 Ω 1/16W
R4,50	RCP166814Z	680 Ω 1/16W
R74	RCP168214Z	820 Ω 1/16W
R36,62,64,67,72,115, 116,118,123,136-138, 143,144,160,164,179, 186,189,205,214,232, 261,291,292,295,303, 206,154	RCP161024Z	1KΩ 1/16W
R192	RCP161224Z	1.2KΩ 1/16W
R132,207,233,247,255 ,273,79,80,251	RCP161524Z	1.5KΩ 1/16W
R226	RCP161824Z	1.8KΩ 1/16W
R20,27,71,73,75,134, 162,122,283,93	RCP162224Z	2.2KΩ 1/16W
R9,25,28	RCP162724Z	2.7KΩ 1/16W
R18,22,58,66,128,129 ,191,219,274,277	RCP163324Z	3.3KΩ 1/16W
R52,57	RCP163924Z	3.9KΩ 1/16W
R26,35,131,165,190, 195,196	RCP164724Z	4.7KΩ 1/16W
R264,265	RCP165624Z	5.6KΩ 1/16W
R14,40,41,82,127,148 ,297,70	RCP166824Z	6.8KΩ 1/16W
R275	RCP168224Z	8.2KΩ 1/16W
R1,13,17,37,38,65, 142,159,161,168,175, 181,202,210,216,227-231,272,276,294,296, 262,68	RCP161034Z	10KΩ 1/16W
R178	RCP161234Z	12KΩ 1/16W
R180	RCP161534Z	15KΩ 1/16W
R187,208	RCP162234Z	22KΩ 1/16W
R121	RCP162734Z	27KΩ 1/16W
R2	RCP163334Z	33KΩ 1/16W
R46	RCP163934Z	39KΩ 1/16W
R7,29,61,63,126,185, 218,234,235,236,224, 222,151	RCP164734Z	47KΩ 1/16W
R21,85,105,107	RCP166834Z	68KΩ 1/16W
R45	RCP168234Z	82KΩ 1/16W
R12,42-44,51,53,77, 78,104,108,112,182, 184,225,256,257,278, 221	RCP161044Z	100KΩ 1/16W
R47,59,117,135,139, 194	RCP162244Z	220KΩ 1/16W
R49,55,176	RCP162744Z	270KΩ 1/16W
R15,34,111,183	RCP164744Z	470KΩ 1/16W
R48	RCP168244Z	820KΩ 1/16W
R106	RCP161054Z	1MΩ 1/16W
R193	RCP161554Z	1.5MΩ 1/16W
R124	RCP161064Z	10MΩ 1/16W
JP264	RCP142204Z	22 Ω 1/4W
R244	RCP121514Z	150 Ω 1/2W
R239	RCP121034Z	10KΩ 1/2W
C1,49,108,119,122, 279,147	CC0501004L	10PF 50WV
C224	CC0501504L	15PF 50WV
C195	CC0501804L	18PF 50WV
C24,287	CC0503304L	33PF 50WV
C8	CC0508204L	82PF 50WV
C4,53	CC0501015L	100PF 50WV
C137	CC0501515L	150PF 50WV
C56,222	CC0501815L	180PF 50WV
C28,220	CC0502215L	220PF 50WV
C31,136	CC0502715L	270PF 50WV
C11,14	CC0503315L	330PF 50WV
C23	CC0505615L	560PF 50WV
C197	CC0500101A	1PF 50WV
C218	CC0500101A	1PF 50WV
C225	CC0500201A	2PF 50WV
C286	CC0500301A	3PF 50WV
C61,62,90,226	CC0500501A	5PF 50WV
C89	CC0501504A	15PF 50WV
C43	CC0501804A	18PF 50WV
C84	CC0502704A	17PF 50WV
C202	CC0504704A	47PF 50WV
C88,116,117	CC0506804A	68PF 50WV
C192	CC0508204A	82PF 50WV
C191	CC0501015A	100PF 50WV
C194	CC0501515A	150PF 50WV
C196,295	CC0501815A	180PF 50WV
C139	CC0503904D	39PF 50WV
C281	CC0501015G	100PF 50WV
C282	CC0501815G	180PF 50WV
C210	CC0501815G	180PF 50WV
C124	CC0506804G	68PF 50WV
C123	CC0501215G	120PF 50WV
C220	CC0502215G	220PF 50WV
C86	CC0502715G	270PF 50WV
C85,201,203	CC0503915G	390PF 50WV
C209	CC0504715G	470PF 50WV
C199	CD3005614Z	560P 300WV
C7,47,50,74,95,99, 100,110,118,120,174, 183,244,246,245,	CC0501027L	0.001UF 50WV
C161	CC0501537L	0.015UF 50WV
C81,83,111,113,126, 173,193,206,207,211-213,228,234,236,249, 250,256,259,268,272, 280,288,292,296 (COPPER SIDE),C270, C177,R302	CC0501047L	0.1UF 50WV
C5,18,20,48,65,87,92 ,96,102,105,106,151, 160,233,251-253,257, 258,260-263,240	CC0504737L	0.047uF 50WV
C32,42,45,46,221,162 ,163	CC0504727L	0.0047UF 50WV
C155	CC0502237L	0.022UF 50WV
C200	CC1001037L	0.01UF 100WV
C2,3,6,9,15-17,19, 25,51,57,58,60,109, 114,138,188,189,205, 216,133,217,219,223, 229,230,232,247,254, 255,265,267,269,271, 277,278,285,184	CC0501037L	0.01UF 50WV
C154	CT0162246Z	0.22UF 16WV
C161	CC0501537L	0.015UF 50MV
C97	CT0164746Z	T/C0.47UF 16WV
C98	CT0162256Z	2.2UF 16WV
C112	CT0161056Z	1UF 16WV
C40,178,171,235	CM0501045Z	0.1UF 50WV
C26,27,237	CM0501025Z	0.001UF 50WV
C29,78,185,41	CM0501035Z	0.01UF 50WV
C39	CM0502235Z	0.022UF 50WV
C176	CM0504725Z	0.0047UF 50WV

C34	CM0504735Z	.047UF 50WV
C12,30,101	CM0502225Z	.0022UF 50WV
C10	CE0504747Z	0.47UF 50WV
C67,75,153,157,170,186,187,198	CE0501057Z	1UF 50WV
C159,214,148	CE0502257Z	2.2UF 50WV
C38,103,182	CE0504757Z	4.7UF 50WV
C13,21,22,44,82,115,158,275,276	CE0251067Z	10UF 25WV
C80,181	CE0252267Z	22UF 25WV
C37,175	CE0254767Z	47UF 25WV
C107,156,238,293	CE0161077Z	100UF 16WV
C152,179	CE0163377Z	330UF 16WV
C91	CE0104777Z	470UF 10WV
C243,248	CE0251087Z	1000UF 25WV
C35	CEM254767Z	47UF 25WV
FL1	EFCFW455HT	C/FILTER 455HT
FL2	EFCFE107MX	C/FILTER 10.7MX RED
X1	EYCAB10240	CRYSTAL 10.240MHZ
X2	EYCAA15360	CRYSTAL 15.360MHZ
X3	EYBAA12660	CRYSTAL 12.660MHZ
X4	EYBAE10697	CRYSTAL 10.6975MHZ
IC1	ENJR00324D	NJM324D
IC3	ENMC45106P	MC145106
IC4,5	ENMC14008B	MC14008BCP
IC7	ENJR04558D	NJM4558D
IC9	ENSM06130Z	TDA6130
Q8,17	T2SC01674L	2SC1674L
Q51	T2SC02538Z	2SC2538
Q52	T2SC01906Z	2SC1906
Q26,36	TDTC0124ES	DTC124ES
Q24,43	TDTC0114ES	DTC114S
Q30,33,62	T2SA01282E	2SA1282AE
Q1,2,9,10-12,25,27,28,29,46,61	T2SC01675L	2SC1675
Q60	TDTA0124ES	DTA124ES
Q3-5,7,14,16,31,35,39,42,44,53,57,58,40	T2SC00945P	2SC945P
Q6,38	T2SA00733P	2SA733P
Q55	T2SA01869Z	2SA1869
Q18,19	FM0J00310Z	F.E.T J310
D3,5,7-10,13,14,20-23,27,33,34,35,37,40,53,60-65,69,75-82,84,85,88-91,97,102,106,107,111-141,143,144,147,149,150,JP191	ED1N04148Z	DIODE 1N4148
D1,2,11,12,30,31	ED1N00060P	1N60P
D110	ED1N04003Z	1N4003
D109	ED1N04007Z	1N4007
D16,17	EDSS00053Z	ISS53
D59,72	EDMA00027W	MA27W-A
D71,145	EDMA00027T	MA27T-A
D18,19,42,99,100,146,148	EDSV00251Z	SVC-251SPA
D70	EDZD05519Z	5.1V 0.5W
D73	EDZD05759Z	7.5V 0.5W
L2,3	ECIFT12002	I.FT
L6	ECIFT12290	I.F.T
L17,20	ECIFT12012	I.F.T
L23	ECIFT12016	I.F.T
L1	ECIFT12252	I.F.T
L44	ECIFT12255	I.F.T
L9,10	ECIFT12256	I.F.T
L15,43	ECIFT12258	I.F.T
L40	ECIFT12262	I.F.T
L14	ECIFT12558	I.F.T
L5	ECIFT12253	I.F.T
L7,42	ECIFT12440	I.F.T
L8	ECIFT12492	I.F.T
L4	ECIFT12526	I.F.T
L503,504	ECCHK16000	CHOKE COIL
T1	ECCHK16004	CHOKE COIL
L34,37	ECCHK16070	CHOKE COIL
L47	ECCHK16176	CHOKE COIL
L16	ECCHK16246	CHOKE COIL
L28	ECSPG18003	SPRING COIL
L30	ECSPG18077	SPRING COIL
L29	ECSPG18075	SPRING COIL
L31	ECSPG18365	SPRING COIL
L35	ECSPG18001	SPRING COIL
L38	ECRFZ10048	RF COIL
L13,39,41	ECBAD18526	BEAD COIL
VR16	RE10200041	S/F/R 1K
VR14,18	RE50200042	S/F/R 5K
VR1,5	RE10300031	S/F/R 10K
VR9	RE10400043	S/F/R 100K
VR4	RE50400087	S/F/R 500K
RA1	RCS0870014	R/ARRAY
RA2	RCS0970015	R/ARRAY
RA3	RCS0670025	R/ARRAY
R201-223	WL0007009Z	LEAD WIRE
R223-R198	WL0207009Z	LEAD WIRE
J29	WX01070703	J/W 7x3x7
JP1-3,4,7,9,23,24-26,32,33,38,39,50,54-57,59,61,62,63,83,66,71,72,79,80,82,85,86,87,93,100,105,106,114,115,118122,124-126,190,135,125,138-140,144,145,152,153,156,157,159,160,128,165,166,168,170,172,174,175,177-179,181,184,188,91,190	WX01060605	J/W 6x5x6
JP200-202,204,205,209-211,212,214,217,219,220,224,226,231-233,235,236,238,239,242,243,245,250,252,253,255-260,262,263,265,271-273,276,278-280,285,267x2,R119,R305,R89,R19,C142,C291,C128,C129,D26,D46,D50,D95,D49-L46,Q45,TP8,JP240	WX01070705	J/W 7x5x7
D237,D25	WX01070708	J/W 7x8x7
JP6,11,12,16-19,34-37,40-49,51-53,58,60,67,70,88,96,101-104,107-109,116,117,127,129,133,136,137,143,147,148,151,161,167,169,176,131,132,111,130	WX01060610	J/W 6x10x6
JP215,218,222,223,225,227,228,230,234,241,244,246-249,251,254,261,266,277,286,287,240,IC6,L36	WX01070710	J/W 7x10x7
JP69,75-78,81	WX01070712	J/W 7x12x7
JP99	WX01070713	J/W 7x13x7
FL3	WX01070715	J/W 7x15x7
TP7-TP8,TP8-TP9	WX01070718	J/W 7x18x7
J7x2,10,17,22,Q41	EX07N48223	P/C/S 3P
J2,6,11,18	EX07N48350	P/C/S 3P
J21	EX07N48490	P/C/S 4P
J5,20	EX07N48222	P/C/S 5P
J13	EX07N48331	P/C/S 6P
J14	EX07N48224	P/C/S 7P
J1	EX07N48543	P/C/S 9P
J28,4	EX07N48244	P/C/S 3P
J12	EX07N41227	P/C/S 3P
J16	EX07N41330	P/C/S 2P
J4	EX07N49140	P/C/S 2P
J29	EX07N48884	PCB CONNS
J28,29	EX07N48151	P/C/H
TP2,3,5	EX07N48612	P/C/S 1PIN
CW/PA,EXT SP	EX06N41045	EAR JACK
J304	EX07N48886	W/C/S 10P
J16-SPK	EX07N48041	W/C/S 2P

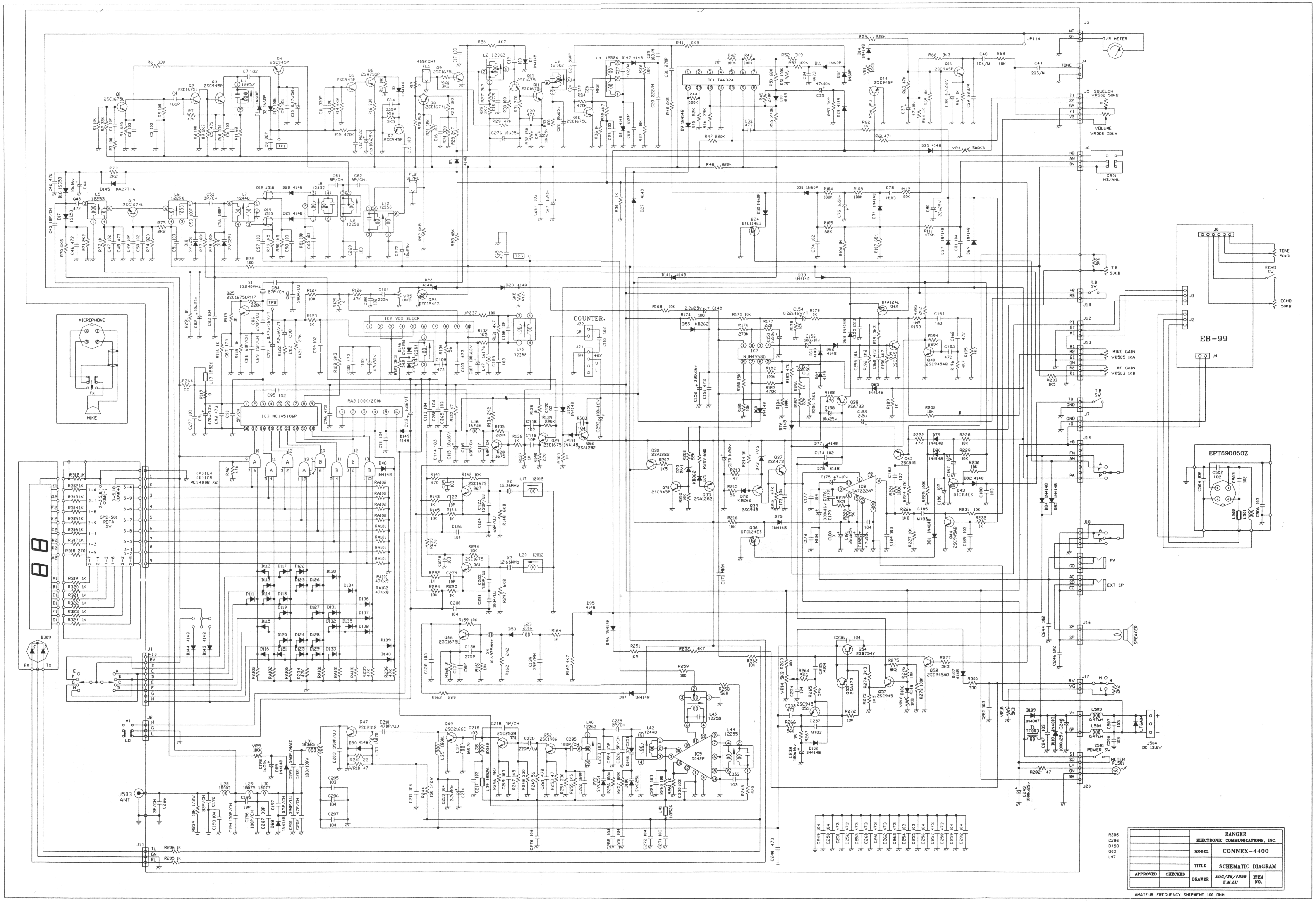
J1	EX07N48899	W/C/S 9P
J13	EX07N48877	W/C/S 6P
J6,11	EX07N48880	W/C/S 3P
J10	EX07N48888	W/C/S 2P
J14	EX07N48897	W/C/S 7P
J5	EX07N48881	W/C/S 5P
J20	EX07N48885	W/C/S 5P
J2	EX07N48882	W/C/S 3P
F.C	EX07N48887	W/C/S 6P
J17,Q41,J9-METER	EX07N48896	W/C/S 2P
J18	EX07N48898	W/C/S 3P
J7	EX07N48993	W/C/S 2P
DC(2)	CC0501037L	0.01UF 50WV
IC8	ENTA07222A	TA7222AP
Q54	T2SB00754Y	TR 2SB754Y
Q49	T2SC021660	TR 2SC2166C
Q47	T2SC023120	TR 2SC2312C
DC SOCKET	EDLT6A400Z	DIODE LT6A400

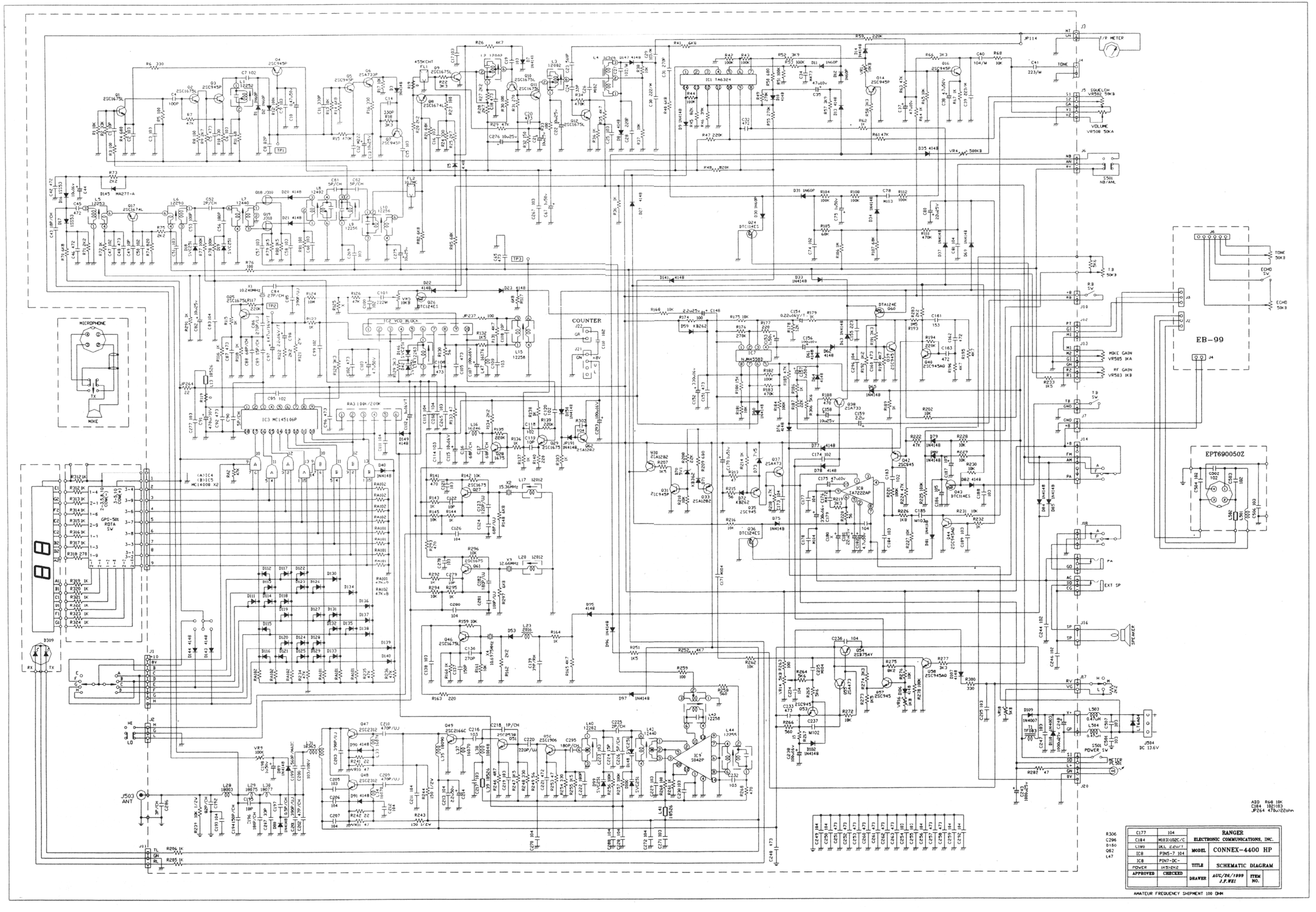
PART LIST
CX-4400 HP MAIN PCB

REFERENCE NUMBER	RANGER PART NO.	DESCRIPTION
	EPT690010Z	MAIN P.C.B
R246	RCP164794Z	4.7 Ω 1/16W
R267	RCP161504Z	15 Ω 1/16W
R241,242	RCP162204Z	22 Ω 1/16W
R133,213,253,282, VR10,VR11	RCP164704Z	47 Ω 1/16W
R130,215,220,	RCP165604Z	56 Ω 1/16W
R11	RCP166804Z	68 Ω 1/16W
R3,5,8,30,33,76,81, 174,260,263,JP237	RCP161014Z	100 Ω 1/16W
R32,249	RCP161514Z	150 Ω 1/16W
R23	RCP161814Z	180 Ω 1/16W
R140,163,177	RCP162214Z	220 Ω 1/16W
R31	RCP162714Z	270 Ω 1/16W
R6,10,16,24,248,254, 300	RCP163314Z	330 Ω 1/16W
R141,188,268,293	RCP164714Z	470 Ω 1/16W
R258,266	RCP165614Z	560 Ω 1/16W
R4,50,209	RCP166814Z	680 Ω 1/16W
R74	RCP168214Z	820 Ω 1/16W
R36,62,64,67,72,115, 116,118,123,136-138, 143,144,160,164,179, 186,189,205,214,154, 261,291,292,295,303, 206,232	RCP161024Z	1KΩ 1/16W
R192	RCP161224Z	1.2KΩ 1/16W
R132,207,233,247,255 ,273,79,80	RCP161524Z	1.5KΩ 1/16W
R226	RCP161824Z	1.8KΩ 1/16W
L7	RCP162024Z	2KΩ 1/16W
R20,27,71,73,75,134, 162,122,283,93	RCP162224Z	2.2KΩ 1/16W
R9,25,28	RCP162724Z	2.7KΩ 1/16W
R18,22,58,66,128,129 ,191,219,274,277	RCP163324Z	3.3KΩ 1/16W
R52,57	RCP163924Z	3.9KΩ 1/16W
R26,35,131,165,190, 195,196	RCP164724Z	4.7KΩ 1/16W
R264,265	RCP165624Z	5.6KΩ 1/16W
R14,40,41,82,127,148 ,297,70	RCP166824Z	6.8KΩ 1/16W
R275	RCP168224Z	8.2KΩ 1/16W
R1,13,17,37,38,65, 142,145,159,161,168, 175,181,202,216,227-231,272,276,294,296, 262,68	RCP161034Z	10KΩ 1/16W
R178	RCP161234Z	12KΩ 1/16W
R180	RCP161534Z	15KΩ 1/16W
R187,208	RCP162234Z	22KΩ 1/16W
R121	RCP162734Z	27KΩ 1/16W
R2	RCP163334Z	33KΩ 1/16W
R46	RCP163934Z	39KΩ 1/16W
R7,29,61,63,126,185, 218,234,235,236,224, 222,151	RCP164734Z	47KΩ 1/16W
R21,85,105,107	RCP166834Z	68KΩ 1/16W
R45	RCP168234Z	82KΩ 1/16W
R12,42-44,51,53,77,78 ,104,108,112,182,184 ,225,256,257,278,221		
R47,59,117,135,139, 194	RCP162244Z	220KΩ 1/16W
R49,55,176	RCP162744Z	270KΩ 1/16W
R15,34,111,183	RCP164744Z	470KΩ 1/16W
R48	RCP168244Z	820KΩ 1/16W
R106	RCP1610547	1MΩ 1/16W

R193	RCP161554Z	1.5MΩ 1/16W
R124	RCP161064Z	10MΩ 1/16W
JP264	RCP142204Z	22 Ω 1/4W
R244,243	RCP121514Z	150 Ω 1/2W
R239	RCP121034Z	10KΩ 1/2W
C1,49,108,119,122, 279,147	CC0501004L	10PF 50WV
C224	CC0501504L	15PF 50WV
C195	CC0501804L	18PF 50WV
C24,287	CC0503304L	33PF 50WV
C8	CC0508204L	82PF 50WV
C4,53	CC0501015L	100PF 50WV
C137	CC0501515L	150PF 50WV
C56,222	CC0501815L	180PF 50WV
C28	CC0502215L	220PF 50WV
C31,136	CC0502715L	270PF 50WV
C11,14	CC0503315L	330PF 50WV
C23	CC0505615L	560PF 50WV
C218	CC0500101A	1PF 50WV
C225,52	CC0500201A	2PF 50WV
C286	CC0500301A	2PF 50WV
C61,62,90,226	CC0500501A	5PF 50WV
C89	CC0501504A	15PF 50WV
C43	CC0501804A	18PF 50WV
C84	CC0502704A	17PF 50WV
C202	CC0504704A	47PF 50WV
C88,116,117	CC0506804A	68PF 50WV
C192	CC0508204A	82PF 50WV
C191	CC0501015A	100PF 50WV
C194	CC0501515A	150PF 50WV
C196,295	CC0501815A	180PF 50WV
C139	CC0503904D	39PF 50WV
C281	CC0501015G	100PF 50WV
C282	CC0501815G	180PF 50WV
C124	CC0506804G	68PF 50WV
C123	CC0501215G	120PF 50WV
C86	CC0502715G	270PF 50WV
C85,201,203	CC0503915G	390PF 50WV
C209,210	CC0504715G	470PF 50WV
C199	CD3005614Z	560P 300WV
C7,47,50,74,95,99, 100,110,118,120,174, 183,244,246,245	CC0501027L	0.001UF 50WV
C81,83,111,113,126, 173,193,206,207,228, 234,236,249,250,256, 259,268,272,280,288, 292,296,211-213 (COPPER SIDE),270, C177,R302	CC0501047L	0.1UF 50WV
C5,18,20,48,65,87,92 ,96,102,105,106,151, 160,233,251-253,257, 258,260-263,240	CC0504737L	0.047uF 50WV
C32,42,45,46,221,162 ,163	CC0504727L	0.0047UF 50WV
C155	CC0502237L	0.022UF 50WV
C200	CC1001037L	0.01UF 100WV
C2,3,6,9,15-17,19,25 ,51,57,58,60,109,114 ,121,138,188,189,205 ,216,217,219,223,229 ,230,232,247,254,255 ,265,267,269,271,277 ,278,285,184	CC0501037L	0.01UF 50WV
C161	CC0501537L	0.015UF 50WV
C154	CT0162246Z	0.22UF 16WV
C97	CT0164746Z	0.47UF 16WV
C98	CT0162256Z	2.2UF 16WV
C112	CT0161056Z	1UF 16WV
C40,178,171,235	CM0501045Z	0.1UF 50WV
C26,27,237	CM0501025Z	0.001UF 50WV
C29,78,185,41	CM0501035Z	0.01UF 50WV
C39	CM0502235Z	0.022UF 50WV
C176	CM0504725Z	0.0047UF 50WV
C34	CM0504735Z	.047UF 50WV
C12,30,101	CM0502225Z	.0022UF 50WV
C10	CE0504747Z	0.47UF 50WV
C67,75,153,157,170, 186,187,198	CE0501057Z	1UF 50WV
C159,214,148	CE0502257Z	2.2UF 50WV
C38,103,182	CE0504757Z	4.7UF 50WV
C13,21,22,44,82,115, 158,275,276	CE0251067Z	10UF 25WV
C80,181	CE0252267Z	22UF 25WV
C37,175	CE0254767Z	47UF 25WV
C107,156,238,293	CE0161077Z	100UF 16WV
C152,179	CE0163377Z	330UF 16WV
C91	CE0104777Z	470UF 10WV
C243,248	CE0251087Z	1000UF 25WV
C35	CEM254767Z	47UF 25WV
FL1	EFCFW455HT	C/FILTER 455HT
FL2	EFCFE107MX	C/FILTER 10.7MX RED
X1	EYCAB10240	CRYSTAL 10.240MHZ
X2	EYCAA15360	CRYSTAL 15.360MHZ
X3	EYBAA12660	CRYSTAL 12.660MHZ
X4	EYBAE10697	CRYSTAL 10.6975MHZ
IC1	ENJR00324D	I.C.NJM324D
IC3	ENMC45106P	MC145106
IC4,5	ENMC14008B	MC14008BCP
IC7	ENJR04558D	NJM4558D
IC9	ENSM06130Z	TDA6130
Q8,17	T2SC01674L	2SC1674L
Q51	T2SC02538Z	2SC2538
Q52	T2SC01906Z	2SC1906
Q26,36	TDTC0124ES	DTC124ES
Q24,43	TDTC0114ES	DTC114S
Q30,33,62	T2SA01282E	2SA1282AE
Q1,2,9,10-12,25,27, 28,29,46,61	T2SC01675L	2SC1675
Q60	TDTA0124ES	DTA124ES
Q3-5,7,14,16,31,35, 39,42,44,53,57,58,40	T2SC00945P	2SC945P
Q6,38	T2SA00733P	2SA733P
Q55	T2SA01869Z	2SA1869
Q18,19	FM0J00310Z	F.E.T J310
D3,5,7-10,13,14,20- 23,27,33,34,35,37,40 ,53,60-65,69,75-82, 85,88-91,97,102, 106,107,111-141,143, 144,147,149,150,151, 28,95,66,96,84,JP191	ED1N04148Z	DIODE 1N4148
D1,2,11,12,30,31	ED1N00060P	1N60P
D110	ED1N04003Z	1N4003
D109	ED1N04007Z	1N4007
D16,17	EDSS00053Z	ISS53
D59,72	EDMA00027W	MA27W-A
D71,145	EDMA00027T	MA27T-A
D18,19,42,99,100,146 ,148	EDSV00251Z	SVC-251SPA
D70	EDZD05519Z	5.1V 0.5W
D73	EDZD05759Z	7.5V 0.5W
L2,3	ECIFT12002	I.FT
L6	ECIFT12290	I.F.T
L17,20	ECIFT12012	I.F.T
L23	ECIFT12016	I.F.T
L1	ECIFT12252	I.F.T
L44	ECIFT12255	I.F.T
L9,10	ECIFT12256	I.F.T
L15,43	ECIFT12258	I.F.T
L40	ECIFT12262	I.F.T
L14	ECIFT12558	I.F.T
L5	ECIFT12253	I.F.T
L7,42	ECIFT12440	I.F.T
L8	ECIFT12492	I.F.T
L4	ECIFT12526	I.F.T
L503,504	ECCHK16000	CHOKE COIL

T1	ECCHK16004	CHOKE COIL
L37,33,34	ECCHK16070	CHOKE COIL
L47	ECCHK16176	CHOKE COIL
L16	ECCHK16246	CHOKE COIL
L28	ECSPG18003	SPRING COIL
L30	ECSPG18077	SPRING COIL
L29	ECSPG18075	SPRING COIL
L31	ECSPG18365	SPRING COIL
L35	ECSPG18001	SPRING COIL
L38	ECRFZ10048	RF COIL
L13,39,41	ECBAD18526	BEAD COIL
VR16	RE10200041	S/F/R 1K
VR14,18	RE50200042	S/F/R 5K
VR1,5	RE10300031	S/F/R 10K
VR9	RE10400043	S/F/R 100K
VR4	RE50400087	S/F/R 500K
RA2	RCS0870014	R/ARRAY
RA1	RCS0970015	R/ARRAY
RA3	RCS0670025	R/ARRAY
R201-R223	WL00070092	LEAD WIRE
R223-R198	WL02070092	LEAD WIRE
JP1-3,4,7,9,23,24-26 ,32,33,38,39,50,54- 57,59,61,62,63,66,71 ,72,79,80,82,85,83, 86,87,93,100,105,106 ,114,115,118-122, 124-126,128,135, 138-140,144,145,152, 153,156,157,159,160, 125,165,166,168,170, 172,174,175,177- 179 ,181,184,188,125,190 ,91,195,142	WX01060605	J/W 6x5x6
JP200-202,204,205, 209,211,212,214,217, 219,220,224,226,231- 233,235,236,238,239, 242,243,245,250,252, 253,255-260,262,263, 265,271-273,276,278- 280,285,267x2,R119, R305,R89,R19,C142, C291,C128,C129,D26, D46,D50,D49-L46,TP8, D95,D49-L46,JP240	WX01070705	J/W 7x5x7
D25,237	WX01070708	J/W 7x8x7
JP6,11,12,16-19,34- 37,40-49,51-3,58,60, 67,70,88,96,101-104, 107-109,116,117,127, 129,133,136,137,143, 147,148,151,161,167, 169,176,131,132,240	WX01060610	J/W 6x10x6
JP215,218,222,223, 225,227,228,230,234, 241,244,246-249,251, 254,261,266,277,286, 287,IC6,L36	WX01070710	J/W 7x10x7
JP75-78,81,69	WX01070712	J/W 7x12x7
JP99	WX01070713	J/W 7x13x7
FL3	WX01070715	J/W 7x15x7
TP7-TP8,TP8-TP9	WX01070718	J/W 7x18x7
J7x2,10,17,22,Q41	EX07N48223	P/C/S 3P
J2,3,6,11,18	EX07N48350	P/C/S 3P
J21	EX07N48490	P/C/S 4P
J5,20	EX07N48222	P/C/S 5P
J13	EX07N48331	P/C/S 6P
J14	EX07N48224	P/C/S 7P
J1	EX07N48543	P/C/S 9P
J28,4	EX07N48244	P/C/S 3P
J12	EX07N41227	P/C/S 3P
J29	EX07N48884	P/C/S 6P
J16	EX07N41330	P/C/S 2P
J28,29	EX07N48151	P/C/H
TP2,3,5	EX07N48612	P/C/S 1PIN
CW/PA,EXT SP	EX06N41045	EAR JACK
J304-MAIN	EX07N48886	W/C/S 10P
J16-SPK	EX07N48041	W/C/S 2P
J1	EX07N48899	W/C/S 9P
J6,11	EX07N48880	W/C/S 3P
J10	EX07N48888	W/C/S 2P
J14	EX07N48897	W/C/S 7P
J5	EX07N48881	W/C/S 5P
J20	EX07N48885	W/C/S 5P
J2	EX07N48882	W/C/S 3P
F.C	EX07N48887	W/C/S 6P
J17,Q41,J9-METER	EX07N48896	W/C/S 2P
J18	EX07N48898	W/C/S 3P
J7	EX07N48993	W/C/S 2P
DC(2)	CC0501037L	0.01UF 50WV
IC8	ENTA07222A	IC TA7222AP
Q54	T2SB00754Y	TR 2SB754Y
Q49	T2SC02166C	TR 2SC2166C
Q47,48	T2SC02312C	TR 2SC2312C
Q37	T2SA01869Z	TR 2SA1869
DC SOCKET	EDLT6A400Z	DIODE LT6A400

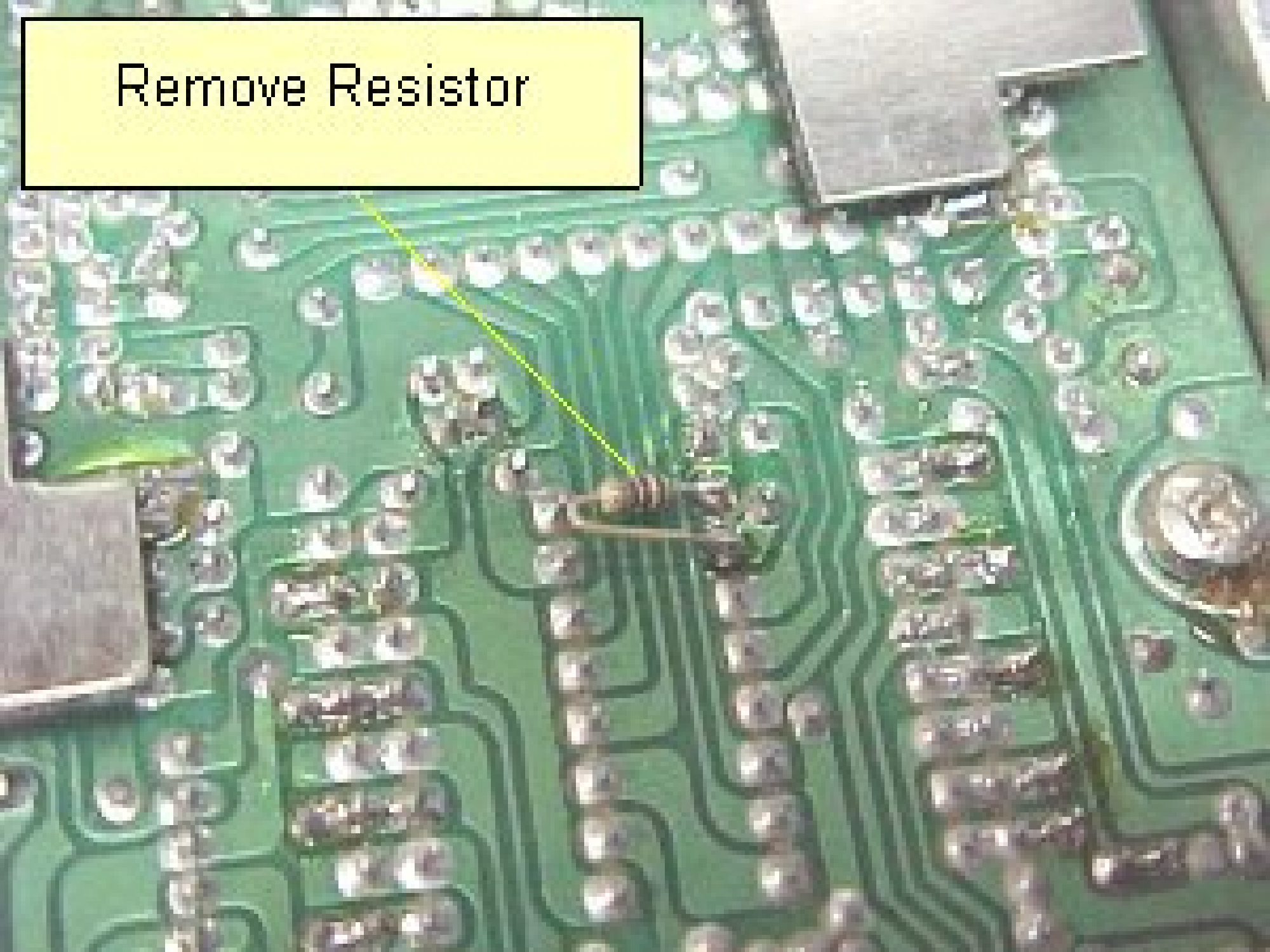

COUNTER.
MICROPHONE
MIKE
EB-99
EPT690050Z
T/R METER
SPEAKER
J503 ANT
J504 DC 13.6V
R306
C296
D150
Q62
L47
RANGER
ELECTRONIC COMMUNICATIONS, INC.
MODEL
CONNEX-4400
TITLE
SCHEMATIC DIAGRAM
APPROVED
CHECKED
DRAWER
AUG/26/1999
Z.M.LU
ITEM NO.
AMATEUR FREQUENCY SHIPMENT 100 OHM

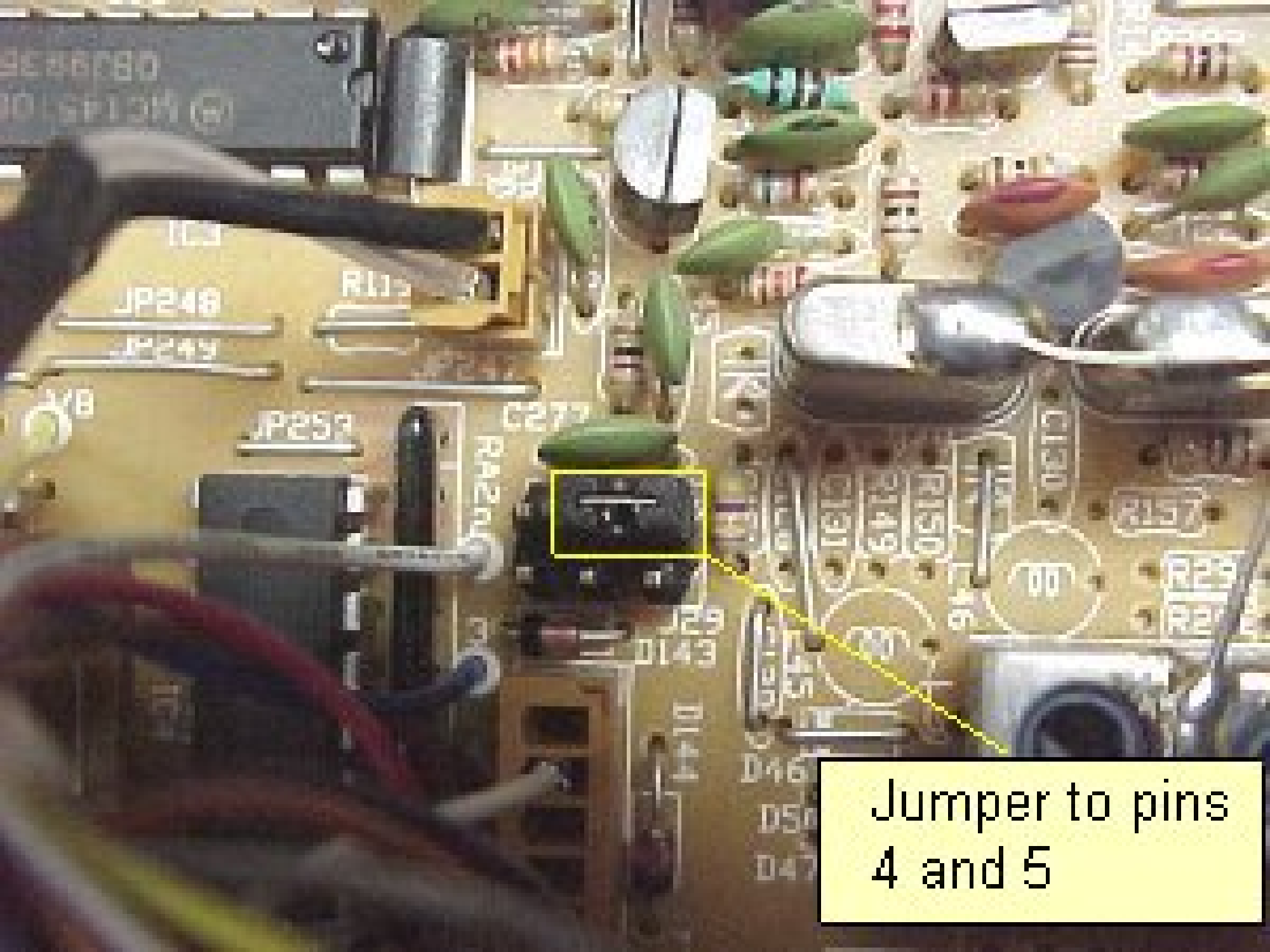


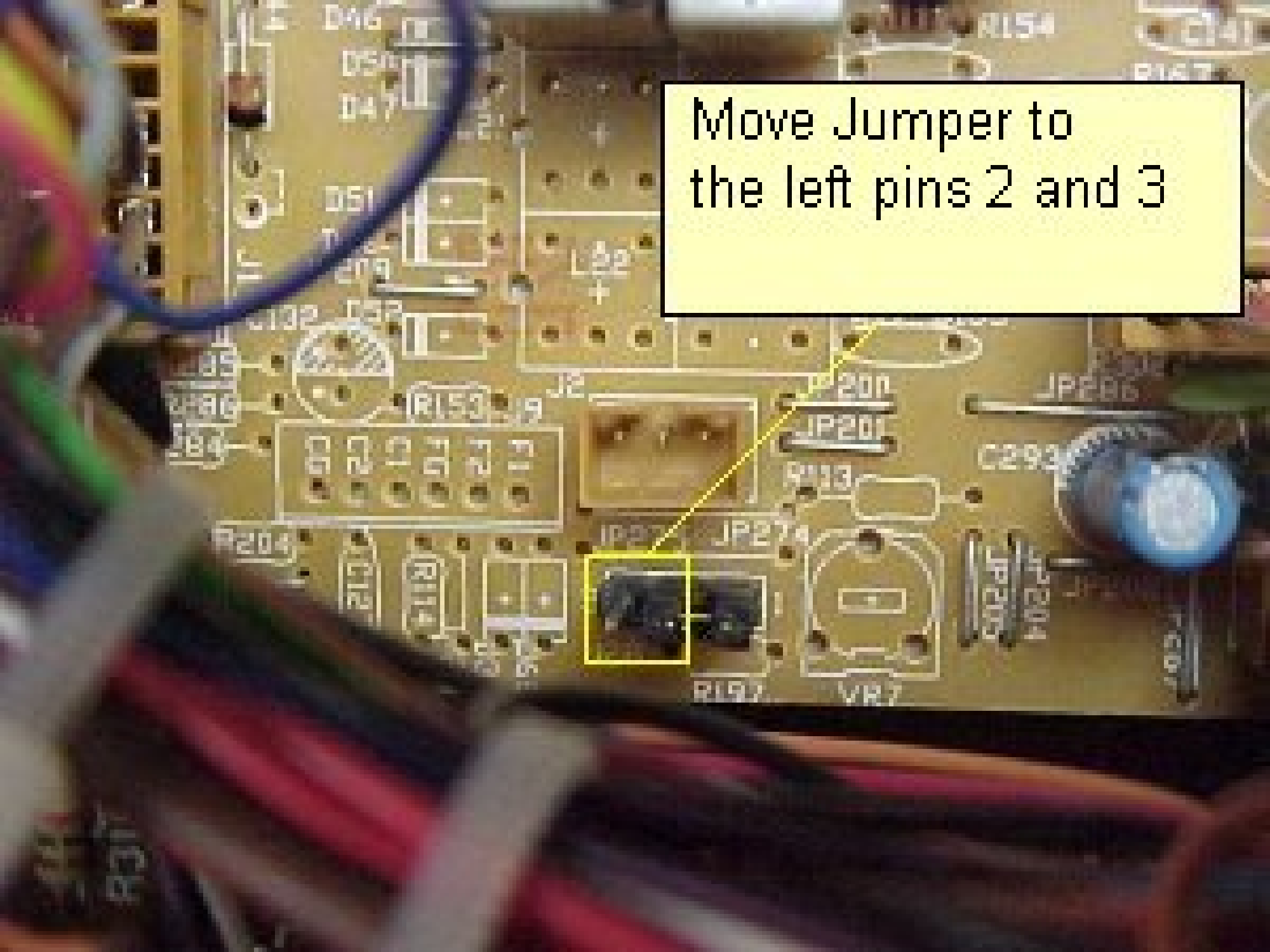
C177	104	RANGER ELECTRONIC COMMUNICATIONS, INC.	
C184	M103\102C/C		
C190	DEL 22UF	MODEL	CONNEX-4400 HP
IC8	PIN5-7 104		
IC8	PIN7-DC-	TITLE	SCHEMATIC DIAGRAM
POWER	1K5\2K2		
APPROVED	CHECKED	DRAWER	AUG/26/1999 J.F.WEI
		ITEM NO.	

R306
C296
D150
Q62
L47

AMATEUR FREQUENCY SHIPMENT 100 OHM


Remove Resistor


Jumper to pins
4 and 5


Move Jumper to
the left pins 2 and 3