

**Chinese Type 884 VHF Packset
Operator's Manual
Last Updated 7/29/2015**



This manual is compiled from available translations of the Chinese manual with additions and corrections provided by N3OC.

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Specifications

The Type 884 radio set is a VHF wideband FM and CW military packset that operates in the 45-50 MHz range.

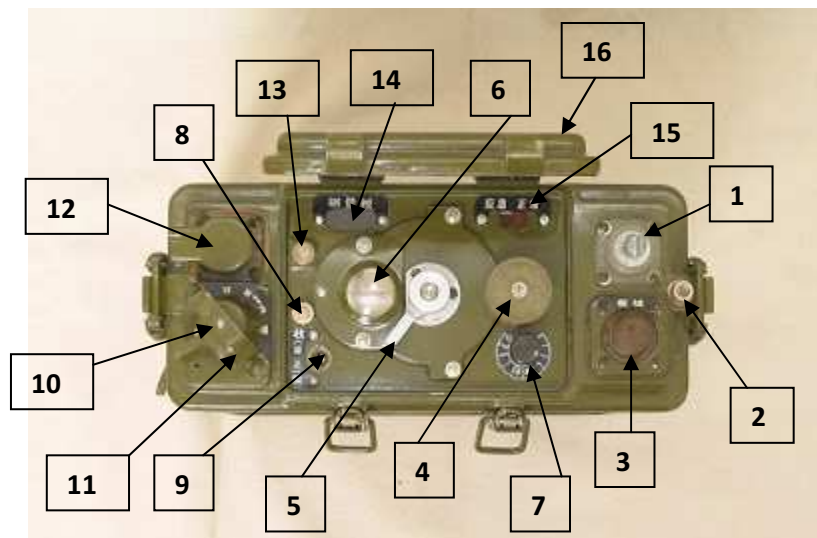
Nominal transmit power output is $\frac{1}{2}$ watt which can be boosted to 1 watt when the battery switch is put in the high-power (emergency) mode.

Nominal FM deviation is 15 KHz.

Receiver sensitivity is around 1uv for 20db quieting. It can be below .5uv if the front end is aligned to a specific frequency. There is no volume control on the receiver.

The radio operates from 12vdc, 3vdc, and 1.5vdc battery power which is provided either by 11 D-cell batteries or alternatively by one 12v gel cell and three D-cell batteries.

Operating Controls



Operating Control Identification

1. Antenna connector
2. Ground terminal
3. Telegraph key
4. Frequency tuning knob
5. Frequency locking lever
6. Frequency indicator window
7. CW tone control (BFO)
8. Receive frequency trimmer

9. Transmit frequency trimmer
10. Radio function selector, CCW to CW:
 - Calibrate
 - Voice with AFC
 - Voice without AFC
 - CW
11. Function selector locking screw
12. Headset/microphone connector
13. Indicator lamp
14. Test connector
 - 1) IF output
 - 2) RX discriminator
 - 3) Audio out
 - 4) No connection
 - 5) Battery A+
15. Transmit power high/low (emergency battery)
16. Top cover

Radio Set Calibration

Calibration utilizes a 1.5 MHz crystal to generate signals at 45, 46.5, 48 & 49.5 MHz. This also means there is a calibration signal present at 51.0 MHz once the set is moved up in frequency. There are four calibration points on the tuning dial marked with a small black triangle at 45, 46.5, 48 & 49.5 MHz.

To calibrate the radio set, do the following:

1. Set the function knob to the calibrate position, which is the far CCW position.
2. Tune the dial to the desired calibration point marked with a black triangle. (If you are using 51.0 MHz there is not a marked point on the dial for this frequency.)
3. Listening in the headset, adjust the receiver trimmer cap for a heterodyne and attempt to zero beat the signal. The trimmer is very touchy so get it as close as you can.
4. Now key the transmitter and you should hear a heterodyne again. Adjust the transmit trimmer for zero beat
5. The set should now be fairly close, usually within a couple KHz of the calibration point.
6. Having test equipment or another radio known to be on the same frequency help you find your signal easier. This calibration procedure is for when there is no test equipment available and will get you fairly close – close enough that the receiver AFC should make communication possible.

An alternative and better way to set the frequency is to use a signal generator or transmitter known to be on frequency and adjust the receiver frequency while watching the discriminator voltage on the test jack pin 2 with a DC multimeter and adjust for zero volts. Once the receiver is set exactly on frequency, lock the tuning lever. Now adjust the transmit frequency with a frequency counter using the transmit trimmer capacitor.

Radio Set Operation

1. Load batteries into battery box, observing the polarity indicators etched on the battery holder. If using D cells, put a plastic battery spacer in the bottom of the box, then 4 D cells, followed by another spacer and 4 more D cells. Put the black foam rubber on top to hold the cells in place.
2. Set function knob to Voice without AFC.
3. Connect headset/microphone.
4. Insert antenna and hand-tighten locking screw.
5. Attach ground wire or counterpoise to grounding screw if desired.
6. Power set on with switch located on microphone.
7. Rotate frequency knob to desired frequency.
 - a. It may be useful to net the frequency with another radio at this point to be certain of your operating frequency.
 - b. Use locking lever to lock frequency knob after it is set.
8. Set function knob to Voice with AFC once frequency is set.
9. You can close the top cover once frequency is set to avoid accidentally changing the frequency.
10. Press PTT button on microphone to transmit.
 - a. Transmit frequency trimmer can be used to more closely net transmit frequency if a frequency counter or reliable receiver is nearby.
 - b. The receiver AFC will track any transmit signals that are off frequency up to around 30 KHz.
11. Release PTT button to listen.

CW Operation

1. Follow the same procedure above except set function knob to the CW position
2. While depressing the microphone PTT button, send with the built-in telegraph key.
3. CW seems to be FSK, meaning the telegraph key shifts the transmit carrier by a fixed amount (approximately 15 KHz) which produces a tone on the receiving radio.

4. The CW tune control appears to be a BFO adjustment which needs to be adjusted to produce a tone on the receiving radio.

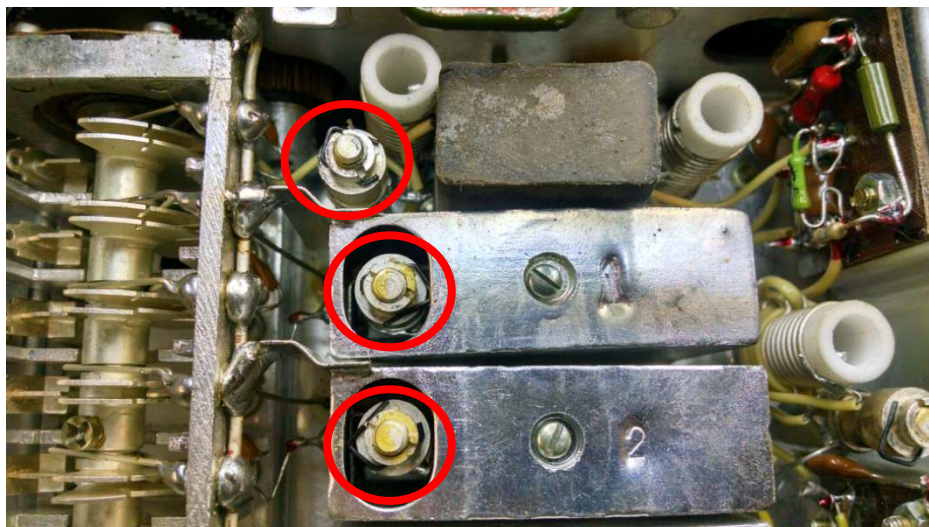
Alignment to the 6 Meter Ham Band

The radio set is designed to operate in a frequency range from 45-50 MHz, so some realignment is needed to make it operate in the ham band (usually to 51.0 MHz). Normally the set is aligned by the main tuning capacitor which has additional sections to move the various stages in the radio to the frequency it is tuned to. Fine adjustment is provided by crude piston trimmer capacitors in each section which are then locked into position with a dab of cement once aligned.

Since you will be moving the set upwards in frequency, realignment of the piston trimmer capacitors is required to achieve full specifications at 51.0 MHz. You will need to move most of them up to the top of their travel, with the adjustment nut just about to the top of the threaded stud.

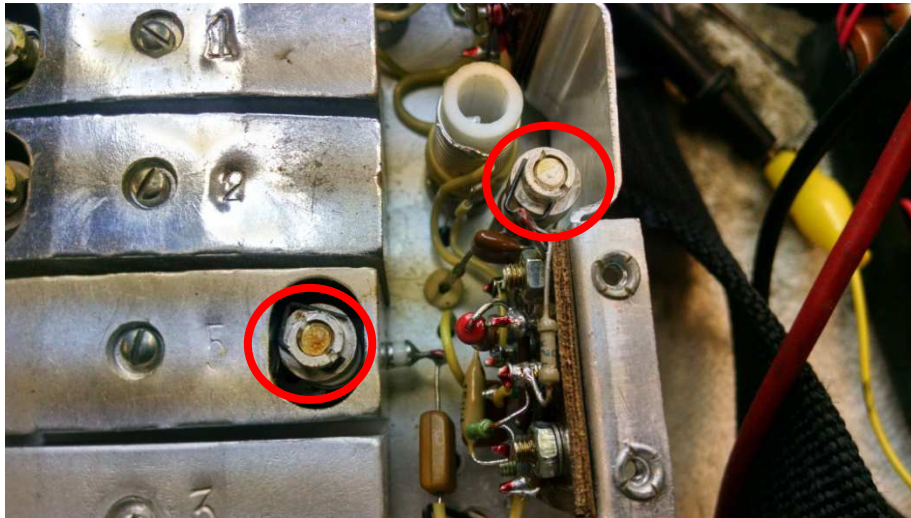
First you will need to break free the cement that locks them in position, and then turn them counter-clockwise with needle nose pliers or an alignment tool until they are properly tuned. I was able to get around .85W power out and less than .5uv receiver sensitivity on 51.0 MHz once these were adjusted.

In the receiver, you need to adjust the piston trimmer just in front of module 1, as well as the trimmer in module 1 and module 2 for best receiver sensitivity at 51 MHz. For my set, this was near top of travel.



Receiver Piston Trimmer Caps Tuned for 51.0 MHz

For the transmitter, you need to adjust the piston trimmer located in between the two final output transistors mounted on the frame, as well as the trimmer in module 5.



Transmit Piston Trimmer Caps Tuned for 51.0 MHz

Once the trimmers are adjusted, the locking nut should be secured with a dab of silicone or a dab of glue from a hot glue gun.

Theory of Operation

The main tuning dial frequency is generated by a Hartley VCO contained in modules 6 & 7. One section of the main tuning capacitor forms a portion of the tank circuit for the VCO in conjunction with a tapped inductor located inside the module. Frequency is also fine tuned by the receiver trimmer cap C29 and during transmit by transmit trimmer cap C27 which are both located on the front panel. A relay contact switches the inductor taps to offset the VCO by the amount of the receiver IF during receive, and directly on frequency during transmit.

The main tuning capacitor also contains additional ganged sections to tune the receiver front end, the transmit pre-driver, the transmit driver and the final PA to the operating frequency. Each of these sections also contains a piston trimmer capacitor for coarse alignment.

Microphone audio is routed through a diode clipping circuit (BG10 & BG11) and applied to module 6 where it directly modulates the VCO. Microphone audio is also routed to the receiver audio amplifier to provide sidetone which is heard in the headset while transmitting.

In the CW mode, the built-in telegraph key is routed via contacts on the antenna relay and the function switch to module 6 to provide a steering voltage which generate a frequency-shift of about 15 KHz when the key is depressed. Microphone audio is disconnected by the function switch in the CW mode. Note that the PTT switch on the microphone must be depressed while sending CW to put the set into the transmit mode. There is no sidetone in the headset for CW.

Calibration signals are provided by a 1500 KHz crystal which is mixed with the IF output to produce a heterodyne which can be zero beated to calibrate the receiver frequency using the receiver trimmer on the front panel. The transmit trimmer can also be zero beated when the set is in the transmit mode to net the transmitter to the same frequency the receiver was calibrated to. The front panel lamp is also illuminated when the selector switch is on the calibrate position.

Modules 1 & 2 contain the receiver RF amplifier. Module 4 contains the mixer which mixes the received signal and the VCO output to produce the IF frequency, which is applied to the IF filter and the IF amplifier in the receiver tray. The signal is limited and applied to the FM discriminator and finally the audio amplifier section.

During AFC operation, the discriminator voltage is connected via the function switch to module 6 to provide a steering voltage to the VCO. Discriminator voltage is also available for monitoring and alignment on pin 2 of the test jack located on the front panel.