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RR-2B Receiver

and

PS-4 Power Converter

A. INTRODUCTION

1. The RR-2B is a small six-tube communications receiver capable of receiving voice, Morse code, and other radio signals within a frequency range of 3000 to 24000 kilocycles. Signals can be tuned at any frequency within the receiver range on any one of the three frequency bands. Single frequency reception is also provided by insertion of a receiving crystal. The receiver casing is constructed for rough handling and the receiver is completely waterproof with or without cover in place.

2. The PS-4 is an adaptor that permits operation of the RR-2B from any 12 volt DC source. The PS-4 may be plugged directly to a compatible transmitter, or connected to a 12 volt battery with the power cable provided. When the PS-4 is plugged directly to the transmitter and connected to the receiver, the transmitter supplies the DC power and the antenna, ground, and audio connections for the receiver.

B. CONNECTION TO A COMPATIBLE TRANSMITTER

1. Plug the PS-4 into the receiver socket on the transmitter.

2. Plug the RR-2B power cord into the four-pin socket on the PS-4.

3. Using the three-wire color coded cable, make the following connections from the PS-4 to the RR-2B: First plug the wires in proper color sequence to the three color coded sockets shown in Illustration 2, line 1. Now refer to Illustration 1. Connect the blue tipped wire to the ungrounded side of the PHONES terminals (6); the black tipped wire to the ground terminal (9); and the yellow tipped wire to the antenna terminal (10). To make the connections to the receiver, press down on the top of the terminal post, insert the tip of the wire into the hole in the side, and release the post. The wire will then be held securely in place.

4. The blue tipped wire is connected to the ungrounded side of the PHONES terminal only when an automatic printer is used and plugged into the transmitter. The connection is made to feed the audio signal from the receiver, through the transmitter, and to the printer. If the printer is not used, the connection is not made to the receiver; instead, headphones would be plugged into both PHONES terminals (5).

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5. Before signals can be heard on the receiver, an antenna and a ground must be connected to the transmitter in accordance with the transmitter instructions.

C. CONNECTION TO A 1.2 VOLT BATTERY

1. Refer to Illustration 2. Connect the power cable (4) to the nine-pin plug (3) on the PS-4. Connect the alligator clip of the red wire to the positive (+) battery terminal, and the alligator clip of the black wire to the negative (-) battery terminal. The PS-4 will not operate if the battery connections are reversed.

2. Plug the RR-2B power cord into the four-pin socket on the PS-4.

3. When the PS-4 is not plugged into a transmitter, separate connections must be made directly to the receiver for the antenna, ground, and audio (if necessary). See your instructions regarding the erection of an antenna and installation of a good ground. Referring to Illustration 1, the antenna lead-in is connected to terminal 10 and the ground lead-in to terminal 9. Remove a small bit of the insulation from the wires before inserting them in the terminal post connections. If an automatic printer is used, audio connections from the printer will be made directly to the receiver as outlined in the printer instructions. If the printer is not used, headphones are connected directly to the PHONES terminals(5).

D. CONNECTION TO A DRY BATTERY PACK

Any dry battery pack capable of delivering 90 volts at 20 milliamperes, $1\frac{1}{2}$ volts at 300 milliamperes, and with a socket to fit the RR-2B power plug may be used to power the receiver. You may be provided with a dry battery pack such as the Burgess 4TA60 or 6TA60. If a dry battery pack is used, the PS-4 is not used. Instead, the receiver power plug (3) plugs directly into the battery. Separate connections must then be made to the receiver for the antenna, ground, and audio (if necessary).

E. UNDERSTANDING THE MEGACYCLE

Since the RR-2B frequency dial is marked in megacycles (MC), this unit must be understood. Normally, frequencies on signal plans are given in kilocycles (KC); 1000 KC equals 1 MC. Merely move the decimal point three places to the left to convert kilocycles to megacycles. For instance, a frequency of 6322 KC would be converted to 6.322 MC and 18454 KC to 18.454 MC.

F. DESCRIPTION OF RR-2B CONTROLS AND SWITCHES

Refer to Illustration 1.

1. Frequency Range Switch (11). This switch is set on one of

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three numbers, depending upon the frequency that the receiver is to be tuned to: position 1 for frequencies between 3.0 and 6.0 MC; position 2 for frequencies between 6.0 and 12.0 MC; and position 3 for frequencies between 12.0 and 24.0 MC.

2. Tuning Knob (7) and Tuning Dial (8). The tuning knob is rotated to tune the frequency as read on the tuning dial in megacycles. The upper scale in the window is merely a reference scale and is divided into 180 equal parts. The lower scale is a direct reading of the frequency in megacycles. Each dial segment is equal to one tenth of a megacycle and the numerals indicate the frequency reading in megacycles. Rotation of the tuning knob causes the tuning dial to sweep past the red hair-line indicator visible in the tuning dial window. Tuning is accomplished by rotating the tuning dial until the desired frequency, expressed in megacycles, appears on the tuning dial directly under the red hair-line indicator. The upper reference scale can be used for logging a previously used frequency for future use.

3. Power ON-OFF and Gain Control (2). This control turns the receiver on and off and regulates the volume level of received signals. Clockwise rotation causes the volume level to increase and rotation in the opposite direction causes the volume level to decrease. When the control is turned to BATT. OFF position, a click can be heard and the power to the receiver is turned off. NOTE: The switch does not turn off the power to the PS-4. The PS-4 can be turned off only by unplugging the unit from the transmitter, or by removing the battery connections.

4. Beat Oscillator Control (4). This control is turned on to receive Morse code signals. It is turned off to receive voice, music, or tone modulated signals.

5. Crystal Oscillator Socket (1). When receiving crystals are used, a crystal is plugged into this socket. The receiver will then receive only on the crystal frequency.

G. PRESETTING THE RECEIVER CONTROLS

1. Turn the GAIN control counterclockwise to BATT. OFF position.
2. Connect power source, antenna, ground, and phones (or audio) as instructed above.
3. Turn the GAIN control about $2/3$ turn clockwise, or until a rushing noise is heard in the phones.
4. Set the range switch to the number corresponding to the desired frequency range. For instance, the range switch would be set to position 3 for a frequency between 12 and 24 MC.
5. Rotate the tuning knob until the frequency in megacycles is

directly underneath the red hair-line indicator on the tuning dial.

6. If crystal operation is to be used, insert the crystal into the crystal oscillator socket. Otherwise, omit this step.

7. For reception of Morse code signals, rotate the beat osc. control somewhere near the zero (0). For reception of voice or tone modulated signals, rotate the beat osc. control to the OFF position.

H. TUNING THE SIGNAL

1. SLOWLY rotate the tuning knob first in one direction, then in the other direction until the desired signal is heard. You may find that the desired signal is to the right or to the left of the indicated mark on the dial.

2. After the signal is heard, very SLOWLY and CAREFULLY adjust the tuning knob until the signal is heard as clear and loud as possible.

3. For reception of Morse code signals, adjust the beat osc. control to the right or left to vary the tone of the signal.

4. Adjust the gain control to a level necessary to copy the signal. When other radio signals interfere with the desired signal, a lower volume level may help to copy through the interference. When the desired signal intensity increases and decreases, adjust the gain control for best listening at the lowest level of the signal.

5. If the signal appears to slowly move away from its frequency setting, it may be necessary to VERY SLIGHTLY readjust the tuning knob. During interference from other signals, slight adjustment of the tuning knob, or adjustment of the beat osc. may help improve reception.

I. CHECKING THE ACCURACY OF THE TUNING DIAL

1. The RR-2B is a stable receiver and the frequency will usually be found close to the reading on the tuning dial. Occasionally, however, because of electrical malfunctions or mechanical shock, the receiver may be off frequency more than a normal amount. Accuracy of the tuning dial may be checked by listening to a frequency standard transmission. Throughout the world many stations broadcast a continuous frequency standard signal on 5, 10, 15, and occasionally on 20 MCS. Signals can be usually heard with the BEAT OSC. either OFF or ON. A tone signal can normally be heard, and most stations broadcast a voice transmission periodically. Some of the many stations transmitting are: Washington, USA (WWV); Honolulu, USA (WWVH); Tokyo, Japan (JJY); Peking, China (BPV); Moscow, USSR (RWM); Rugby, England (MSF); and Buenos Aires, Argentina (LOL).

2. The receiver can be tuned to one of the frequency standard stations to determine how far off the receiver tuning dial may be. To hear weak standard signals, it may help to turn the BEAT OSC. to the 0 mark (CN). To listen to tone signals or voice transmission, the BEAT OSC. must be off.

3. The frequency standard stations also give time checks. Normally, the tone leaves the air for about 20 seconds and returns to indicate the time every 10 or 20 minutes, on the half hour, or on the hour. Usually, a voice transmission is made to give the local time.

J. TUBE REPLACEMENT

1. The metal case must be removed to replace the tubes. First remove the 20 screws which are located around the edges of the top of the receiver. Next, remove the dessicator by unscrewing the large slotted screw on the side of the receiver. The panel and receiver unit may then be gently lifted out of the metal case.

2. Remove the metal shield covering a tube by pressing on the shield and turning it counterclockwise. The tube may be gently rocked from side to side during removal, but do not rock the tube excessively as the glass envelope of the tube may fracture. Tubes should be replaced one at a time to avoid placing a tube in the wrong socket.

K. CHECKING TROUBLES

1. No sound is heard in the headphones.

a. Check all connections at the battery. Check that the plugs to and from the PS-4 are properly plugged in. If possible, check the battery voltage at the transmitter.

b. Check the headphones by momentarily touching the phone cord tips to the terminals of a flashlight battery. Touching across one terminal of a 12 volt battery would not harm the phones, but do not touch the phones across the entire battery. When the phones are momentarily touched across the small battery, a click in the headphones indicates that the phones are not defective.

c. First replace the 1U5 tube and check the receiver. Next replace the three 1T4 tubes, one at a time. Finally, replace the 1L6 tube.

d. If the receiver still fails to function, make any repairs necessary with any test equipment available.

2. The receiver operates, but signals are weak.

a. Check for a weak battery and charge the battery if neces-

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sary. If a dry battery is used, replace with another battery.

b. Check the complete antenna system to insure that no part of the antenna or lead-in is grounded. Grounded means making an electrical connection with the earth. Also, check to insure that all antenna connections are making good electrical contact.

c. Replace the tubes as outlined above.

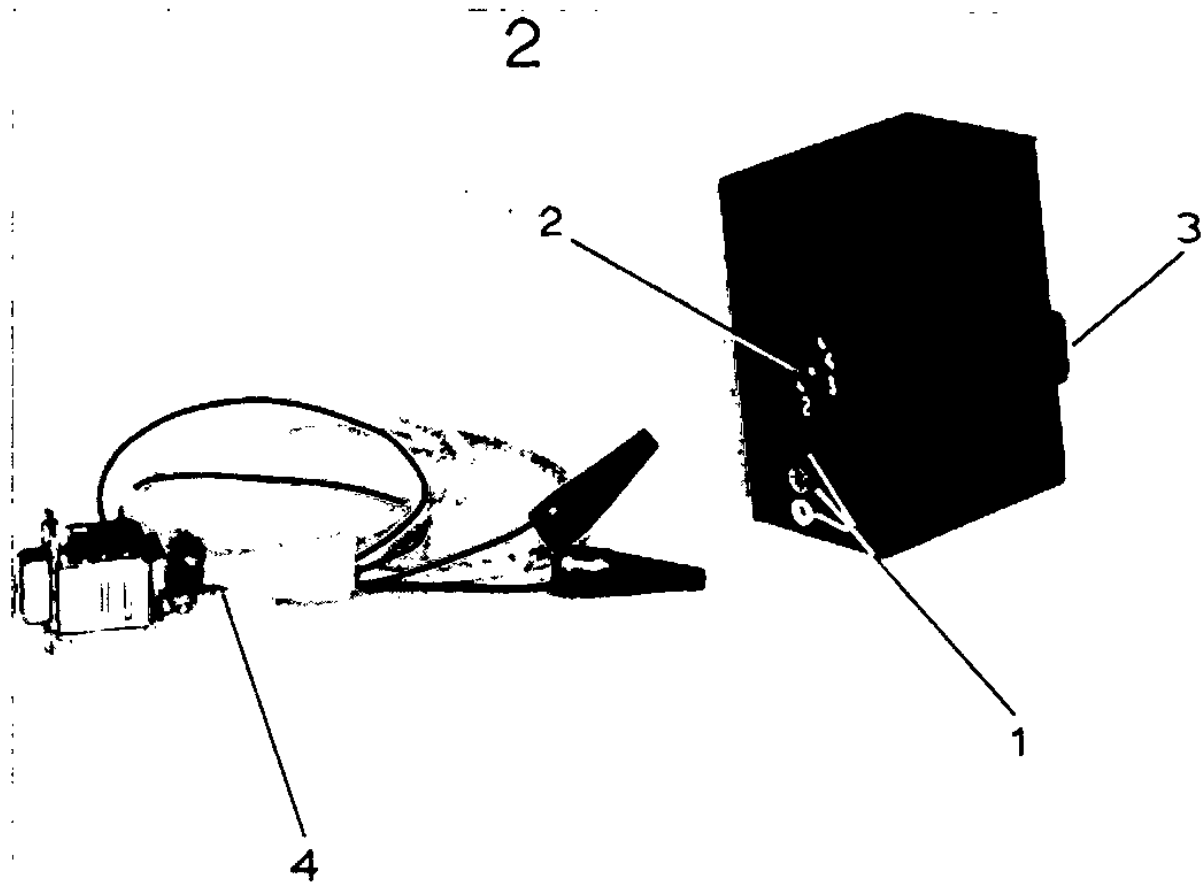


Illustration 2 PS-4 Power Converter

1. Antenna (Yellow), Phone (Blue), and Ground (Black) Plug Connections To Receiver
2. Four-pin Power Socket For Connection To Receiver
3. Power Plug for Direct Connection To Transmitter Or To Battery Through Power Cable (4)
4. Power Cable For Connection To 12 Volt Battery

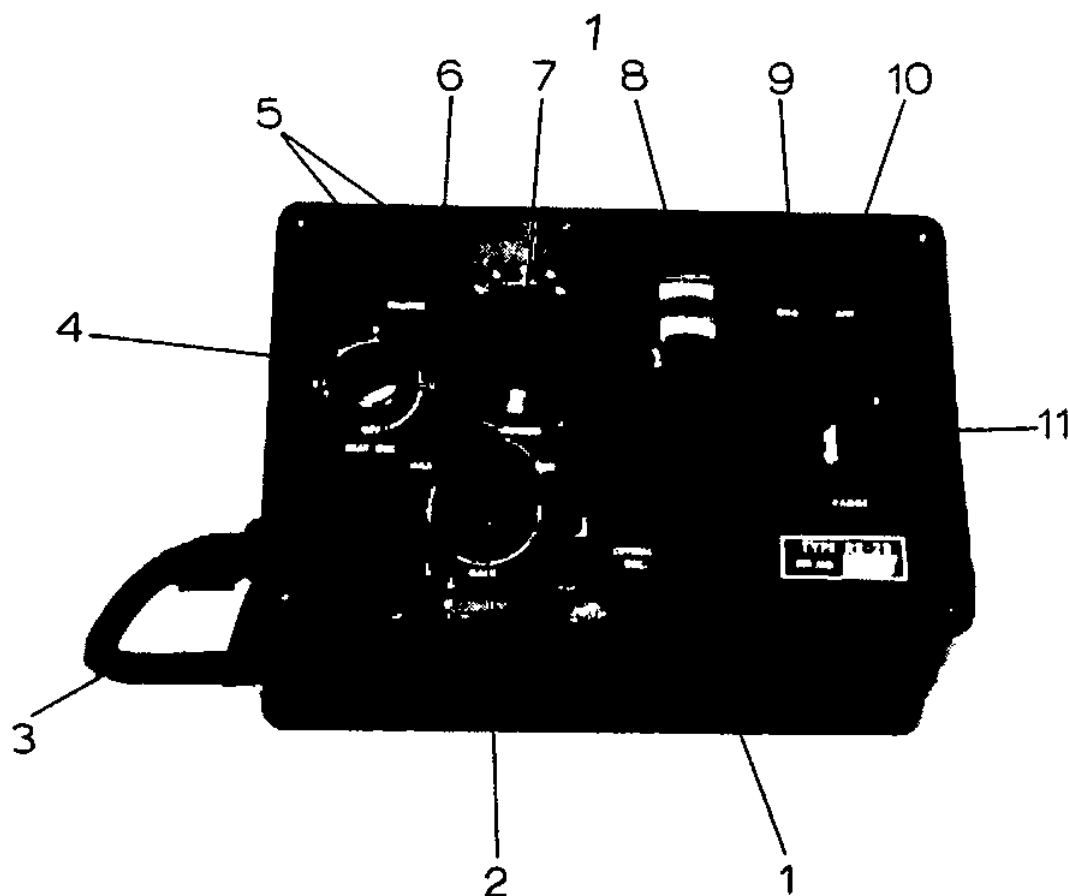


Illustration 1 RR-2B Receiver

1. Crystal Oscillator Socket
2. Power ON-OFF and Gain Control
3. Power Plug
4. Beat Oscillator Control
5. Phones Terminals
6. Ungrounded Phone Terminal
7. Tuning Knob
8. Tuning Dial
9. Ground Terminal
10. Antenna Terminal
11. Frequency Range Switch