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M E S S E N G E R

1 2 5

**CITIZENS RADIO TRANSCEIVER
MODEL NO. 242-125**

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SECTION 1 GENERAL INFORMATION

1.1 SCOPE OF MANUAL

This service manual includes servicing and alignment instructions for the Messenger 125 transceiver.

Revision notices will be published as this unit is revised. Insert these notices in order at the back of this service manual.

1.2 FACTORY CUSTOMER SERVICE

A liaison between the customer and the factory is provided by the E. F. Johnson Company Customer Service Department. This department is available for consultation and assistance on technical problems, parts information, and availability of local and factory repair facilities.

If it is necessary to write to the Customer Service Department, please include any information you feel will help solve your problem.

For any of the above requirements contact:

E. F. JOHNSON COMPANY
Customer Service Department
Waseca, Minnesota 56093

1.3 FACTORY RETURNS

Normally, repair service is available locally through authorized Johnson Citizens Band Radio Service Centers; a

list of these service centers is available upon request from the factory Customer Service Department. Do not return any equipment to the factory without authorization from the Customer Service Department.

1.4 PURCHASE OF PARTS

The authorized Johnson Service Centers stock commonly needed replacement parts. If a part is not available locally it may be ordered from the Customer Service Department. When ordering please supply the following information:

Model number of the unit
Serial number of the unit
Description of the part
Part number of the part

1.5 DESCRIPTION

The Messenger 125 is a 5 channel Citizens Band transceiver.

It is an extremely compact unit. Its dimensions are 1 9/16 inches high, 4 19/32 inches wide and 7 inches deep. The transceiver comes equipped with the necessary hardware for vehicle installation.

Supply voltage to operate the transceiver is provided by the vehicle battery in mobile operation.

1.6 SERIAL NUMBER INTERPRETATION

The E. F. Johnson Company uses a white adhesive-backed cloth printed with the unit serial number and attached to the back of the transceiver chassis rail. Each serial number contains an alphabetical designator which indicates a major revision. For example: An A in the serial number indicates that the unit includes all the changes specified in revision A. Units with a major revision are referred to by their alphabetical designator in this manual. A unit with revision A is called an A model, with revision B a B model, etc.



SECTION 2 SPECIFICATIONS

2.1 GENERAL

(Electrical specifications are nominal unless otherwise stated.)

Frequency Range	26.965 - 27.255 MHz
Channels	5
Dimensions of Enclosure	1 9/16" high x 4 19/32" wide x 7" deep
Unit Weight	Approximately 2 lbs.
Shipping Weight	Approximately 3 lbs.
Microphone	High capacity ceramic element, Cylolac case. Push-to-talk switch, hang-up stud.
Circuitry	13 transistors, 8 diodes and 1 thermistor.
Compliance	FCC Type Accepted Rule 95 (D) DOT Type Approved RSS 136

2.2 RECEIVER

(All microvolts are at antenna terminal and numbers are 1/2 the microvolts into a 50 ohm 6 dB pad.)

Sensitivity	8dB minimum at 0.5 microvolts (10 dB nominal)
Selectivity	6 kHz bandwidth at -6 dB 20 kHz bandwidth at -60 dB
Frequency Control	±0.005% crystal from -30°C to +60°C.
Spurious Rejection	50 dB (except image of 10 dB)
Antenna Impedance	50 ohms
Audio Output Power	2 watts at 10% distortion
Speaker Impedance	16 ohms
Squelch Range	0.3 to 15 microvolts 15 microvolts minimum
Squelch Sensitivity	4 dB or less signal change for 40 dB of quieting at 1 microvolt.
Squelch Noise Immunity	Highly immune to impulse-type noise.
Intermediate Frequency	455 kHz

AGC Characteristics Flat within ±6 dB from 250,000 to 5 microvolts with 18 dB rolloff from 5 to 0.5 microvolts.

Noise Limiting Series-type, automatic threshold adjustment and IF clipping.

2.3 TRANSMITTER

Emission	6A3
Frequency Control	±0.005% crystal from -30°C to +60°C.
RF Power Output	4 watts maximum at 13.8 VDC
RF Spurious and Harmonic Attenuation	Better than FCC and DOT requirements.
Output Impedance	50 ohms
Audio Input Impedance	1000 ohms
Audio Frequency Response	±4 dB 400-3000 Hz.
Modulation	High level AM, class B modulator speech compression, clipping and audio filtering. 70% minimum upward.

2.4 POWER SOURCE REQUIRED

	13.8 volts DC input Receive: Squelched 0.2 ampere Transmit: 0.7 ampere
Circuit Protection	2 ampere fuse

2.5 MOUNTING

Mounting bracket furnished with unit.

2.6 ACCESSORIES

250-0715-001	Power Pack
239-0120-001	Inconverter
250-0049-001	Matchbox, CB
250-0849-001	Antenna Meter
503-0002-001	Ni-Cad Rechargeable Battery
137-0828-001	4 ft. fiberglass antenna - 27 MHz
250-1801-001	Car Noise Suppression Kit
142-1801-005	100 ft. coaxial cable
142-1801-004	50 ft. coaxial cable

The E.F. Johnson Company reserves the right to change prices or specifications without notice and without incurring obligation.

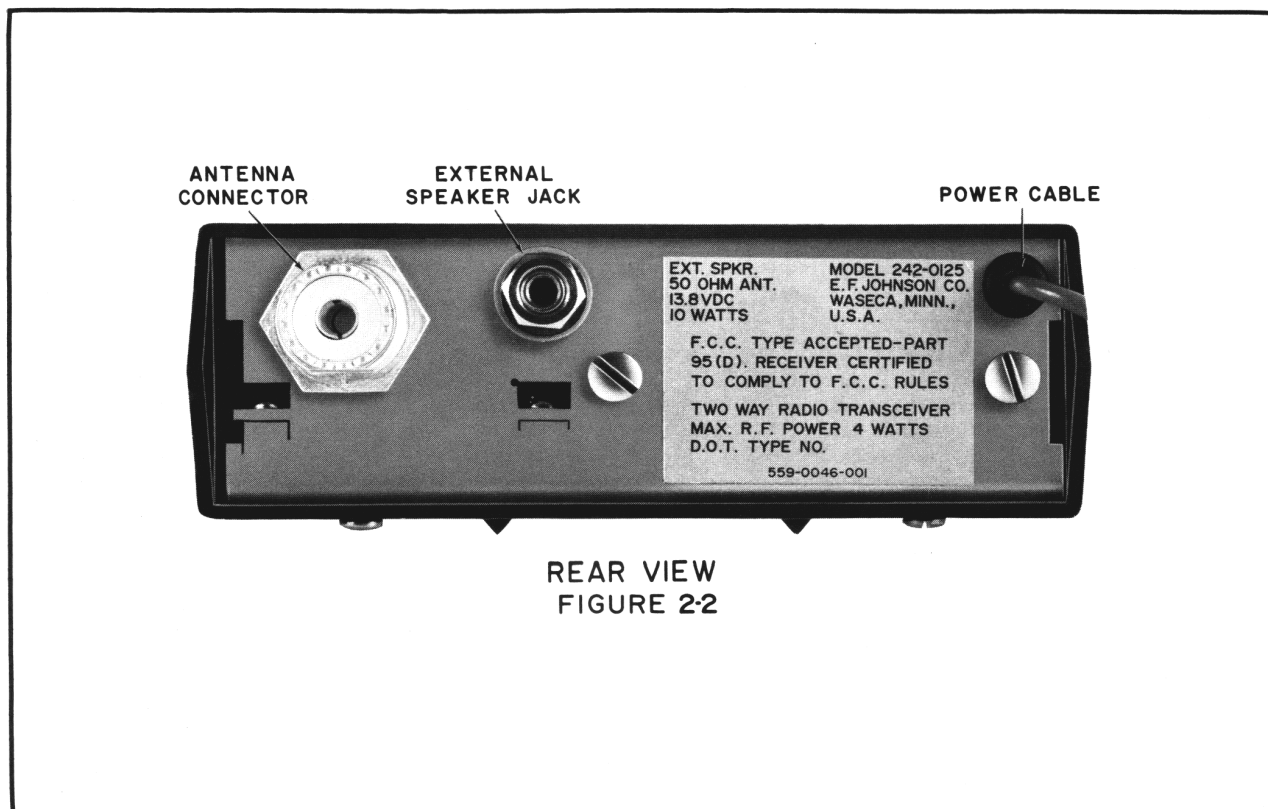
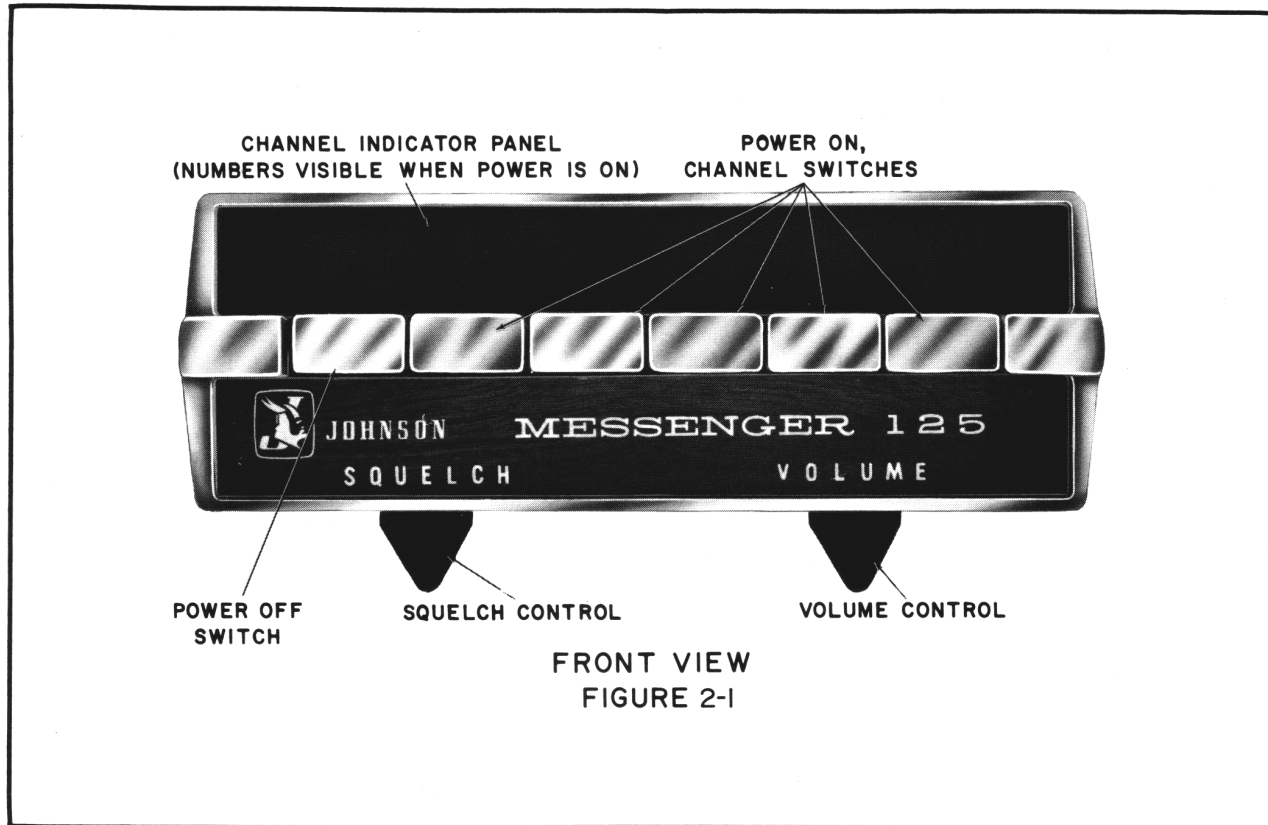


TABLE 2-1
 TRANSISTOR COMPLEMENT

<u>TRANSISTOR</u>	<u>TYPE</u>	<u>FUNCTION</u>	<u>PART NUMBER</u>
Q1	3018	Receiver RF Amplifier	576-0003-018
Q2	3011	Receiver Mixer	576-0003-011
Q3	3011	Receiver Oscillator	576-0003-011
Q4	3011	First IF Amplifier	576-0003-011
Q5	3011	Second IF Amplifier	576-0003-011
Q6	1008	Squelch Amplifier	576-0001-008
Q7	1017	Audio Preamplifier	576-0001-017
Q8	1017	Audio Driver	576-0001-017
Q9	2001	Audio Output	576-0002-001
Q10	2001	Audio Output	576-0002-001
Q11	4006	Transmitter Oscillator	576-0004-006
Q12	4004	Transmitter Driver	576-0004-004
Q13	4005	Transmitter Final	576-0004-005

TABLE 2-2
 DIODE COMPLEMENT

<u>DIODE</u>	<u>TYPE</u>	<u>FUNCTION</u>	<u>PART NUMBER</u>
D1	1N67A	AGC Rectifier	523-1000-067
D2	1N67A	Detector	523-1000-067
D3	1N881	Noise Limiter	523-1000-881
D4	10V Zener	Receiver B+ Regulator	523-2003-100
D5	1N881	Compressor Rectifier	523-1000-881
D6	500 mA, 200 PIV	Transmitter B+ Isolation	523-1001-002
D7	1N881	Antenna Switch	523-1000-881
D8	1N881		523-1000-881
D9	1N881		523-1000-881

3.2 POWER CABLE INSTALLATION

CAUTION

The Messenger 125 is wired for negative ground operation at the factory. Serious damage will result if it is installed in a positive ground vehicle without using an E. F. Johnson Inconverter, Model 239-120.

- a. Connect the cable to the accessory terminal of the vehicle ignition switch or to another 12 VDC source using the tap connector illustrated in Figure 3-1. Installation instructions are on the front of the tap connector package.
- b. The power cable does not contain a ground lead. The ground is obtained through the outer connector of the transmission line or an external wire.

3.3 ANTENNA INSTALLATION

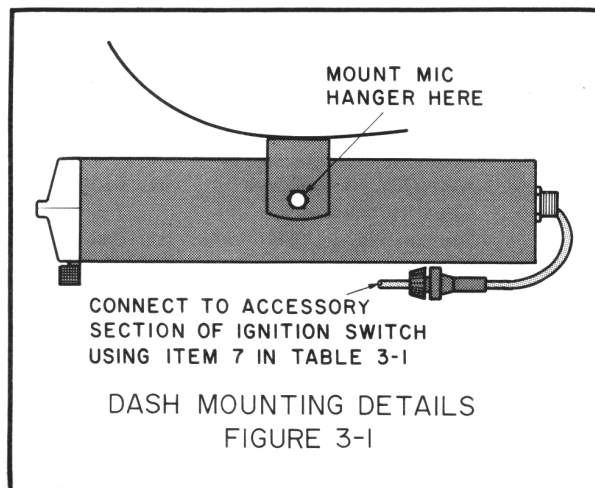
- a. Refer to the instructions included with the antenna for installation details.
- b. Route the transmission line.
- c. Install the coaxial connectors. Refer to Figure 3-3 for details.

3.4 DASH MOUNTING INSTALLATION

(Refer to Figure 3-2)

CAUTION

Avoid installing the transceiver in the direct air stream of the vehicle heater. Temperatures in this area can measure up to 150° F and can cause component failures.



- a. Determine the transceiver location.
- b.1. Hold the transceiver in its proposed location with the mounting bracket (item 1 in Figure 3-1) attached. Mark the mounting bracket location.
2. Remove the mounting bracket from the transceiver.
3. Hold the mounting bracket up to the dash at the location you marked. Mark the mounting bracket slot positions. Check for a free space behind the dashboard in the area marked (no obstructions such as wires, brackets, etc.)
4. Center punch and drill two holes separated as much as the mounting bracket and area selected allow, using a No. 21 drill.
- c. Install the mounting bracket. Use the No. 10 hardware illustrated by items 3, 4 and 5 in Table 3-1.
- d. Install the transceiver in the mounting bracket. Use item 2 illustrated in Table 3-1. Attach the microphone hanger to the bracket with one of the screws.
- e. Attach the power cable to the transceiver power jack.
- f. If the antenna does not supply a good ground, connect a ground wire from the rear plate to car chassis ground (such as a dashboard screw).
- g. Perform the steps in section 3.5.

3.5 FINAL CHECKOUT

- a. Connect a Bird Model 43 with 10A element or equivalent wattmeter into the transmission line.
- b. Trim the antenna for best VSWR. The transceiver has been used at the factory and the output network will not require tuning to match it to the antenna. The VSWR obtained should be 1.5 to 1 or less.
- c. Check the transmitter power output. Typical power is 3.5 watts.
- d. Check the transmitter frequency with a frequency meter. The maximum allowable deviation from the center frequency is 0.005%.
- e. Check the modulation. Minimum acceptable is 70% upward and 80% downward. A suggested method is outlined in Section 5.
- f. Give the transceiver a complete operational check-out. Make several contacts with another unit. Correct any noise suppression problems that affect vehicle operated transceiver performance.