INSTRUCTION MANUAL

VICE-PRESIDENT ROY

SOLID STATE 40 CHANNEL CITIZEN BAND TRANSCEIVER

THIS TRANSCEIVER IS FCC TYPE ACCEPTED
FOR USE IN CITIZENS CLASS D SERVICE

SPECIFICATIONS

TRANSMITTER SECTION

POWER OUTPUT	4Watt Max (AT 13.8V DC)
EMISSION	6A3
SPURIOUS RESPONSE REJECTION	All harmonic and spurious suppression greater than F.C.C. and D.O.C requirements
MODULATION	AM, 90% typical

RECEIVER SECTION

CIRCUIT TYPE	Dual conversion superheterodyne with RF stage and 455 KHz ceramic filter
FREQUENCY	1 crystal-controlled PLL, 40channels in the 27 MHz Citizens Band
SENSITIVITY	1.0μV for 10dB S/N
SQUELCH RANGE	0-1mV
SELECTIVITY	70 dB down at $\pm$ 10KHz
IF FREQUENCY	1st IF: 10.695MHz 2nd IF: 455 KHz
IMAGE REJECTION	55dB
AUDIO OUTPUT	3.5W maximum at 8 ohm load
CURRENT DRAIN	250mA on standby (no signal)
CURRENT DRAIN (MAXIMUM)	Less than 1.5A
ANTENNA	Nominal 50 ohms impedance
POWER SOURCE	Operates from nominal 12.6 volts DC, negative or positive ground system
DIMENSIONS (OVERALL)	5 3/16(W) x 7 1/2(D) x 2 1/8(H) inches
WEIGHT	3 lbs

INSTRUCTIONS APPLICABLE TO TRANSCEIVERS CARRYING SERIAL NUMBER 00000001 OR HIGHER.

THE FCC REQUIRES A LICENSE BEFORE YOU OPERATE THIS TRANSCEIVER

This model is designed to operate under FCC Rules and Regulations Part 95. Operation of this unit is not permitted until you have obtained the necessary FCC license. The Class D Citizens Band License may be obtained by any citizen over 18 years of age by filling out FCC license application form 505. You are required to read and understand the applicable FCC rules and regulations. These can be obtained from the Superintendent of Documents, Government printing Office, Washington 25, D.C., requesting Volume VI of FCC Rules and Regulations [which includes Part 95]. When you sign the application form you certify that you have read the rules and regulations. Remember courtesy on the air is the mark of A good operator. Always listen before you transmit. Choose the least crowded frequency for your communications.

TRANSMITTER IDENTIFICATION CARD

When you receive your license, you are required to fill out the Transmitter Identification card, FCC Form 452-C, which will be found with the unit. You should fill out the card as follows:

1. Fill in your call sign.
2. Fill in the name of the licensee.
3. Fill in the address where the license is located.
4. Previously answered
5. Date of license expiration should be entered.
6. Enter your signature

Affixed the card to the unit.

DESCRIPTION

This model is an all-transistor 2-way radio transceiver for mobile operation. A frequency synthesizer circuit provides 40 crystal controlled PLL transmit and receive channels in the 27 MHz Band, engineered for trouble-free performance. Your transceiver uses heat resistant transistors in all critical areas. Current drain on 12volts DC is exceptionally low. Operation over long periods is feasible even with your engine turned off. The transceiver may also be operated from A.C when used with an optional Power Supply.

RECEIVER

The receiver is a sensitive and highly selective dual-conversion superheterodyne type providing crystal-controlled PLL operation on all 40 CB channels. The circuit incorporates a number of features designed to provide optimum reception. The receiver incorporates an effective full time switchable Automatic Noise Limiter in the audio stages. A ceramic filter provides sharp selectivity and high adjacent channel rejection. As a result, transmissions on adjacent channels cause minimum interference.
A variable squelch control is incorporated to "silence" the receiver when no signals are being

received. The squelch circuit is adjustable providing varying degrees of sensitivity to incoming signals.

TRANSMITTER

The transmitter offers crystal-controlled operation on all 40 CB channels, 5 watt DC power input to the final RF with average modulation capabilities is possible by the use of high-efficency Transistors and low loss components, wiring, and mounting boards. The legal limit of power for this service is provided.

POWER SUPPLY

The transceiver is ready for connection to a 12 volt DC, negative or positive ground system. DC power is provided to the transceiver by means of a fused power lead.

OPERATING CONTROLS AND FEATURES

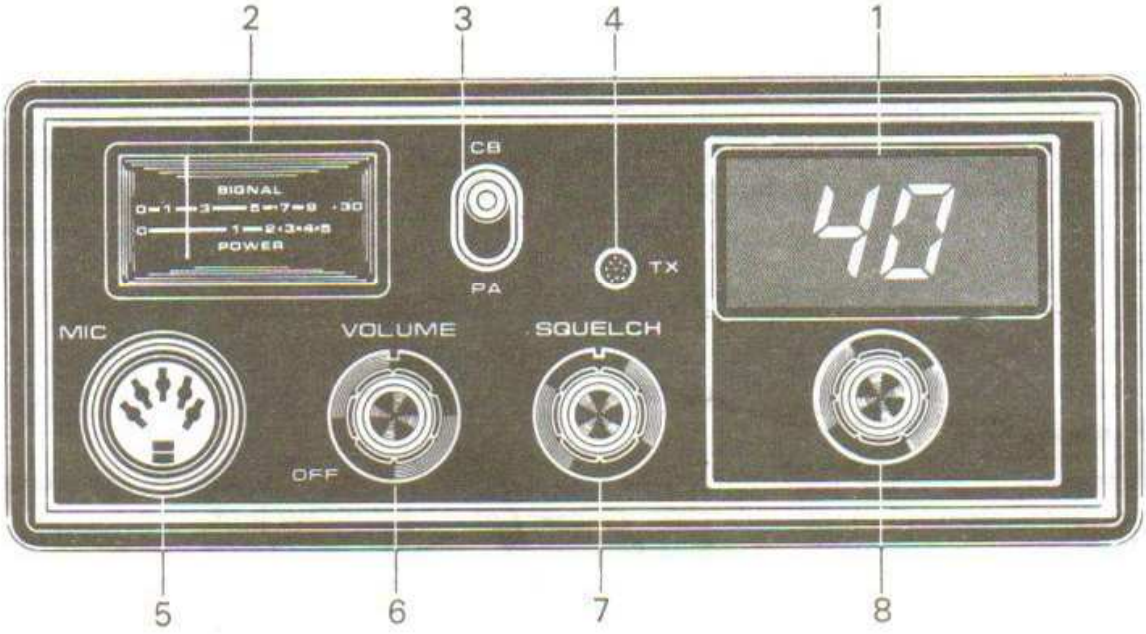


FIGURE 1

(1) L.E.D. DISPLAY . . . . . .L.E.D. (Light Emitting Diode) lamp Indicates the channel selected by 40 position rotary-switch.

(2) S/P-RF ILLUMINATED METER. . . . .Indicates relative incoming signal strength (top scale) and relative RF power output (bottom scale) when transmitting.

(3) CB.-P.A. SWITCH . . . . . .For public addrees use. External 8 ohm speaker must be plugged into the rear chassis using tini-plug. At P.A position use volume control to adjust sound level

(4)TX INDICATOR LIGHT . . . . . .Lights up when you are transmitting.

(5)MICROPHONE INPUT . . . . . .5 Pin socket for push-to-talk microphone.

(6)ON-OFF/VOLUME . . . . . .Controls output from the built-in speaker, or external speaker connected to the "EXT SP" or PA jack (rear of transceiver). Incorporates "ON-OFF" power switch at the extreme counter-clockwise position.

(7)SQUELCH CONTROL. . . . . .Used to quiet the receiver during absence of receive signals. Sensitivity to incoming signals is fully adjustable.

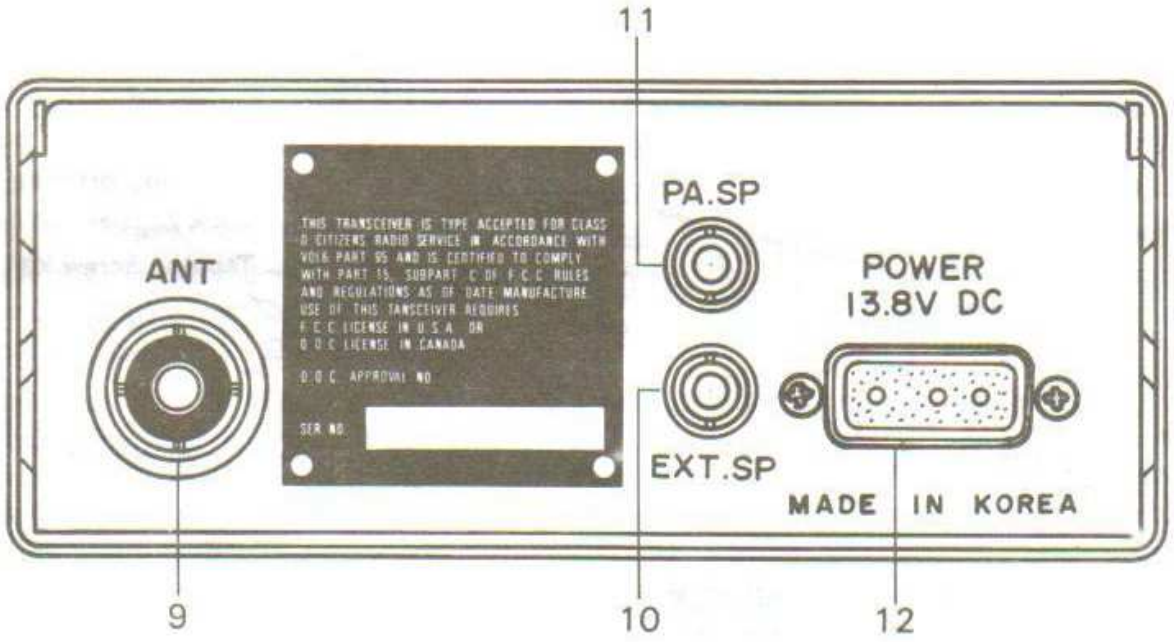


FIGURE 2

(8)CHANNEL SWITCH . . . . . .This rotary switch selects one of 40 channels for transmit and receive operation.

(9)ANTENNA CONNECTION. . . . . .To match antenna lead-in cable [RG-58/U or RG-8U] with PL-259 type coaxial connector.

(10)EXTERNAL SPEAKER JACK. . . . . .Impedance of any device such as headphone connected to this jack should be 8-16 ohms. Insertion of plug into jack automatically silences the transceiver internal speaker.

(11)PA SPEAKER JACK . . . . . .For Public Address [PA] operation. Horn impedance should be in 8-16 ohm range.

(12)DC POWER SOCKET . . . . . .12 volts DC for transceiver supplied through DC power Cable to this socket.

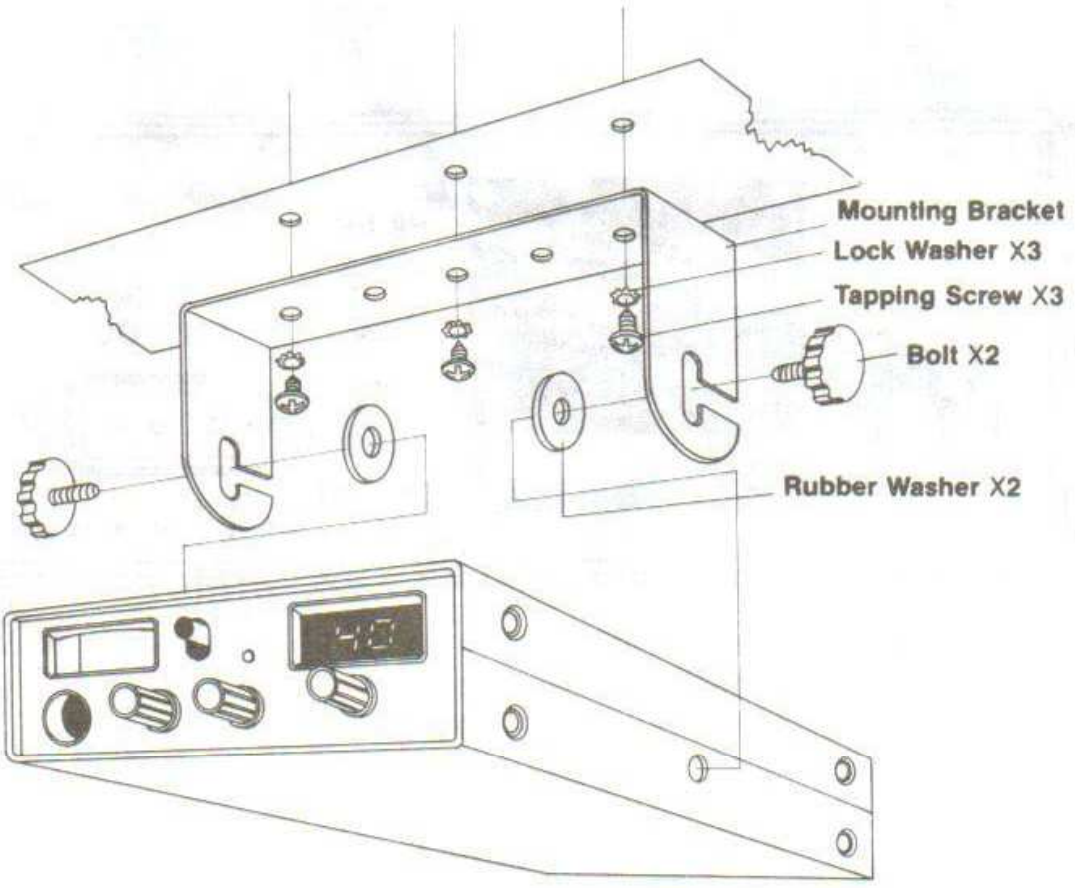


FIGURE 3. MOBILE MOUNTING

TRANSCEIVER INSTALLATION

MOUNTING

Always mount where controls are readily accessible, Unit may be mounted to the underside of the dashboard of a car, truck, etc., utilizing special bracket included with transceiver [see Figure 3]. Attach bracket to the underside of dashboard using the self-tapping screws supplied. Attach the transceiver to the bracket using the two knurled securing screws at the side.

Tilt the unit to the most convenient angle before tightening securing screws.

DC POWER CONNECTIONS

The transceiver is designed to operate from a battery source of 11.5 to 14.5 volts DC, employing either negative or positive ground electrical systems. The fused DC power cable supplied is used to make the necessary power connection to the transceiver. Red [fused] lead is connected to the positive [+] side of the electrical system and the black lead is connected to the negative [−] side of the system.

In a negative ground vehicle, connect the Red lead to the "hot" point in the electrical system [battery positive], and the Black lead to any point connected to the vehicle chassis [battery negative].

In a positive ground vehicle, connect the Black lead to the "hot" point in the electrical system [battery negative], and the Red lead to any point connected to the vehicle chassis [battery positive].

For connection to the "hot" battery side a suitable post can usually be found on the fuse block. The transceiver draws a maximum of 1.5 ampere of current, therefore you can use a terminal which supplies power to the Radio or other accessory [Use the unfused input side. The DC power cable is equipped with its own fuse]. Connection at this point will ensure DC power is automatically cut off to the transceiver when the ignition is turned off.

IMPORTANT : DC VOLTAGE AT THE TERMINAL SELECTED ON THE FUSE BLOCK MUST BE AT LEAST 11.5 VOLTS FOR PROPER OPERATION.

When you have completed the connections of the red and black leads of the DC power cable, attach the 3-pin female plug at the other end of the power cable to the matching male power connector at the rear of the transceiver. The plug can be inserted in only one direction for your convenience.

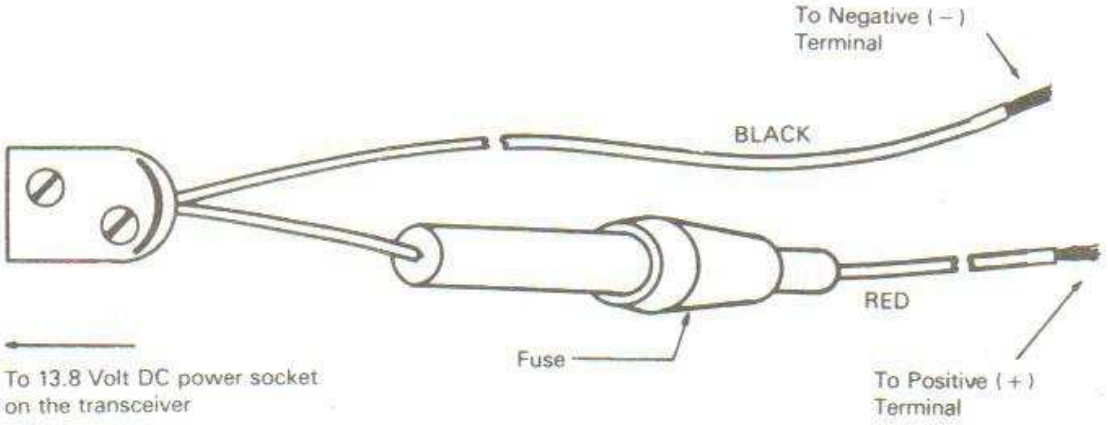


FIGURE 4. CONNECTING DC POWER CORD

ANTENNA CONNECTION

The lead-in cable from the CB antenna must be terminated with a PL-259 type male connector. Attach to the matching antenna input connector at the rear of the transceiver.

MICROPHONE BRACKET

Attach the microphone bracket provided to any convenient location.

MIRCOPHONE CONNECTION

Insert the 5-pin plug at the end of the coiled cord into the microphone socket.

DO NOT TRANSMIT WITHOUT AN ANTENNA CONNECTED TO THE TRANSCEIVER.

ANTENNAS

Efficient mobile operation requires the best possible radio frequency radiator or antenna. Many types are available including trunk mount, bumper mount, roof top mirror, etc. Selection is a matter of available space and personal preference. Virtually unlimited selection is available and you should consult your dealer for his specific recommendation. All good antennas are packaged complete with hardware and connecting cable. Usually no tools are required, although some mounting methods require a small hole be drilled. Remember if you have a choice generally speaking a longer antenna performs best and the higher the better.

IGNITION INTERFERENCE

Normally the suppression on modern automotive engines is adequate to prevent annoying interference to your CB transceiver. If it does not, consult your dealer who will recommend additional suppression measurements.

RECEIVING

1. Select desired channel using the channel Selector Switch.
2. Rotate "squelch" control to the extreme counter-clockwise position.
3. Rotate the "VOLUME/ON-OFF" switch clockwise, to apply power. Operation will be instantaneous.
4. Set the "VOLUME/ON-OFF" switch clockwise to a comfortable listening level [approximately 1/3 setting]. The receiver is now ready to operate.

SQUELCH ADJUSTMENT

The Squelch control eliminate annoying background noise in the absence of signals. To adjust the SQUELCH control properly turn up VOLUME until background noise is heard Rotate the SQUELCH slowly clockwise until the background noise just disappears. At this point the receiver will be quiet under "no-signal" conditions, however a reasonable strength incoming signal will overcome the squelch action and be heard. As the control is advanced the squelch action is progressively increased and stronger incoming signals are needed to overcome it. To receive weak signals or to disable the squelch circuit turn the control fully counter clockwise.

EXTERNAL SPEAKER JACK

Recommended plug for the EXT SPEAKER jack is a "TINIPLUG" subminiature phone plug. The impedance of earphones or speakers connected should be 8-16 ohms. Insertion of a plug automatically silences the transceivers internal speaker.

SIGNAL STRENGTH METER

When receiving, this meter provides a relative indication of signal strength in "S" units providing a means of comparsion between one received signal and another.

TRANSMITTING

Prior to operating your transmitter do the following.

1. Your Class D citizens band equipment license must be posted at the main control station location.
2. A properly executed mobile identification card, 452C, must be affixed to the mobile unit.
3. Rules Part 95 must be read and understood.

To transmit, depress the push-to-talk button on the microphone. The Red Transmit Indicator light will come on and will "flicker" slightly as you speak into the microphone. Use the microphone like a telephone speaking several inches from the face. Do not shout, use a normal speaking voice.

When you are transmitting, the receiver is silenced and reception is, therefore, impossible. In the same way, your signal cannot be heard by another station when he is transmitting - - - each must take turns. To receive again, simply release the microphone push-to-talk button.

INDICATING METER

In transmit position the METER gives a relative indication of antenna RF power output on the bottom power scale. As you speak, the pointer should "flicker" slightly, indicating you are modulating the RF carrier. The RF power meter will read true antenna power output when the transceiver is connected to a 50-OHM resistive load. The level indicator indication will not be accurate if the load is mismatched but this will not adversely affect operation is a standard good quality antenna is used.

USE AS PUBLIC ADDRESS SYSTEM

Provision has been made for Public Address [PA] operation utilizing the microphone and audio stages in the transceiver. For PA operation, use an external high-efficiency public address horntype speaker with an impedance range of 8 to 16 ohms. Connect to the PA jack on the rear panel of the transceiver. The required plug is a subminiature phone plug, a plug is packaged in the accessory package accompanying this unit. PA volume is controlled by the receiver volume control. To switch to PA position, the squelch control must be rotated to extreme counter clockwise position until it clicks to a stop.

AVAILABLE CITIZEN BAND FREQUENCIES

Your transceiver provides operation on all available U.S. Citizens Band channels. Frequencies are listed in accompanying table.

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

INSTRUCTIONS FOR ALIGNMENT

PROTECTIVE COVER

Turn Transceiver over (speaker grille upward), and remove the facing chassis cover (2 screws each side). The speaker is connected by two leads to the main chassis so remove cover with care.

P.L.L CIRCUIT ALIGNMENT

10.24 MHz

Connect a frequency counter to the pin 12 and check to see 10.24000 MHz ±100Hz.

VCO ALIGNMENT

1. Set the Radio to channel 40 and in transmit mode. (make certain 50 ohm dummy load or wattmeter is connected to antenna terminal)
2. Connect a circuit tester between T.P.I and ground.
3. Adjust L203 to obtain +5.0V DC.
4. Set the Radio to channel 1 and in receive mode.
5. Check to see the T.P.I DC voltage dropping to a level between 0.3 to 1.0 volt DC.

As long as the DC level stays between 5.0V DC for Transmit at channel 40 and 0.3 to 1.0V DC for receive at channel, the VCO is set properly.

The magnitude of the T.P.I voltage swing is determined by C211 at factory. The optimum value of C211 was found to be around 60 pfd.

ALIGNMENT OF TRANSMITTER CIRCUITRY

RF DRIVER STAGE ALIGNMENT

1. Select channel 19.
2. Connect an oscilloscope to the base of Q301.
3. Adjust L204, L301, L302 for maximum amplitude of scope display (27.185 MHz)
4. Connect the scope to Q302 collector.
5. Adjust L303 for maximum amplitude on scope display.

RF POWER AMPLIFIER ALIGNMENT

1. Set power supply voltage to 13.8V and set the Radio to channel 19 position.
2. Connect a watt meter to the antenna connector.
3. Adjust L304, L305, and L306 for maximum power indication. Also again touch up L303, L302 and 301 to peak power.
4. When all coils are peaked, the power meter should indicate above 4.0 watt.
5. Turn L306 counterclockwise until the power reading of 3.8 watt is obtained.

TRANSCEIVER SERVICING

Transceiver has been fully tested prior to shipment and will not normally require further adjustments.

WARNING

As prescribed in Part 95.58, paragraph [e] of the FCC Rules and Regulations, the manufacturer of the transceiver is required to issue the following warnings:

1. Certain repairs and adjustments to this transceiver may be made legally only by a person in possession of a valid First or Second Class FCC Radiotelephone Operators License [or equivalent in Canada], or by a person under the direct supervision of a holder of such a license. This applies particularly to those repairs or adjustments, such as replacement of crystals and transmitter oscillator components, which might affect the transmitter's ability to comply with FCC regulations.
2. Use only approved replacement parts when servicing the transmitter. The use of a component [such as a crystal, semiconductor, capacitor, etc.] having different electrical characterisitcs and ratings than that originally used could result in a violation of the FCC Regulations and is therefore prohibited.

CRYSTAL CONTROLLED "PHASE LOCKED LOOP" SYNTHESIZING SYSTEM

This transceiver uses a frequency synthesizing system which employs two crystals and the PLL (phase locked loop) circuit to produce 40 transmitting and 40 receiving channels. The accompanying chart shows the operating mode.

PRESIDENT ROY

Parts Layout. Main PC Board.

MIDLAND 150M
4001
11

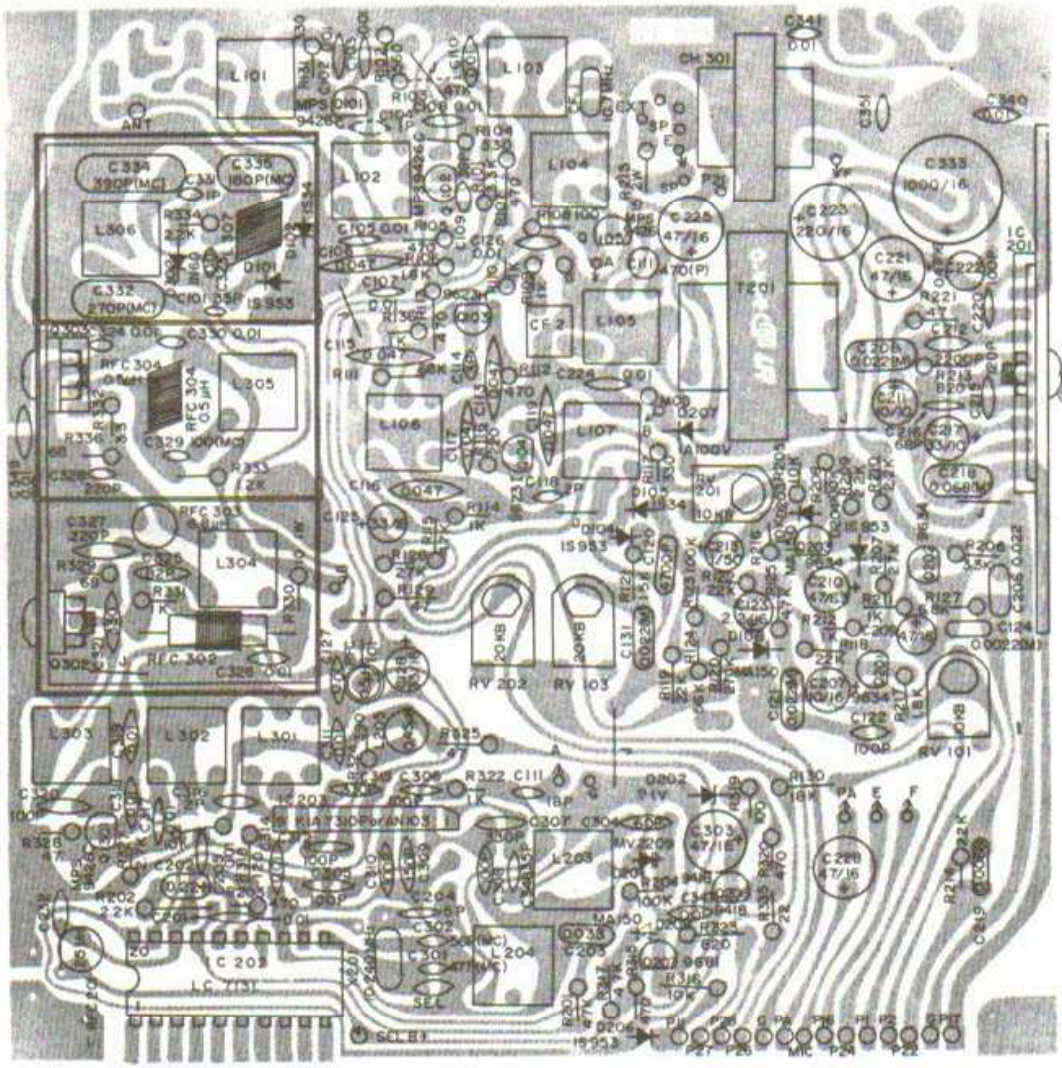


FIGURE 5. ADJUSTMENTS

VCO FREQUENCIES AND MIXING

CH NO	CHANNEL FREQ (MHz)	CRYSTAL OSC	VCO	
			T X	R X
1	26.965	10.24	16.725	16.27
2	26.975	"	16.735	16.28
3	26.985	"	16.745	16.29
4	27.005	"	16.765	16.31
5	27.015	"	16.775	16.32
6	27.025	"	16.785	16.33
7	27.035	"	16.795	16.34
8	27.055	"	16.815	16.36
9	27.065	"	16.825	16.37
10	27.075	"	16.835	16.38
11	27.085	"	16.845	16.39
12	27.105	"	16.865	16.41
13	27.115	"	16.875	16.42
14	27.125	"	16.885	16.43
15	27.135	"	16.895	16.44
16	27.155	"	16.915	16.46
17	27.165	"	16.925	16.47
18	27.175	"	16.935	16.48
19	27.185	"	16.945	16.49
20	27.205	"	16.965	16.51
21	27.215	"	16.975	16.52
22	27.225	"	16.985	16.53
23	27.255	"	17.015	16.56
24	27.235	"	16.995	16.54
25	27.245	"	17.005	16.55
26	27.265	"	17.025	16.57
27	27.275	"	17.035	16.58
28	27.285	"	17.045	16.59
29	27.295	"	17.055	16.60
30	27.305	"	17.065	16.61
31	27.315	"	17.075	16.62
32	27.325	"	17.085	16.63
33	27.335	"	17.095	16.64
34	27.345	"	17.105	16.65
35	27.355	"	17.115	16.66
36	27.365	"	17.125	16.67
37	27.375	"	17.135	16.68
38	27.385	"	17.145	16.69
39	27.395	"	17.155	16.70
40	27.405	"	17.165	16.71

TRANSMIT FREQUENCY CHECK

1. Set the Radio to transmit mode with no modulation.
2. Connect the frequency counter to the antenna load or to the tab provided at the wattmeter.

The frequency should be within ±800Hz from each channel center frequency as tabulated in the frequency table attached.

MODULATION SENSITIVITY ALIGNMENT

1. [Set the unit into transmit mode and apply 20 mV, 1 KHz signal to the Mic input circuit.
2. RV 201 should be adjusted to obtain 85% modulation at this condition.
3. Next, decrease signal input to 6mV and observe that the modulation ratio is keeping the value higher than 60%.

RF METER ALIGNMENT

Adjust RV202 so that the meter pointer should indicate the same wattage as the reading obtained on the wattmeter. Refer to "3.6" in this alignment procedure.

ALIGNMENT OF RECEIVER CIRCUITRY

RECEIVER SENSITIVITY ALIGNMENT

1. Set the signal generator at 27.185 MHz, 1 KHz and 30% modulation. Also set the radio at channel 19 position.
2. Adjust L204, L101, L102, L103, L104, L105, L106 and L107 for maximum audio output across the 8 ohm dummy load resistor.

This alignment should be performed by gradually decreasing the signal generator output signal to a minimum level required for tuning to avoid inaccurate alignment due to AGC action.

SQUELCH CIRCUIT ALIGNMENT

1. Set the signal generator to provide RF input signal of 54 dB (1 KHz, 30% modulation.)
2. Rotate the squelch control in full clockwise direction.
3. Temperarily adjust RV 101 for maximum audio output, and note the audio output level. Then, adjust RV 101 so that the audio output level decreases by 6dB.

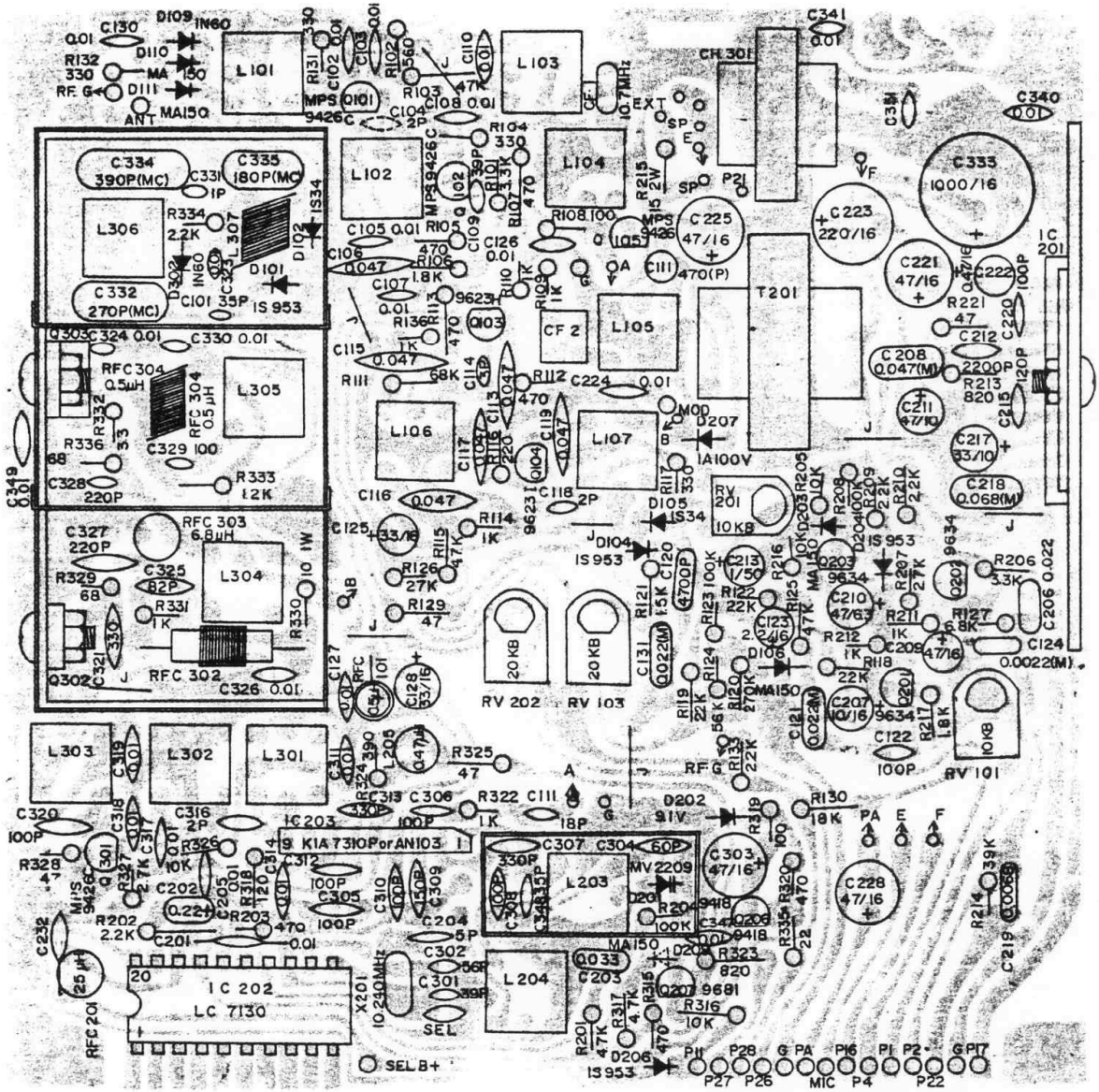
S-METER ADJUSTMENT

1. Set the signal generator to provide 40 dB signal output.
2. Adjust RV103 so that the S-indicator read S "9" on the indicator provided on the front panel.

RETURNING THE UNIT FOR SERVICE

In the event repair is necessary please return unit to the store from which it was purchased. If necessary to return to our service head quarters, pack your transceiver extremely carefully. Use UPS prepaid. Please enclose a description of difficulty experienced as well as when and where unit was purchased.

Parts Layout. Main PC Board.



Q101, Q102: MPS 9426(C), 2SC 1923
Q103, Q104: MPS 9623 (H, L), 2SC 373
Q105.: MPS 9426 (B, C), 2SC 1923
Q201, Q202, Q203: MPS 9634 (C0), 2SC 733
Q206: MPS 9418 (T), 2SC 509
Q207: MPS 9681 (T), 2SA 495
Q301: MPS 9426 (B, C), 2SC 388 A
Q302: 2SC 1957, 2SC 2314, 2SC 1678
Q303: 2SC 1306, 2SC 2078, 2SC 495
Q304: MPS 9600 (I), 2SC 373

27MHz RF AMP Q101
10MHz CONV Q102
455 KHz 1ST IF AMP Q103
455KHz 2ND IF AMP Q104
RF DRIVE AMP Q302

L101 L102 L103 L104 L105 L106 L107
CF1 10.7MHz
CF2
D101 1S953
D102 1S34
D103 1N60
D104 1S953
D105 1S34
D106 1S1555
D107 MA150
D108 MV2209
D201 MV2209
D202 8.6V ~ 9.1V
D203 MA150
D204 1S953
D205 MA150
D206 1S953
D207 1A100V
D208 MA150
D209 MA150
D301 1A100V
D302 1N60
D303 1N60
D304 1N60
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D306 1N60
D307 MOD LED INDICATOR
D308 AWI INDICATOR
D309 1N60
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D498 1N60
D499 1N60
D500 1N60

IC 201 KIA 7205P KIA 7205AP
IC 202 LC 7130
IC 203 7310P or AN103

SW1 BCD CODE 40CH SW FOR LED DRIVE
40 LED DISPLAY
R301–314 1K 1/4W X14

BLUE
WHITE
RED
PUSH
MIC
MIC UNIT

BOTTOM VIEW
MPS 9426
MPS 9623 9631 9634 9681 8000 9418 9600
2SC 1306 2078
2SC 1957 2SC 2314

SIDE VIEW KIA 7205P
TOP VIEW LC 7130
SIDE VIEW KIA 7310P AN 103

CHASSIS GND
BATTERY NEGATIVE
R VARIABLE
R CONTROL NOT ACCESSIBLE FROM SIDE.

S/RF METER
ADJUST RV103 20KB
VR101 SQL 10K(C) W/O /SW1
VR102 50KA LAF VOL
VR103 RF GAIN 50KB
TONE SW4
ANL OFF SW SW3
SW2A SW2B
CB PA
HI LO
ANT
SP
J1 EXT. SP
J2 PA SP
J3
TP1 TP2 TP3 TP4 TP5 TP10
POWER DC + 13.8V –
FUSE 2A
PL1 6.3/70

NOTE:
ΔVOLTS AT TRANSMIT CONDITION ALL VOLTAGES MEASURED FROM P C BOARD GND WITH DC VTVM AT NO SIGNAL (AT 13.8 V POWER SUPPLY) IF MEASUREMENT VALUES OR TAGGED ARE INEXCESS OF ±20% OF VALUES SHOWN THEN REASON FOR DIFFERENCE SHOULD BE CORRECTED.