

CHAPTER 8—STATION RADIO B47

SECTION 36 GENERAL DETAILS

Purpose

The SR B47 is a VHF, FM voice only radio. It is used in both armoured and armoured reconnaissance regiments as the co-operation and flank set. It is also used by APC borne infantry. It is primarily a vehicular set but it can be manhandled with some difficulty.

Facilities

Very simple tuning which is entirely visual.

A squelch circuit which gives silent listening until a signal is received. This circuit also allows automatic rebroadcast to take place between two B47 sets or a B47 and a C42 set.

Automatic modulation control which keeps the input from the microphone to the set constant, thus there is no improvement to be gained by shouting into the microphone.

High and low power transmission strengths.

Frequency coverage

The range is 38–56 Mc/s with channels spaced at every 100 Kc/s.

Power Supply

The power required is normally 24V which is provided from radio or vehicle batteries. The PSU is part of the set. To allow for variations in the voltage of vehicle batteries a device is incorporated in the radio harness which automatically adjusts the PSU to work on voltages from 20 to 29V. Because the device is incorporated in the harness it is important that this set is normally used with such a harness. If the harness is not used (ie, a simple 'O' Box is used) then the set automatically adjusts itself for an input of 29V. If the input is NOT in fact 29V but some lesser value (as it may well be) then set performance is reduced. For this reason 'O' Boxes should only be used for routine tests and not for operational use.

INSTRUCTORS NOTE: Some 12V B47s were made but these are not normally held by RAC units. The voltage clearly stated on a plate on the face of the set.

Current Consumption (Maximum)

24V set—3 amps.

Antennas

An 8ft rod mounted in antenna base No. 28.

An elevated antenna for use on 27 ft. telescope mast (as for SR C42).

Antenna Tuning Unit (ATU) No. 8

The ATU is used to electrically tune the 8ft rod to the frequency in use. It must be mounted close to the antenna base No. 28 and it must be earthed to the metal work of the vehicle.

Range

As with other VHF equipments the range will depend mainly on siting. Between two vehicle borne B47s a range of five miles will often be possible. When working to manpack sets the range may be less as the manpack equipments are more likely to suffer from poor siting. On LP the range will be about one quarter of that obtained on HP.

Mechanical Construction

The set is contained in a sealed die-cast aluminium case with an external flange to protect the face.

Controls (See Figure 36 : 1)

Power on/off switch—controls the power input to the set.

Lamp—lights when the power is on: has a dimmer shield.

3 amp fuse—protects the set from excessive power input.

Cursor Adjustor—moves the hairline in the channel scale window.

Channel Scale—indicates the working frequency of the set, calibrated in 100 Kc/s divisions.

Centre Zero Meter—used in tuning the set.

Calibrator Switch—which has five positions:—

- Cursor Adjust — this is a rough adjustment of the channel scale.
- Channel Adjust — this is a fine adjustment of the channel scale so that it is accurate to the nearest channel.
- Noise on HP — the AF output is permanently connected to the headsets and the squelch circuit is cut out. High power is selected.

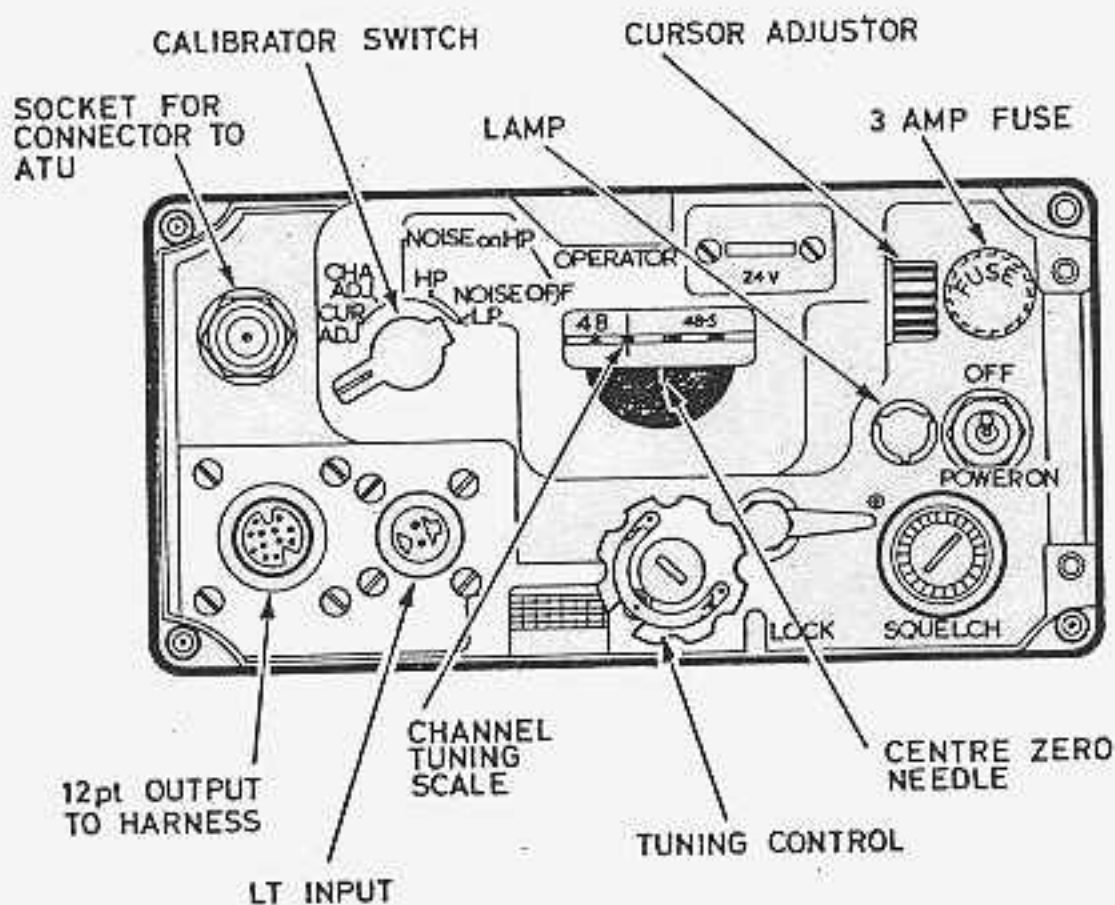


Fig 36 : 1

- HP Noise Off — the squelch circuit operates and in the absence of an incoming signal the audio output is disconnected from the headsets. When a signal is received the squelch circuit triggers off a relay which connects the audio output to the headsets. High power is automatically selected.
- LP Noise Off — As above with the difference that low power is selected.
- Tuning Control — adjusts the frequency in use as shown in the channel scale window. It can be locked in any position.
- Squelch — this adjusts the setting of the trigger mechanism referred to above. Great care must be taken to ensure that this control is properly set or weak signals will fail to "trigger off" the relay and consequently they will never be heard.

ATU Controls

Meter—indicates power into the antenna.

Tuning knob—electrically matches the antenna to the frequency in use. It can be locked in any position.

INSTRUCTORS NOTE: This set will be damaged if any attempt is made to transmit without a correctly tuned antenna system being connected. The antenna system may be an 8ft rod with associated ATU or a correctly adjusted elevated antenna. In the former case the ATU adjustment should be completed within ten seconds of the pressel switch being pressed. The damage which results from not observing this rule is not immediately apparent but it is cumulative. Each time it occurs the performance of the transmitter is reduced so that eventually a thoroughly poor set results.

SECTION 37 DRILLS AND TESTS

Opening Up Drill

- Erect 8 ft of antenna.
- Check the connections from the antenna to the ATU.
- Check the coax connector from the ATU to the set.
- Check that the set is switched to 'Noise Off—LP'.
- Connect the batteries or switch the master switch to on.

Tuning Drill

- Switch the power on and turn up the volume control.
- Switch to 'CURSOR ADJUST'.
- Turn the tuning control until the scale reads the nearest Mc/s to the required frequency.

Centre zero the needle (needle must swing in the same direction as the scale is moving). See Figure 37 : 1.

Adjust the hairline with the cursor adjustor until the hairline is over the Mc/s mark.

Switch to CHANNEL ADJUST.

Turn the tuning control until the scale reads the required frequency. (See Figure 37 : 2).

Centre zero the needle on the required frequency (again, the needle must swing in the same direction as the scale is moving).

Lock the tuning control.

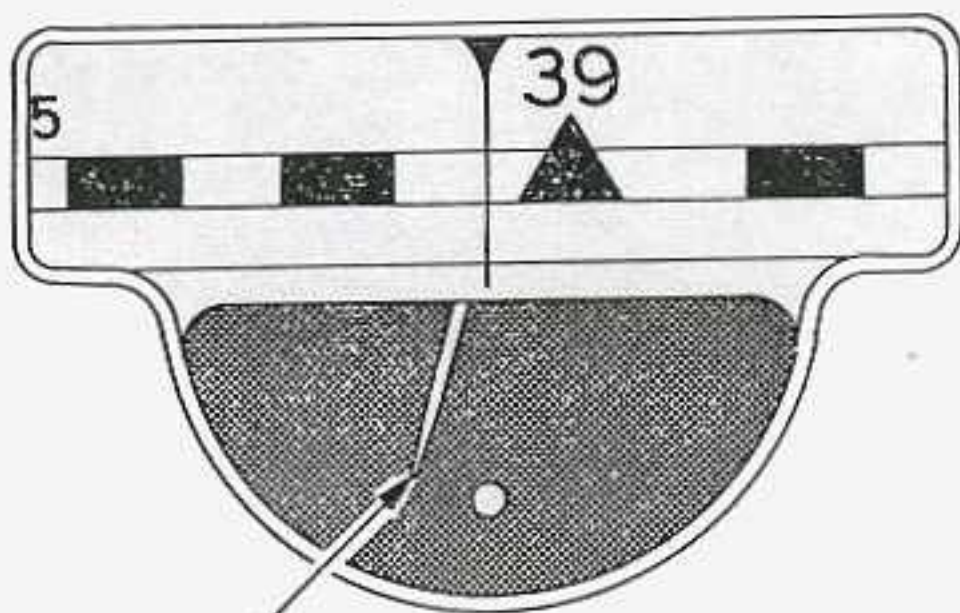
Switch to Noise Off—HP. (HP is selected to ensure accurate tuning of the ATU which is difficult on LP).

Turn the squelch control clockwise until a loud hissing noise is heard. Check that no signal is being received, then turn back the control until the noise just stops. Do not attempt to adjust the squelch control if a signal is coming in. (The reason for turning the volume control full up to start with was to ensure that no weak incoming signal is missed).

Press the pressel switch and tune the ATU for radiation
Lock the ATU control knob } Normally done on
orders from control

Switch to Noise Off—LP. (Only in exceptional circumstances should the set be left on HP).

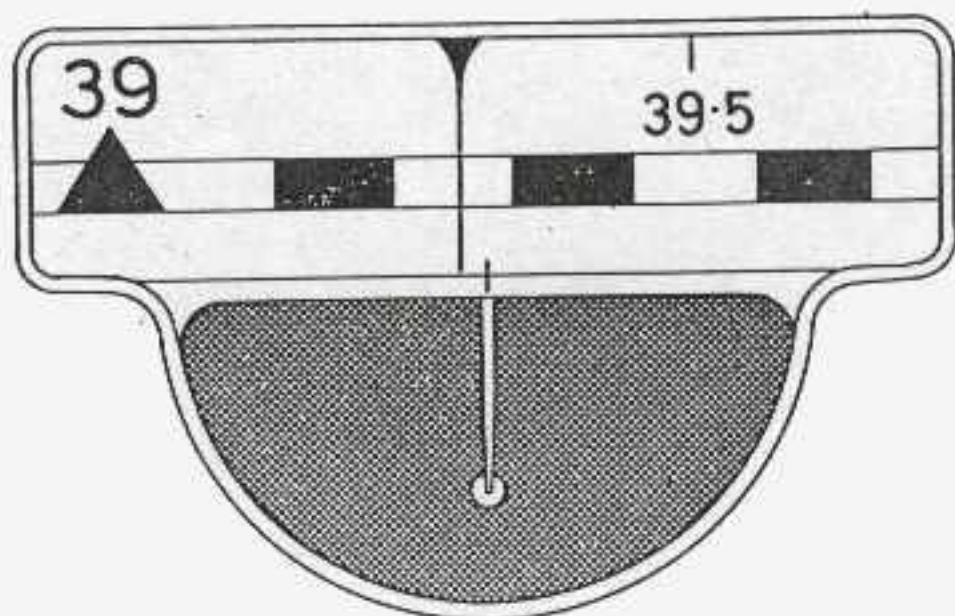
Scale moving left



Needle swings
to left

Fig. 37 : 1

When all the stations on the net have been heard, adjust the volume control, if required.



Scale set to 39.3 Mc/s

Fig. 37 : 2

Tuning Check

The following two checks must be carried out after ten minutes, thirty minutes and thereafter every hour:—

Switch to channel adjust and re-centre zero the needle if necessary. Check the adjustment of the squelch control.

Tests

To check that the set is in working order:—

Connect the ATU and antenna.

Switch on the set and tune to an interference free frequency between 38 and 39 Mc/s. Do NOT press the pressel switch.

Repeat above on a frequency between 45 and 46 Mc/s.

Repeat above on a frequency between 53 and 54 Mc/s.

Check for radiation and sidetone.

If the set does not behave normally check the following in the order given:—

Fuse (and if it does not work, the lamp bulb).

Audio gear.

The check to consist of substituting known good items for the suspect ones. If the set still does not work report the matter.