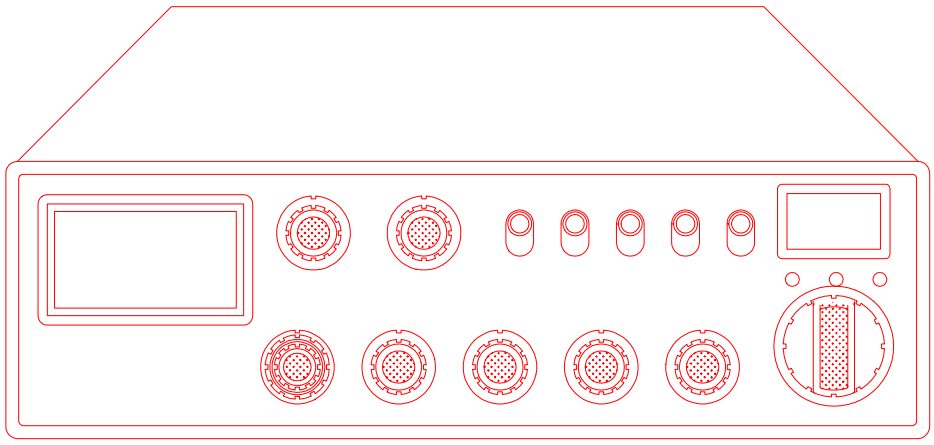
Galaxy

CB Radios

Model DX 949

Service Manual ©



DX 949

TABLE OF CONTENTS

CHAPTER 1 SPECIFICATIONS

1.0 GENERAL

Model	DX 949
Frequency Range	26.965 - 27.405MHz.
Emission Modes	AM/USB/LSB
Frequency Control	Phase Lock Loop (PLL) synthesizer.
Frequency Tolerance	± 0.005 %.
Frequency Stability	± 0.001 %.
Operating Temperature Range	-30°C to +50°C.
Microphone	Plug-in dynamic; with push-to-talk switch and coiled cord.
Input Voltage	13.8V DC nominal ±15%.
Current Drain : Transmit (AM full mod.)	<3.5A.
Current Drain : Receiver (Squelched)	<0.5A.
(Max. audio output)	<1.0A.
Antenna Connector	UHF, SO239.
Dimensions	2-3/8”(H) x 7-7/8”(W) x 9-1/4”(D).
Weight	5 lb.

1.1 TRANSMITTER

RF Power Output	AM : 4W SSB : 12W
RF Transmit Modes	AM/SSB
Modulation	High and low level Class B, Amplitude Modulation : AM and SSB
Spurious Emissions	-55 dB.
Carrier Suppression	-55 dB.
Audio Frequency Response	300 to 2500Hz
Antenna Impedance	50 Ohms.
Output Indicators	Meter shows relative RF output power, SWR and AM Modulation. Transmit LED glows red when transmitter is in operation.

1.2 RECEIVER

Sensitivity For 10dB S/N (AM)	<0.5μV
Sensitivity For 10dB S/N (SSB)	<0.25μV.
IF Frequency	AM : 10.695 MHz 1st IF, 455 KHz 2nd IF.
Image Rejection	-65 dB.
Adjacent Channel Selectivity	-60 dB.
RF Gain Control	45 dB adjustable for optimum signal reception.
Automatic Gain Control (AGC) Figure Of Merit	100 mV for 10 dB Change in Audio Output
Squelch	Adjustable; threshold less than 0.5 μV.
Noise Blanker	RF type.
Audio Output Power	2 watts into 8 Ohms.
Audio Frequency Response	AM and SSB : 300 to 2500 Hz.
Built-in Speaker	8 Ohms, round.
External Speaker (Not Supplied)	8 Ohms; disables internal speaker when connected.

(SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE)

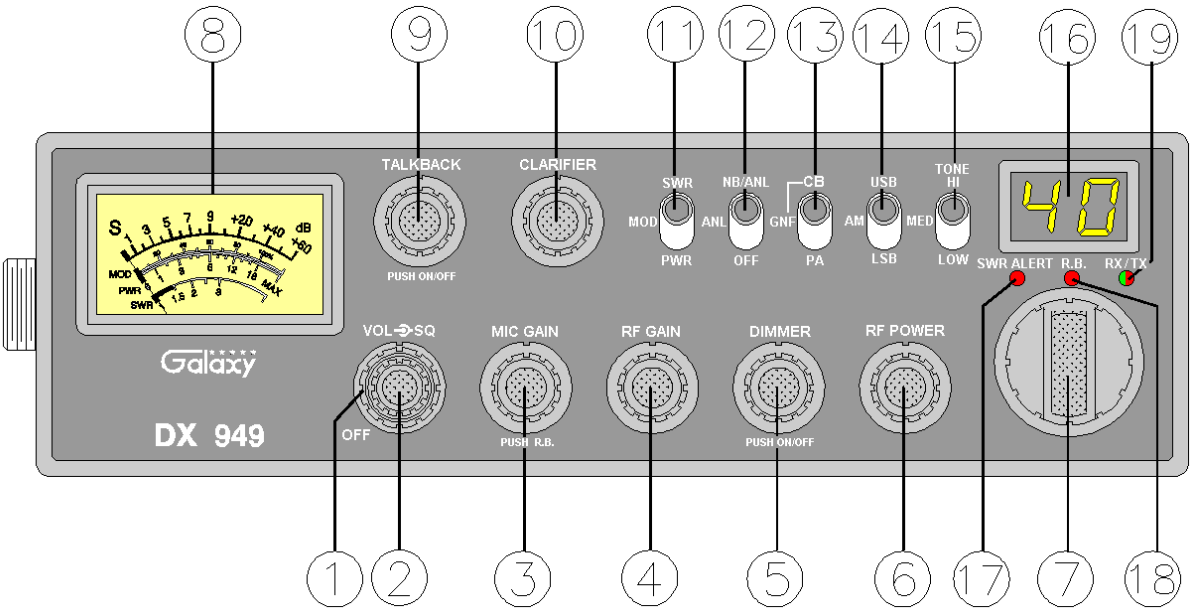


Figure 2-1 Front Panel

2.0 INTRODUCTION

This section explains the basic operating procedures for the Galaxy DX 949 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. 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 counter-clockwise, then slowly 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.

2. ON/OFF VOLUME CONTROL

Turn clockwise to apply power to the radio and to set the desired listening level.

3. MIC GAIN

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. Pushing this knob turns the Roger Beep on and off. When the Roger Beep is on, the radio transmits an audio tone at the end of your transmission. This indicates the end of your transmission so that people who are having trouble hearing you will know that you are done speaking. As a courtesy to others, use the Roger Beep only when necessary.

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

5. DIMMER CONTROL
This knob controls the level of brightness for the meter lamp and the LED channel display. Also, pushing this knob turns the meter lamp and the display LED's on and off.

6. RF POWER CONTROL
This control allows the user to adjust RF power output.

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

8. FRONT PANEL METER
The Front Panel Meter allows the user to monitor signal strength, RF output power, SWR level and AM modulation level.

9. TALKBACK CONTROL
Pushing this knob turns the Talkback circuit on and off. 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. CLARIFIER
Allows tuning of the receive frequency above or below the channel frequency by up to 1.0 KHz. Although this control is intended primarily to tune in SSB signals, it may be used to optimize AM signals .

11. SWR/MOD/ PWR SWITCH
This switch controls the function of the meter during the transmit mode. In the SWR position, the meter indicates the Standing Wave Ratio (SWR) of your antenna. There are no adjustments because the SWR circuit in this radio calibrates itself automatically. When the switch is in the MOD position, the green scale on the meter indicates your percentage of modulation. This operates in AM only, not in SSB. When this switch is in PWR position, the meter indicates your power output.

12. NB/ANL/OFF SWITCH
In the ANL position, the Automatic Noise Limiter is activated. When the switch is placed in the NB/ANL position, the RF Noise Blanker is also activated. The Noise Blanker is very effective in eliminating repetitive impulse noise such as ignition interference.

13. PA/GNF/CB SWITCH

In the PA position, your voice will come out of the speaker that you need to plug in to the PA. SP. jack on the rear panel. The radio does not operate when you are in the PA mode. The CB mode is normal operation of the radio. In the GNF mode, you are in CB operation but the Galaxy Noise Filter is engaged. This is a special noise filter that de-emphasizes audio high frequency response in order to increase the signal-to-noise ratio of weak signals. While you will notice a dramatic reduction in the "rushing" sound when this filter is activated, it does not have much effect on the signal-to-noise ratio of strong signals. It is mostly used for SSB reception.

14. MODE SWITCH
This control allows you to select one of the following operating modes : USB/AM/LSB .

15. TONE SWITCH HI/MED/LO
This switch changes tone quality in receive only. In LO position, bass is increased and in HI position, treble is increased.

16. CHANNEL DISPLAY
The channel display indicates the current selected channel.

17. SWR ALERT LED
This LED lights red when your SWR is higher than about 3:1. This is not an exact indicator of 3:1 SWR, but it is an indication that you should check your SWR reading.

18. R.B. LED
This lights green when the Roger Beep is on.

19. RX/TX LED
This LED lights green during receive and red during transmit.

2.1.2 REAR PANEL

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

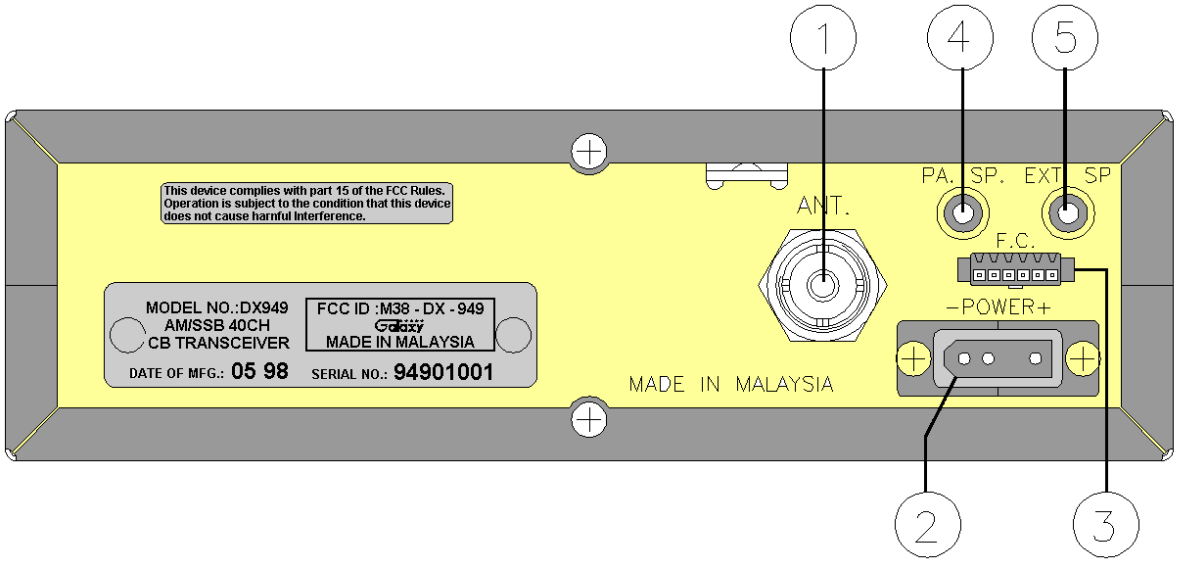


Figure 2-2 Rear Panel

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. FREQUENCY COUNTER CONNECTOR
This connector is for the optional Galaxy FC 347 six digit frequency counter. All connections are made through this connector. No soldering is required.

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	CHANNEL FREQUENCY	CHANNEL	CHANNEL FREQUENCY
1	26.965 MHz	21	27.215 MHz
2	26.975 MHz	22	27.225 MHz
3	26.985 MHz	23	27.255 MHz
4	27.005 MHz	24	27.235 MHz
5	27.015 MHz	25	27.245 MHz
6	27.025 MHz	26	27.265 MHz
7	27.035 MHz	27	27.275 MHz
8	27.055 MHz	28	27.285 MHz
9	27.065 MHz	29	27.295 MHz
10	27.075 MHz	30	27.305 MHz
11	27.085 MHz	31	27.315 MHz
12	27.105 MHz	32	27.325 MHz
13	27.115 MHz	33	27.335 MHz
14	27.125 MHz	34	27.345 MHz
15	27.135 MHz	35	27.355 MHz
16	27.155 MHz	36	27.365 MHz
17	27.165 MHz	37	27.375 MHz
18	27.175 MHz	38	27.385 MHz
19	27.185 MHz	39	27.395 MHz
20	27.205 MHz	40	27.405 MHz

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 low impedance (500 ohm) dynamic microphone. For installation instructions of the microphone, see section "ALTERNATE MICROPHONES AND INSTALLATION".

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

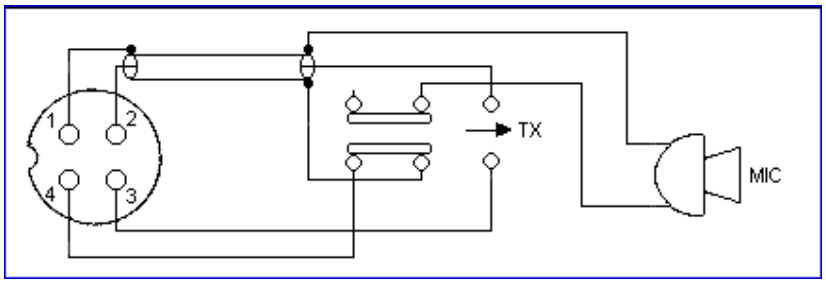


Figure 2-3 Your Transceiver Microphone Schematic

If the microphone to be used is provided with pre-cut leads, they must be revised as follows :

(i) Cut leads so that they extend 7/16” beyond the plastic insulating jacket of the microphone cable.
(ii) All leads should be cut to the same length. Strip the ends of each wire 1/8” and tin the exposed wire.
Before beginning the actual wiring read carefully, the circuit and wiring information provided with the microphone you select. Use the minimum head required in soldering the connections. Keep the exposed wire lengths to a minimum to avoid shorting when the microphone plug is reassembled.

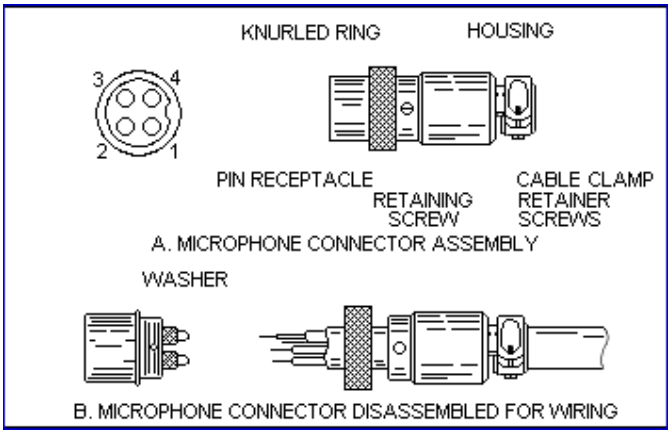


Figure 2-4 Microphone Plug Wiring

To wire microphone cable to the plug provided, proceed as follows :

(i) Remove the retaining screw.

(ii) Unscrew the housing from the pin receptacle body.

(iii) Loosen the two cable clamp retainer screws.

(iv) Feed the microphone cable through the housing, knurled ring and washer as shown Figure 2-4.

(v) The wires must now be soldered to the pins as indicated in the above wiring tables. If a vise or clamping tool is available it should be used to hold the pin receptacle body during the soldering operation, so that both hands are free to perform the soldering. If a vise or clamping tool is not available, the pin receptacle body can be held in a stationary position by inserting it into the microphone jack of the front panel. The numbers of the pins of the microphone plug are shown in Figure 2-5, as viewed from the back of the plug. Before soldering the wire to the pins, pre-tin the wire receptacle of each pin of the plug.

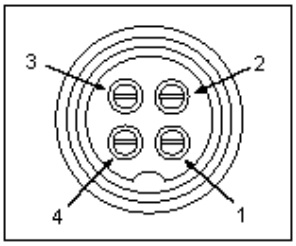


Figure 2-5 Microphone plug pin numbers viewed from rear of pin receptacle.

Be sure that the housing and the knurled ring of Figure 2-3 are pushed back onto the microphone cable before starting to solder. If the washer is not captive to the pin receptacle body, make sure that it is placed on the threaded portion of the pin receptacle body before soldering.

(vi) When all soldering connections to the pins of the microphone plug are complete, push the knurled ring and the housing forward and screw the housing onto the threaded portion of the pin receptacle body. Note the location of the screw clearance hole in the plug housing with respect to the threaded hole in the pin receptacle body. When the housing is completely threaded into the pin receptacle body, a final fraction of a turn either clockwise or counter-clockwise may be required to align the screw hole with the threaded hole in the pin receptacle body. When these are aligned, the retaining screw is then screwed into the place to secure the housing to the pin receptacle body.

(vii) The two cable clamp retainer screws should now be tightened to secure the housing to the microphone cord. If the cutting directions have been carefully followed, the cable clamp should secure to the insulating jacket of the microphone cable.

(viii) Upon completion of the microphone plug wiring, connect and secure the microphone plug in the transceiver.

CHAPTER 3

3.0 INTRODUCTION

This section explains the technical theory of operation for the Galaxy DX 949 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, Q25, Q27, Q28 and Q61. The PLL circuit is programmed by the user's rotary channel switch GPS-501. The switch allows GPS-501 to communicate the correct binary data information to the programmable divider inside of IC3. IC3 then controls the VCO (Voltage Controlled Oscillator), consisting of VCO 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 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 balanced modulator circuit.

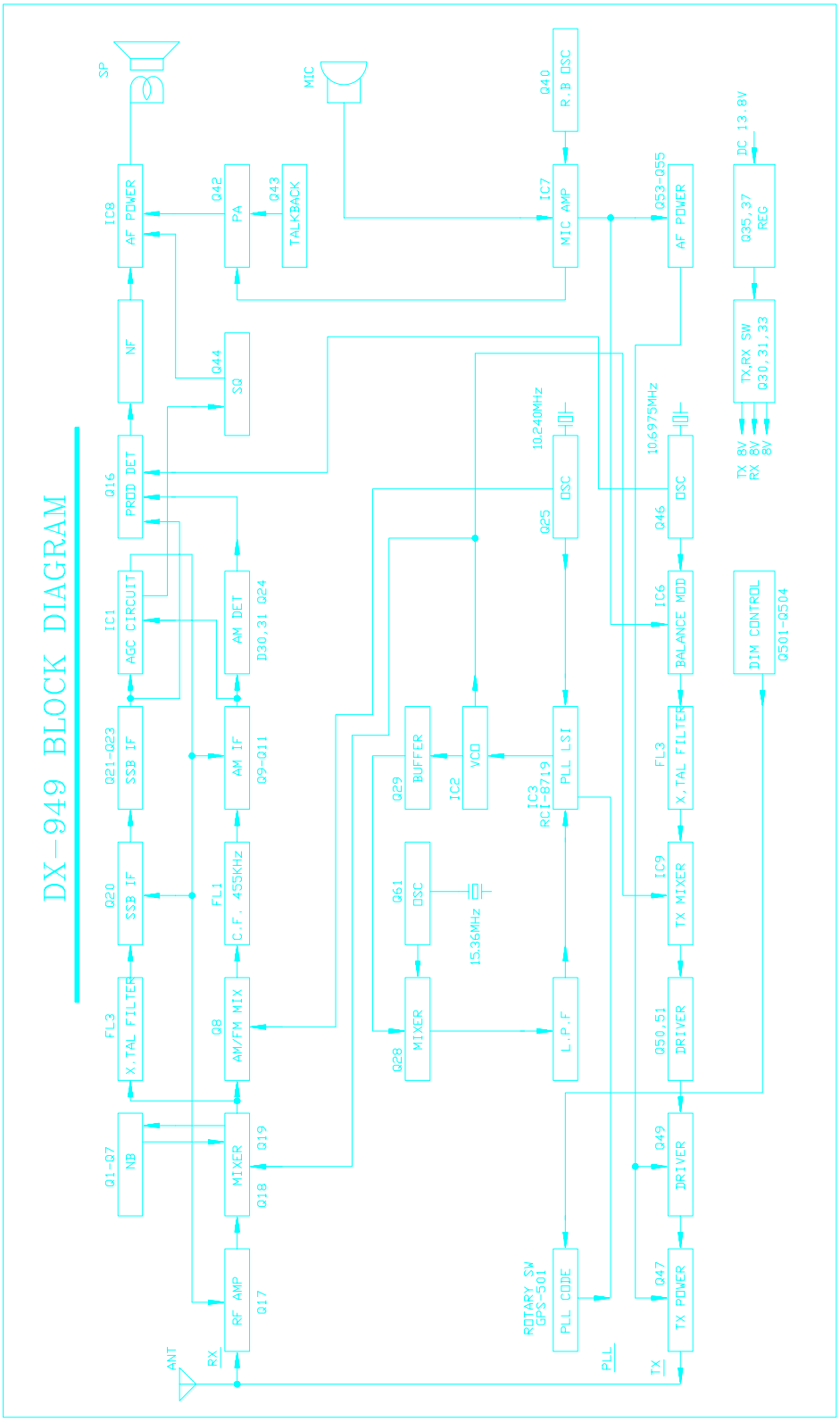
(ii) If the transceiver is in the AM mode, the AF amplifier controls directly the RF amplifier gain of the last RF amplifier which produces a true amplitude modulation RF signal.

(iii) If the transceiver is in the SSB mode, the audio signal is mixed with 10.6975MHz oscillator in IC6.

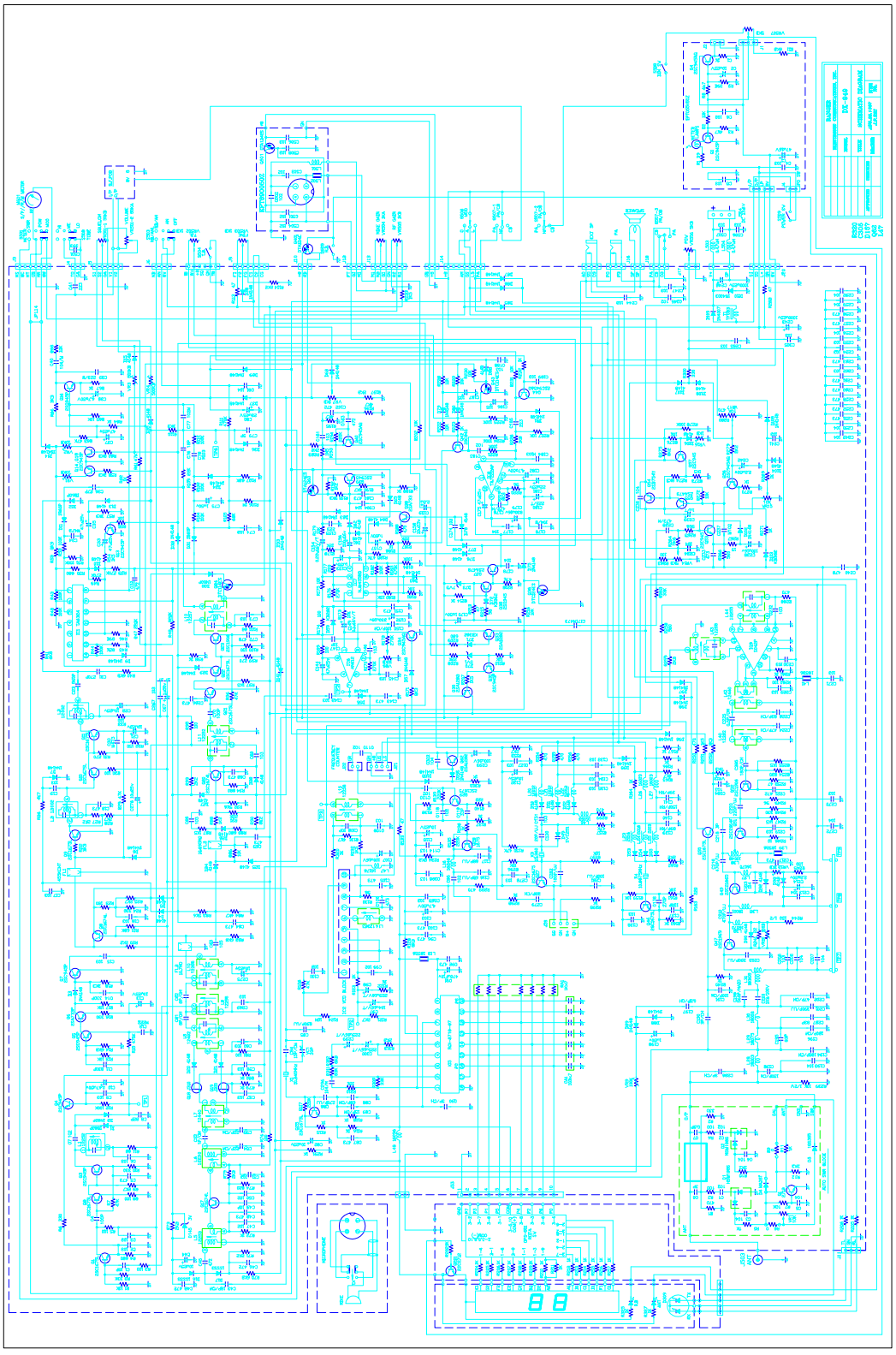
3.4 TRANSMITTER AMPLIFIER CIRCUIT

The transmitter takes the basic exciter signal from the TX mixer and amplifies it through a series of amplifiers consisting of Q50, Q51, Q49 and Q47 where it is sent out to the antenna connector.

DX 949 BLOCK DIAGRAM



DX 949 CIRCUIT DIAGRAM



CHAPTER 4

4.0 REQUIRED TEST EQUIPMENT

① DC Power Supply (13.8VDC, 10A)
② RF Wattmeter (25~60 MHz, 25W)
③ Multimeter
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	Disconnect the "short PCB" from TP7, TP8 and TP9. Set radio to CH 1 AM RX mode. Clarifier setting in 12 o'clock. Connect Oscilloscope to TP3. Set radio to CH 1 AM RX mode. Connect frequency counter IC 3 Pin 8	L14 L15 VC1	2.6 VDC ± 0.1 Maximum Output 10.24000 MHz ± 20 Hz
AM Frequency	Set radio to CH 1 AM RX mode. Connect frequency counter to TP3.	L20	16.27000 MHz ± 20 Hz
USB Freq.	Set radio to CH 1 USB mode. Connect frequency counter to TP3.	L21	16.27250 MHz ± 20 Hz
LSB Freq.	Set radio to CH 1 LSB mode. Connect frequency counter to TP3.	L22	16.26750 MHz ± 20 Hz
TX Frequency Offset	Set radio to CH 1 LSB TX mode. Connect frequency counter to TP3	VR7	16.26750 MHz ± 20 Hz
AM OSC	Set radio to CH 1 AM TX mode. Connect frequency counter to TP5	L23	10.69500 MHz ± 20 Hz
USB OSC	Set radio to CH 1 USB TX mode. Set VR6 fully clockwise. Connect frequency counter to TP5.	L24	10.69250 MHz ± 20 Hz
LSB OSC	Set radio to CH 1 LSB TX mode. Connect frequency counter to TP5. Connect scope to TP5 and adjust VR6 for minimum signal.	L25	10.69750 MHz ± 20 Hz

4.1.2 TRANSMITTER ALIGNMENT

ITEM	U.U.T. SETTING	ADJUST POINT	MEASUREMENT
BIAS Current	Set radio to CH 19 USB TX mode. MOD off. Connect current meter to TP7(+) and TP9(-) Connect current meter to TP7(+) and TP8(-)	 VR12 VR10	 50 mA 100 mA
SSB TX Power	Set radio to CH 19, USB TX mode. Connect "short PCB" to TP7 and TP9. Connect RF power meter to antenna jack. AF signal 30 mV, 1 KHz to microphone.	L40, L42, L43, L44 L40, L42	MAX ≥12W Spurious emission Min. Balance Power Between CH 1 and CH 40.
SSB ALC	Audio signal 30 mV, 1 KHz to microphone. Set radio to CH 19, USB TX mode.	VR13	11.5 W
SSB Carrier Balance	Set radio to CH 19, USB TX mode. Mic Gain off. Connect scope to Antenna Connector.	VR6	Spurious Emission To Minimum.
SSB APC	Set radio to CH 19, USB mode. MOD off. Connect Voltmeter to TP7.	VR17	DC12.5V
AM TX Power	Set radio to CH 19 AM TX mode. No MOD.	VR14	3.8W
RF Power Meter	Set radio to CH 19 AM TX mode. Mod off.	VR9	Adjust RF Power meter to "4" on PWR scale.
AM Modulation	Set radio to CH 19 TX mode. Audio signal 30 mV, 1 KHz to microphone. Set Mic Gain Fully Clockwise.	VR16	90%

4.1.3 RECEIVER ALIGNMENT

ITEM	U.U.T. SETTING	ADJUST POINT	MEASUREMENT
AM Sensitivity	Set radio to CH 19 AM RX MODE. Clarifier setting at 12 o'clock. RF Gain fully clockwise, SQ fully counter clockwise. VOL control at 2 o'clock. Connect RF SG to antenna jack Output Frequency 27.185 MHz, MOD 30%. Set radio to CH 40 AM mode. RF SG setting 27.405 MHz. Set radio to CH 1 AM mode. RF SG setting 26.965 MHz.	L2, L3, L5, L6, L7, L8, L9, L10 L6, L7	Audio output > 2V S/N 10 dB For Balance between CH 1 and CH 40
USB Sensitivity	Set radio to CH 19 USB mode. VOL control fully clockwise. RF SG setting to 27.186 MHz @ 0.5 uV MOD to off	L11, L12	Audio output > 2V S/N 10 dB
LSB Sensitivity	Set radio to CH 19 LSB mode. VOL control fully clockwise. RF SG setting to 27.184 MHz @ 0.5 uV MOD to off	L11, L12	Audio output > 2V S/N 10 dB
NB Adjust	Set radio to CH 19 AM mode RF SG setting 27.205 MHz @ 100 uV MOD 30%, NB/ANL switch on. Connect Voltmeter to TP1	L1	DC voltage to max. (>2.0V)
AM Squelch	Set radio to CH 19 AM mode SQ control at fully clockwise. RF SG setting 10 mV, MOD 30%	VR4 Slowly	Adjust very slowly until squelch just closes
SSB Squelch	Set radio to CH 19 USB mode. SQ control fully clockwise. RF SG setting 10 mV	VR3 Slowly	Adjust very slowly until squelch just closes
AM S/RF Meter AM S-Meter	Set radio to CH 19 AM mode. Meter switch at S/RF position. RF SG setting to 27.185 MHz @ 100 uV MOD 30%,	VR1	Meter needle to S9 on the S scale
SSB S-Meter	Set radio to CH 19 USB mode. S/RF switch at S/RF position. RF SG setting 27.186 Mhz, MOD off 100 uV	VR2	Meter needle to S9 on the S scale

Figure 4-1 Transmitter test setup

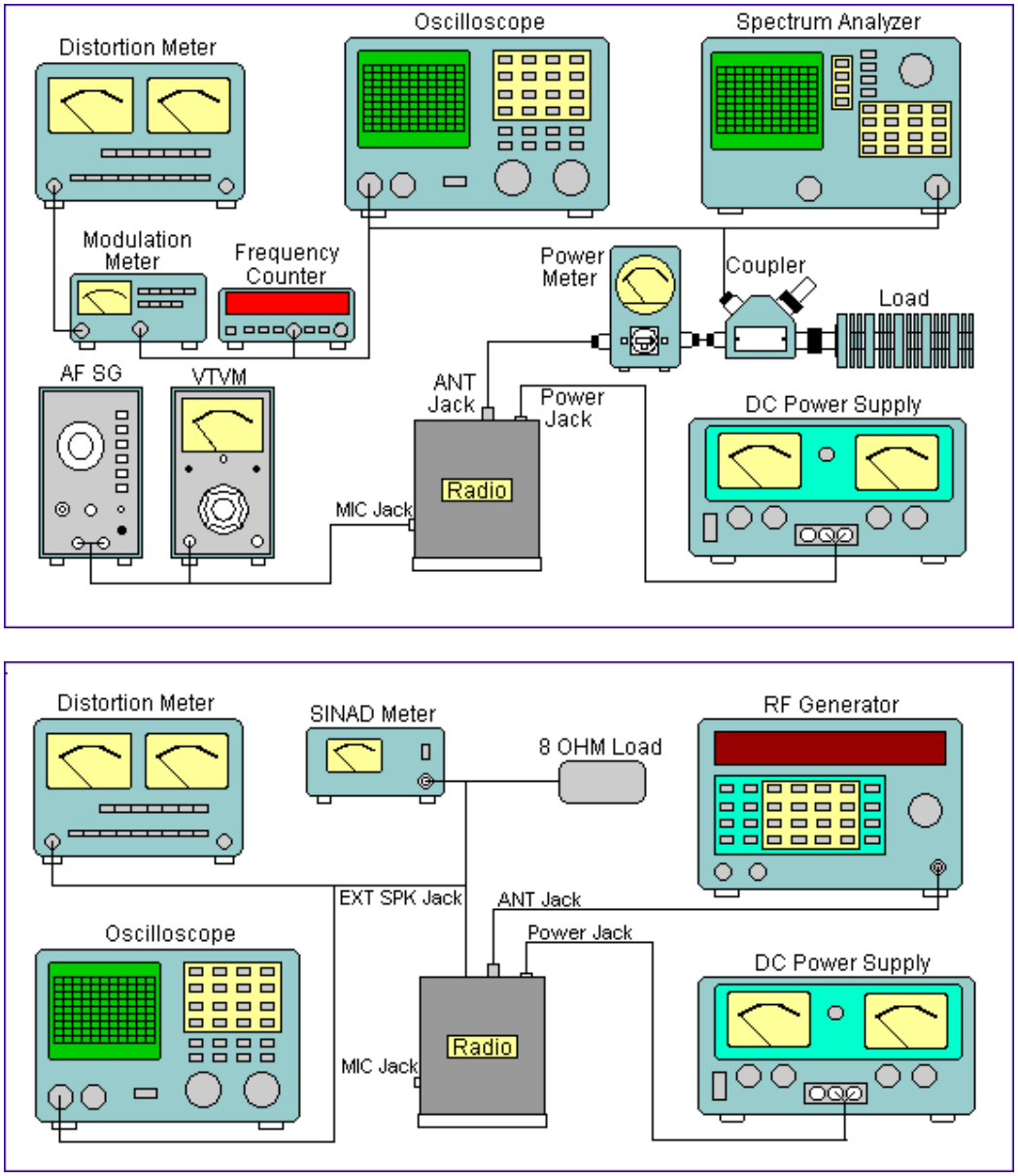


Figure 4-2 Receiver test setup

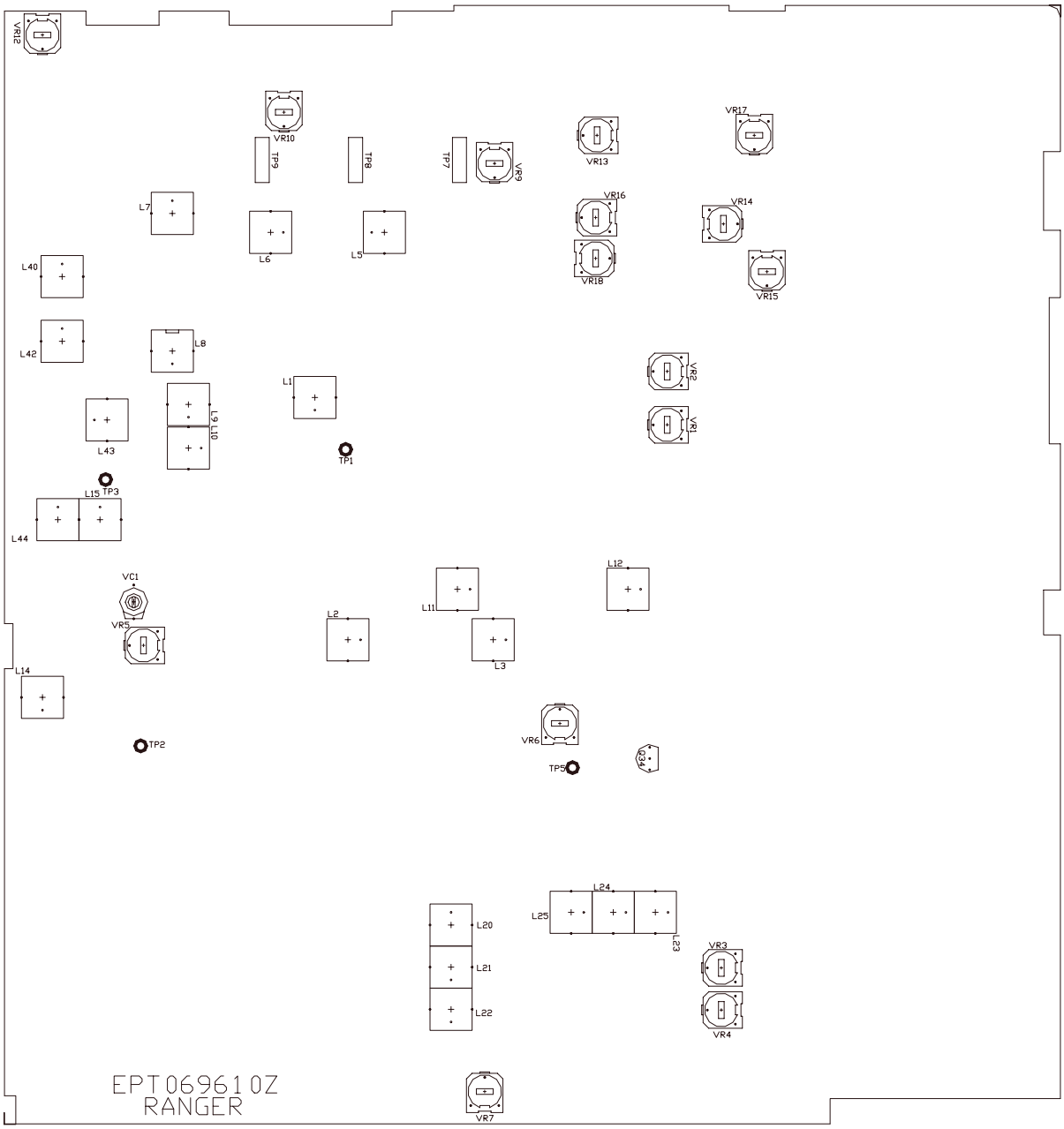


Figure 4-3 Main PCB Adjustment Locations

CHAPTER 5

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;

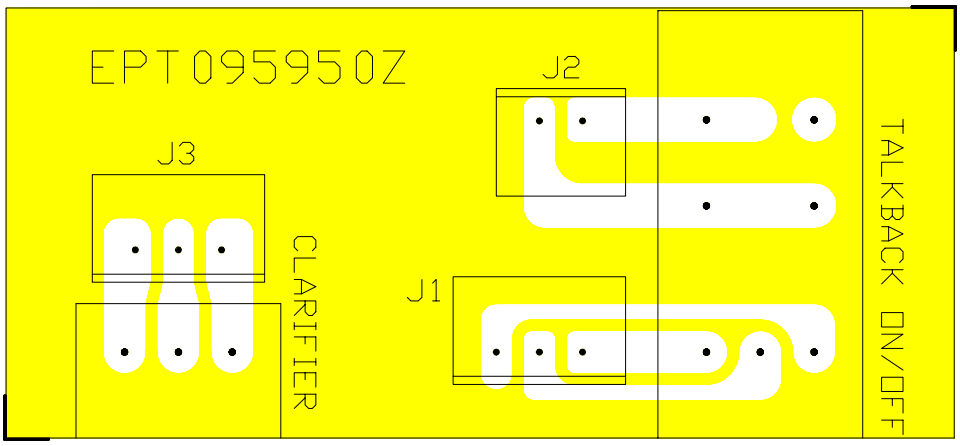
Check Item	**Action**
Whip antenna (option)	If cracked or broken, replace it.
Coaxial cable	If sheath is cracked, seal with vinyl tape. If immersed with water, install new coaxial cable.
Coaxial & power plug connections	If loosened, reconnect. If corroded, clean contacts.
Battery connection	If corroded,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

5.2 FUSE REPLACEMENT

To protect the equipment from serious damage, one fuse are provided on the power supply lines. The fuses 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 4A 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.

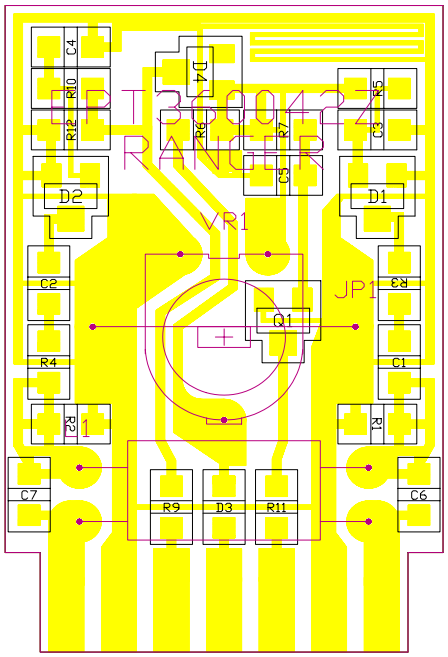


PART LIST:

DX 949 VR P.C.B

ITEM	REFERENCE NUMBER	RANGER PART NUMBER	DESCRIPTION
1		EPT095950Z	VR P.C.B.
2	J1,J2	EX07N48223	PCB C/S 2P
3	J3	EX07N48350	PCB C/S 3P
4	TALKBACK	RV10303543	10KB/PUSH SW
5	CLARIFIER	RV10203528	VR 1KB

REMARK:
SOLDER SIDE (WHITE)

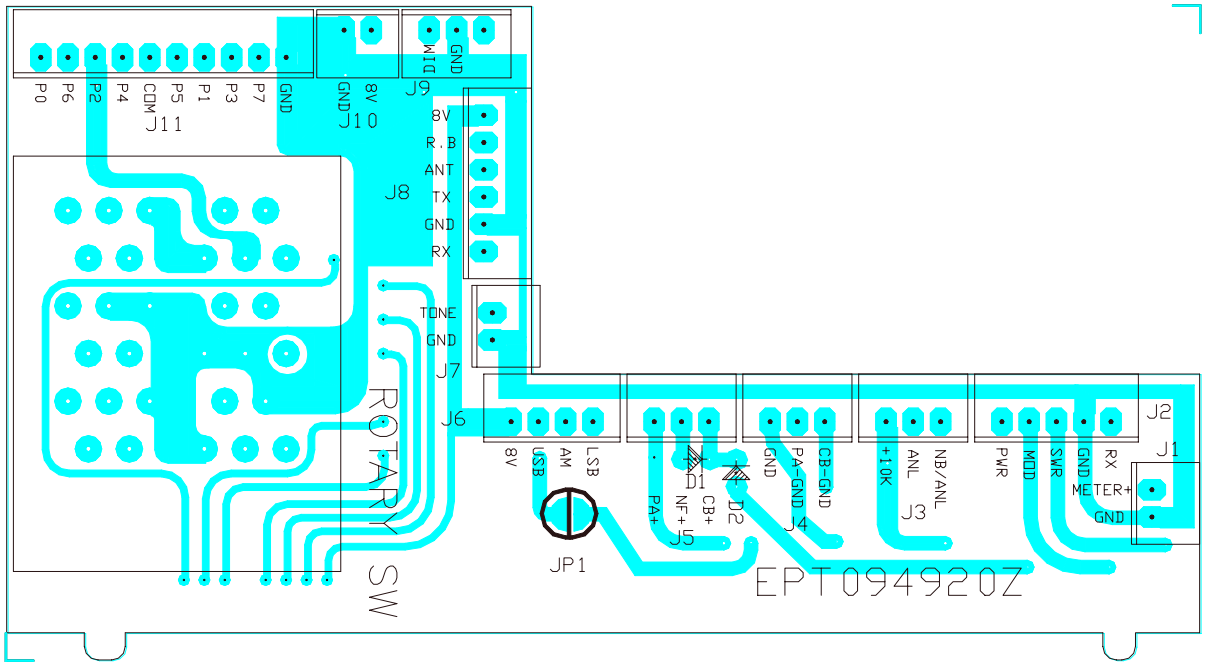


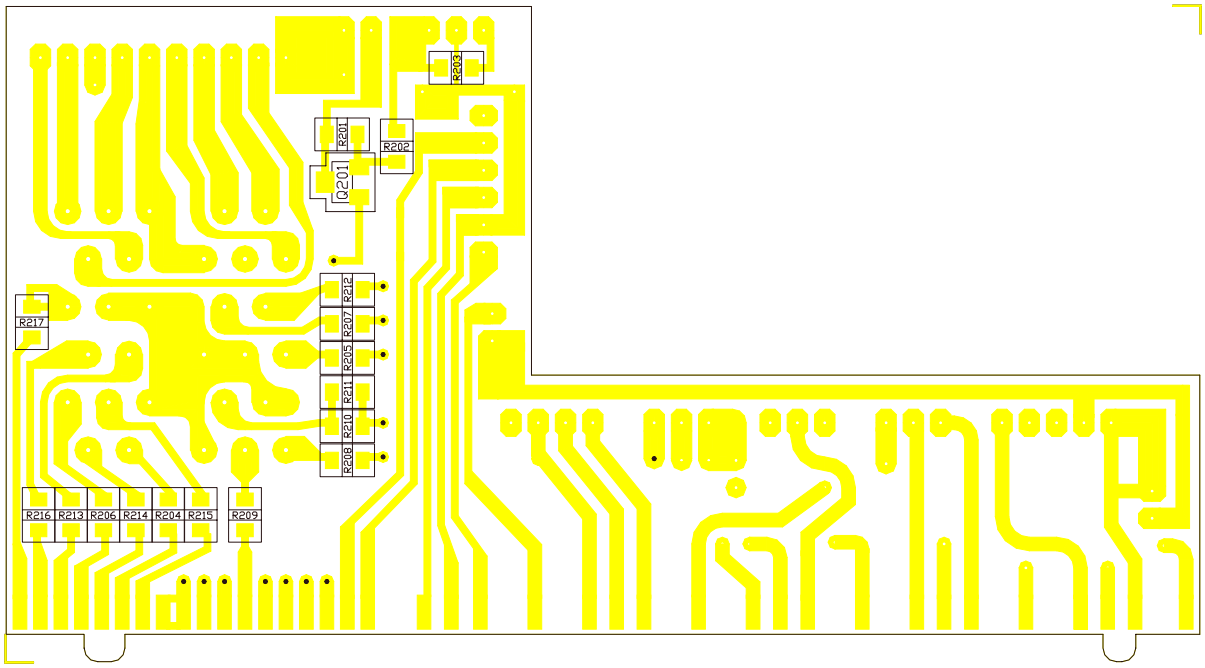
PART LIST :

DX 949 ANT P.C.B

ITEM	REFERENCE NUMBER	RANGER PART NUMBER	DESCRIPTION
1		EPT360042Z	ANT P.C.B.
2	R9	RCY010004Z	0 ohm 0.1W
3	R1	RCY014714Z	470 ohm 0.1W
4	R3,R4	RCY011014Z	100 ohm 0.1W
5	R2	RCY013314Z	330 ohm 0.1W
6	R5,R11	RCY011024Z	1K ohm 0.1W
7	R10	RCY012224Z	2.2K ohm 0.1W
8	R12	RCY014724Z	4.7K ohm 0.1W
9	R7	RCY011034Z	10K ohm 0.1W
10	C5	RCY012234Z	22K ohm 0.1W
10	C7	CK1059AB1A	0.5PF 50V
11	C6	CK1030AB1A	3PF 50V
12	C3,C4	CK2104AB7R	0.1μF 50V
13	C1,C2	CK1102AB7L	0.001μF 50V
14	Q1	TY2SC2712G	TR 2SC2712
15	D3	EDSS00355Y	DIODE ISS355
16	D1,D2	EDHM0198SY	DIODE HSM198S
17	D4	EDMA0028TY	DIODE MA28T
18	L1	ECRFZ10053	CORE C3RH0610
19	VR1	RE10300009	10K ohm
20	JP1	WX01070715	JUMPER WIRE

REMARK:
SOLDER SIDE (YELLOW)


P0
P6
P2
P4
COM
P5
P1
P3
P7
GND
J11
GND
8V
J10
MIC
GND
J9
8V
R.B
ANT
TX
GND
RX
J8
TONE
GND
J7
J6
ROTARY SW
8V
USB
AM
LSB
PA+
NF+
CB+
D1
D2
J5
GND
PA-GND
CB-GND
J4
+10K
ANL
NB/ANL
J3
PWR
MOD
SWR
GND
METER+
GND
RX
J2
J1
JP1
EPT0949202

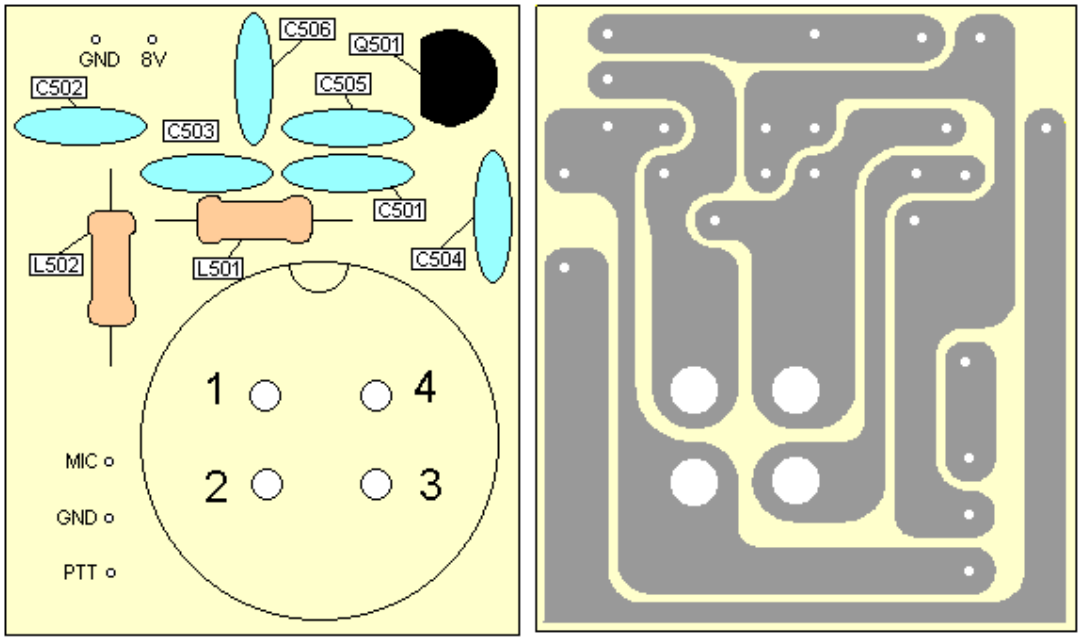

R203
R201
R202
Q201
R212
R207
R205
R211
R210
R208
R217
R216
R213
R206
R214
R204
R215
R209

PART LIST :

DX 949 ROTARY SW P.C.B

ITEM	REFERENCE NUMBER	RANGER PART NUMBER	DESCRIPTION
1		EPT094920Z	ROTARY SW P.C.B.
2	R202,R204-R217	RCY011024Z	1K ohm 0.1W
3	Q201	TY2SC2712G	TR 2SC2712
4	ROTARY SW	EWRT32000S	ROTARY SW
5	J7,J9,J10	EX07N48223	PCB C/S 2P
6	J1	EX07N48234	PCB C/S 2P
7	J3,J5	EX07N48350	PCB C/S 3P
8	J4	EX07W48824	PCB C/S 3P
9	J6	EX07N48490	PCB C/S 4P
10	J2,J8	EX07N48222	PCB C/S 5P
11	J11	EX07N48209	PCB C/S 10P
12	D1,D2	EDIN04148Z	DIODE IN4148
13	COPPER SIDE	CM0503935Z	0.039μF 50V

REMARK:
COMPONENT SIDE (CYAN)
SOLDER SIDE (YELLOW)



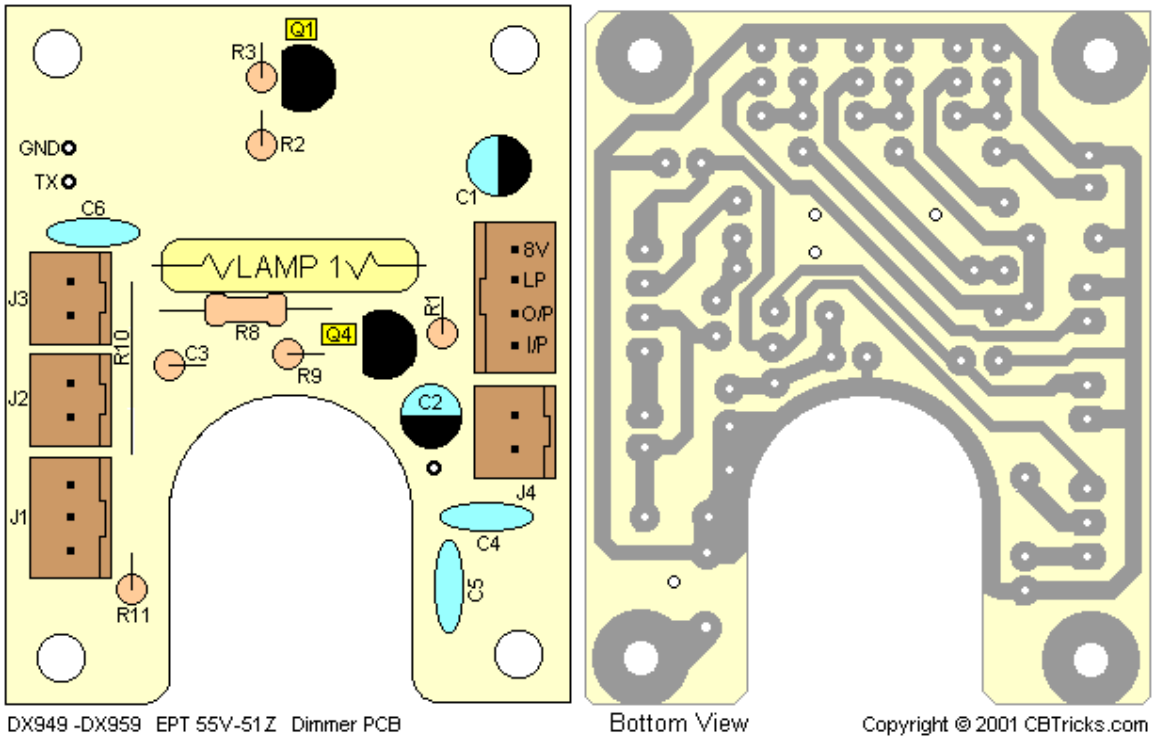
EPT690050Z

Galaxy DX Radios DX949 - DX959
CBTricks.com

PART LIST :

DX 949 MIC P.C.B

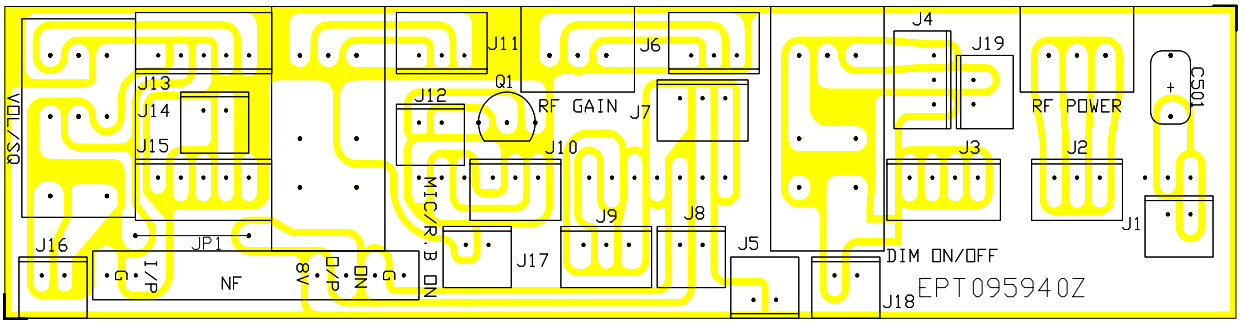
ITEM	REFERENCE NUMBER	RANGER PART NUMBER	DESCRIPTION
1		EPT690050Z	MIC P.C.B.
2	C501,C502,C503,C504	CC0501027L	0.001µF 50V
3	C505,C506	CC0501037L	0.01µF 50V
4	Q501	TDTA0124ES	T/R DTA124ES
5	L501	ECCHK16001	CHOKE COIL 5.6µH
6	L502	ECBAD18526	BEAD COIL
7	MIC PCB	EX06N41020	MIC JACK
8	J12	EX07N48903	WIRE C/H 3P
9	J26	EX07N48233	WIRE C/H 2P



PART LIST :

DX 949 METER P.C.B

ITEM	REFERENCE NUMBER	RANGER PART NUMBER	DESCRIPTION
1		EPT055V51Z	METER P.C.B.
2	R11	RCP166824Z	6.8K ohm 1/16W
3	R9	RCP163934Z	39K ohm 1/16W
4	R1	RCU143904Z	39 ohm 1/4W
5	C3	RCU141024Z	1K ohm 1/4W
6	R3	RCU144724Z	4.7K ohm 1/4W
7	R2	RCU141034Z	10K ohm 1/4W
8	R8	RCM144724B	4.7K ohm 1/4W
9	R10	WX01070712	JUMPER WIRE
10	C4,C5,C6	CC0501037L	0.01µF 50V
11	C2	CE0251067Z	10µF 25V
12	C1	CE0164767Z	47µF 16V
13	Q1,Q4	T2SC00945P	TR 2SC945P
14	J2,J3,J4	EX07N41226	PCB C/S 2P
15	POW	EX07N41250	PCB C/S 4P
16	J1	EX07N41216	PCB C/S 3P
17	LAMP1	EX02N40230	LAMP 0.05 12V

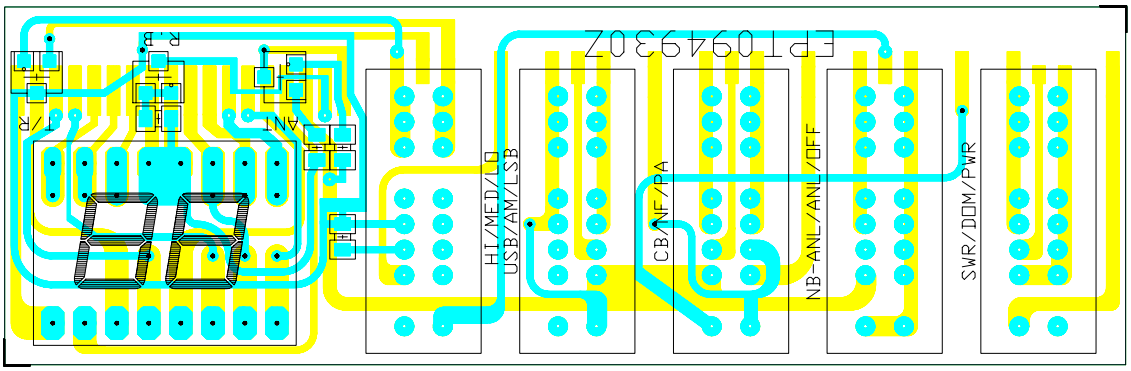


PART LIST :

DX 949 BAND P.C.B

ITEM	REFERENCE NUMBER	RANGER PART NUMBER	DESCRIPTION
1		EPT095940Z	BAND P.C.B.
2	VOL/SQ	RV50303522	VR 50KB/50KA W/SW
3	RF GAIN	RV10203528	VR 1KB
4	DIM ON/OFF	RV50203542	5KB/PUSH SW
5	MIC/R.B ON	RV10203541	1KA/PUSH SW
6	RF POWER	RV50203525	VR 5KB
7	BAND P.C.B.	ENRG0IC080	MODULAR IC080
8	JP1	WX01070710	JUMPER WIRE
9	J2,J8,J12,J16,J17	EX07N48223	PCB C/S 2P
10	J4,J6,J11	EX07N48350	PCB C/S 3P
11	J13	EX07W48826	PCB C/S 5P
12	Q1	TDTA0124ES	T/R DTA124ES

REMARK:
SOLDER SIDE (WHITE)

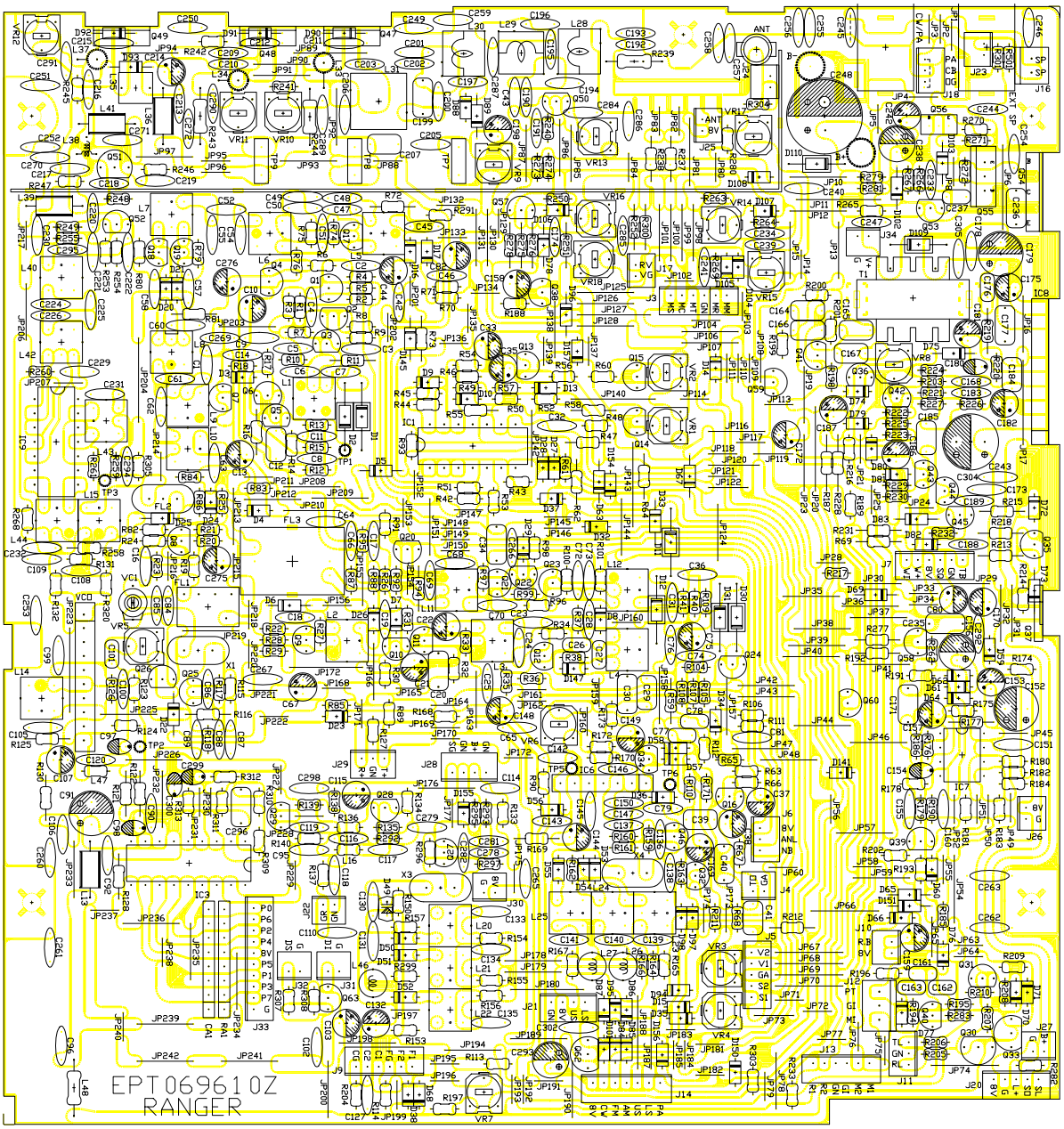


PART LIST :

DX 949 DISPLAY P.C.B

ITEM	REFERENCE NUMBER	RANGER PART NUMBER	DESCRIPTION
1		EPT094930Z	DISPLAY P.C.B.
2	DISPLAY P.C.B.	EX03N40483	LED DISPLAY
3	R325,R326	RCY011024Z	1K ohm 0.1W
4	C501	CK1103AB6U	0.01μF 50V
5	ANT	EX01Y40116	LED LAMP
6	R.B	EX01Y40117	LED LAMP
7	T/R	EX01Y40114	LED LAMP
8	HI/MED/LO	EWSL31027K	SLIDE SW
9	USB/AM/LSB	EWSL31027K	SLIDE SW
10	CB/NF/PA	EWSL31027K	SLIDE SW
11	NB-ANL/ANL/OFF	EWSL31027K	SLIDE SW
12	SWR/DOM/PWR	EWSL31027K	SLIDE SW

REMARK:
SOLDER SIDE (YELLOW & CYAN)



DX 949 MAIN PCB.

REMARK:
SOLDER SIDE (WHITE)

PART LIST
DX 949 MAIN PCB

REFERENCE NUMBER	RANGER PART NO.	DESCRIPTION
	EPT069610Z	MAIN P.C.B
TP7,8,9	EPT120060Z	P.C.B DC B+
TP6	RCP160004Z	0 Ω 1/16W
R246	RCP161004Z	10 Ω 1/16W
R267	RCP161504Z	15 Ω 1/16W
R241	RCP162204Z	22 Ω 1/16W
R113,133,213,253,282	RCP164704Z	47 Ω 1/16W
R130,215,220,294	RCP165604Z	56 Ω 1/16W
R11, 101	RCP166804Z	68 Ω 1/16W
R3,5,8,30,33,76,81, 95,169,174,260,263	RCP161014Z	100 Ω 1/16W
R32,100,245	RCP161514Z	150 Ω 1/16W
R23	RCP161814Z	180 Ω 1/16W
R140,163,177	RCP162214Z	220 Ω 1/16W
R31,99	RCP162714Z	270 Ω 1/16W
R6,10,16,24,248,254, 300	RCP163314Z	330 Ω 1/16W
R188,250,268,280,293 ,299,154,155,156	RCP164714Z	470 Ω 1/16W
R258,266	RCP165614Z	560 Ω 1/16W
R4,50,89,94,209	RCP166814Z	680 Ω 1/16W
R74	RCP168214Z	820 Ω 1/16W
R62 ,64,67,72,79,80, 98, 116,118,122,223, 136-138,123,270,271, 115,252,160,164,166, 167,179,186,205,206, 214,232,189,238,240, 237,291,292,295,303, 320	RCP161024Z	1K Ω 1/16W
R88,192	RCP161224Z	1K2 Ω 1/16W
R54 ,87 ,97,132,207, 233,247,251,255,273	RCP161524Z	1K5 Ω 1/16W
R226	RCP161824Z	1K8 Ω 1/16W
R20,27,71,73,75,114, 134,162,197,279,283, 313,259	RCP162224Z	2K2 Ω 1/16W
R9,25,28,121,153	RCP162724Z	2K7 Ω 1/16W
R18,22,58,60,66,110, 128,171,191,219,274	RCP163324Z	3K3 Ω 1/16W
R52,57	RCP163924Z	3K9 Ω 1/16W
R26 ,84,131,165,190, 195,196,252	RCP164724Z	4K7 Ω 1/16W
R83,92,264,265,93	RCP165624Z	5K6 Ω 1/16W
R14,40,41,70,82,312	RCP166824Z	6K8 Ω 1/16W
R90,275	RCP168224Z	8K2 Ω 1/16W
R1,13,17,56,65,68,86 ,159,161,175,181,202 ,210,216,272,276,296 ,297,173,227-231	RCP161034Z	10K Ω 1/16W
R178,310	RCP161234Z	12K Ω 1/16W
R180	RCP161534Z	15K Ω 1/16W
R91,109,187,208	RCP162234Z	22K Ω 1/16W
R2,262,309,311	RCP163334Z	33K Ω 1/16W
R46	RCP163934Z	39K Ω 1/16W
R7 ,29,61,63,96,126, 150,157,185,218,222, 224	RCP164734Z	47K Ω 1/16W
R21,105,107	RCP166834Z	68K Ω 1/16W
R45	RCP168234Z	82K Ω 1/16W
R12 ,42,43,44,51,53, 104,108,112,182,184, 225,278,221	RCP161044Z	100K Ω 1/16W
R47,117,135,139,194	RCP162244Z	220K Ω 1/16W
R49,55,170,172,176	RCP164744Z	270K Ω 1/16W
R15,111,183	RCP164744Z	470K Ω 1/16W
R48	RCP168244Z	820K Ω 1/16W
R106	RCP161054Z	1M Ω 1/16W
R193	RCP161554Z	1M5 Ω 1/16W
R124	RCP161064Z	10M Ω 1/16W
R244	RCP121514Z	150 Ω 1/2W
R239	RCP121034Z	10K Ω 1/2W
C218	CC0500301L	3PF 50WV
C79	CC0500501L	5PF 50WV
C1,49,108,147	CC0501004L	10PF 50WV
C76	CC0501804L	18PF 50WV
C36	CC0502704L	27PF 50WV
C287	CC0503304L	33PF 50WV
C8	CC0508204L	82PF 50WV
C4,70	CC0501015L	100PF 50WV
C137	CC0501515L	150PF 50WV
C31,136	CC0502715L	270PF 50WV
C11,14	CC0503315L	330PF 50WV
C23	CC0505615L	560PF 50WV
C225	CC0500591A	0.5PF 50WV
C52,197	CC0500101A	1PF 50WV
C61,62,90,190	CC0500501A	5PF 50WV
C84,89	CC0501504A	15PF 50WV
C43	CC0501804A	18PF 50WV
C54,55	CC0502204A	22PF 50WV
C119,226,279	CC0503304A	33PF 50WV
C202,224	CC0504704A	47PF 50WV
C88	CC0506804A	68PF 50WV
C150,191	CC0501015A	100PF 50WV
C194,192	CC0501515A	150PF 50WV
C195	CC0503904A	39PF 50WV
C196,295,222	CC0501815A	180PF 50WV
C139,141	CC0503904D	39PF 50WV
C140	CC0501515D	150PF 50WV
C130	CC0502004G	20PF 50WV
C116,117	CC0506804G	68PF 50WV
C281	CC0501015G	100PF 50WV
C282	CC0501815G	180PF 50WV
C220	CC0502215G	220PF 50WV
C86	CC0502715G	270PF 50WV
C85,201,203	CC0503915G	390PF 50WV
C216,210	CC0504715G	470PF 50WV
VC1	CV050200AZ	T/C 20PF 5Q
C199	CD30056l4Z	560P 300WV
C7 ,47 ,50,74,95,99, 100,118,120,110,174, 183,244,246,245	CC0501027L	0.001UF 50WV
C81,173,193,206,207, 213,211,249,250,256, 259,272,292,302,304, 215,236,270	CC0501047L	0.1UF 50WV
C5 ,18 ,48,64,65,68, 72,87,92,96,102,105, 106,143,151,160,233, 240,251,252,253,257, 258,260,261,263,266, 20	CC0504737L	0.047UF 50WV
C32,42,45,46,162,163 ,221	CC0504727L	0.0047UF 50WV
C155	CC0502237L	0.022UF 50WV
C200	CC1001037L	0.01UF 100WV
C2,3,6,9,15,16,17,19 ,131,51,57,58,60,63, 66,69,73,109,114,161 ,127,133,284,134,135 ,138,142,145,146,189 ,205,262,278,217,219 ,229,230,232,285,247 ,298,254,255,265,267 ,269,271,305	CC0501037L	0.01UF 50WV
C97,149	CT0161046Z	0.1UF 16WV
C154	CT0162246Z	0.22UF 16WV
C98,180,299,300	CT0162256Z	2.2UF 16WV
C40,178,296	CM0501045Z	0.1UF 50WV
C77,237	CM0501024Z	0.001UF 50WV
C78,184	CM0501035Z	0.01UF 50WV
C39,185,41	CM0502235Z	0.022UF50WV
C176	CM0504725Z	0.0047UF 50WV
C34,20	CM0504735Z	0.047UF50WV
C12	CM0502225Z	0.0022UF 50WV
C10	CE0504747Z	0.47UF 50WV
C67 ,75,153,157,170, 186,187,198	CE0501057Z	1UF 50WV
C159,214,242	CE0502257Z	2.2UF 50WV
C103,182,38	CE0504757Z	4.7UF 50WV

C13,21,22,44,82,115, 132,158,275,276,239	CE0251067Z	10UF 25WV	L35 L38	ECSPG18001 ECRFZ10048	0.8x3.5x7t 25UH
C80,181	CE0252267Z	22UF 25WV	L39,41,13	ECBAD18526	3.5x6x1.2
C33,37,144,175	CE0254767Z	47UF 25WV	VR7,12,16,18	RE10200041	1K VM6CK PV
C156,238,293,107	CE0161077Z	100UF 16WV	VR13,14	RE50200042	5K VM6CK PV
C152,179	CE0163377Z	330UF 16WV	VR1,2,6,17	RE10300031	10K VM6CK PV
C91	CE0104777Z	470UF 10WV	VR9,15	RE10400043	100K VM6CK PV
C243,248	CE0251087Z	1000UF 25WV			
C35	CEM254767Z	47UF 25WV	VR3,4	RE50400087	500K OHM
FL1	EFCFW455HT	CERAMIC FILTER	VR10 RA1	RE10100074 RCS0870028	100 OHM RESISTOR ARRAY
FL2	EFCFE107MX	CERAMIC FILTER	CA1	CCS0873000	CAPACITPR ARRAY
FL3	EFX8106952	CRYTAL FILTER	JP65,73,119,122	WX01070707	JUMPER WIRE
X1	EYCAB10240	CRYSTAL FILTER	J9 JP1-4,8,21,24,25,28, 33,34,45,49-52,55,56 ,58 ,60,63,64,71,75- 77,79,80,82-84,88,95 ,96,102,109,110,111, 114,117,118,121,129, 132-137,139,145-150, 152-156 ,160x2 ,164, 165,168,169,173,175, 182,183,185,191,192, 193,195-197,199,177	WX01070703 WX01060605	JUMPER WIRE JUMPER WIRE
X3	EYCAA15360	CRYSTAL FILTER			
X4	EYBAE10697	CRYSTAL FILTER			
IC6	ENMA00612Z	I.C AN-612			
IC3	ENRG871997	I.C RCI-8719-97			
IC7	ENR004558Z	I.C BA4558			
IC9	ENSM06130Z	I.C TDA6130			
VC0	ENNOHIC070	IC070			
Q8,17,20	T2SC01674L	2SC1674L	JP201 ,202,207, 211, 214-218,220,221,227- 231,237,238,240,R19, R305	WX01070705	JUMPER WIRE
Q51	T2SC02314F	2SC2314F			
Q23,52	T2SC01906Z	2SC1906			
Q36	TDTC0124ES	DTC124ES			
Q24,43	TDTC0114ES	DTC114ES	JP10,12,15,16,29,30- 32 ,35-38 ,40,43,44, 46-48,57,59,78,85-87 ,90,92-94,97-101,106 ,107,120,124-126,128 ,130,131,138,142,144 ,151,158,163,166,176 ,178,179,187,189,190 ,194,198,200,203,206 ,208-210,212,213,219 ,225,226,232-36,239, 241,242,L36	WX01070710	JUMPER WIRE
Q60	TDTA0124ES	DTA124ES			
Q30,33,62	T2SA01282E	2SA1282AE			
Q1 ,2,9,10,11,21,22, 25,28,29,46,50,27	T2SC01675L	2SC1675L			
Q3,4,5,7,13,14,15,16 ,31,34,35,39,40, 42, 44,53,56,57	T2SC00945P	2SC945P			
Q6,38	T2SA00733P	2SA733P			
Q55	T2SA01869Z	2SA1869			
Q18,19	FZZZJ00310Z	F.E.T. J310			
D3 ,4-7 ,9,10,20,21, 13-15 ,24-29 ,32-38, 50-57 ,60-65, 68,69, 75-82 ,92 ,93,85-90, 102,104-108,141,150, 155,95-98,R269	ED1N04148Z	1N4148	JP74 JP54,66,67,70,74 JP180,188,89,127,172 JP6 ,11,17,140, 143, 204,223	WX01070712 WX01070713 WX01070714 WX01070716	JUMPER WIRE JUMPER WIRE JUMPER WIRE JUMPER WIRE
D1,2,11,12,30,31	ED1N00060P	1N60P	J4,22,26,30,7,10,17, 25	EX07N48223	PCB CONN/S
D110	ED1N04003Z	1N4003			
D109	ED1N04007Z	1N4007	J6,9,11,18	EX07N48350	PCB CONN/S
D16,17	EDSS00053Z	1SS53	J28,21	EX07N48490	PCB CONN/S
D59,72	EDMA00027W	MA27W-A	J5,20,3	EX07N48222	PCB CONN/S
D71,103,145,156	EDMA00027T	MA27T-A	J13	EX07N48331	PCB CONN/S
D49	EDSV00251Z	SVC-251SPA	J14	EX07N48224	PCB CONN/S
D70	EDZD05519Z	5.1V 0.5W	J33	EX07N48209	PCB CONN/S
D73	EDZD05759Z	7.5V 0.5W	J12	EX07N41227	PCB CONN/S
L2,3	ECIFT12002	7MC-7172ABW	SP	EX07N41330	PCB CONN/S
L6	ECIFT12290	I.F.T.	TP2,3,5	EX07N48612	PCB CONN/S
L20,21,22	ECIFT12012	I.F.T.	TP7,8,9	XZZZ90006Z	PCB STOPPER
L25	ECIFT12013	I.F.T.	J33	EX07N48967	WIRE CONN/H
L23,24	ECIFT12016	I.F.T.	J16	EX07N48041	WIRE CONN/H
L1,11	ECIFT12252	I.F.T.	J17-J2(40Z)	EX07N49030	WIRE CONN/H
L44	ECIFT12255	I.F.T.	J4	EX07N48917	WIRE CONN/H
L9,10	ECIFT12256	I.F.T.	J14-J6(20Z)-J5-J8(40Z)	EX07N48928	WIRE CONN/H
L12	ECIFT12257	I.F.T.			
L15,43	ECIFT12258	I.F.T.	J6	EX07N48920	WIRE CONN/H
L40	ECIFT12262	I.F.T.	J5	EX07N48915	WIRE CONN/H
L14	ECIFT12263	I.F.T.	J30,J10	EX07N48918	WIRE CONN/H
L5	ECIFT12253	I.F.T.	J7	EX07N49031	WIRE CONN/H
L7,42	ECIFT12440	I.F.T.	J21,J22	EX07N48887	WIRE CONN/H
L8	ECIFT12492	I.F.T.	JB-J6(40Z)-J11	EX07N48968	WIRE CONN/H
L48	ECCHK16096	470UH	J20-METER	EX07N48997	WIRE CONN/H
L503,504	ECCHK16000	0.47UH	J4(METER)-J16(40Z)	EX07N48901	WIRE CONN/H
L26,27,46	ECCHK16003	470UH	J1(METER)-J4(40Z)	EX07N49002	WIRE CONN/H
T1	ECCHK16004	1.1MH EI-19	J11-J8(20Z)-12(40Z)-J10	EX07N49029	WIRE CONN/H
L33,37	ECCHK16070	22UH			
L47	ECCHK16176	4.7UH 2.4mm	J18	EX07N49024	WIRE CONN/H
L16	ECCHK16246	22UH 2.4MM	J3	EX07N49073	WIRE CONN/H
L28,30	ECSPG18003	0.8x6.5x7.5t	J9	EX07N49023	WIRE CONN/H
L29	ECSPG18075	0.8x6x8.5t	J3(METER)-J9(20Z)	EX07N49005	WIRE CONN/H
L31	ECSPG18365	0.8x6.5x 7.5tmm	LAMP-J1(20Z) R233-J1(50Z)	EX07N48233 EX07N48896	WIRE CONN/H WIRE CONN/H

IC8	ENTA07222A	TA7222AP
Q54	T2SB00754Y	2SB754Y
Q49	T2SC02166C	2SC2133C
Q47	T2SC01969C	2SC1969C
Q37	T2SA01869Z	2SA1869

UPDATES & CORRECTIONS

Any updates or corrections to this Service Manual will be included in the Tech Support section of our website at www.GalaxyRadios.com.