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M E S S E N G E R

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CITIZENS RADIO TRANSCEIVER

MODEL NO. 242-110

MODEL NO. 242-152

MODEL NO. 242-156

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SECTION 1

GENERAL INFORMATION

1.1 SCOPE OF THIS MANUAL

This service manual includes servicing and alignment instructions for the Messenger 100 and 110 Transceivers. A special section on installation and mobile noise suppression is included. 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 a complete system diagram. Especially important are accessories used, attachments and modifications effected during or after installation.

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. In case 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

1.5 DESCRIPTION

The Messenger 100, Model 242-152-1/23 and Messenger 110, Model 242-110-1/23 are 6 and 5 channel respectively, Citizens Band Transceivers. The basic transceivers weigh 5-1/2 pounds and are completely solid state. Supply voltages to operate the transceivers are provided by the vehicle's battery in mobile operation or by an AC operated

DESCRIPTION (cont'd)

13.8 Volt DC output power supply in base station operation. Specific references in this service

manual to either the Messenger 100 or 110 will be made only where differences exist.

NOTE: An early model Messenger 100, Model No. 242-156-1/23, is identical to the Messenger 110 except that it has an illuminated channel indicator as in the current Messenger 100.

SECTION 2 SPECIFICATIONS

2.1 GENERAL

| | | | |
|----------------------------|---|-------------------------------------|--|
| Frequency Range | 26.965 - 27.255 MHz | Audio Output Power | 3 watts minimum at 10% distortion with 5 microvolts input |
| Channels | Six (Messenger 110 has five) | Speaker Impedance | 3.2 ohms (nominal) |
| Dimensions of Enclosure | 2-1/2" high x 6-3/16" wide x 8-3/4" deep | Squelch Range | 15 microvolts minimum |
| Unit Weight | Approximately 5 lbs. | Squelch Sensitivity | 1 dB or less signal change for 40 dB of quieting at 1 microvolt. |
| Shipping Weight (one unit) | Approximately 6 lbs. | Squelch Noise Immunity | Highly immune to impulse-type noise |
| Microphone | High capacity (low impedance) ceramic element. Cylolac case. Push-to-talk switch, hang up stud. | Intermediate Frequencies | 455 kHz |
| Circuitry | 14 transistors, 7 diodes, and a thermistor | AGC Characteristics (See Figure 11) | 20 ±10 dB roll-off from 500 to 0.5 microvolts |

2.2 RECEIVER

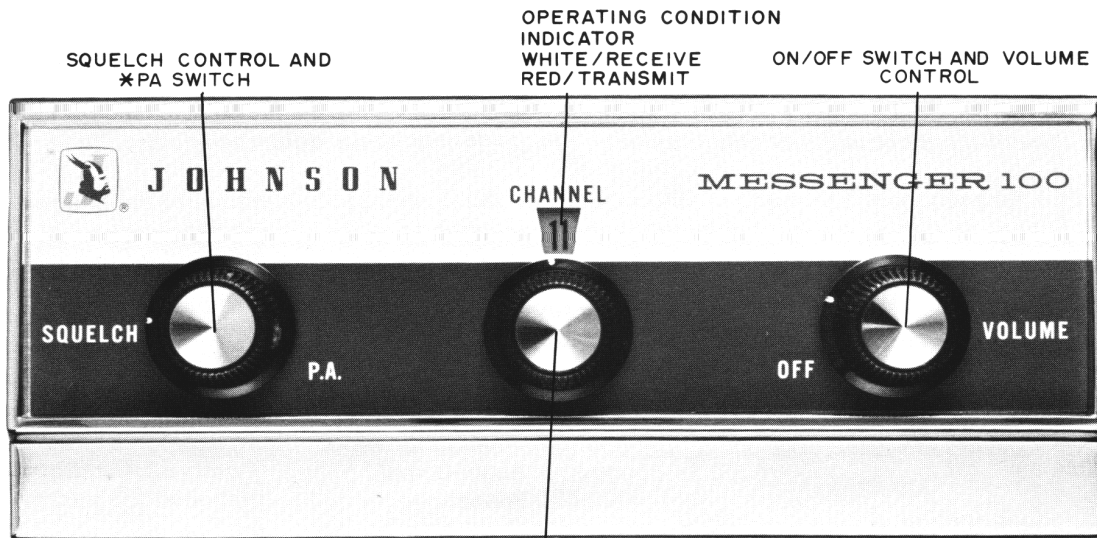
(All microvolts are at antenna terminal and numbers are 1/2 the microvolts into a 50 ohm 6 dB pad.)

| | |
|--------------------|--|
| Sensitivity | 8 dB minimum at 0.5 microvolts |
| Selectivity | 6 kHz bandwidth at -6 dB (nominal) 30 kHz bandwidth at -60 dB (nominal) |
| Spurious Rejection | 45 dB except image of 20 dB (nominal) |
| Antenna Impedance | 50 ohms (nominal) |

| | |
|----------------|---|
| Noise Limiting | Series - type, automatic threshold adjustment and IF clipping |
| Circuitry | All transistor single conversion |

2.3 TRANSMITTER

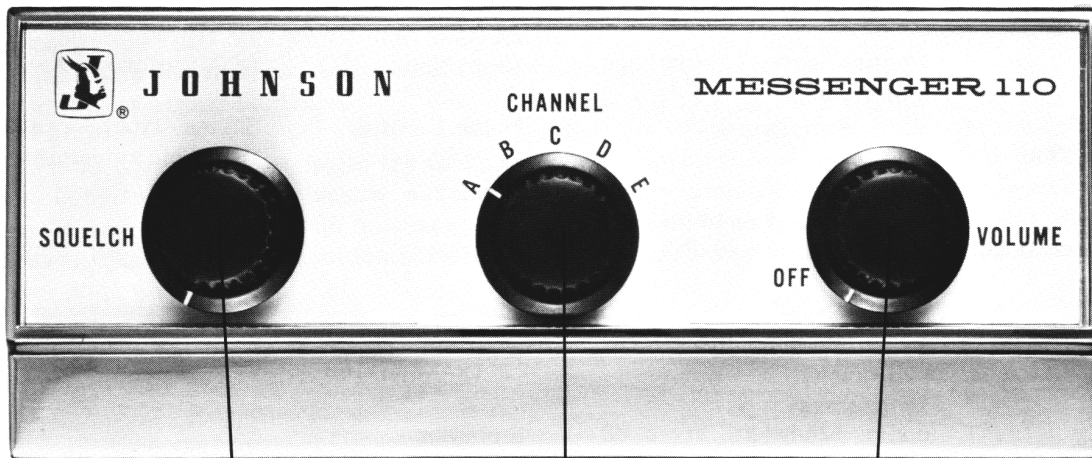
| | |
|-------------------------|---------------------------------------|
| Emission | 6A3 |
| Frequency Control | ±0.005% crystal from -30°C. to +60°C. |
| DC Power Input to Final | 5 watts maximum at 13.8 VDC |



* THE TRANSMITTER IS DISABLED WHEN CONTROL IS SWITCHED TO PUBLIC ADDRESS POSITION

CHANNEL SELECTOR

FRONT VIEW
MESSENGER 100



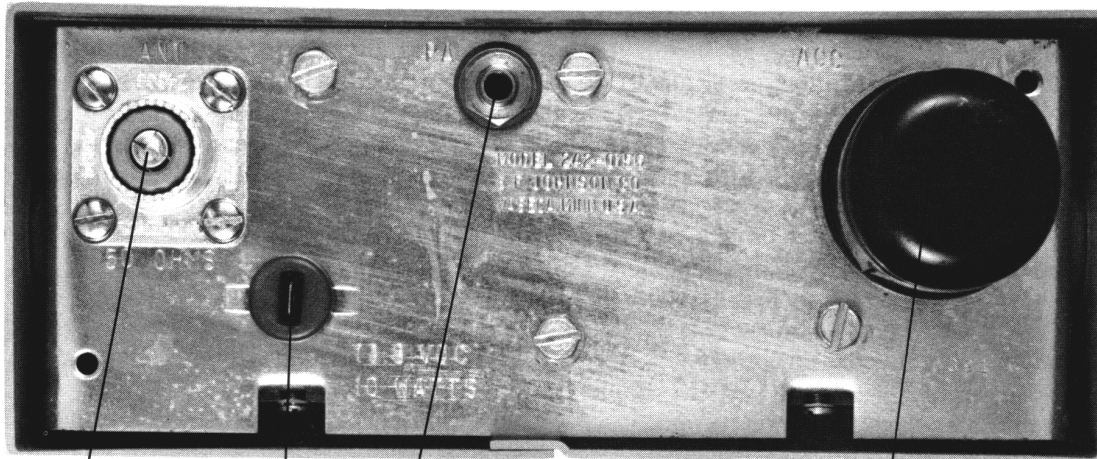
SQUELCH CONTROL

CHANNEL SELECTOR

ON/OFF SWITCH AND VOLUME CONTROL

FRONT VIEW
MESSENGER 110

FIGURE I



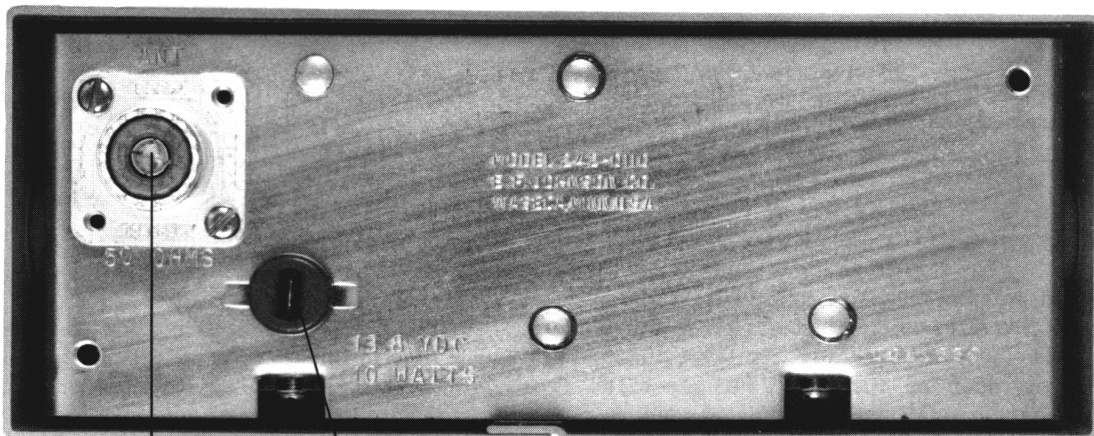
ANTENNA
CONNECTOR

POWER JACK

PA

ACCESSORY (JUMPER PLUG INSTALLED)
JACK

REAR VIEW
MESSENGER 100



ANTENNA
CONNECTOR

POWER
JACK

REAR VIEW
MESSENGER 110

FIGURE 2

SPECIFICATIONS (cont'd)

| | |
|--------------------------------------|--|
| RF Power Output | 3 watts minimum at 13.8 VDC 2.8 watts for 110 |
| RF Spurious and Harmonic Attenuation | Better than FCC and DOT requirements. (FCC and DOT type accepted) |
| Output Impedance | 50 ohms (nominal) |
| Audio Input Impedance | 1000 ohms (nominal) |
| Audio Frequency Response | ±4 dB 400-3000 Hz |
| Modulation | High level AM, class B modulator, speech compression, clipping and audio filtering |
| Circuitry | 70% minimum upward |

2.4 POWER REQUIREMENTS

13.8 Volt DC input (EIA Standard)

Receive 0.1 - 0.3 amps

Transmit 0.6 amps

117 Volt AC (Power Supply Model No. 239-125)

Receive 4 watts
Transmit 8 watts

2.5 ACCESSORIES

| | |
|------------------------------|---|
| AC Power Supply | Model No. 239-125 |
| CB Matchbox | Model No. 250-49 |
| "Antenna Meter" | Model No. 250-849 |
| In-Converter | Model No. 239-120 |
| Tone-Alert | Model No.250-861 (for Messenger 100 only) |
| Power Supply with Tone-Alert | Model No.239-123 (for Messenger 100 only) |
| Power Pack | Model No. 250-854-2 |

SECTION 3 VEHICLE INSTALLATION

3.1 GENERAL

A good antenna installation is essential for satisfactory transceiver performance. Select a good antenna location carefully. A level unobstructed area, such as the roof, will generally provide the best ground plane. When necessary, the trunk lid area will suffice as an antenna location but generally it is not as desirable as the roof area. In most instances, the hood area is generally unsuitable for antenna installation and use of this area for antenna mounting should be discouraged.

When selecting the antenna location consider the easiest and shortest route for the transmission line.

The transceiver should be mounted with the best maintenance accessibility and operating con-

venience in mind. Avoid mounting the transceiver in the direct hot air stream of the vehicle's heater.

If possible, connect the "hot lead" from the power plug to the accessory section of the ignition switch. This gives the operator the added feature of being able to turn the transceiver on and off with the ignition switch.

When installing the Messenger it is recommended that the following sequence of installation operations be followed.

3.1.1 INSTALLATION SEQUENCE

CAUTION:

Avoid installing the Messenger in the direct air stream from the vehicle's heater as temperatures in this area can measure to 150°F which

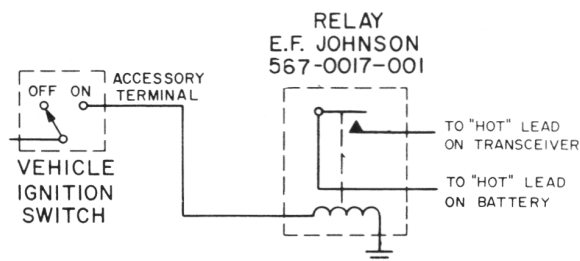
VEHICLE INSTALLATION (cont'd)

can result in component failure.

1. Install the antenna and transmission line.
2. Install the transceiver's dash mounting bracket with the hardware provided.
3. Install the microphone holder.
4. Install the transceiver in the dash mounting bracket.
5. Connect the "hot" wire to the accessories section of the ignition or to the "hot" side of the battery.

NOTE:

In some cases of severe DC line noise, the accessory terminal is not a desirable place to obtain B+ for the transceiver, as the windshield wipers, heater, turn signals, air conditioning, windshield washer and ignition sometimes all draw from the same line. Although the transceiver contains a noise filter it may not remove all noise generated on the accessory line. In this case, a direct line to the battery, or an accessory switch operated relay connected directly to the battery, is a good solution. See Figure 3.



CONNECTIONS FOR ACCESSORY SWITCH OPERATED POWER RELAY
FIGURE 3

6. Trim the antenna for minimum VSWR.
7. Test drive the vehicle.
8. Instruct the operator in the proper operation of the Messenger and correct voice communi-

cations procedures.

3.1.2 ANTENNA AND TRANSMISSION LINE INSTALLATION

1. Locate the area selected for mounting of the antenna. Drill the holes necessary to mount the antenna.
2. Route the transmission line from the antenna location to the transceiver. Keep the transmission line as short as possible. Refer to Figure 4 for the correct method of installing UHF connectors. When the installation of the transmission line is complete, check for continuity between the center conductor and the antenna with the antenna end of the transmission line connected. Also check for a shorted transmission line by disconnecting both ends of the line and measuring the resistance between the inner and outer conductors.

3.1.3 TRANSCEIVER INSTALLATION

1. Select the transceiver's mounting location. Make sure it is not in the direct air stream of the vehicle's heater. Using the mounting bracket as a guide drill the bracket mounting holes. Secure the mounting bracket.
2. Install the transceiver in the mounting bracket. Tighten the mounting bracket to the transceiver's cabinet.
3. Install the microphone holder.

3.1.4 ANTENNA TRIMMING

1. Insert a Johnson Model 250-849 VSWR bridge or a thruline wattmeter into the transmission line.
2. Key the transmitter and trim the antenna for the best VSWR. This should be a ratio of 1.5:1 or better.

3.1.5 OPERATIONAL CHECKOUT

1. While test driving the vehicle give the trans-

RG-8/U



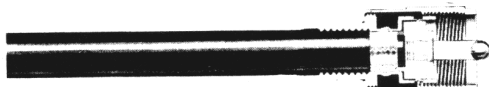
Cut end of cable even. Remove vinyl jacket 1-1/8", except 83-1SP plug remove vinyl jacket 1-1/4".



Bare 5/8" of center conductor. Trim braided shield. Slide coupling ring on cable. Tin exposed center conductor and braid.

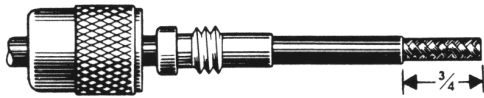


Screw the plug sub-assembly on cable. Solder assembly to braid through solder holes, making a good bond between braid and shell. Solder conductor to contact. Do not use excessive heat.



For final assembly, screw coupling ring on plug sub-assembly.

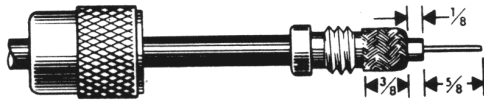
RG-58/U



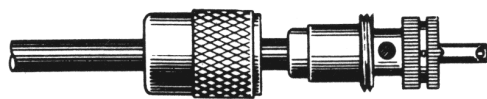
Cut end of cable even. Remove vinyl jacket 3/4". Slide coupling ring and adapter on cable.



Fan braid slightly and fold back as shown.



Position adapter to dimension shown. Press braid down over body of adapter and trim to 3/8". Bare 5/8" of conductor. Tin exposed center conductor.



Screw plug sub-assembly on adapter. Solder braid to shell through solder holes. Use enough heat to create bond of braid to shell. Solder conductor to contact.



For final assembly, screw coupling ring on plug sub-assembly.

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**UHF COAXIAL CONNECTORS
ASSEMBLY INSTRUCTIONS
FIGURE 4**