T3000 Series
Calibration Software
User's Guide

439-37100-00

About This Guide

Welcome to the T3000 calibration software user's guide. The calibration software allows the user to electronically tune and individually configure T3000 series handportable radios.

Overview

This guide covers the T3000 series calibration software, and explains how to install and use this software. It is structured in 3 chapters, with the Tait Software Licence agreement at the end.

Chapter 1: Getting Started

Introduces the software, and gives software installation and test equipment set-up instructions.

Chapter 2: General Operations

Explains how use the calibration software.

Chapter 3: Calibration Procedures

Gives detailed instructions on how to perform each calibration test.

Typographical Conventions

This guide uses the following typographical conventions:

Convention	Description
Bold	Menu Bar commands Menu names and options Field Names Button names in dialogue boxes
`Monospace font`	Indicates commands to be entered by the user via the keyboard
ALL CAPITALS	Keyboard keys e.g. CTRL, ENTER

Related Documents

M3000-00-10X	T3000 Series Service Manual
M3000-00-20X	T3000 Series II Service Manual
T3000-5000-00X	T3000 Programming Software Users' Guide (IPN 439-35000-0X)

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Chapter 2 General Operations

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1 Getting Started

About This Chapter

This chapter covers the following topics:

- Software Overview
- Hardware Requirements
- Calibration Kit Components
- Test Equipment Required
- Installing The Software
- Connecting The Radio

Software Overview

The T3000 radio has been designed to be totally electronically tuned, with all physical tuning points either eliminated or replaced with electronic tuning. Calibration of the T3000 is normally only carried out during product manufacture, or after major service.

The calibration package performs three major tasks:

- measurement - carried out with the radio in computer controlled test mode, with all test equipment operated by the user
- calculation - the controller processes the data
- programming - the radio is placed in programming mode, and all data required for the radio's self-configuration is written to its database

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Note Each radio is calibrated over a predetermined operating band, and the radio performance is not guaranteed outside of this band.

Software Compatibility

Version 2.04 calibration software is compatible with all current fully approved radio software versions at 26/3/96 that support the following calibration databases:

T3010	v0.01, v1.01
T3020	v0.03
T303X & T3040	v1.01, v1.02, v1.03

The following frequency bands are covered:

VHF low	136 to 154MHz (-31XX)
VHF high	145 to 174MHz (-32XX)
Band III low	174 to 195MHz (-41XX)
Band III high	184 to 208MHz (-42XX)
UHF low	400 to 440MHz (-51XX)
UHF mid	440 to 470MHz (-52XX)
UHF high	470 to 520MHz (-53XX)
UHF USA mid	450 to 470MHz (-55XX)
UHF USA high	470 to 490MHz (-56XX)
UHF Germany	410 to 430MHz (-54XX)
UHF China	336 to 360MHz (-70XX)
UHF Korea	360 to 400MHz (-71XX)
UHF Russia	300 to 340MHz (-72XX)
UHF 800MHz	806 to 870MHz (-81XX)

Hardware Requirements

While the T3000 calibration software will run on XT, AT, 386, or 486 IBM* compatible PCs, the recommended machine configuration is:

- A 386 or higher PC
- 2MB RAM
- VGA display
- Hard disk with 500kB of free space

Note The calibration software requires a large portion of the PCs 640K base memory to run reliably. To optimise memory usage, refer to the MS-DOS user manual.

* IBM is a registered trademark of International Business Machines.

Calibration Kit Components

The following items are contained in the T3000-7100 calibration kit:

- Diskette containing the latest calibration software.
- T3000 calibration test unit.
- T3000-7300 radio calibration cable. This connects the calibration test unit to the radio.
- T3000-7600 battery eliminator.
- X3000-19 programming lead. This connects the calibration test unit to a COM port of the PC.
- T3000-7400 RF test lead. This provides an RF connection from the radio to test instruments and can be used with the radio open. One end is fitted with a BNC plug and the other end has a modified N-type plug.
- T3000-7500 open radio control lead. This enables connection to the T3000 calibration test unit when the radio is open. One end is fitted with a modified accessory connector and the other end has a 15 way socket.

Note A calibration software upgrade package is also available under the product code T3000-7200-002. This contains a diskette with the latest calibration software and the T3000 Calibration Software User's Guide.

Test Equipment Required

The following list specifies the general performance requirements of test equipment used in the calibration process.

- Power supply providing +7.2V, with a 3A capacity.
- Sinad meter: accurate to ±1dB sinad at a reading of 12dB sinad.
- Audio signal generator: 600Ω output, output frequency variable from 50Hz to >10kHz, with a flat frequency response. Output level variable, with both a continuous adjustment and a 10dB step adjustment. Full output is >3Vp-p into a 600Ω load.

- RF signal generator: capable of producing an internally modulated RF signal in the range of 100 to 520MHz with an output impedance of 50Ω and a frequency error of <2ppm. Output level can be varied over the range of 0dBm to -127dBm and must be accurate to within 2dB.
- Frequency counter: an oven controlled reference is preferred, however a TCXO reference with temperature stability of 5ppm (0ºC to 50ºC) will suffice.
- Power meter: this must be accurate to ±10% FSD.
- Modulation meter: this must be accurate to ±10% FSD. A demodulated audio output should also be available. Low pass filtering must be >15kHz and high pass filtering must be < 20Hz.
- 20MHz dual trace oscilloscope.
- 20dB RF power attenuator, 50Ω. Must be accurate to within 1dB and capable of handling 10W input power.
- Digital multimeter - 3½ digit.

A multifunction test set may be used as long as it has the appropriate function to perform the calibration correctly e.g. Rhode & Schwarz CMS52 Radio Communications Test Set, with a high stability oscillator.

Note These test equipment performance requirements are satisfactory for servicing, but are not adequate for verifying the accuracy of the Factory Test Report that accompanies each new T3000.

Installing The Software

Copy all the files on the 3.5" diskette to the working directory on the hard disk e.g. `copy a:*.* c:\calib`, then press ENTER (↵).

Creating A Windows* Desktop Icon

In the windows **Program Manager** select the **Program Group** in which you wish to place the calibration software icon.

Select the **New** command from the **File** menu.

Select **Program Item** then choose the **OK** button.

In the **Program Item Properties** dialogue box, enter the following information:

Description:	`Calib v2.04`
Command Line:	[drive/directory path]`\calib.exe`
Working Directory:	[drive/directory path that you want data files to be saved in]

Select **Change Icon**, then change the directory path to the one that holds the calib.ico file.

e.g. `c:\calib\calib204.ico`

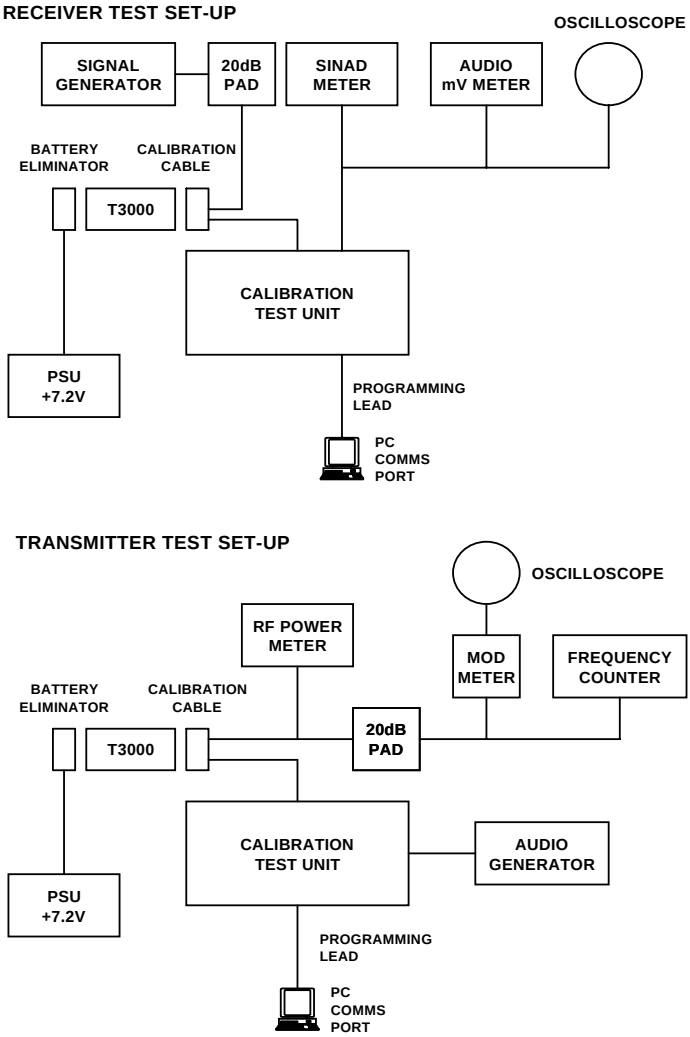
The icon provided allows you to visually identify the icon representing the calibration software. When this icon is selected, choose the **OK** button.

In the **Program Item** dialogue box choose OK to create the new item on your desktop. To change the group in which it appears, click and drag it to the required group.

* Windows is a trademark of the Microsoft Corporation.

Connecting The Radio

The following diagram shows how to set up the test equipment.



2 General Operations

This chapter covers the following topics:

- Starting The Program
- Navigation
- Using The Menu Bar
- Loading Files
- Saving Files
- Programming The Radio
- Using the Utilities Menu
- Exiting The Program

Starting The Program

Connect the test equipment, as shown in Chapter 1.

Connect the battery eliminator and radio calibration cable to the T3000 and switch on the radio.

On the PC, change to the directory in which the calibration software was installed, and type `calib` to run the calibration program.

If the calibration software has been installed under Windows, click on the appropriate Windows desktop icon.

The calibration software runs in graphics mode by default. To run in text mode, type:

```
calib /t
```

Note Running in text mode will not normally provide significant performance enhancement.

Navigation

The calibration software can be used either with a mouse or keyboard. The following keyboard commands are common to all calibration software windows or menus.

Key	Function
F1	Help
F3	Exit window & return to main menu
F4	Quit program without saving
F5	Refresh screen
ALT	Go to menu bar
ENTER (↵)	Selects the current DAC setting as the data value for the current test, and will then move on to the next window object or test
TAB	Move to next window object
SHIFT-TAB	Move to previous window object
↑ ↓	Move up and down DAC adjustment range in single steps
→ ←	Change to next data input field, or move along menu items, without saving the current DAC settings
PAGEUP	Move to top of DAC adjustment screen
PAGEDOWN	Move to bottom of DAC adjustment screen
HOME	Go to top of DAC adjustment range
END	Go to bottom of DAC adjustment range

In the program windows, the following convention applies:

Exit the window without saving the data

Exit the window and save the data

Using The Menu Bar

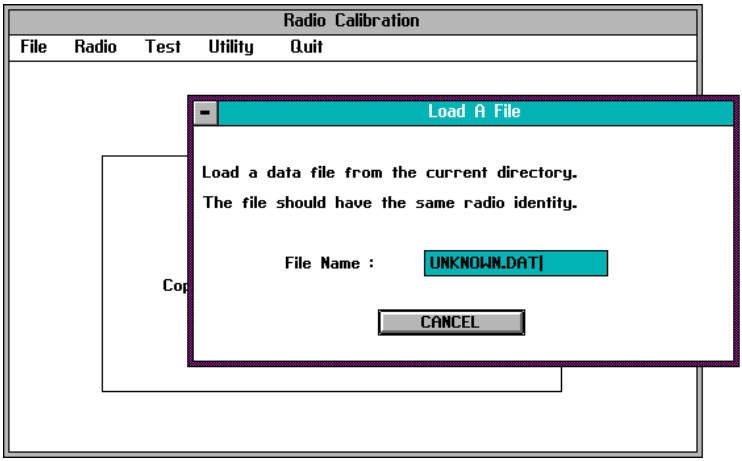
The key words on the main menu bar are selected either by clicking on them with the mouse or by holding down the ALT key and pressing the underlined letter.

To access on-line help while either in the main menu or in a window, press F1. Help is context sensitive and the information given will relate to the window active when the F1 key was pressed.

Loading Files

Only calibration data from a radio with the same radio identity can be used to calibrate another radio.

Select **File** from the main menu then **Load** and the file will be loaded from the current directory. The following window appears:



Enter the appropriate file name and press ENTER (↵).

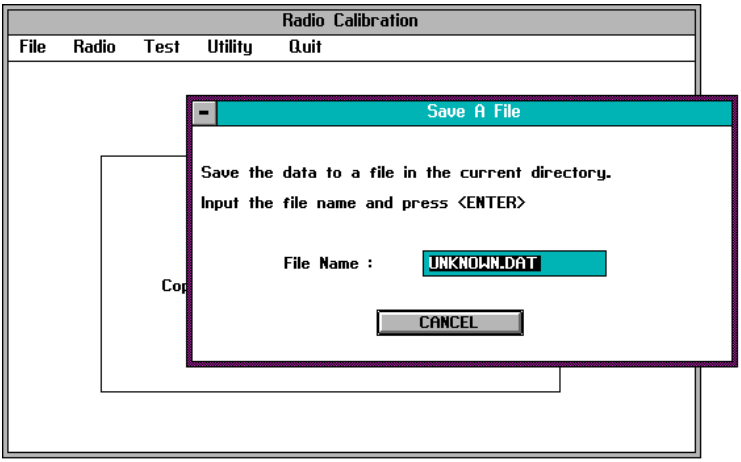
Choose the **LOADED** button to exit the window.

Saving Files

Once calibration is completed, it is possible to save the calibration data. This will be saved to the current directory.

In the main menu, select **File** then **Save** (or **Save As**).

The following window appears:



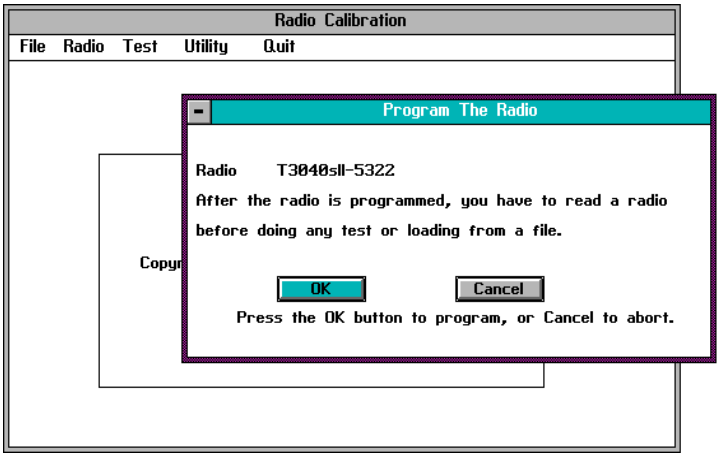
Enter the file name and press ENTER (↵).

Choose the **SAVED** button to exit the window.

Programming The Radio

After completing either full calibration or individual tests, it is necessary to enter the calibration data in the radio's database.

Select **Program Database** from the **Radio** menu and the following window appears:

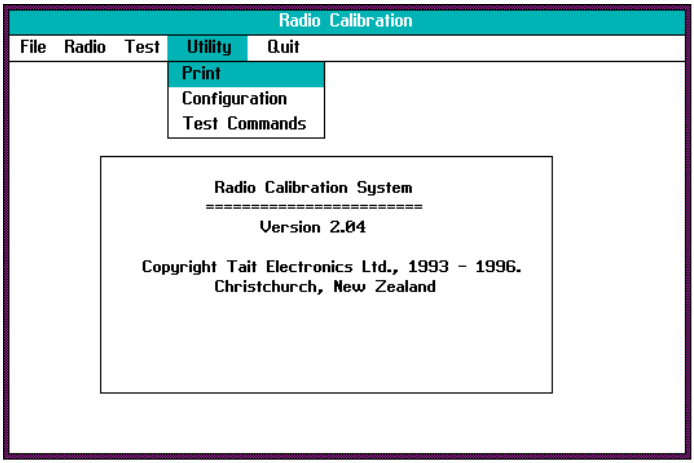


When the window opens, the **OK** button is highlighted. Press ENTER (↵) to select **OK** button and the calibration data is entered into the radio's database.

To exit this window ***without*** programming the database, choose the **CANCEL** button without first selecting **OK**.

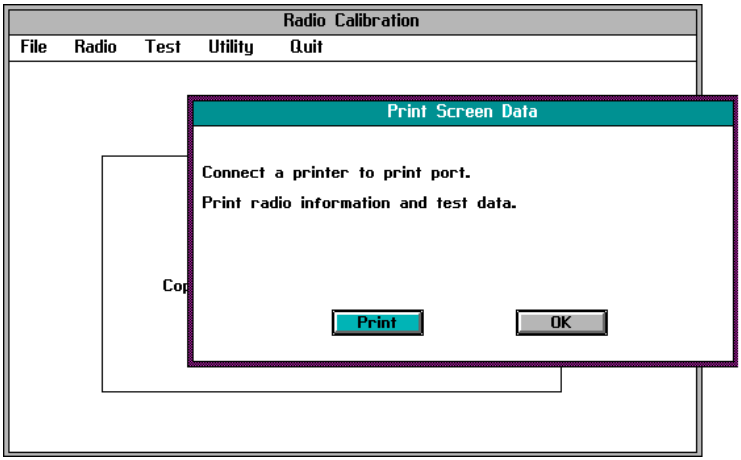
Using The Utility Menu

Select **Utility** from the main menu, and the following window appears:



Printing

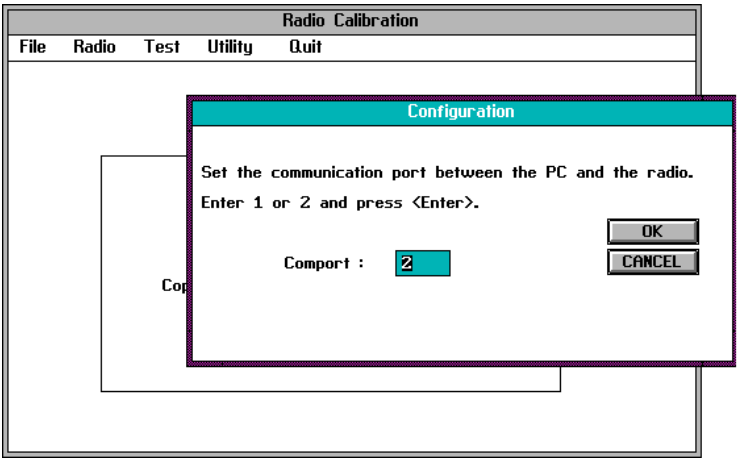
Choose **Print** from the **Utility** menu and the following window appears:



Choose the **Print** button and radio information and test data will be printed.

Configuration

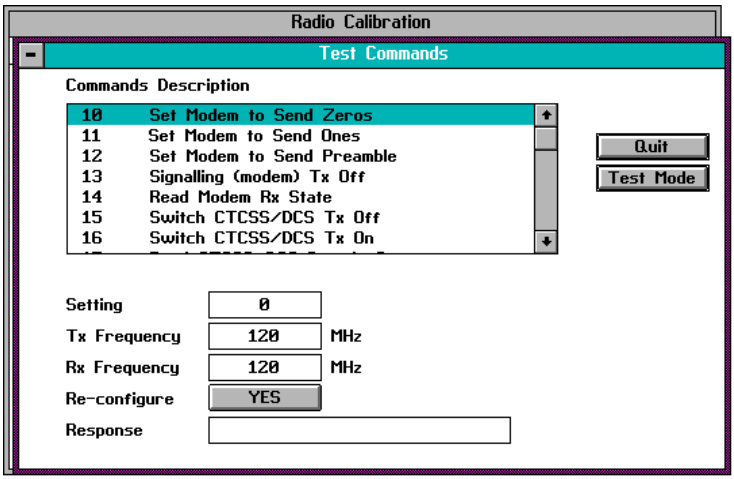
Choose **Configuration** from the **Utility** menu and the following window appears:



This menu allows the COM port connection details to be changed.

Test Commands

Choose **Test Commands** from the **Utilities** menu and the following window appears:



Select a test command and press ENTER (↵).

If either user mode or program mode is required, click on the **Test Mode** button to select either **Test Mode**, **User Mode** or **PGM Mode**.

For commands 110 to 119, the value in the **Setting** window (0 to 255) will be sent to the appropriate control element. After changing the setting value, the desired command must be resent for it to take effect.

For details on the test facilities available, refer to Section 5.2 "Test Facilities" of the M3000-00 Service Manual.

Exiting The Program

From the main menu select **Quit**. Click on **OK** to exit the program or **CANCEL** to return to the main menu.

Selecting **F4** at any time will also exit you from the calibration program.

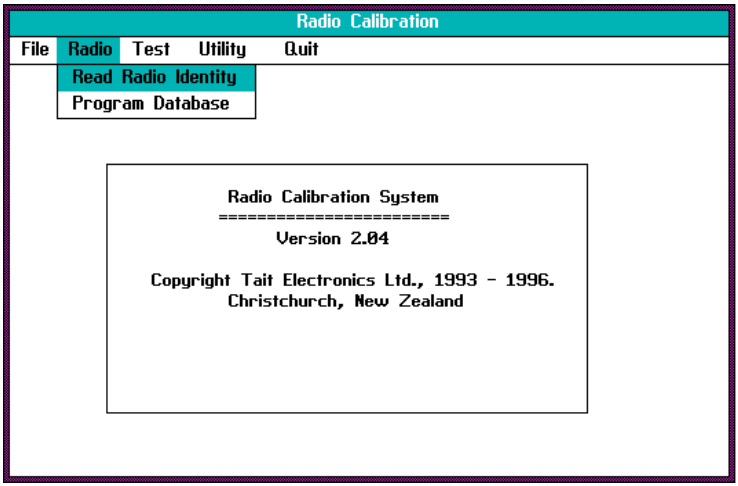
3 Calibration Procedures

This chapter covers the following topics:

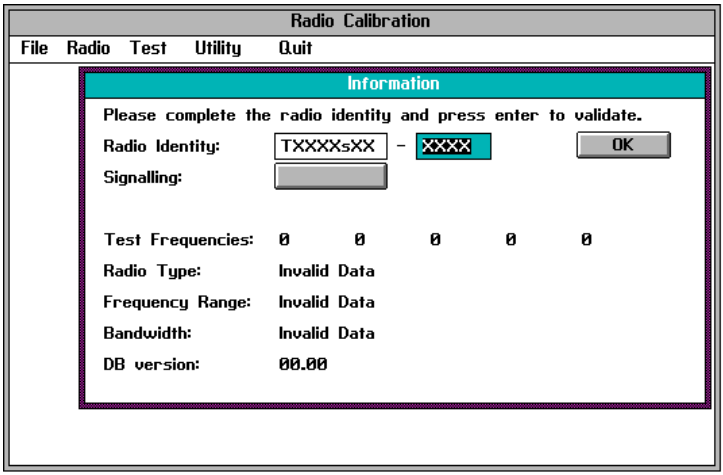
- Reading The Radio Identity
- Full Calibration
- TCXO Output Frequency
- Power Control Test
- Balance Adjust Test
- Maximum Deviation Adjustment
- Front End Tuning
- Maximum Volume Threshold
- Squelch
- RSSI Thresholds (T3030, T3035 & T3040 Radios Only)
- Battery Thresholds

Reading The Radio Identity

Press ALT then select **Radio** from the main menu, and the following window appears:



Select **Read Radio Identity**, and the following window appears:



Enter the last 4 characters of the 8 character T-code. This is found on the radio identity label on the rear cover of the radio.

Press ENTER (↵), and the information on the screen is then updated.

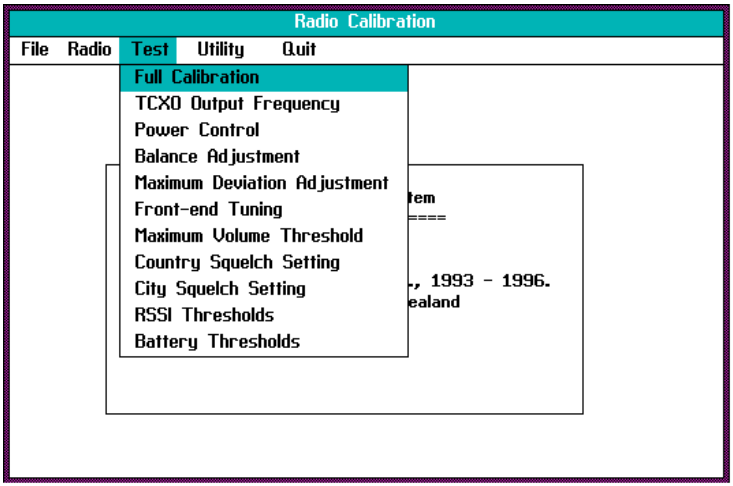
Note The first 4 digits of the radio identity are programmed using T3000 programming software. This must be programmed prior to calibration.

Click on the **Signalling** button and select either **CTCSS** (T3030, T3035 and T3040 only), **Selcall** or **No** (none).

Choose the **OK** button to exit to the main menu.

Full Calibration

From the main menu, select **Test** and the following window appears:



Select **Full Calibration** from the **Test** menu.

The program will now step the user through the calibration tests automatically, displaying commands on the screen at the beginning of each test. If a full calibration is not required, individual parameters may be selected for calibration and test in the **Test** menu.

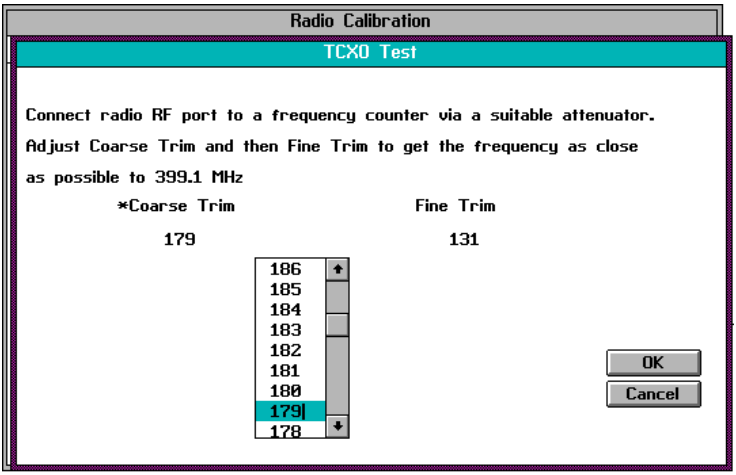
The **Program Database** window will appear automatically at the completion of a full calibration.

Note After full calibration or when individual tests have been carried out, it is necessary to enter the new data into the radio's database to complete the calibration or test procedure (refer to "Program Database"). The **Program Database** window will only appear automatically at the completion of a full calibration.

TCXO Output Frequency

The T3000 is a synthesised radio, phase locked to a high stability TCXO. The TCXO needs careful alignment to ensure that the transmitter and receiver are on frequency.

Select **TCXO Output Frequency** from the **Test** menu and the following window appears:



Connect the RF output of the radio to the frequency counter via the attenuator.

Adjust the **Coarse Trim** DAC, while monitoring the frequency counter.

Set the frequency as close as possible to the required frequency and press ENTER (↵).

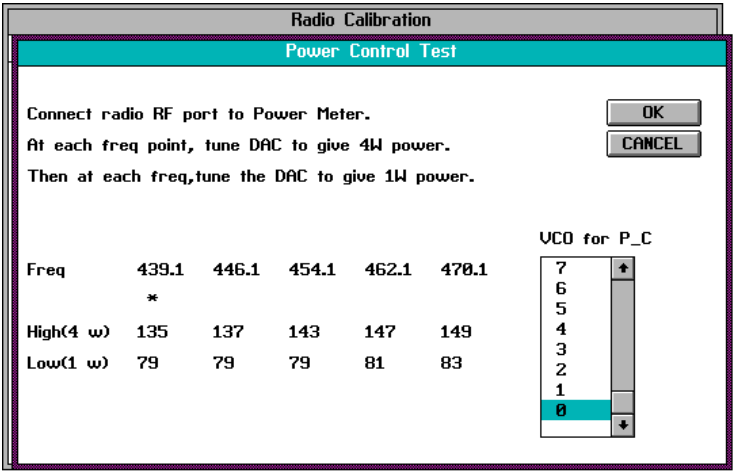
On pressing ENTER (↵), **Fine Trim** is selected. Set the frequency as accurately as possible, then press ENTER (↵).

Choose the **OK** button.

Power Control Test

The power control must be set for both high and low power at five points across the frequency band of the radio. This ensures a flat power output across the operating band.

Select **Power Control** from the **Test** menu and the following window appears:



With the RF output of the radio connected to the power meter, the radio is set to transmit at each of the five points in the band.

Adjust the power control DAC so that the radio output power is set as closely as possible to the maximum rated power (5W VHF, 4W UHF and Band III).

Press ENTER (↵) after each setting and repeat this process for low power setting (1W).

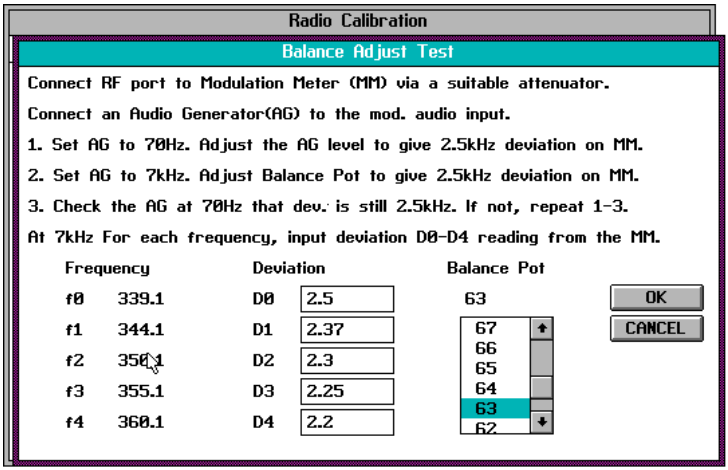
Choose the **OK** button.

Note It is recommended that the lead to the power meter is kept as short as possible to achieve best accuracy.

Balance Adjust Test

The modulation balance adjustment ensures a flat modulation response across the frequency band of the radio.

Select **Balance Adjustment** from the **Test** menu and the following window appears:



Connect the RF output of the radio to the modulation meter via the attenuator.

Set the audio generator to 70Hz, set the test unit 'Tx Audio' switch to 'Mod Audio' and increase the audio generator output level to give ±2.5kHz deviation.

Increase the audio generator frequency to 7kHz without changing the output level. Adjust the **Balance Pot** to give ±2.5kHz deviation and press ENTER (↵).

Reset the audio generator frequency to 70Hz and repeat the previous two steps until the deviation at 70Hz and 7kHz is the same, then set the audio generator to 7kHz.

On pressing ENTER (↵), the first frequency step is selected. Type in the deviation reading observed on the modulation meter and press ENTER (↵).

Type in the next 4 deviation readings, pressing ENTER (↵) after each entry.

Note Using TAB to move to the next entry point will not change the data.

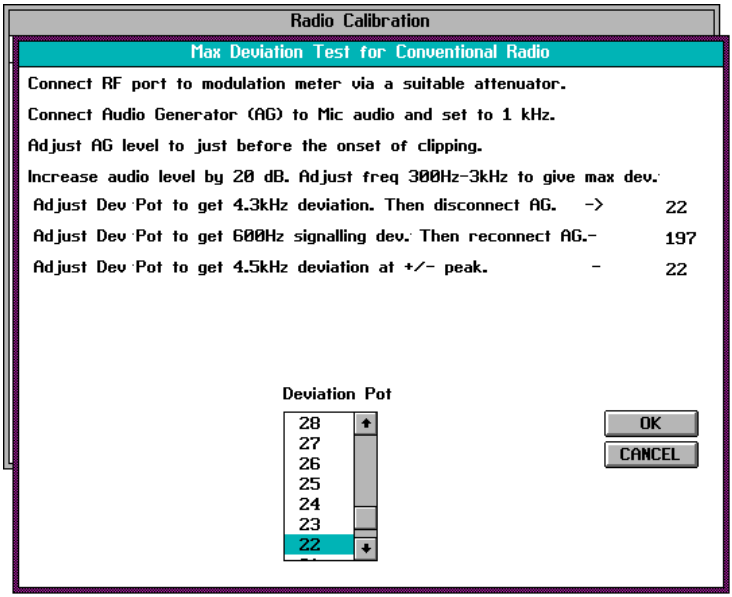
When all readings have been entered, choose the **OK** button.

Maximum Deviation Adjustment

In this Chapter, deviation settings are given first for wide band, followed by settings for medium band in brackets ( ) and settings for narrow band in square brackets [ ].

T3010 & T3020 Radios - No Selcall

Select **Maximum Deviation Adjustment** from the **Test** menu, and the following window appears:



Set the audio generator to 1kHz and set the test unit 'Tx Audio' switch to 'Mic Audio'.

Observe the demodulated waveform on the oscilloscope and adjust the audio generator level until the peaks of the waveform just begin to flatten (about 3mV).

Increase the audio level by 20dB and vary the audio generator frequency between 300Hz and 3kHz to find the frequency of maximum deviation.

Adjust the **Deviation Pot** to give ±4.3kHz deviation and press ENTER (↵).

Set the test unit 'Tx Audio' switch to the off position.

To set the signalling deviation, adjust the **Deviation Pot** to give ±600Hz deviation and press ENTER (↵).

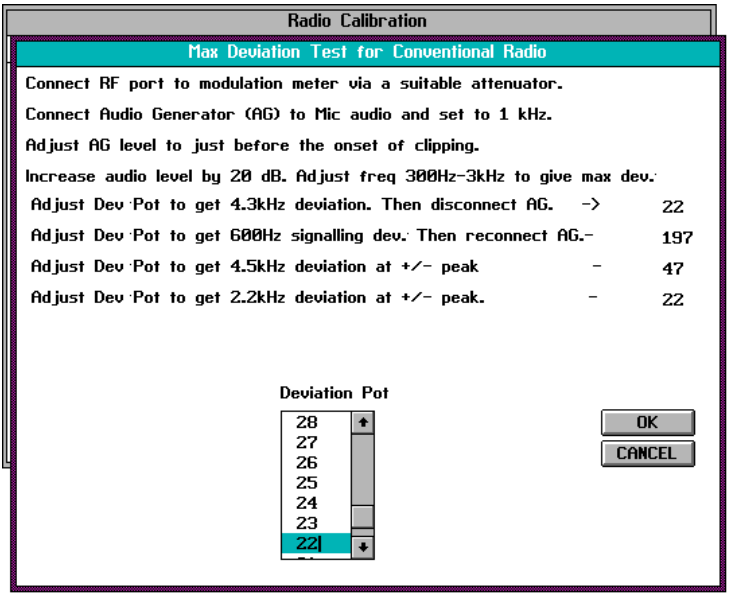
Set the test unit 'Tx Audio' switch to 'Mic Audio'.

Readjust the **Deviation Pot** for ±4.5kHz (±3.6kHz) [±2.2kHz] deviation at the frequency of maximum deviation, and press ENTER (↵).

Choose the **OK** button.

T3020-XX2X Programmable Bandwidth Radios

There is one additional step in the test procedure, as shown:

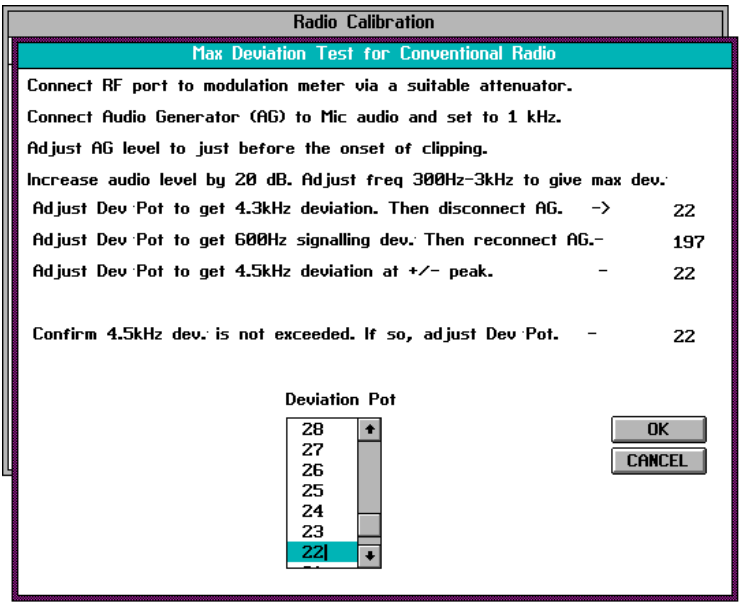


Readjust the **Deviation Pot** for ±2.2kHz deviation at the frequency of maximum deviation, and press ENTER (↵).

Choose the **OK** button.

T3010 & T3020 Radios - With Selcall

Select **Maximum Deviation Adjustment** from the **Test** menu, and the following window appears:



Set the audio generator to 1kHz and set the test unit 'Tx Audio' switch to 'Mic Audio'.

Observe the demodulated waveform on the oscilloscope and adjust the audio generator level until the peaks of the waveform just begin to flatten (about 3mV).

Increase the audio level by 20dB and vary the audio generator frequency between 300Hz and 3kHz to find the frequency of maximum deviation.

Adjust the **Deviation Pot** to give ±4.3kHz deviation and press ENTER (↵).

Set the test unit 'Tx Audio' switch to the off position.

To set the signalling deviation, adjust the **Deviation Pot** to give ±600Hz deviation and press ENTER (↵).

Set the test unit 'Tx Audio' switch to 'Mic Audio'.

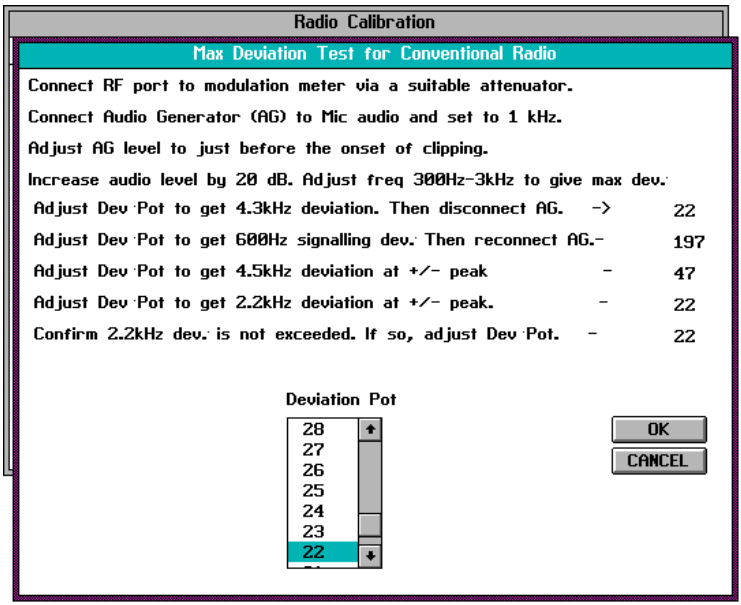
Readjust the **Deviation Pot** for ±4.5kHz (±3.6kHz) [±2.2kHz] deviation at the frequency of maximum deviation, and press ENTER (↵).

Sweep the frequency band between 300Hz and 3kHz and check that ±4.5kHz (±3.6kHz) [±2.2kHz] is not exceeded at any frequency.

Choose the **OK** button.

T3020-XX2X Programmable Bandwidth Radios

There are 2 additional steps in the test procedure, as shown:



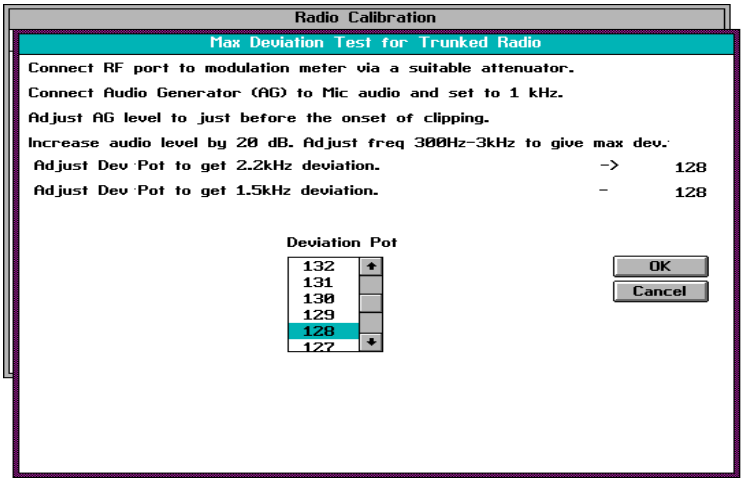
Readjust the **Deviation Pot** for ±2.2kHz deviation at the frequency of maximum deviation, and press ENTER (↵).

Sweep the frequency band between 300Hz and 3kHz and check that ±2.2kHz is not exceeded at any frequency.

Choose the **OK** button.

T3030, T3035 & T3040 Radios

Select **Maximum Deviation Adjustment** from the **Test** menu and the following window appears:



Set the audio generator to 1kHz and set the test unit 'Tx Audio' switch to 'Mic Audio'.

Observe the demodulated waveform on the oscilloscope and adjust the audio generator level until the peaks of the waveform just begin to flatten.

Increase the audio level by 20dB and vary the audio generator frequency between 300Hz and 3kHz to find the frequency of maximum deviation.

Adjust the **Deviation Pot** to give ±4.5kHz (±3.6kHz) [±2.2kHz] deviation and press ENTER (↵).

Note If CTCSS is enabled, adjust the **Deviation Pot** to give ±4.3kHz (±3.5kHz) [±2.1kHz] deviation instead, and press ENTER (↵).

An FFSK tone will then be transmitted.

Adjust the **Deviation Pot** for ±3.0kHz (±2.4kHz) [±1.5kHz] deviation at the frequency of maximum deviation, and press ENTER (↵).

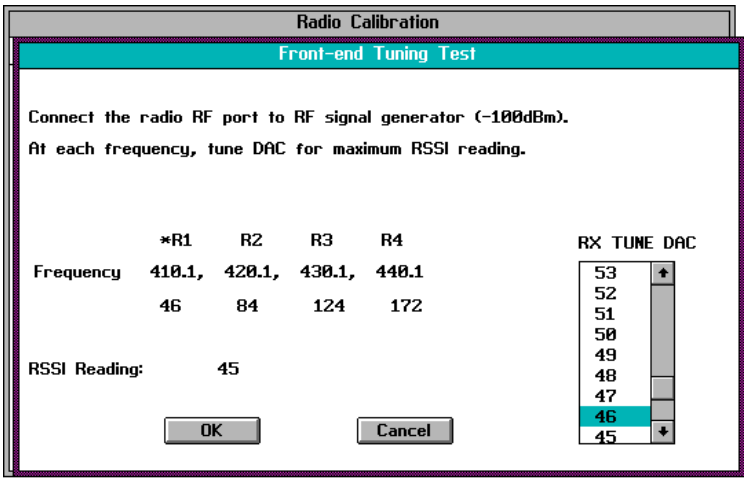
Choose the **OK** button.

Front End Tuning

The T3000 receiver front end is electronically tuned and during calibration is set to give maximum sensitivity at five points across the frequency band.

Note The TCXO output frequency must be set accurately *before* tuning the front end.

Select **Front-End Tuning** from the **Test** menu and the following window appears.



Connect the RF output of the radio to the RF signal generator via the attenuator. Connect the 'Sinad' audio output on the test unit to the sinad meter.

Set the signal generator to the required frequency with modulation set for ±3.0kHz (±2.4kHz) [±1.5kHz] deviation at 1kHz AF and an output level of -100dBm at the radio.

Tune the **Rx Tune DAC** to achieve an approximately maximum RSSI reading and press ENTER (↵).

A "warning" window appears while the calibration software maximises this result. When the window disappears, an asterisk appears beside the next frequency.

Set the signal generator to this frequency and tune the **RX Tune DAC** as before.

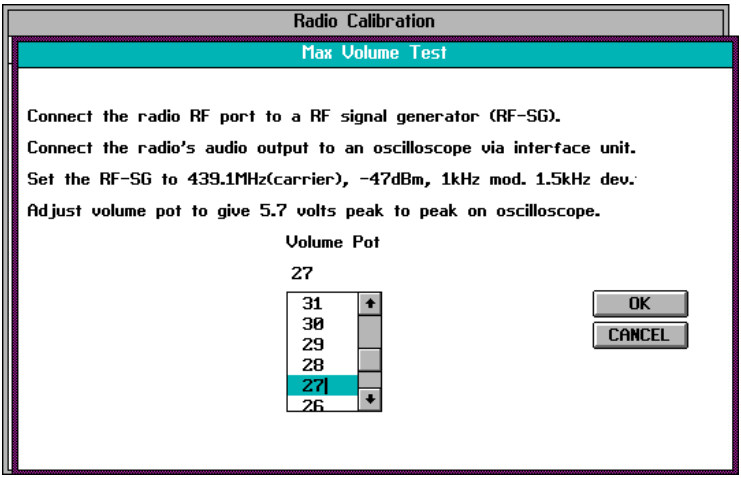
Repeat these two steps for each successive frequency, and choose the **OK** button.

Note If the data input for R1 or R2 is incorrect, the R0 data (calculated from R1 and R2) will be invalid, and an error message appears. It will then be necessary to reset the R1 and R2 values.

Maximum Volume Threshold

The maximum volume threshold is set to ensure that the T3000 speaker is not overdriven (no audible distortion).

Select **Maximum Volume Threshold** from the **Test** menu and the following window appears:



Connect the RF output of the radio to the RF signal generator via the attenuator and connect the 'Sinad' audio output on the test unit to the oscilloscope.

Set the signal generator to the frequency shown in the test window, with modulation set for ±3.0kHz (±2.4kHz) [±1.5kHz] deviation at 1kHz AF and an RF level of -47dBm at the radio.

Adjust the **Volume Pot** to give 5.7Vp-p on the oscilloscope and press ENTER (↵).

Choose the **OK** button.

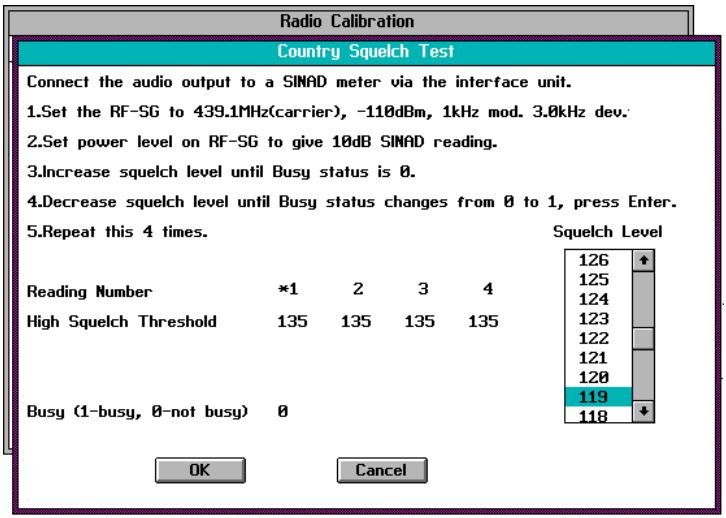
Squelch

There are 2 programmable squelch settings for T3010 and T3020 radios. These are 'country' and 'city' squelch, and correspond to nominal settings of 10dB and 16dB sinad respectively.

T3010 & T3020 Non Programmable Bandwidth Radios

Country Squelch

Select **Country Squelch Setting** from the **Test** menu and the following window appears:



Connect the RF output of the radio to the RF signal generator via the attenuator. Connect the 'Sinad' audio output on the test unit to the sinad meter.

Set the signal generator to the frequency shown in the test window, with modulation set for ±3.0kHz (±2.4kHz) [±1.5kHz] deviation at 1kHz AF and an output level to give a 10dB sinad.

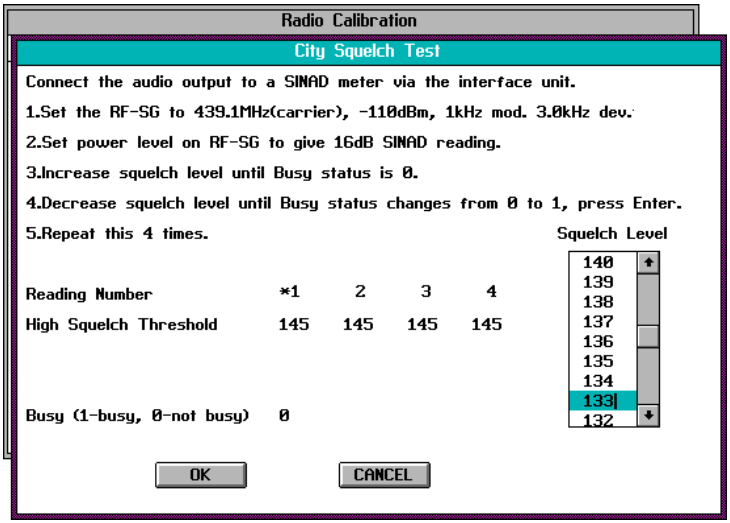
Increase the **Squelch Level** DAC until the **Busy** status is '0'.

Decrease the squelch setting until the **Busy** status changes from '0' to '1', then press ENTER (↵).

Repeat 3 more times and choose the **OK** button.

City Squelch

Select **City Squelch Setting** from the **Test** menu and the following window appears:



Connect the RF output of the radio to the RF signal generator via the attenuator. Connect the 'Sinad' audio output on the test unit to the sinad meter.

Set the signal generator to the frequency shown in the test window, with modulation set for ±3.0kHz (±2.4kHz) [±1.5kHz] deviation at 1kHz AF and an output level to give a 16dB sinad.

Increase the **Squelch Level** DAC until the **Busy** status is '0'.

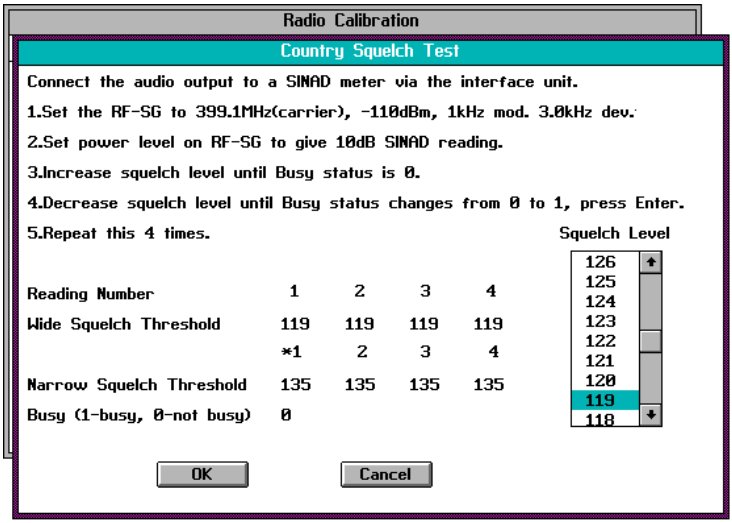
Decrease the squelch setting until the **Busy** value changes from '0' to '1', then press ENTER (↵).

Repeat 3 more times and choose the **OK** button.

T3020-XX2X Programmable Bandwidth Radios

Country Squelch

Select **Country Squelch Setting** from the **Test** menu and the following window appears:



Connect the RF output of the radio to the RF signal generator via the attenuator. Connect the 'Sinad' audio output on the test unit to the sinad meter.

Set the signal generator to the frequency shown in the test window, with modulation set for ±3.0kHz deviation at 1kHz AF and an output level to give a 10dB sinad.

Increase the **Squelch Level** DAC until the **Busy** status is '0'.

Decrease the squelch setting until the **Busy** status changes from '0' to '1', then press ENTER (↵).

Repeat 3 more times, then press ENTER (↵).

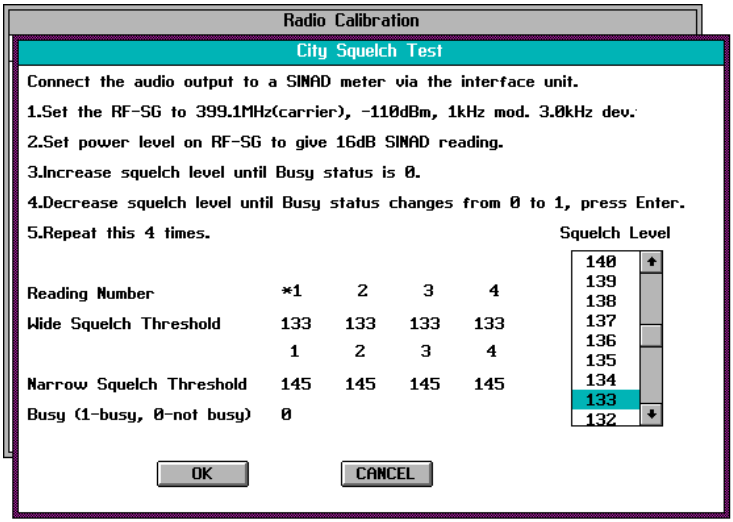
Set the signal generator modulation to ±1.5kHz deviation at 1kHz AF, adjust the output level to give a 10dB sinad.

Decrease the squelch setting until the **Busy** status changes from '0' to '1', then press ENTER (↵).

Repeat 3 more times, and choose the **OK** button.

City Squelch

Select **City Squelch Setting** from the **Test** menu and the following window appears:



Connect the RF output of the radio to the RF signal generator via the attenuator. Connect the 'Sinad' audio output on the test unit to the sinad meter.

Set the signal generator to the frequency shown in the test window, with modulation set for ±3.0kHz deviation at 1kHz AF and an output level to give a 16dB sinad.

Increase the **Squelch Level** DAC until the **Busy** status is '0'.

Decrease the squelch setting until the **Busy** value changes from '0' to '1', then press ENTER (↵).

Repeat 3 more times, then press ENTER (↵).

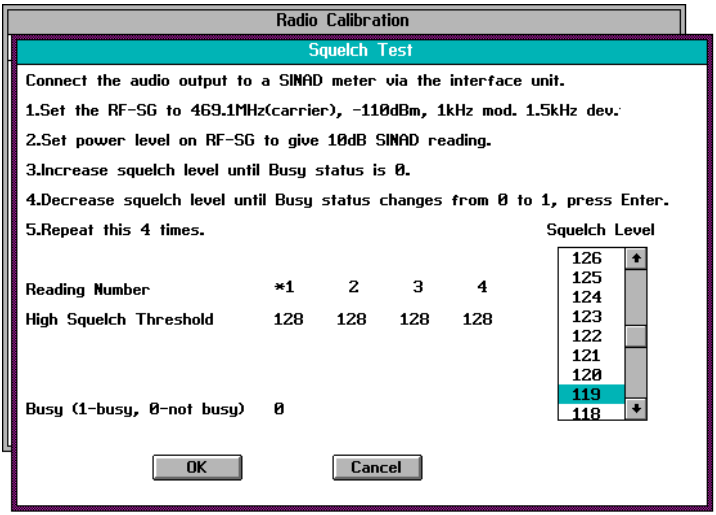
Set the signal generator modulation to ±1.5kHz deviation at 1kHz AF, adjust the output level to give a 16dB sinad.

Decrease the squelch setting until the **Busy** value changes from '0' to '1', then press ENTER (↵).

Repeat 3 more times, and choose the **OK** button.

T3030, T3035 & T3040 Radios

Select **Country Squelch Setting** from the **Test** menu and the following window appears:



Connect the RF output of the radio to the RF signal generator via the attenuator. Connect the 'Sinad' audio output on the test unit to the sinad meter.

Set the signal generator to the frequency shown in the test window, with modulation set for ±3.0kHz (±2.4kHz) [±1.5kHz] deviation at 1kHz AF and an output level to give a 10dB sinad.

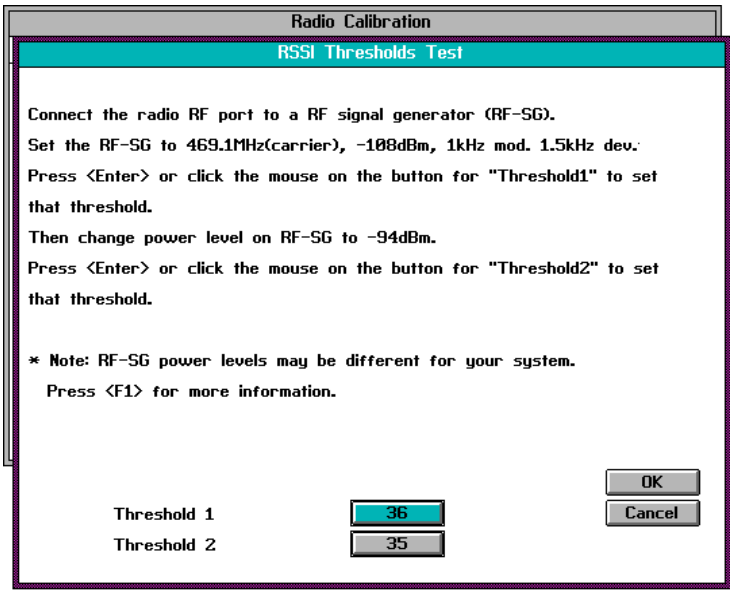
Increase the **Squelch Level** DAC until the **Busy** status is '0'.

Decrease the squelch setting until the **Busy** value changes from '0' to '1', then press ENTER (↵).

Repeat 3 more times and choose the **OK** button.

RSSI Thresholds (T3030, T3035 & T3040 Radios Only)

Select **RSSI Thresholds** from the **Test** menu and the following window appears:



Connect the RF output of the radio to the RF signal generator via the attenuator. Connect the 'Sinad' audio output on the test unit to the sinad meter.

Set the signal generator to the frequency shown in the test window, with modulation set for ±3.0kHz (±2.4kHz) [±1.5kHz] deviation at 1kHz AF and an RF level of -108dBm at the radio.

Press ENTER (↵) to set RSSI Threshold 1. Threshold 2 is now selected.

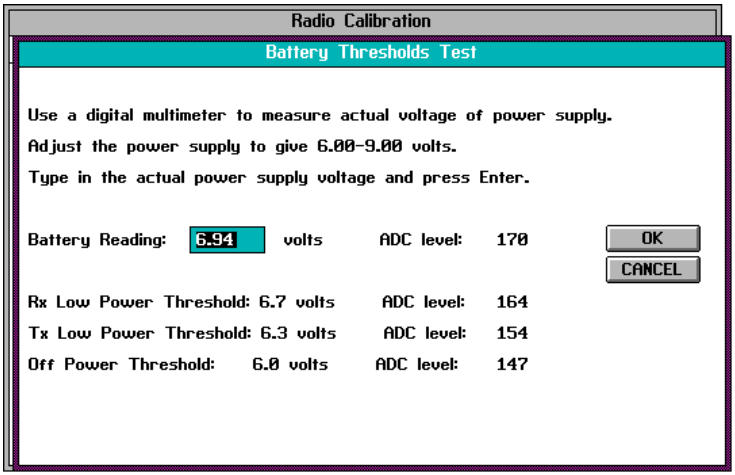
Set the signal generator output to -94dBm and press ENTER (↵) to set RSSI Threshold 2.

Choose the **OK** button.

Battery Thresholds

This test allows the radio to recognise the battery levels at which transmit or receive operation is marginal. These levels are used to give the 'battery low power' and 'off power' warnings.

Select **Battery Thresholds** from the **Test** menu and the following window appears:



Adjust the power supply to give between 6 and 9V (normal battery voltage is 7.2V).

Using the digital multimeter, measure the power supply output voltage to 2 decimal places.

Type in the measured voltage and press ENTER (↵). The **Rx Low Power**, **Tx Low Power** and **Off Power** threshold levels are now automatically updated.

Choose the **OK** button.

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