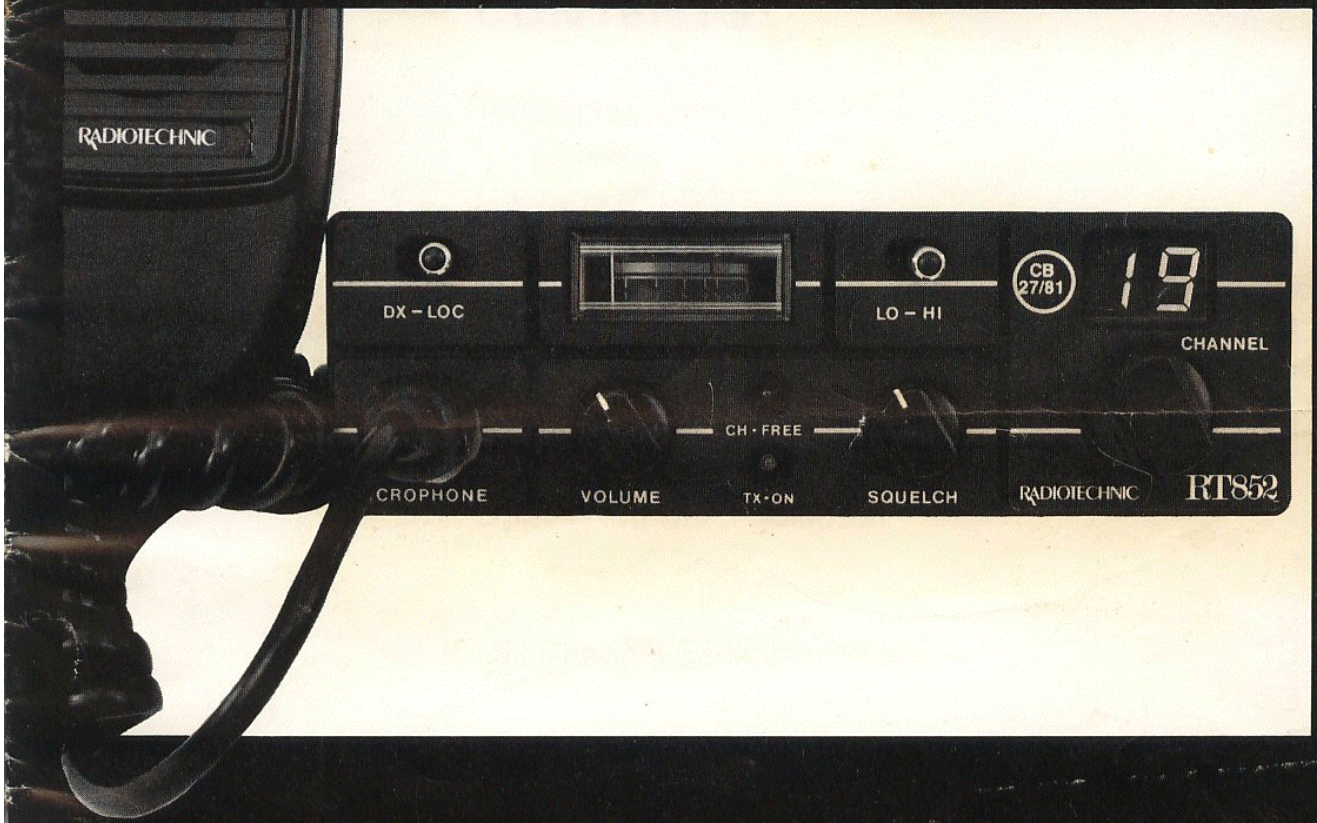
RADIOTECHNIC

RT852



Operators Manual

Citizens Band Transceiver
40 Channel 27 MHz FM

RADIOTECHNIC

RT852

Operators Manual

CONTENTS:

PAGE

Technical Specifications: 4

Installation:

Locating the Set 5
Mounting and Electrical Connections 5
Aerial Adjustment 6
Interference Suppression 11
Remote Speaker 11
Notes 11

Operating Instructions:

1 Volume/On/Off Switch 12
2 Squelch 12
3 Channel Selector 13
4 Hi/Lo Switch 13
5 Signal/RF Meter 14
6 DX/LOC Switch 14
7 CH free Light 14
8 TX Light 14

Block Diagram: 7
Schematic Diagram: 8–9

Specifications

General

Frequency	26-28 MHz/operational — 27, 60125–27, 99125 MHz
Channels	40 switched
Frequency Tolerance	0.001%
Operating Temperature	minus 10°C–plus 55°C
Operating Voltage	12 volt battery/13.2 V nominal
Operating Voltage Range	11–16 volts DC
Dimensions	165 × 155 × 50 mm
Semiconductors	24 Transistors, 14 Diodes, 4 IC's, 2 LED, 1 Channel Display
Ceramic Filter	2
Crystal Filter	1
Weight	1,400 gr.

Receiver

Sensitivity	Better than 0.2 uV(pd) for 12 dB sinad
Selectivity	±3.6 KHz–6 dB, 10 KHz–85 dB
Adjacent Channel Rejection	80 dB
IF Frequencies	455 KHz/10,695 MHz
Squelch, Adjustable	0.1–1.5 uV
Image Rejection	Better than 90 dB
Audio Output	2 Watt/8 ohm

Transmitter

RF Output	0.4–4.0 Watt (LO-HI)
Type of Modulation	FM
Modulation Deviation	2.5 KHz max.
Harmonic, Spurious Rejection	Better than 5×10^{-8}/2.5 $\times 10^{-6}$ Watt
Antenna Impedance	50 ohm

Installation

Locating the Set

Before starting the installation work, carefully consider where the set can best be sited for convenient operation and, in the case of vehicle mounted units, for driver and passenger safety. Remember to find a suitable position for the microphone bracket as well as the radio itself.

Choose a position that will provide a strong fixing and will also allow a good electrical connection to the chassis of the vehicle — run a separate wire from the mounting bracket to 'earth' if necessary. (It is not necessary to separately 'earth' the set in this way in the case of Base Station Installations).

Mounting and Electrical Connections

The Radiotechnic Transceiver is supplied with a universal mounting bracket and the necessary bolts to allow the set to be located either above or below its fixing points and adjusted to the most convenient angle.

Having established the best position, proceed as follows:

1. Loosely fit the bracket to the set and offer it up into position. Be sure to allow sufficient space at the back of the set for the aerial plug and cable. Ideally leave enough room to be able to remove the aerial plug when the set is in situ. This will be of particular benefit when attaching an SWR meter for aerial adjustment.

   Once you are satisfied that nothing will interfere with the mounting position remove the bracket from the set and using it as a template drill the holes for the fixing screws/bolts being careful not to damage any cables, hoses, etc.

2. Connect the aerial cable fitted with a suitable PL-259 plug to the SO-239 aerial socket on the rear panel of the set.

3. Fit the microphone clip to a convenient fixing point (it can be located on the side of the set using one of the four mounting bracket bolts if required). Plug in the microphone to the socket on the front of the set.

4. Connect the black lead from the set to either the negative (–) terminal on the battery or to a suitable 'earth' point on the chassis.

5. The red lead can either (a) go direct to the positive (+) terminal on the battery in which case fit an in-line choke and avoid passing it close to potential sources of interference* such as the coil and alternator or (b) connect it to a positive feed closer to the set. Choose one that stays on when the ignition is turned off and do not pick a feed to the wiper motor or any other potential noise source*.

*See the note at the end of this section relating to vehicle noise suppression.

6. In base station installations a suitable power supply (voltage transformer) capable of supplying at least 3 amps at 13.8 volts DC output must be used. Connect the Red (+) lead to the positive (+) terminal on the power supply and the black lead to negative (–).

WARNING: UNDER NO CIRCUMSTANCES ATTEMPT TO CONNECT THE SET DIRECTLY TO THE MAINS 220/240 VOLT AC SUPPLY AS IRREPAIRABLE DAMAGE MAY BE CAUSED BOTH TO IT AND YOU.

N.B.

The RT 852 is for use in negative earth vehicles only. Consult your Radio Dealer or a qualified vehicle electrician if considering its use in a positive earth vehicle.

Aerial Adjustment

Once the above transceiver installation work has been carried out and a suitable aerial has been fitted you are nearly ready to start using your new set. However, it is vitally important to adjust the length of the aerial whip before transmitting.

The object of the aerial adjustment is to ensure that the aerial is matched to the transceiver i.e. that the standing wave ratio (SWR) is within certain acceptable limits.

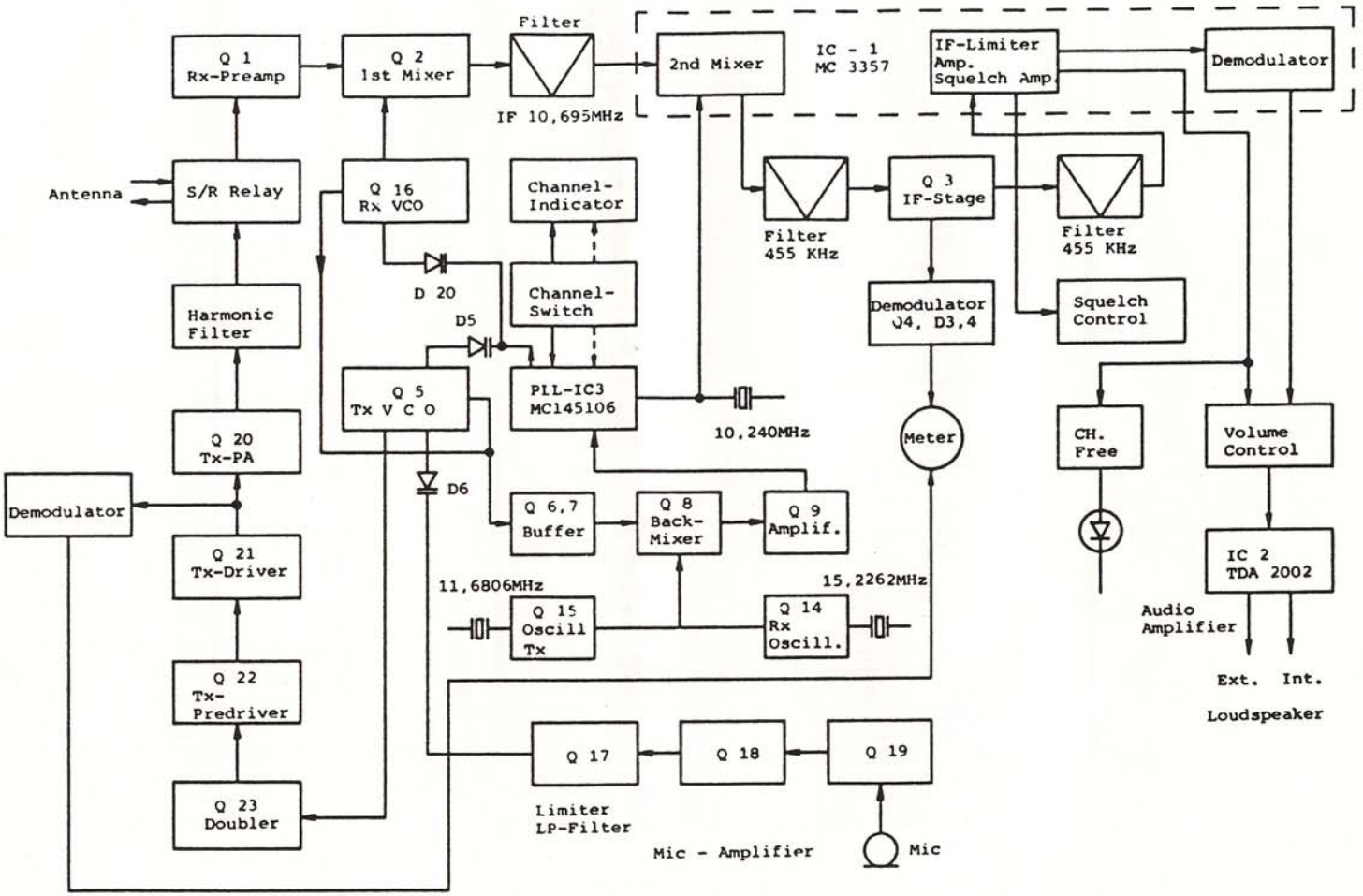
Most good Radio Dealers will be happy to carry out this SWR adjustment for you — perhaps for a small fee. However, it is a simple enough task if carried out step by step and provided you have the use of an SWR meter and its patch lead.

Following this basic method will enable you to achieve satisfactory results.

1. Ensure your transceiver is turned off.

2. Uncouple the aerial plug from the back of the set and re-connect it to the side of the meter marked ANT. Connect one end of the patch lead to the

Block Diagram



transmitter (XMTR) side of the meter and the other into the set.

3. Switch on the set, select channel 1 and make sure that the HI/LO switch is at HI i.e. 4 watts output. Move the two-position meter switch, usually marked FWD and REF, to the FWD (forward) position and press the transmit key on the microphone. Using the rotary knob of the meter adjust the needle to the 'set' position on the scale — usually the extreme end of the red sector. Having calibrated the meter in this way and without further touching the rotary knob switch to the REF position and take a meter reading. Release the microphone key.

IMPORTANT If at this stage the reading is in the red sector or in excess of 3.0 to one then a serious fault is indicated and further transmitting could damage the set. The fault will almost certainly be a short circuit in one of the aerial plugs, the patch lead, meter or possibly the lack of a good electrical connection between the aerial mount and the vehicle body. Seek expert help if necessary.

4. Change to channel 40 and carry out the same procedure again and note where the needle stops on REF. You are now ready to carry out some final adjustments to your antenna.

A very quick guide is that ideally, you are trying to trim your antenna so that the SWR meter needle moves as little as possible from channel 1 to 40 when carrying out the checks previously described. If the reading is higher on channel 40 than on channel 1 then the antenna needs shortening. If it reads lower on channel 40 than channel 1 then it needs lengthening.

5. The instructions with your antenna will tell you how to go about lengthening or shortening the antenna. Take off only about 1/4 in. at a time, until you have the least possible movement on the SWR meter scale on channel 1 and 40, then do a final check on channel 20 and you should find the scale hardly moves at all on this channel.

Ideally you are looking for a reading of 1.1:1 on your scale, readings of up to 2:1 are acceptable but may reduce performance slightly. Readings of 3:1 and above are not acceptable and could cause damage to your transceiver. Once you have reached the best possible SWR you can either leave the meter permanently in line as a continual reference, or, turn the transceiver off and uncouple the Patch

Lead and the SWR Meter and screw the antenna lead back into the rear of the transceiver. You are now ready to transmit.

Interference Suppression

Use of a mobile transceiver at low signal levels is often limited by the presence of electrical noise. The primary source of noise in most vehicles is generated from the Alternator/Dynamo and the ignition system in the vehicle. Under most operating conditions, when the signal level is adequate, the background noise does not present a serious problem. Also when extremely low level signals are being received, the transceiver may be operated with the vehicle engine turned off as the unit requires very little current and will therefore not drain the battery. Even though your transceiver has a selective automatic noise limiter, in some installations ignition interference may be high enough to make good communications impossible. These noises come from several sources and many possibilities and variations between vehicles may require different solutions to reduce the noise. For this reason we recommend that stubborn cases be referred to a qualified car radio fitter for expert attention.

Remote Speaker

The external speaker jack socket on the rear panel is used for remote receiver monitoring. The external speaker should have 8 ohms impedance and be capable of handling at least 3 watts. When an external speaker is connected, the internal speaker is disconnected.

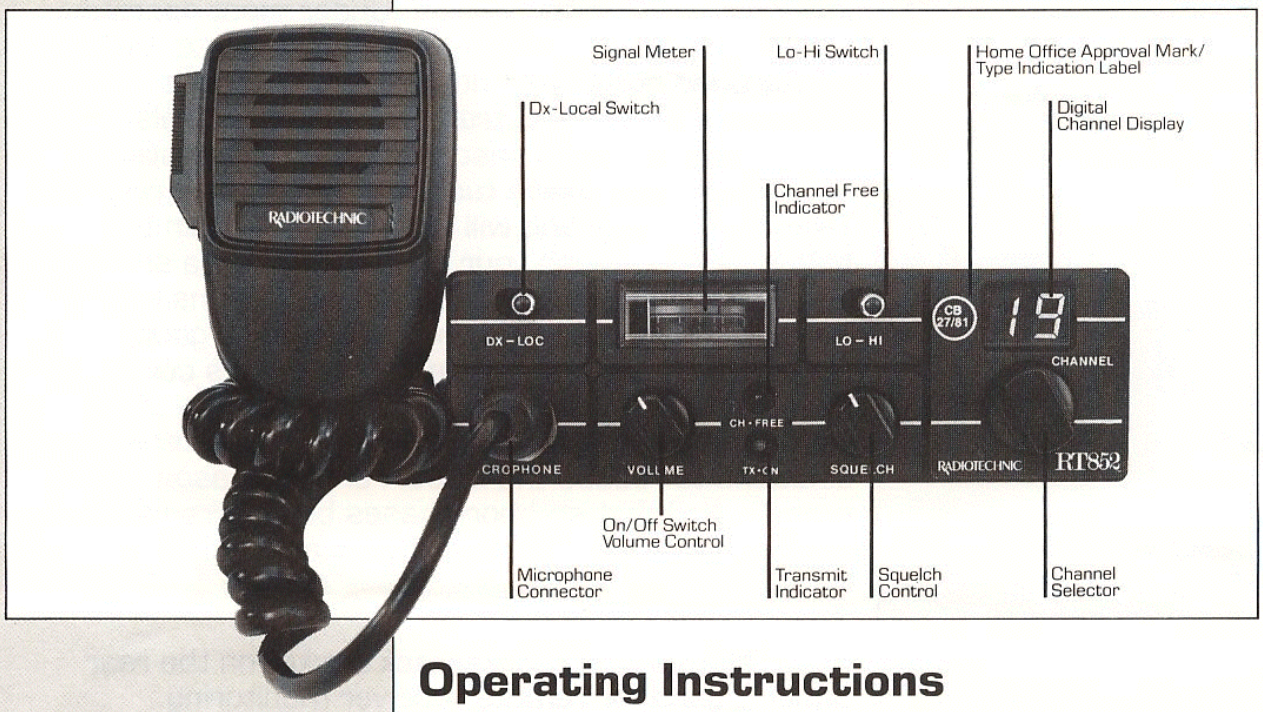
Notes

1. Operation of this equipment requires a valid Home Office Licence issued by the Post Office. Do not transmit with the set until you have obtained your Licence. Illegal operation can result in severe penalties. Be sure that you read all the regulations specified in the Licence before operating your transmitter.

2. Since the maximum Effective Radiated Power (ERP) output of the transceiver via the aerial is limited by the Home Office the antenna is an important factor affecting transmission distance. Only a properly matched antenna will allow maximum power transfer from the 50 ohm transmission line to the radiating element. This must be of the type

recommended in your licence by the Home Office, and how to get the maximum performance out of this is dealt with under Aerial Adjustment in this instruction book.

3. Before installing your transceiver in a boat, consult your dealer for all information regarding adequate grounding systems and the prevention of electrolysis between fittings in the hull and the water.



Operating Instructions

Volume/On/Off Switch

Turn clockwise to switch on the transceiver and set to the desired listening level.

Squelch

This control is used to cut off or eliminate receiver or FM background noise in the absence of an incoming signal. For maximum receiver sensitivity it is recommended that the control be adjusted only to the point where the receiver/FM background noise is eliminated.

Turn fully anti clockwise, then slowly clockwise until the receiver noise disappears. Any signal to be received must now be slightly stronger than the average received noise.

Any further movement clockwise of the control will increase the threshold level which the signal must overcome in order to be heard. Only very strong signals will be heard at a maximum clockwise setting. You may experience intermittent popping

sounds or very garbled background voices on certain channels. This is caused by operators of units both in U.K. and abroad which have a sideband facility (SSB) which is not allowed by U.K. legislation, sometimes breaking across your incoming signal. This is called "Bleeding Across" but this should not inconvenience your operation as by careful use of the squelch control, the majority of these signals can be blanked out.

Channel Selector

This control selects any one of the 40 27 MHz Citizens Band channels desired for use. Whilst no hard and fast rules have been laid down by the Home Office, it is recommended that channel 19 be reserved for the Mobile Channel for use by people on Motorways or main roads to pass on information about road and traffic conditions, directions, emergencies etc. Similarly channel 14 is most used as a calling channel by non-mobile operators. Having established contact on either 14 or 19 it is courteous to other users to find a vacant channel and move off these calling channels for any extended conversations.

Channel 9 is generally regarded as the Emergency Channel and in some areas it is constantly monitored by organisations such as REACT who are best able to help co-ordinate emergency assistance should the need arise. Keep off channel 9 unless you really need to summon help.

The general Calling Channel, Mobile Channel and the Emergency Channel may vary in different parts of the country so be careful how you use your new transceiver if you are a newcomer to the area or to using the CB channels.

HI/LO Switch

This operates the 10 dB attenuator and reduces the actual power from your transceiver from 4 watts to 0.4 watts. It must be used in any installation where the antenna height exceeds that detailed in the legislation laid down by the Home Office.

N.B. When the HI/LO switch is on the LO setting, your needle will not move so far across the dial.This is because you are only using 1/10th of the normal power, but this has no effect on received signal strength.