Royce
ELECTRONICS CORPORATION

OWNER'S/SERVICE MANUAL

Model 1-641

DIGITAL READOUT

40 Channel
Gyro-Lock
SSB/AM Base Station
Citizensband
Transceiver

Ser. 1 FCC DATA 1-641

GENERAL

Your new Royce 1-641 is a professional quality Citizens Band Transceiver designed to operate on either AM, Lower Single Sideband (LSB) or Upper Single Sideband (USB). It has many innovative engineering and user functions. Among them, a Royce plus feature is an amplified AGC circuit, built in to your 1-641. This expands the range of a normal AGC circuit by many times, and is usually found only in the most expensive sets. Your amplified AGC will enable you to hear clearly, even a very weak distant signal, and still allow you to hear a unit parked next to you without distortion. Royce's Gyro-Lock synthesizer is also employed in your 1-641. This is a phase loop lock synthesizer, giving you all channel frequencies from only three crystals in conjunction with one LSI (large scale integrated circuit and an I.C. (integrated circuit). Royce's Gyro-Lock is self compensating for frequency drift, keeping your 1-641 on center channel, every channel. Careful reading of this 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

Receiver: Sensitivity of less than a 1/2 of a microvolt on SSB and AM. A tuned RF stage pulls in even the weakest signals.

A deluxe mechanical filter on SSB provides the highest degree of selectivity and rejection of unwanted adjacent channel signals. Four Ceramic Filters for AM reception deliver over 70 db adjacent channel rejection. Additional receiver features include: variable squelch, clarifier control, integrated circuit audio preamplifier stage, metering automatic noise eliminator, PA-CB switch.

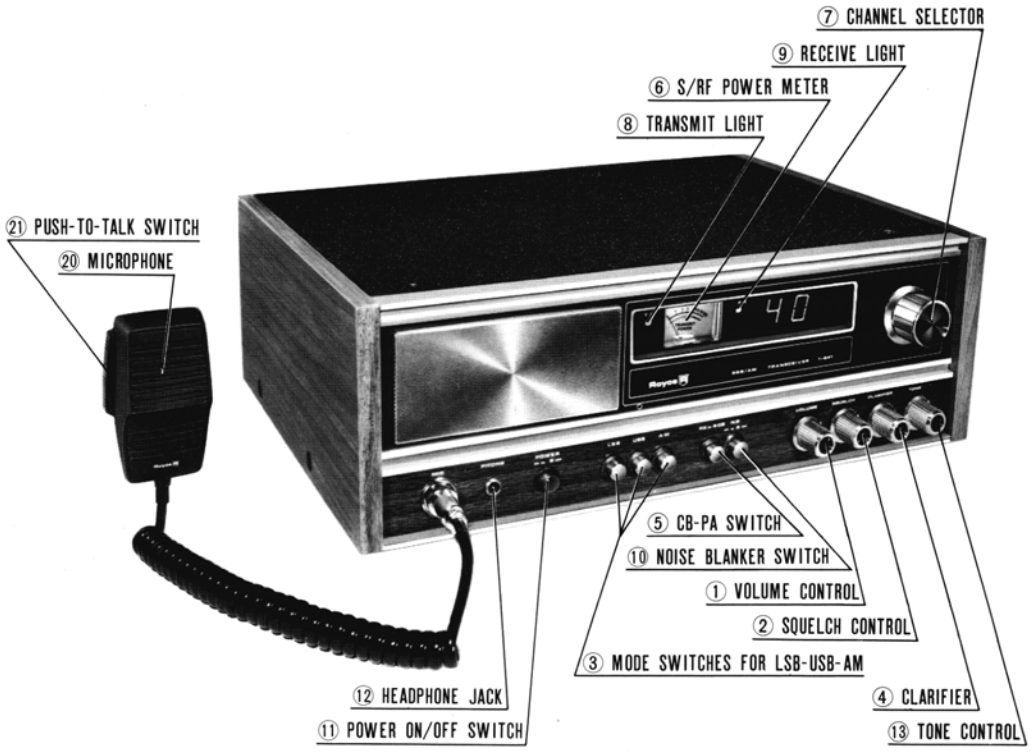
Transmitter: High efficiency is obtained through use of select components and sophisticated engineering design. An ALC circuit is employed in the SSB mode to provide maximum "Talk Power" without distortion. The SSB signal is generated by use of a integrated circuit balanced modulator and Royce's GYRO-LOCK synthesizer, to keep you on center channel, every channel. Relay switching is employed for dependability.

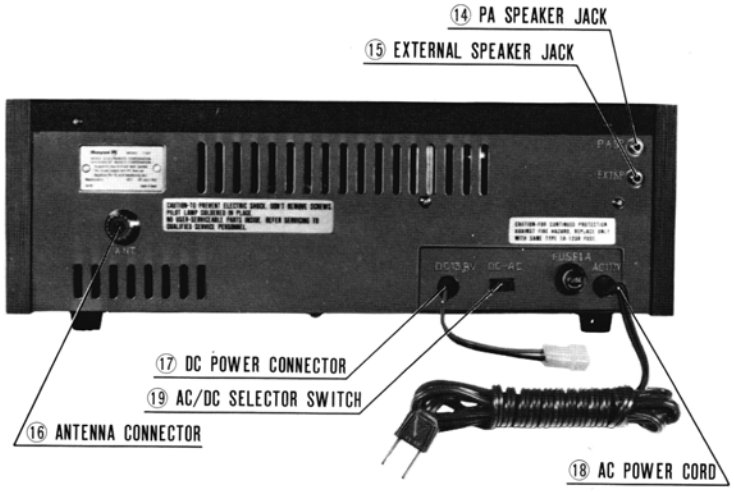
Power supply: Your 1-641 is designed to operate from ordinary house current (117 Volts AC, 60 cycle). Simply connect the AC Power to any convenient outlet.
Either Positive or Negative Ground 12 Volts DC (13.8 VDC EIA) is built in.

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

THE SERIAL NUMBER AND MODEL NUMBER OF YOUR 1-641 ARE LOCATED ON THE REAR PANEL OF THE TRANSCEIVER ON THE RIVETED PLATE. RECORD AND RETAIN THESE NUMBERS FOR FUTURE REFERENCE

OPERATION OF CONTROLS





Front View:

1. Volume Control
2. Squelch Control
3. Mode Switches for LSB-USB-AM
4. Clarifier
5. CB-PA Switch
6. S/RF Power Meter
7. Channel Selector
8. Transmit Light
9. Receive Light
10. Noise Blanker Switch
11. Power On/Off Switch
12. Headphone Jack
13. Tone Control

Rear View:

14. PA Speaker Jack
15. External Speaker Jack
16. Antenna Connector
17. DC Power Connector
18. AC Power Cord
19. AC/DC Selector Switch

Microphone:

20. Microphone
21. Push-To-Talk Switch

FEATURES AND CONTROLS

1. VOLUME CONTROL

To adjust the volume continue advancing the control in a clockwise position.

2. 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.

3. PUSHBUTTON MODE SWITCHES FOR LSB-USB-AM

AM transmission is amplitude modulation of the radio frequency carrier with an audio signal (voice). The components of the transmitted signal include the carrier and its two sidebands, upper and lower. For 100% modulation, each sideband contains one-fourth as much power as the carrier. The information transmitted is in the sidebands.

USB transmission is the transmission of the upper sideband only of a single sideband signal. In single sideband transmission, the carrier and one sideband are removed from the transmitted signal. Thus, only one sideband is transmitted.

LSB transmission is the transmission of the lower sideband, only. Three push-buttons provide selection of the mode of operation desired.

4. CLARIFIER

The clarifier is an electronic tuning circuit which allows you to shift the frequency of your receiver plus or minus 1.5 KHz (3 KHz total). In SSB operation, even small differences in frequencies between stations can cause poor reception. In effect, the clarifier electrically fine tunes the station being received. In AM operation, this acts as a Delta Tune circuit.

5. PA-CB PUSH-BUTTON SWITCH

In the "PA" position, your 1-641 is converted to a public address amplifier or hailer. The PA function should not be used unless an 8-16 ohm external speaker is connected to the "PA" Jack located on the back of the chassis. Once this optional speaker has been connected, simply put the PA-CB switch to the "PA" position and depress the microphone push-to-talk switch.

6. SIGNAL/RF Power Meter

The 1-641 is equipped with a large, easy-to-read combination meter.
In the receive position, the meter reads the level of the incoming signals. In the transmit position, it indicates relative power output.

NOTE: (1) In the AM mode, the meter will read power at all times when the transmit button is depressed. On SSB, however, it will only indicate RF output power when you modulate the signal.

(2) In the SSB mode, no meter can follow the rapid voice peak power attained. Therefore, while the transmitter is developing much more power than on AM, this additional power will not be fully reflected on the meter.

7. CHANNEL SELECTOR

The Channel Selector switch is used to select the fixed center frequency. It automatically adjusts both the receiving and transmitting frequencies. Set the selector switch to the desired channel. The channel will be displayed by large (15MM) easy-to-read LEDs (light emitting diodes).

8. TX INDICATOR

Your 1-641 is equipped with a LED (light emitting diode) transmit indicator light on the front panel. When the PTT switch on the mike is depressed, the LED will light, indicating you are in the transmit mode.

9. RX INDICATOR

Your 1-641 is equipped with an LED (light emitting diode) receive indicator light on the front panel. When lit, it indicates you are in the receive mode.

10. NOISE BLANKER

Your 1-641 is equipped with a sophisticated electronic noise blanker system to virtually eliminate extraneous noise coming into the receiver. In effect, noise pulses are blanked (or eliminated) from incoming signals before they reach the amplification stage of the receiver. This causes no loss in the signal receive level. Noise blankers are much more effective than noise limiters in eliminating noise from power lines, auto ignitions, etc. Generally, the noise blanker should be left on at all times. A switch has been provided to eliminate the circuit if desired.

11. POWER ON/OFF SWITCH

The push-button switch simply turns your 1-641 on or off.

12. HEADPHONE JACK

For private, quiet operation of your 1-641. Accepts a standard one-fourth inch three-pin phone plug.

13. TONE CONTROL

This control varies the audio level response of the receiver. In noisy areas, a high treble audio response makes reception easier. This control can be varied through a range of audio response from bass to treble. Adjustment should be made to suit receiving conditions or individual preference.

14. PA SPEAKER JACK

For attaching optional 8-16 ohm PA speaker. Use 3.5MM jack.

15. EXTERNAL SPEAKER JACK

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

16. ANTENNA CONNECTOR

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

17. DC POWER CONNECTOR

This jack accepts the DC Power Cord (supplied).

18. AC POWER CORD

Simply connect to any convenient household outlet (117 V AC).

19. AC/DC SELECTOR SWITCH

Simply set for power selection. AC for household use, DC for mobile use.

20. MICROPHONE JACK

This jack is used to attach your Royce microphone (supplied) or any optional microphone to your 1-641.

NOTE: (1) It is very important that the impedance of accessory microphones be similar to the one supplied. Your 1-641 uses a 500 ohms (impedance) dynamic microphone.

(2) Microphone preamps, unless specifically designed for SSB, can cause distortion, loss of power, and cause unnecessary interference on adjacent channels.

SPECIFICATIONS

GENERAL

1.	Semiconductors	: 33 Transistors 6 FET, 8 IC's, 44 Diodes and 4 LEDs
2.	Frequency Range	: 26.965MHz – 27.405MHz
3.	Modes of Operation	: AM, Lower Sideband and Upper Sideband
4.	Controls	: Volume Control
		: Power on-off switch
		: Variable Squelch Control
		: Variable Tone Control
		: Noise Blanker Switch
		: Mode Selector Switches (3)
		: Clarifier Control
		: Channel Selector Switch
		: CB-PA Switch
		: AC-DC Switch
5.	Connectors and Jacks	: Microphone Connector
		: Coaxial type Antenna Connector
		: Public Address Speaker Jack
		: Headphone Jack
		: External Speaker Jack
		: DC Power Jack
6.	Speaker	: 3-1/2 inches, 8 ohms
7.	Microphone	: Dynamic Microphone (500 Ohms)
8.	Power Supply	: 13.8 VDC /117 VAC
9.	Dimensions	: 10-5/8"(D) × 15-1/16"(W) ×5-9/32"(H)
10.	Weight	: 18 LBS 12 OZS

RECEIVER

1.	Sensitivity at S/N 10 dB	: AM.....0.7μV SSB.....0.2μV
2.	Selectivity	: AM.....5KHz SSB.....2.2KHz
3.	AGC Figure of Range	: 80 dB
4.	Squelch Range	: 0.5μV – 500μV
5.	Audio Output Power	: 4 Watts
6.	Distortion at input 100μV	: 6 %
7.	Audio Frequency Response	: 300 – 2200Hz
8.	Supurious Response	: More than 45 dB supurious signal is required to produce the same amount of audio output as the desired receive signal.
9.	IF Frequency	: 1st IF 10.695MHz and 2nd IF 455KHz
10.	Current Drain no audio	: 650 mA (AC)

SSB TRANSMITTER

1.	RF Output Power	: 12 Watts PEP
2.	Carrier Suppression	: More than 40 dB
3.	Unwanted Sideband Suppression	: More than 60 dB
4.	Harmonic Suppression	: More than 60 dB
5.	Current Drain	: 1000 mA (AC)

AM TRANSMITTER

1.	RF Output Power	: 4 Watts
2.	Modulation Capability	: More than 75 %
3.	Harmonic Suppression	: More than 60 dB
4.	Current Drain	: 800 mA (AC)

POWER SUPPLY

1. AC OPERATION

Your Royce 1-641 is designed to operate from any 117-volts AC, 60 cycle (ordinary house current) outlet. Simply connect the AC power cord to any convenient house outlet.

2. DC OPERATION

While it is highly unlikely that you will use your 1-641 in an automobile, you may desire to run it off a 12-volt battery in case of emergencies. You can do this by attaching the DC cord to the set. Attach the red (fused) wire to the battery plus(+) terminal. Attach the black lead to the battery minus(−) terminal.

SHOULD YOU DESIRE TO OPERATE THE 1-641 IN YOUR VEHICLE, IT IS EQUIPPED TO OPERATE EITHER POSITIVE OR NEGATIVE GROUND. CAREFULLY FOLLOW THE INSTRUCTIONS BELOW.

NO MOBILE MOUNTING BRACKET IS SUPPLIED OR AVAILABLE.

3. 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.

4. 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.

ANTENNA INSTALLATION

BASE INSTALLATION

When the 1-641 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 condition. 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 limits are printed in the Part 95 F. C. C. regulations enclosed with this transceiver). Generally, a maximum of 26 feet of lead-in cable should be used due to 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 communications. 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.

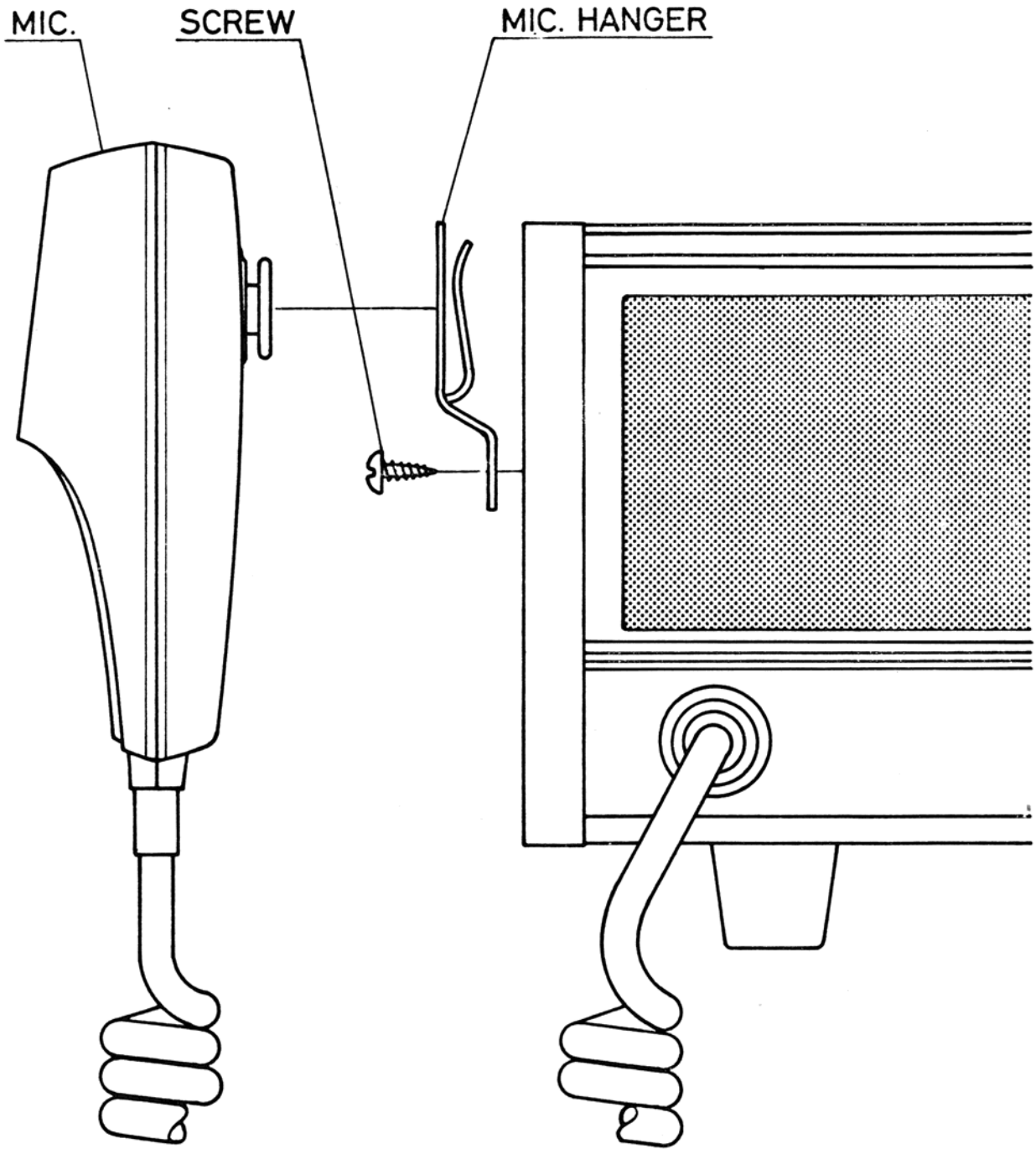
BASE STATION INSTALLATIONS

For base station use, simply plug in the AC power cord into any convenient 117 Volt household wall plug.

MOBILE INSTALLATIONS

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 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.

MOUNTING INSTRUCTIONS



MEASURING SWR

To accurately measure the SWR of your antenna, it will be necessary to obtain the use of an accurate SWR meter. Royce markets several models of SWR meters, and a meter is a necessity for monitoring your antenna system to maintain maximum performance and range.

UNDERSTANDING SWR

In theory, your transceiver has a 50 ohm output and your antenna is 50 ohms. If a 50 ohm cable (such as RG58/U or RG8/U) is used, all the power from your transceiver will be transmitted via the coaxial cable and radiated by the antenna. Under these conditions the SWR (standing wave ratio) of your antenna system would be 1:1. In practice, the antenna must be 50 ohms and tuned to the exact channel. This condition seldom exists and standing waves are set up on the cable. This SWR robs you of power and likewise range. While 1:1 is not always possible to obtain, you should tune your antenna system so the SWR does not exceed 1.5 to 1 or at maximum 2 to 1. Here are some examples of the power losses for various SWR ratios:

SWR		Power Loss
1:1	=	0
1.3:1	=	2%
1.5:1	=	3%
1.7:1	=	6%
2:1	=	11%
3:1	=	25%
4:1	=	38%
5:1	=	48%
6:1	=	55%
10:1	=	70%

OPERATING PROCEDURES

AC OPERATION

Turn all controls to a counter-clockwise position.

TO RECEIVE:

1. Push power button to "ON" position.
2. Set "MODE" switch to AM–USB or LSB.
3. Set channel dial to desired channel.
4. Set noise blanker switch to "ON" position.
5. Set PA-CB switch to "CB" position.
6. Set Clarifier to the center position.
7. Advance volume control clockwise to desired listening level.
8. Adjust tone control to desired tone level.
9. Adjust squelch control as necessary.

TO TRANSMIT:

IT IS ILLEGAL TO OPERATE THE TRANSMITTER SECTION OF THIS TRANSCEIVER PRIOR TO RECEIVING A VALID STATION LICENSE AND CALL SIGN.

CAUTION: Never operate the transmitter without an adequate antenna system as damage to the final RF output transistor may occur.

A. Select the desired channel.

B. Set mode selector for AM-USB or LSB.

C. Depress the push-to-talk switch on microphone and talk in a normal voice 3-4 inches from the microphone.

DC OPERATION

Follow all functions above after connecting your DC power cord and setting AC/DC switch in DC position.

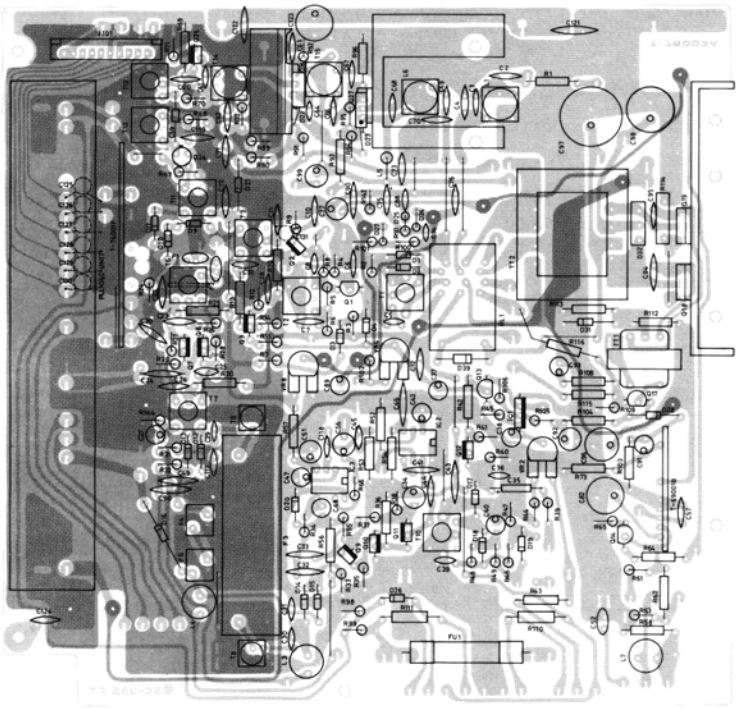
SERVICING YOUR TRANSCEIVER

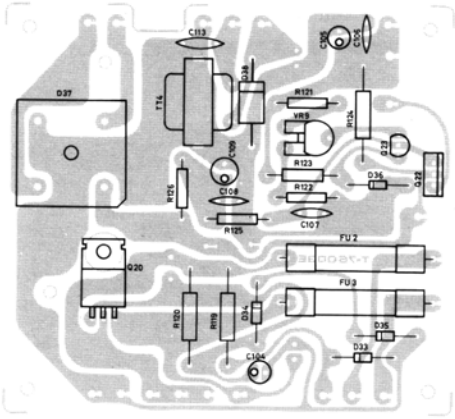
The technical information, diagrams, and charts provided in this manual are supplied for the use of a qualified holder of a first or second class radiotelephone license in servicing this transceiver. It is the user's responsibility to see that this unit is operating at all times in accordance with the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

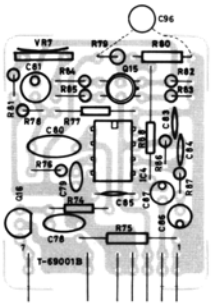
If you install your own transceiver, do not attempt to make any transmitter tuning adjustments. Adjustments are prohibited by the F. C. C. unless you hold or are in the presence and under the supervision of a first or second class radiotelephone licensed person. A Citizens Band or Amateur license is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

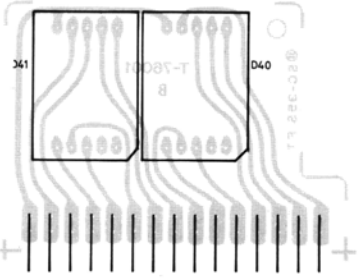
PARTS LAYOUT

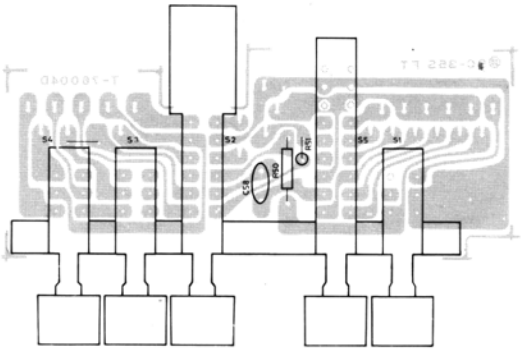
TOP VIEW

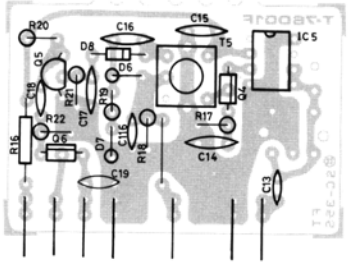


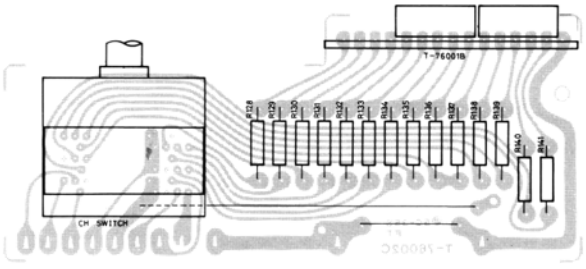




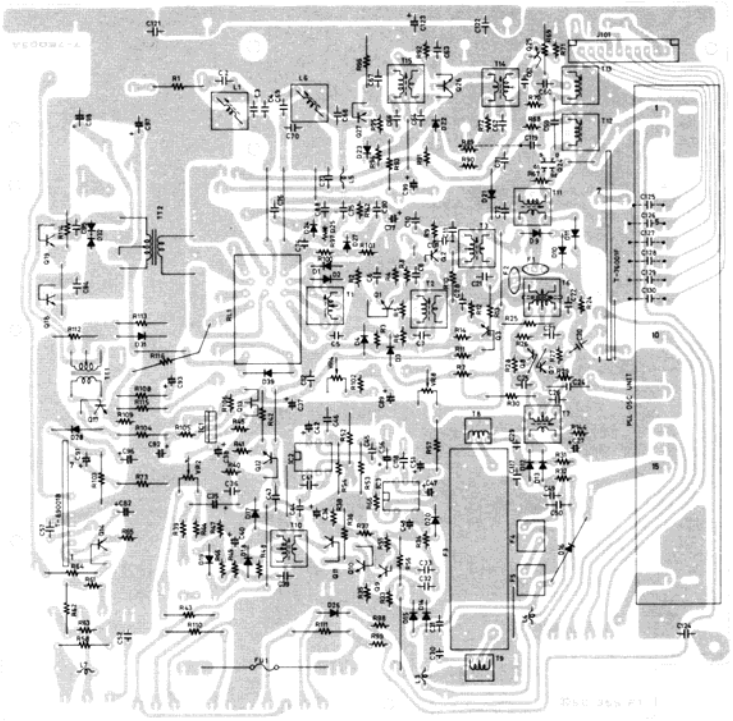


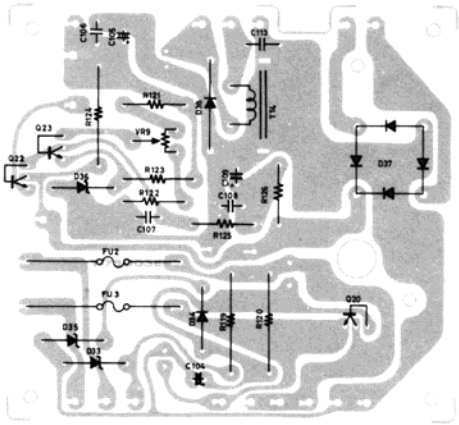


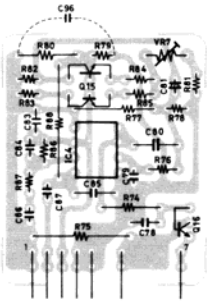


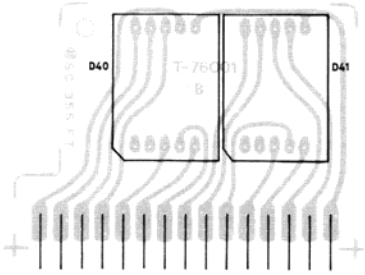


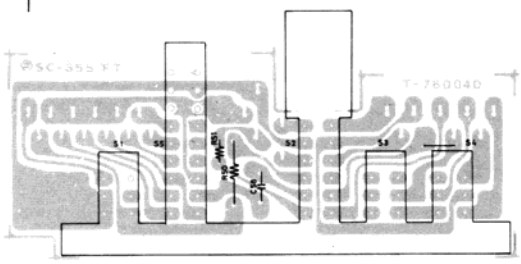
BACK VIEW

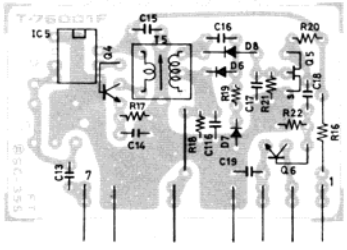


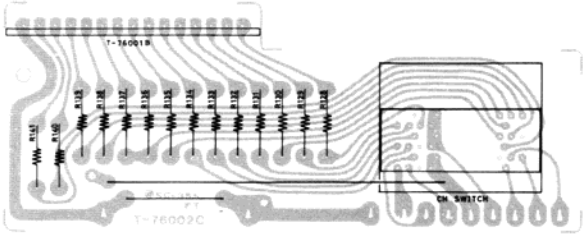




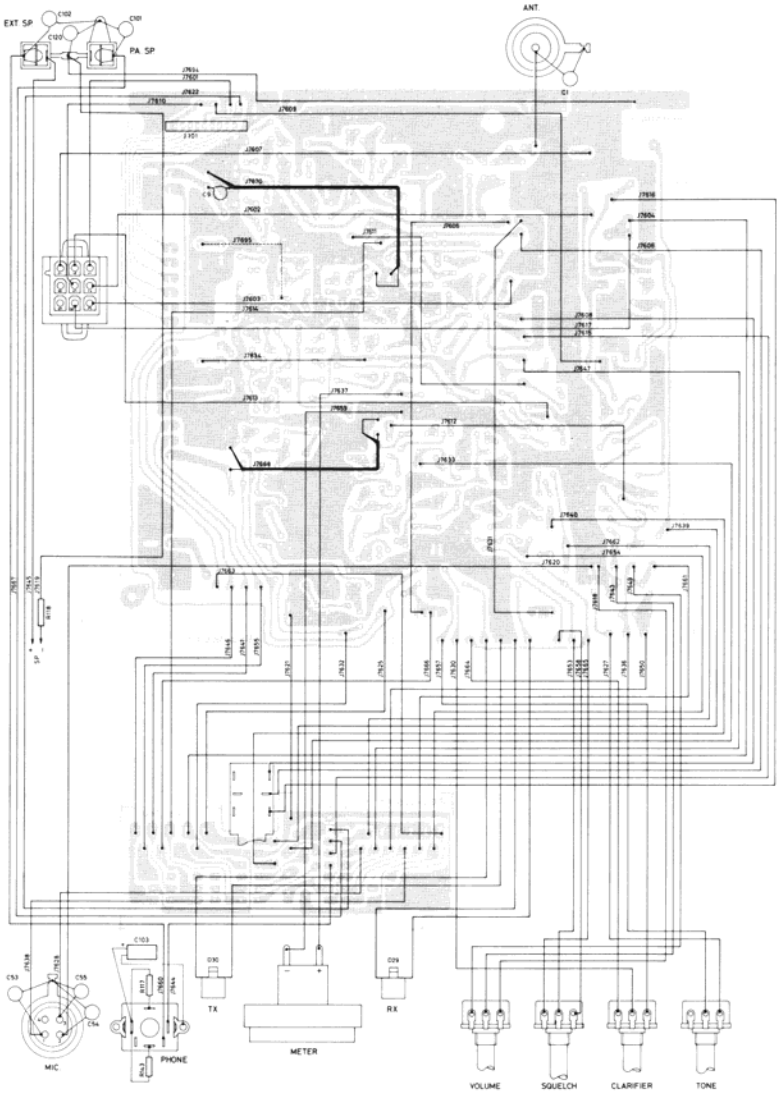


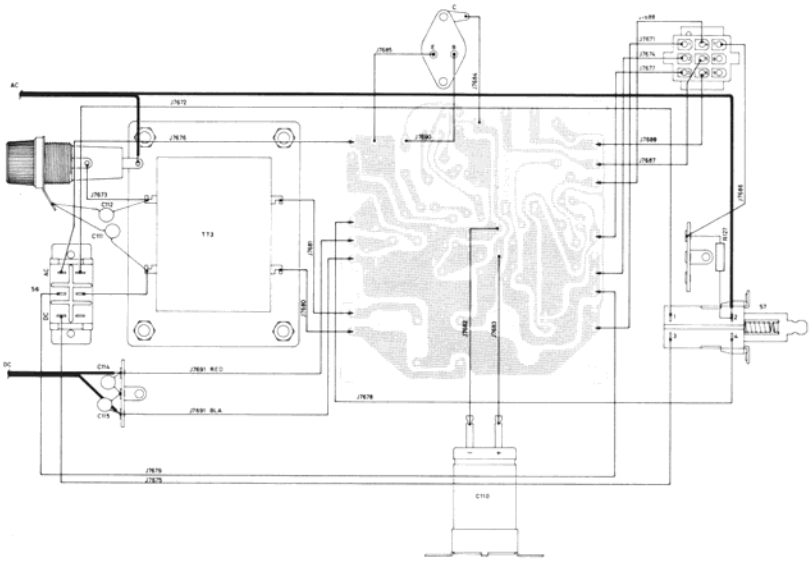


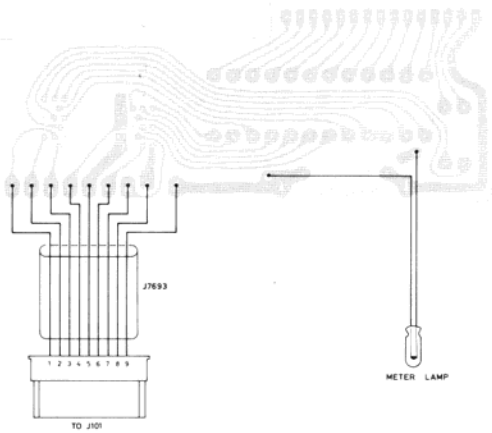




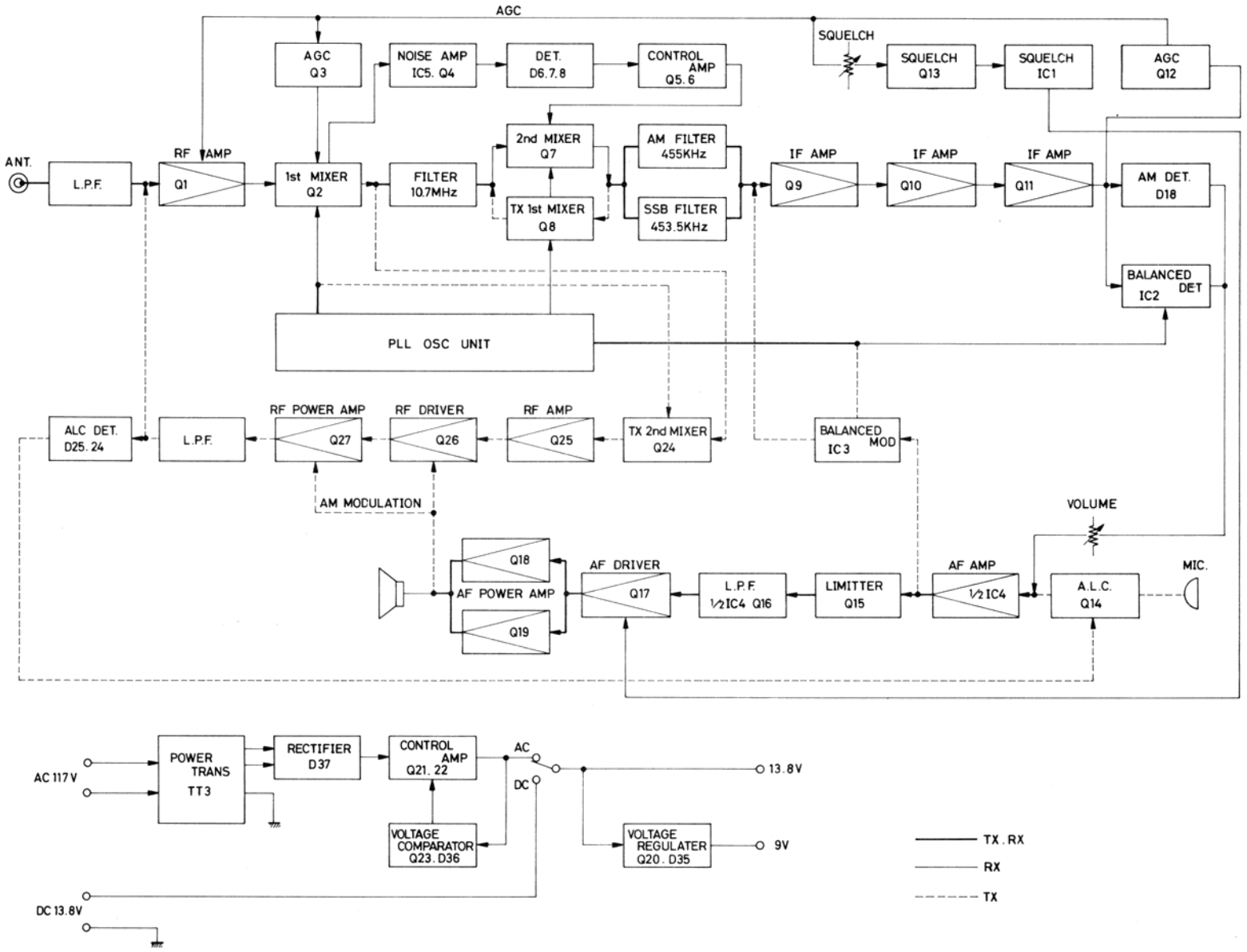
WIRING DIAGRAM







BLOCK DIAGRAM



FEDERAL COMMUNICATIONS COMMISSION REQUIREMENTS

Your new Royce 1-641 is a combination receiver-transmitter designed and built for licensed Class D operation on any of the 40 frequencies designated as citizens band 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 is included with this manual. Additional 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. To operate your transceiver legally while waiting for your license to be returned from the F. C. C., you may complete F. C. C. form No. 555-B, which is a temporary permit. Form 555-B is enclosed with the literature packaged with this transceiver.

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.

LIMITED WARRANTY

We warrant each new Royce product to the original consumer purchaser to be free from defects in material and workmanship for a period of ninety (90) days from date of purchase as shown on purchaser's receipt.

Royce will repair or replace, AT ITS OPTION AND FREE OF CHARGE, during the warranty period, any part which proves defective in material and/or workmanship under normal installation, use, and service. To obtain the name and address of a warranty service center in your area, just contact your local dealer listed in the telephone directory or return the unit to our factory, TRANSPORTATION CHARGES PREPAID, at the address below. THIS WARRANTY IS LIMITED TO DEFECTIVE PARTS REPAIR AND/OR REPLACEMENT ONLY AND DOES NOT COVER ANY ACCESSORY USED IN CONNECTION WITH THIS PRODUCT' LABOR CHARGES AND/OR DAMAGE INCURRED IN INSTALLATION, REPAIR, OR REPLACEMENT AS WELL AS INCIDENTAL AND CONSEQUENTIAL DAMAGES CONNECTED THEREWITH ARE EXCLUDED.

> Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Any damage to this product as a result of misuse, abuse, neglect, accident, incorrect wiring (not our own), improper installation, repair or alteration outside our factory or authorized service centers, or any use violative of instructions furnished by us, WILL VOID THIS WARRANTY.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. In the event of a problem with warranty service or performance, you may be able to go to a small claims court, a state court, or a federal district court.

Royce Electronics Corporation
1746 Levee Road
North Kansas City, Missouri 64116
816-842-7505

I-641 ALIGNMENT INSTRUCTION

RECEIVER

1. Testing Equipment to be used:

* Power Supply 13.8VDC	1 set
* Standard Signal Generator	1 set
* Low Frequency Voltmeter	1 set
* Oscilloscope	1 set
* 8 ohms Dummy Load	1 pc.
* Speaker	1 pc.
* Microphone	1 pc.

2. Aligment Procedures:

1) Set the Mode Switch to AM, Volume Control at maximum, Squelch at minimum, Clarifier in the center and the CB-PA Switch to CB.
2) Set the SSG on Channel 19 and Channel Selector of the unit on Channel 19. Then, connect the Power Supply and 8 ohms Dummy Load to the transceiver unit.
3) Feed the signal from the SSG and set the audio output for a peak reading by adjusting T-1, T-2, T-3, and T-10.
   In this case be sure that antenna input should be less than 1μV at the AF standard output power. Also, make sure that the audio on the oscilloscope is a sine wave.
4) Set the antenna input at 1μV so that the antenna power may be more than 0.5 Watt at the maximum volume of all channels.
5) Set the antenna input at 1,000μV so that the output power should be more than 3.5 watts at the maximum volume.
6) Set the antenna input to 50,000μV and the low frequency output to 0.5 watt by volume control. Then, decrease the antenna input until the low frequency output stays 10 dB lower. Be sure that the antenna input then should be less than 5μV.
7) Set the antenna input to 100μV and the meter indication to 9 by VR4.
8) Set the volume control and squelch control at maximum, and set the tight squelch by VR2 so that the output from speaker is heard when the antenna input is increased upto 500μV.
9) Set the antenna input to 0.7μV and be sure that the low frequency output should be over 10 dB more when the modulation of the SSG is turned off at the normal output.
10) Set the Mode Switch to USB, Volume Control at maximum, Squelch at minimum and Clarifier in the center. Tune off the modulation of the SSG and remove the frequency by 1 KHz.
11) Make sure that the maximum sensitivity shoud be less than 0.2μV.
12) Make sure of AGC like with AM.
13) Set the antenna input to 0.15μV and keep the AF output to be over 10 dB lower when the antenna input is turned off at the normal output.

3. PA Functioning:

1) Set the PA-CB Switch to PA. Connect the dummy load to PA Speaker Jack and microphone to Microphone Jack.
2) Make sure of the variation of the sound level with the volume control by pushing down the push-to-talk knob on the microphone.

4. Reciver Alignment Specifications:

AM:	Maximum Sensitivity	less than 1μV
	Low Frequency Output	more than 3.5 Watts
	AGC	more than 80 dB
	Meter	S9 at 100μV
	SQ	500μV
	S+N/N	more than 10 dB at 0.7μV
SSB:	Maximum Sensitivity	less than 0.2μV
	AGC	more than 80 dB
	Meter	S9 at 100μV
	S+N/N	more than 10 dB at 0.15μV

TRANSMITTER

1. Connection of test equipment.
   * Power supply at 13.8 VDC.
   * Connect a Power meter, oscilloscope frequency counter, spectrum analyzer and P-P RF volt meter to the RF output connector.
   * Connect an AF oscillator and AF volt meter to the microphone connector.
2. Power adjustment.
   * Set the mode switch to AM.
   * Adjust T7, 6, 11, 12, 13, 14, and T15 for the maximum point.
   * Adjust L6 for 3.6 W output.
   * Adjust L1 to increase 2nd harmonic.
3. Frequency-Make sure every channel stays within ±800Hz.
4. Modulation Limiter Adjustment.
   * Put in 1KHz and 500mV signal from AF oscillator and adjust VR7 for 90% modulation.
5. Modulation capability.
   * Put in 1KHz signal by AF oscillator and get 90% modulation for the minus side. The plus side should be over 80%.
6. SSB.
   * Set the mode switch to USB.
   * Put in two-tone signal of 1KHz and 1.6KHz by two AF oscillators.
7. ALC alignment.
   * Adjust the two-tone signal of AF oscillator for 3 W RF power output.
   * Adjust VR8 for 11W PEP RF power output when the two-tone signal is increased by 20 dB.
8. Carrier suppression.
   * Cut off the two-tone signal and make sure the output level of the carrier is below −40 dB.
   * Set the mode switch to LSB and do the same.

Regulated power supply

1. Connect the output cord at the terminal 1 of regulated power supply to the minus (−) terminal of voltmeter, and that at the terminal 2 to the plus (+) of it. Set AC/DC switch in AC position and supply 117 volts to the power supply unit. Then, turn on the power switch.
2. Adjust VR9 in power supply to read 13.8 volts on the voltmeter.

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Q1 2SC1856
Q2 2SC460
Q3 2SC460(A)
Q4 2SC460
Q5 2SK30
Q6 2SC458(C)
Q7 2SC460
Q8 2SC460
Q9 2SC458(C)
Q10 2SC458(C)
Q11 2SA673
2SA561
2SA562
Q12 2SC458(D)
2SC1335
2SC711
Q13 2SK30
2SK40
Q14 2SB561
Q15 MPS32310
Q16 2SD467
2SC735
Q17 2SD467
2SC735
Q18 2SC1061
Q19 2SC1061
Q20 2SC1061
Q21 2SC1030
Q22 2SC1173
Q23 2SC711
2SC458B
Q24 3SK45
Q25 2SC460
Q26 2SC1018
Q27 2SC1945

→|← 1S2076 or 1S1588
S1 N.B
S2 AM
S3 USB MODE
S4 LSB
S5 PA/CB
S6 DC/AC
S7 POWER

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