



Model I-653B
OWNER'S MANUAL

**GYRO-LOCK
23-CHANNEL
CITIZENSBAND TRANSCEIVER**



GENERAL

Your new Royce 1-653B is a high quality 23 Channel AM Citizensband transceiver. It has many features and engineering design. Careful reading of the instruction manual before operation is essential for proper operation and prevention of damage.

PACKING

This unit has been especially protected for shipment. Open the carton carefully to avoid damage. Examine the unit for any visible damage. If the transceiver has been damaged in shipment, save the box and packing material and notify the transportation company.

DESCRIPTION

A sensitive dual conversion superhetrodyne circuit is employed with a tuned RF stage. This delivers top range performance.

Three ceramic filters provide a high degree of selectivity and rejection of unwanted adjacent channel interference.

Royce's automatic amplified A.G.C. circuit greatly improves the range of signal power the receiver can accept without distortion. Its fully electronic. Whether the station is extremely close or far away you'll hear him. No need to push local-distant buttons or turn RF gains. Its fully automatic.

Additional receiver features include variable squelch, noise eliminator, integrated circuit audio stages, signal strength meter.

TRANSMITTER

The heart of your 1-653B is the all new Gyro-Lock oscillator. It provides full 23 channel operation from only three crystals. Integrated circuits (four in all) plus other components replace the balance of crystals. Gyro-Lock is the most accurate frequency system available for CB.

A metal type RF final is used for reliability. High level push pull audio with Royce's Mod-U-Gard delivers maximum talk power without overmodulation.

GENERAL

Your 1-653B is equipped with a powerful Public Address paging circuitry. It also is equipped to operate from 12 Volts DC positive or negative ground.

Royce's WIRELESS chassis is construction employed. Major circuits are module for ease of serviceability. All connecting wires to the printed circuit board found in normal CB sets have been eliminated to improve overall reliability and minimize failures from loose, broken, or damaged wires.

OPERATION OF CONTROLS



Front Panel

- 1) OFF-ON-VOLUME CONTROL
- 2) SQUELCH CONTROL
- 3) CHANNEL SELECTOR
- 4) S/RF-POWER METER
- 5) MICROPHONE CONNECTOR
- 6) PA-CB SWITCH
- 7) NOISE ELIMINATOR SWITCH
- 8) PUSH-TO-TALK SWITCH

Rear Panel

- 9) PA SPEAKER
- 10) EXTERNAL SPEAKER
- 11) DC POWER CONNECTOR
- 12) ANTENNA CONNECTOR

FEATURES AND CONTROLS

1. VOLUME/POWER ON-OFF

This combination control supplies power to your 1-653B and adjusts the receiver volume. The switch should be turned clockwise from the "off" position. You will hear an audible "click". The channel dial and meter will light. To adjust the volume continue advancing the control in a clockwise position.

2. CHANNEL SELECTOR

The channel selector switch is used to select the channel frequency. It automatically adjusts both the transmitter and receiver frequencies.

3. SQUELCH CONTROL

The squelch control is used to eliminate background noise when there are no signals present strong enough to overcome the noise. To adjust the squelch control, select a channel where there is no signal. Turn the volume up to normal listening levels. Rotate the squelch control clockwise until the background noise disappears.

4. S/RF METER

The 1-653B is equipped with a large, easy-to-read combination meter with a built-in transmit and modulation light.

In the receive position, the meter reads the level of the incoming signals. In the transmit position, it indicates relative power output.

5. AUTOMATIC NOISE ELIMINATOR

Your 1-653B is equipped with an automatic noise eliminator. This greatly reduces extraneous noise coming into the receiver via the antenna. In effect, the noise pulses are clipped from the incoming signals before they reach the audio amplifier. This causes little or no loss in the signal receive level. A pushbutton switch has been provided for elimination and control of this circuit.

6. CB-PA SWITCH

A pushbutton switch converts your 1-653B into a powerful Public Address system. The "PA" function requires use of an optional 8-16 ohm paging speaker (Royce 2-060). This speaker must be connected to the "PA" jack on the back of the set. Once this speaker has been connected, simply put the PA-CB switch to the "PA" position. Depress the microphone push-to-talk switch to activate the circuit.

NOTE: THE VOLUME CONTROL ADJUSTS PA OUTPUT LEVEL.

7. PA SPEAKER JACK

For attaching optional 8-16 ohm PA speaker, use 3.5mm jack.

8. EXTERNAL SPEAKER JACK

You may add any 8-16 ohm external speaker. Simply plug your accessory speaker into the jack. Inserting the 3.5mm plug will automatically disconnect the internal speaker.

9. TRANSMIT LIGHT

Your 1-653B is equipped with a modern light emitting diode (LED) transmit indicator light. This light will be lighted red when the transceiver is in the transmit mode.

10. ANTENNA CONNECTOR

A standard SO-239 type connector is supplied for attaching either mobile or base antennas.

11. DC CONNECTOR

This connector is used to supply power to your 1-653B. The plug-in feature allows easy removal for switching vehicles.

12. MICROPHONE

The receiver and transmitter are controlled by the press-to-talk switch on the microphone. To transmit, simply press in this switch. Release the switch to receive. When transmitting, hold the microphone 3 to 4 inches from your mouth and speak clearly at normal voice levels.

SPECIFICATIONS

GENERAL

- | | |
|--|---|
| 1. Semiconductors | : 25 transistors, 21 diodes, 4 integrated circuits, and 1 thermistor. |
| 2. Self-Contained Speaker | : 3 inch, 8 ohm voice coil. |
| 3. Microphone | : Dynamic microphone with push-to-talk switch, 500 ohms. |
| 4. Controls, Indicators and Connectors | : Volume control with power on-off switch
: Variable Squelch Control.
: Channel Selector.
: Illuminated Channel Indicator.
: Pushbutton A.N.L.
: Pushbutton PA-CB.
: Coaxial type antenna connector.
: External Speaker Jack.
: Public Address Speaker Jack.
: Microphone Connector. |
| 5. Power Supply | : 13.8 Volts DC (positive or negative ground). |
| 6. Cabinet Description | : Plastic front with chrome plating and vinyl coated metal cabinet. |
| 7. Dimensions | : 8-7/8" D × 7" W × 2-1/4" H. |

RECEIVER

- | | |
|---|----------------------------------|
| 1. Frequency Range (MHz) | : 26.965-27.255 |
| 2. Sensitivity | : 0.5uV for 10db S+N/N |
| 3. Selectivity | 5KHz minimum at 6db down |
| 4. Adj. Channel Rejection | : More than 60db. |
| 5. Audio Power output at 8 ohms | : More than 4W at 10% distortion |
| 6. Audio fidelity (1KHz=0db, 6db down) | : 400Hz-2,000Hz |
| 7. A.G.C. figure of merit (Input 94db for 10db range) | : More than 80db |
| 8. Squelch sensitivity (Threshold) | : Less than 0.5uV |
| 9. Spurious Rejection | : More than 45db |

TRANSMITTER

- | | |
|--------------------------|------------------|
| 1. Frequency Range (MHz) | : 26.965— 27.255 |
| 2. RF Output Power | : 4W average |
| 3. Modulation Capability | : 100% |
| 4. Spurious Suppression | : More than 50db |
| 5. Frequency Tolerance | : ± 0.005% |

POWER SUPPLY

Almost all cars and most trucks currently operating in the U.S. are negative ground. There are some large trucks and construction equipment which do operate on positive ground. Your Royce 1-653B will operate on either. In the negative ground systems the minus (–) pole of the battery is attached to the car body, engine block, etc.

NEGATIVE GROUND HOOKUP:

Attach the red (fused) wire to the fuse block terminal or any convenient plus (+) lead. Devices operated by the ignition key such as the radio, light, etc. are best since when you turn the ignition off, the unit will be turned off. Attach the black lead to the car body via any convenient method.

NOTE: Many newer cars use plastic dash pieces. Make sure the screw or contact you choose is attached to the metal framework of the car.

POSITIVE GROUND HOOKUP:

In the event that you do have a positive ground vehicle, the following hookup must be made. Attach the red (fused) lead to the car body via any convenient screw, bolt, etc. Attach the black lead to the terminal block or any convenient wire which goes to the minus (–) pole of the battery.

FAILURE TO MAKE THE PROPER CONNECTION COULD RESULT IN UNIT DAMAGE.

ANTENNA REQUIREMENT

This transceiver will operate with any standard 52 ohm ground-plane, vertical, mobile whip, long wire or other CB antenna. A standard SO-239 type connector is provided on the back panel for use with popular PL-259 antenna plug.

ANTENNA INSTALLATION

BASE STATION:

When the 1-653B is used as a base station, any Citizens Band beam, dipole, ground-plane or vertical antenna may be used. A ground-plane type will provide greater coverage, and, since it is essentially non-directional, it is ideal in base station to mobile operation. From base station to base station, or point to point operation, a directional beam will give greater distance even under adverse conditions. The range of the transceiver depends basically on the height of the antenna and, whenever possible, select the highest location within F.C.C. limits. (These regulations limit the antenna height to 20 feet above an existing structure or 60 feet above ground for a non-directional antenna and 20 feet above an existing structure for a beam). Generally 26 feet of lead-in cable should be used to minimize line losses. However, a desirable antenna location may justify the loss in extra lead-in length.

MOBILE ANTENNAS:

A vertical whip antenna is best suited for mobile use. A non-directional antenna must be used for best results in any case. The base loaded whip antenna will normally provide effective communication. For greater range and more reliable operation, a full quarter wavewhip should be used. Either of these antennas use the metal car body as a ground-plane and the shield of the base lead as well as the metal case of the transceiver should be grounded. A standard antenna connector (type SO-239) is provided on the transceiver for easy connection to a standard PL-259 cable termination.

MOBILE INSTALLATION

A location in the car or truck should be chosen carefully for convenience of operation and non-interference with normal driving functions. Mounting may be under the dash or instrument panel or any place a secure installation can be made. The carrying handle again serves as the mounting bracket or additional perforated straps or brackets may be used as desired. The 12 Volt cable may be connected to any convenient terminal but preferably to the ignition switch to prevent unauthorized persons from operation of your unit. With this method the unit will only operate when your key is turned on. Engine ignition interference should not be a problem and vehicles equipped with standard broadcast radios will have enough suppression to eliminate ignition interference. If interference is present, any skilled auto radio repairman should be able to eliminate it for you.

BASE STATION INSTALLATION

For base station use the Royce Model 2-050 power supply is recommended. When this power supply is used, simply connect the red (+) and black (-) terminals on the power supply to the (+) and (-) leads on your 1-653B. Do not attempt to operate this transceiver by connecting directly to 110 Volts AC.

GENERAL OPERATING PROCEDURE

CAUTION: BEFORE OPERATING THIS TRANSCEIVER, YOU ARE REQUIRED BY LAW TO READ AND UNDERSTAND PART 95 OF THE FCC RULES AND REGULATIONS. CHECK TO SEE IF THE PROPER CONNECTIONS HAVE BEEN MADE ON THE POWER CABLE, ANTENNA SYSTEM, AND MICROPHONE.

RECEIVER

- a. Put PA-CB switch to the CB position.
- b. Put ANL switch to the "on" position.
- c. Turn the volume and squelch controls fully counter clockwise.
- d. Rotate the volume control clockwise. You will hear an audible "click" and the meter and channel dial lights will come on. Continue rotating clockwise to desired listening level.
- e. With no signal present, rotate the squelch control clockwise until the rushing noise disappears.

TRANSMITTER

WARNING: IT IS ILLEGAL TO OPERATE THE TRANSMITTER SECTION OF THIS TRANSCEIVER PRIOR TO RECEIVING A VALID STATION LICENSE AND CALL SIGN FROM THE FEDERAL COMMUNICATIONS COMMISSION.

CAUTION: NEVER OPERATE THIS UNIT WITHOUT AN ADEQUATE ANTENNA SYSTEM OR LOAD. ANTENNA SWR SHOULD NOT EXCEED 3:1. FAILURE TO FOLLOW THESE RECOMMENDATIONS COULD RESULT IN DAMAGE TO THE RF OUTPUT TRANSISTOR.

1. Plug in microphone.
2. Set Channel Selector to the desired channel.
3. To transmit, depress the Push-To-Talk switch on the microphone.
Hold the microphone 3 to 5 inches from your mouth and talk in a normal level.

PUBLIC ADDRESS

Attach an optional paging speaker (Royce Model 2-060 or equivalent) to the P.A. jack on the back of the unit.

Put the PA-CB switch to the "PA" position. To activate circuit, simply depress the Push-To-Talk switch on the microphone.

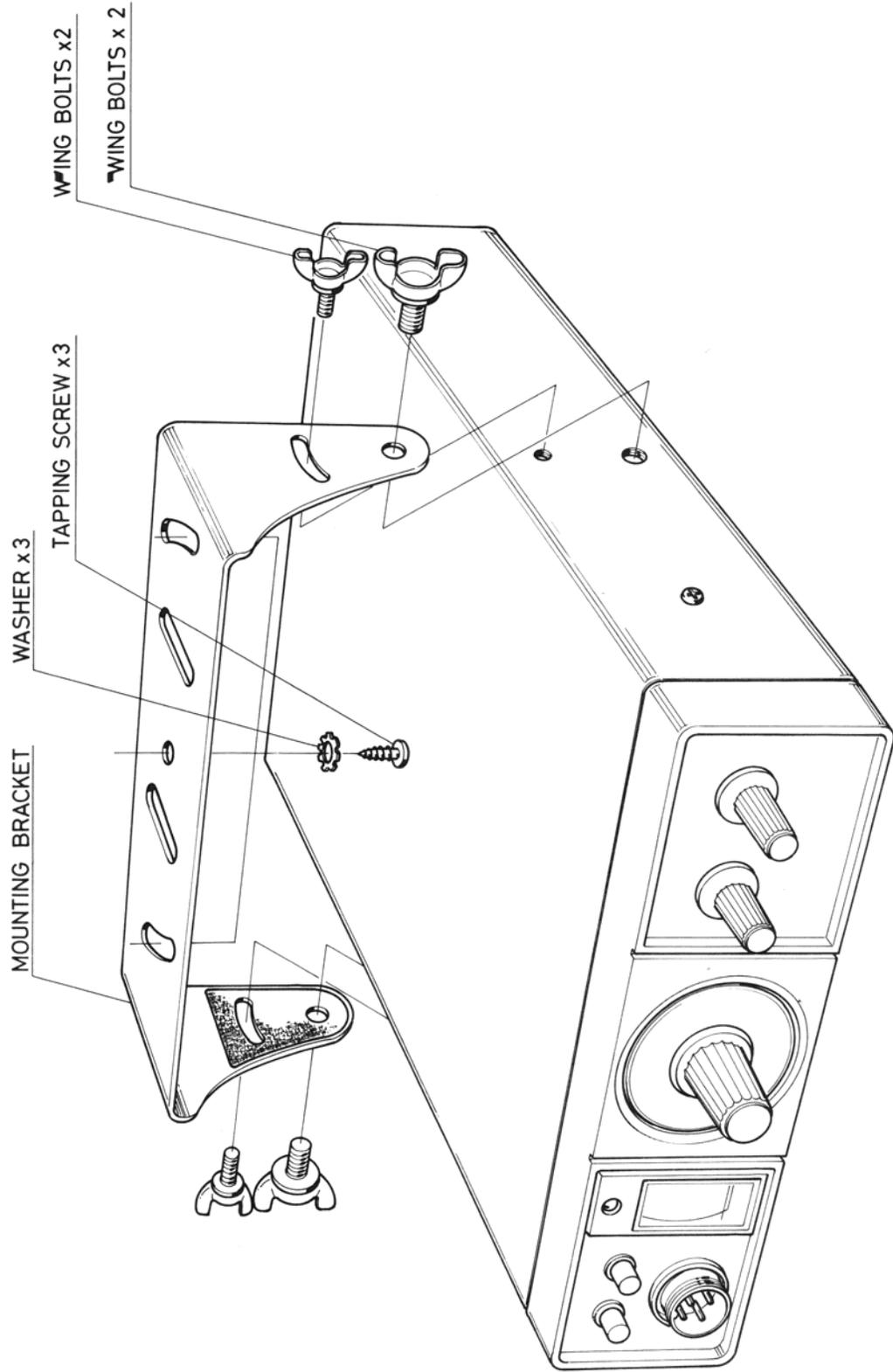
In some cases, feedback may occur if there is not enough separation between the microphone and paging speaker. Orient microphone so it is 180 degrees from speaker. If this does not solve the problem, you may have to move the speaker farther away.

SERVICING YOUR TRANSCEIVER

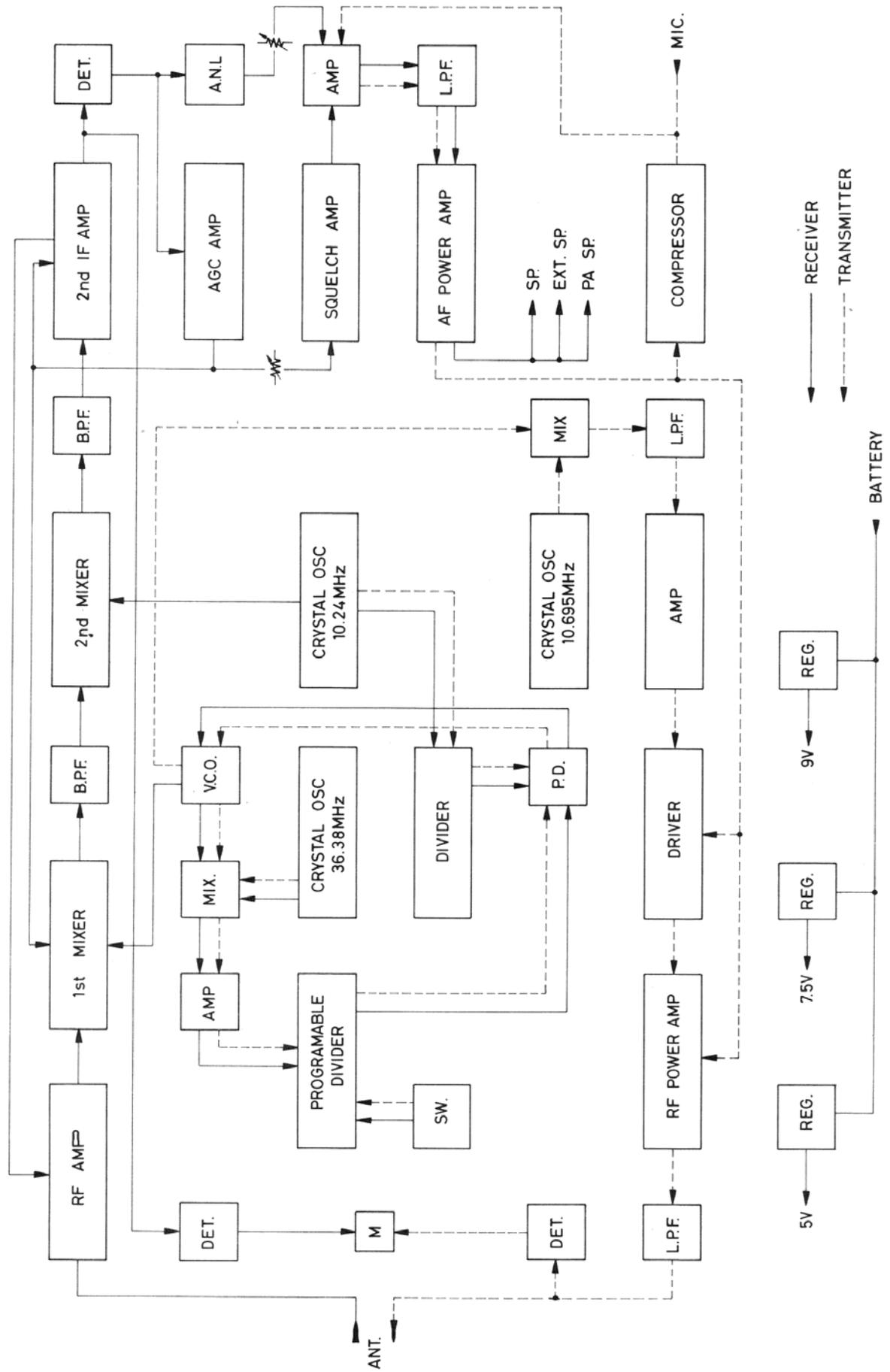
The technical information, diagrams, and charts provided in this manual are supplied for the use of a qualified holder of a first or second class radiotelephone license in servicing this transceiver. It is the user's responsibility to see that this unit is operating at all times in accordance with the F.C.C. citizens radio service regulations.

If you install your own transceiver, do not attempt to make any transmitter tuning. Adjustments are prohibited by the F.C.C. unless you hold or are in the presence and under the supervision of a first or second class radiotelephone licensed person. A Citizens Band or Amateur license is not sufficient.

MOUNTING INSTRUCTIONS

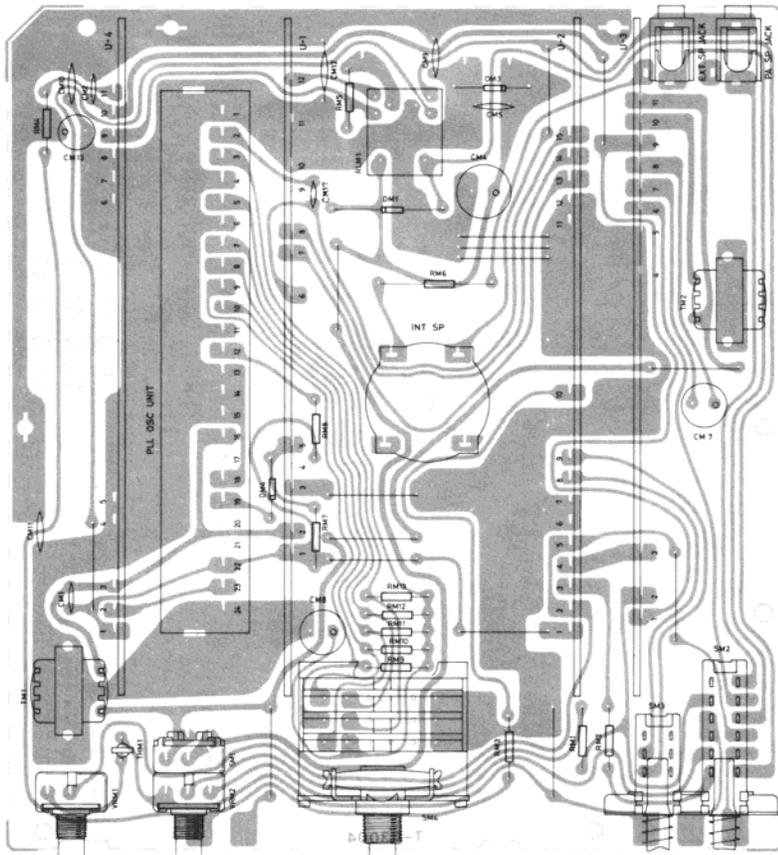


BLOCK DIAGRAM

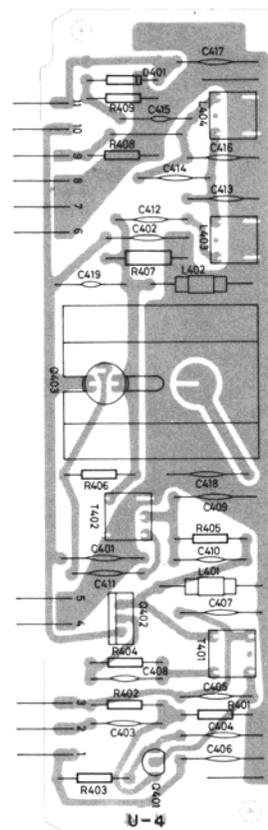
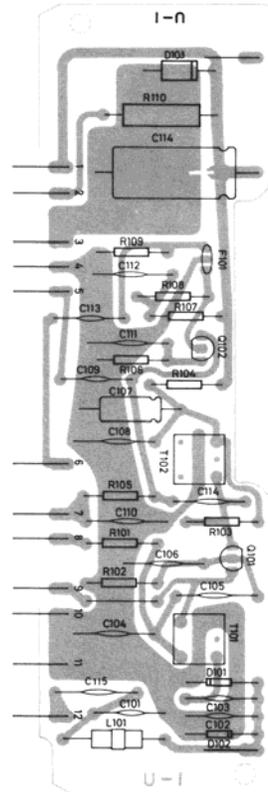
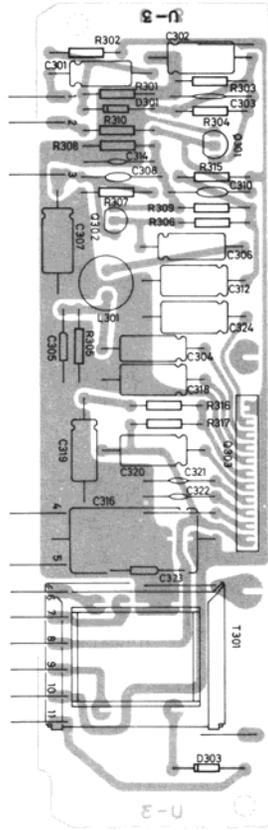
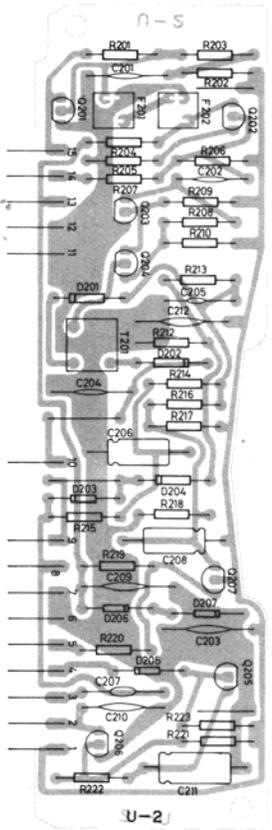


PARTS LAYOUT

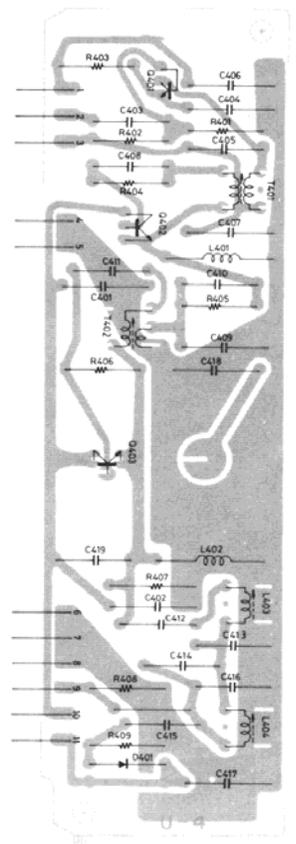
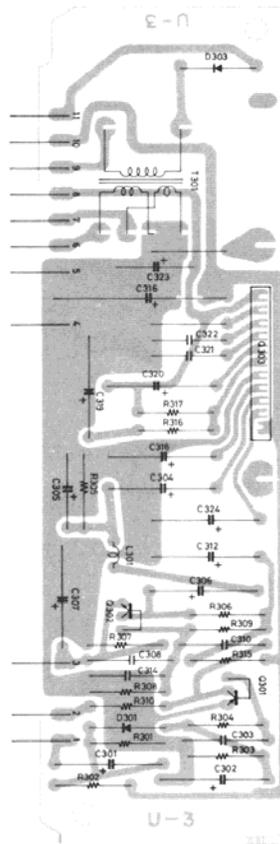
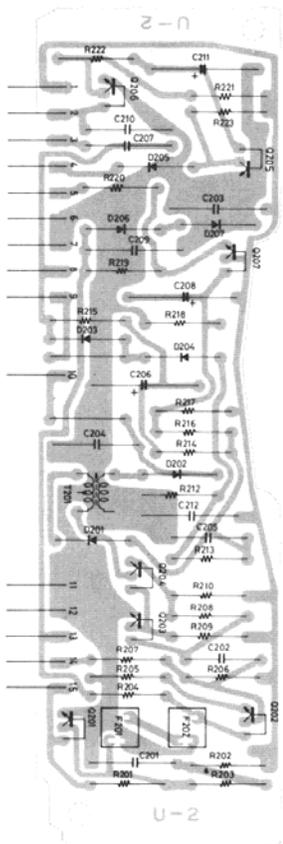
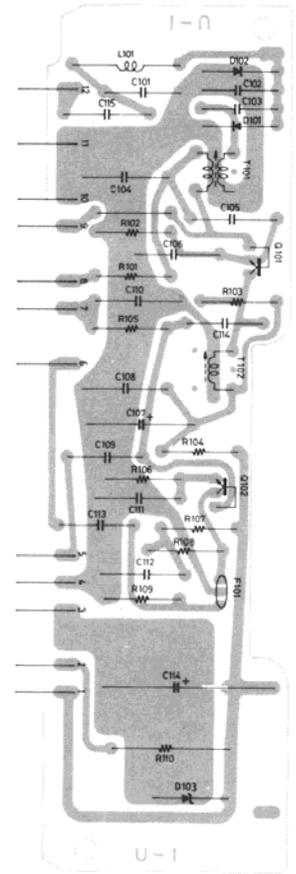
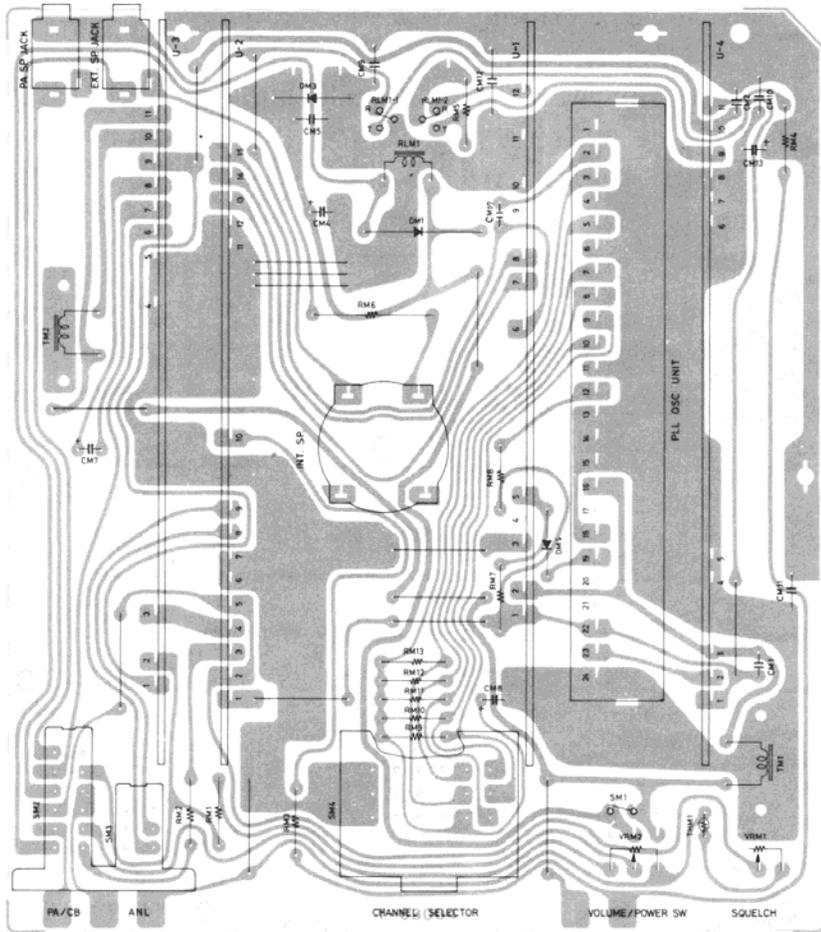
TOP VIEW



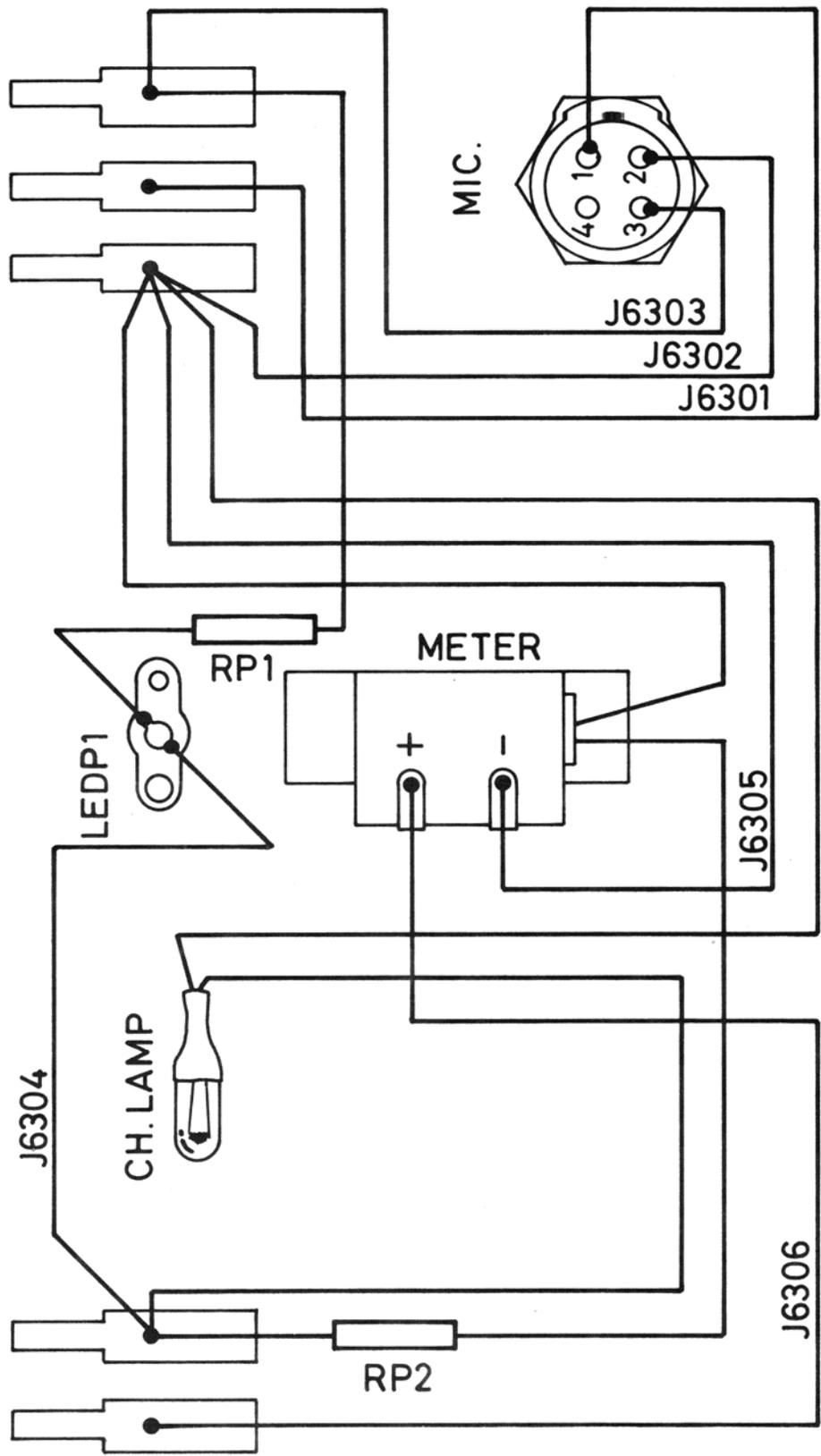
SQUELCH VOLUME/POWER SW CHANNEL SELECTOR ANL PA / CB



BACK VIEW



WIRING DIAGRAM



I -653B Alignment Instruction

RECEIVER

- A. Inject at the ant. jack a 27.115MHz signal ($\pm .002\%$; 30% modulation at 1KHz).
 B. Connect an audio voltmeter and oscilloscope across on 8 ohm load and plug into external speaker jack.

Test Equipment	Test Point	Adjust	Remarks
1. RF signal generator (low range to avoid audio saturation)	Inject at ant. jack	Channel sel to 13	_____
		T-101, T-102, T-201,	Max. output with vol. control at max, squelch control at min. output should be more than 500mw (2.0v/8 ohm) with gen. voltage at $1\mu\text{V}$; S & N/N= more than 10dB on all channels

AGC RESPONSE

Set the output voltage of a signal generator at $50000\mu\text{V}$ and adjust the volume control so that the voltmeter output is 500mW (2.0v/8 ohm). Then, lower the output voltage of the generator so that the voltmeter output is 10dB down. The output voltage of the signal generator should be under $5\mu\text{V}$ at this time.

AUDIO POWER CHECK

With a generator output of 1mV and squelch control at minimum, audio output should be more than 4w (5.7v/8 ohm) at maximum position of volume control.

TRANSMITTER

- A. Power Supply – 13.8VDC.
 B. Use a suitable power meter, non-inductive dummy load and oscilloscope connected to antenna jack.

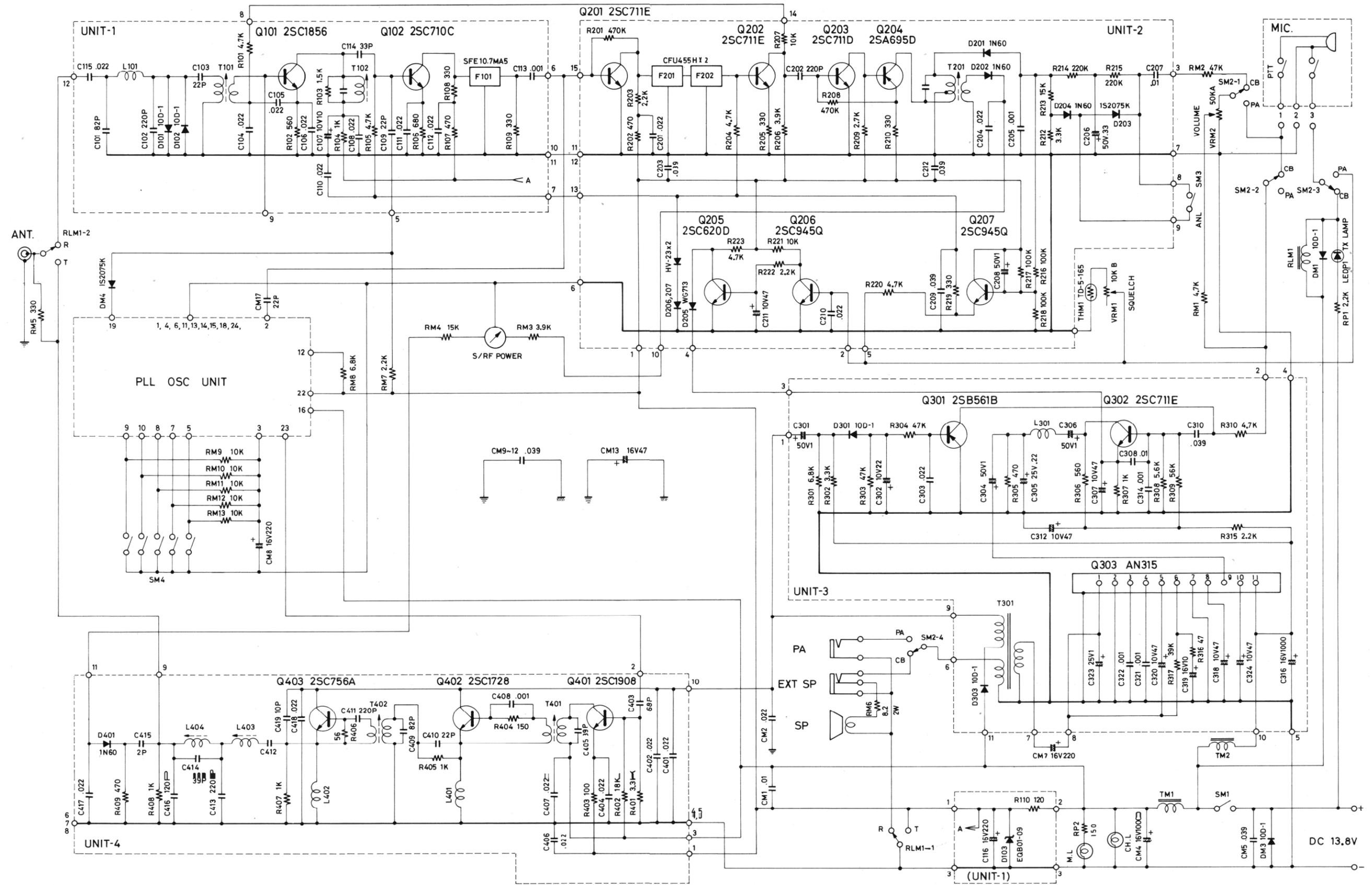
Test Equipment	Test Point	Adjust	Remarks
1. Power Meter	antenna jack	T-401, T-402, L-403, L-404,	Adjust for maximum output power
2. Freq. Counter	across dummy load	_____	Check all channels $\pm 800\text{Hz}$
3. A.F. Oscillator with AF voltmeter in shunt (1KHz 10mV)	Inject at mic input	_____	– 90% modulation on oscilloscope
		_____	Reduce AF oscillator output to 5mV; modulation $\geq 50\%$

I-653B Voltage Chart

		Vb (V)		Vc (V)		Ve (V)		
		RX	TX	RX	TX	RX	TX	
Q101	2SC1856	1.6	0	7.0	0	0.9	0	
Q102	2SC710C	1.2	0	7.9	0	0.7	0	
Q201	2SC711E	0.6	0	4.6	0	0	0	
Q202	2SC711E	1.2	0	2.1	0	0.6	0	
Q203	2SC711D	0.7	0	4.5	0	0	0	
Q204	2SA695D	4.5	0	0	0	5.1	0	
Q205	2SC620D	0.7	0	0	0	0	0	NO SQUELCH
		0.1	0	2.1	0	0	0	SQUELCH
Q206	2SC945Q	0.1	0	2.1	0	0	0	NO SQUELCH
		0.7	0	0.1	0	0	0	SQUELCH
Q207	2SC945Q	2.5	0	8.6	0	1.9	0	
Q301	2SB561B		0~0.5 [*]		—		0	※MIC INPUT LEVEL 0~100mV/600Ω
Q302	2SC711E	1.2	1.2	11.9	11.9	0.5	0.5	NO SQUELCH
		1.1	1.2	13.3	11.9	1.4	0.5	SQUELCH
Q401	2SC1908	2.1	1.8	13.8	13.8	8.6	1.3	
Q402	2SC1728		—	12.7	12.7		—	
Q403	2SC756A ⁽²⁾		—	12.7	12.7		—	

		PIN NO										
		1	2	3	4	5	6	7	8	9	10	11
Q303	AN315	V 5.7	0	1.2	6.9	10.7	5.7	0	5.7	5.7	13.0	13.6

SCHEMATIC DIAGRAM



FEDERAL COMMUNICATIONS COMMISSION REQUIREMENTS

Your new Royce 1-653B is a combination receiver-transmitter designed and built for licensed Class D operation on any of the 23 frequencies designated as citizensband channels by the Federal Communications Commission. You are required to read and understand Part 95 of the F.C.C. Rules and Regulations prior to operation of this unit. Part 95 regulations are available for \$2.25 from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. You are also required to complete F.C.C. Form 505 and submit it to the F.C.C. in order to receive your license to operate this unit. F.C.C. regulations will be violated if you transmit with this unit prior to receipt of your license.

NOTE: The technical information, diagrams, and charts provided in this manual are supplied for the use of a qualified holder of a first or second class radiotelephone license in servicing this transceiver. It is the user's responsibility to see that this unit is operating at all times in accordance with the F.C.C. Citizens Radio Service regulations.

If you install or service your own transceiver, do not attempt to make any transmitter tuning adjustment. Transmitter adjustments are prohibited by the F.C.C. unless you hold a first or second class radiotelephone license or are in the presence of a person holding such a license. A citizens band or amateur license is not sufficient.

ROYCE ELECTRONICS CORPORATION HEREBY CERTIFIES THAT THIS EQUIPMENT HAS BEEN DESIGNED, MANUFACTURED, AND FURNISHED IN ACCORDANCE WITH VOL. 6 PART 95 OF THE CURRENT FCC RULES AND REGULATIONS FOR CLASS D CITIZENS BAND OPERATION.

FULL 90 DAY WARRANTY POLICY

Royce products are built to rigid specifications and quality audited at several stages in their manufacturing. We warrant each new Royce product to be free from defects in material and craftsmanship for a period of 90 days from date of purchase. We will repair free of charge or replace at no charge any unit which becomes defective during the warranty period except for products which have been subject to misuse, neglect, accident, modification in wiring not of our own installation, or to use in violation of instructions furnished by us. The warranty does not cover any accessory used in connection with this product. In warranty products should be returned to Royce Electronics freight prepaid.

Royce Electronics Corporation will repair or replace, at their option, and return the item freight prepaid.

Royce  **electronics** corporation

Division of Masco Corporation

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