

# Part 1: Using the Conventional Programming Application

This part describes the basic operation of the Conventional Programming Application.

## Topics

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# Getting Started

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This application provides an easy way of changing settings and features of Tait Orca portable radios using a standard IBM-compatible PC.

This manual is intended as an installation guide and reference for the Conventional Programming Application. It provides the following information:

- installation instructions and hardware setup
- an overview of the Conventional Programming Application
- reference guide to all parameters and settings

## Minimum System Requirements

The application requires the following minimum configuration:

- an IBM compatible PC with an 80486 microprocessor (or better)
- Windows® 95, Windows 98, Windows 2000 or Windows NT® 4
- 16 MB of RAM
- a VGA colour graphics display
- a hard disk drive with 8 MB of free space (20 MB Recommended)
- CD-ROM drive
- a printer (if you intend to keep a hard copy of data)
- a Microsoft or compatible mouse and driver (if you wish to use the program with a mouse)

## Equipment Supplied

- application CD-ROM
- radio programming lead with an RJ-11 telephone-style socket at one end and an accessory connector at the other (TOPA-SV-007)
- radio programming cable with a 9-pin or 25-pin serial connector at one end and an RJ-11 telephone-style plug at the other

## Application Installation

To install the application:

1. Insert the CD-ROM into your CD drive.
2. If the autorun does not automatically start, double-click on My Computer.

3. Double-click on the CD-ROM drive to view the CD's contents.
4. Double-click on the file setup.exe.

The installation program will guide you through the installation process. Read the information presented on the screen carefully.

## Connecting a Radio to the PC

To connect the radio to the PC:

1. Connect the programming cable to the programming lead.
2. Connect the accessory connector to the radio.
3. Connect the serial connector to the computer's serial port.

Plug the serial connector into one of the COM ports. You can specify the COM port the application uses to communicate with the radio using the [File>Preferences](#) command.

Once connected, the radio must be switched on before it can be programmed. To ensure the radio does not switch itself off during the session, use a fully-charged battery or a DC service adaptor (TOPA-SV-005).

*If your serial connector is 25-pin and your computer has a 9-pin serial port, you will need an adaptor cable. This is available from your PC dealer.*

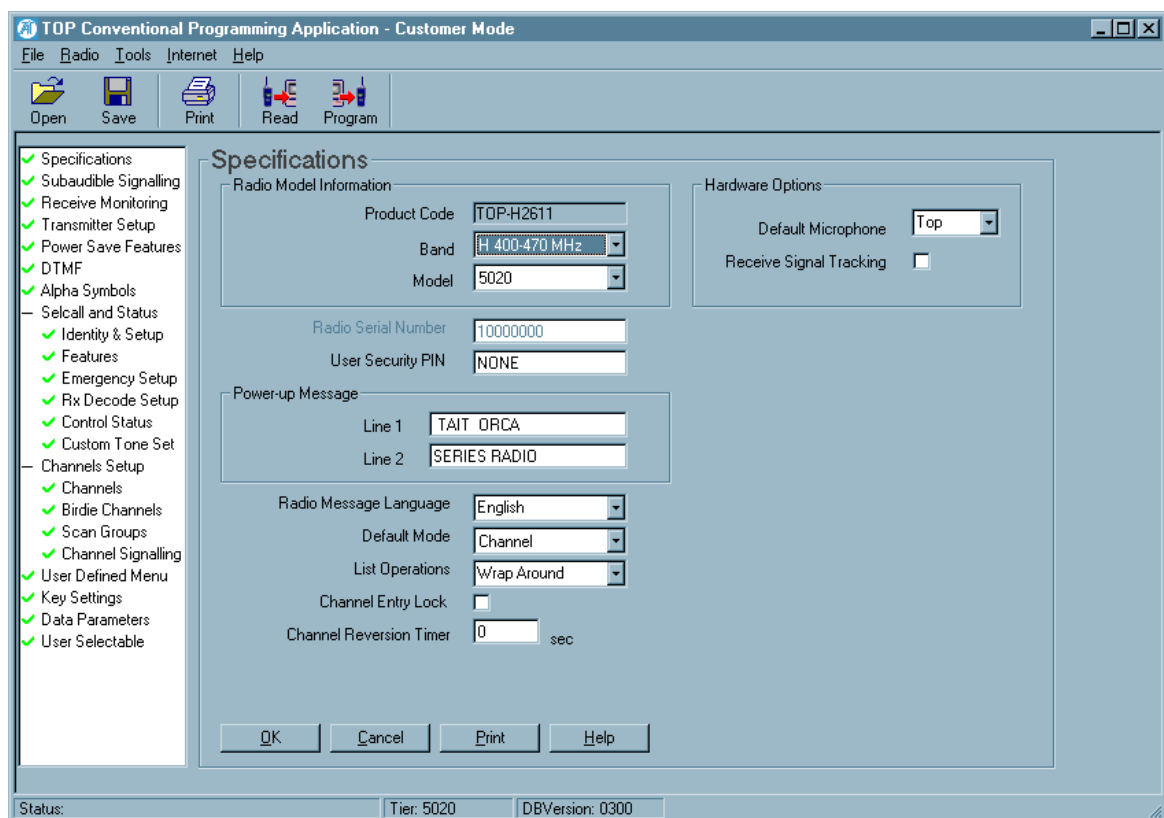
# Conventional Programming Application Basics

When you first start the Conventional Programming Application, the main window appears showing:

Menus: A series of menus along the top of the window.  
See “[Menu Commands](#)” on page 15.

Toolbar: A toolbar with a series of buttons. See “[The Toolbar](#)” on page 20.

Forms tree: A list of forms. See “[The Forms Tree](#)” on page 20.



Before changing any radio settings you can:

- [read a radio](#) or
- [open a radio programming database that has been saved to disk](#) or
- [create a new radio programming database file](#)

Press the F1 key for context-sensitive help.

## Reading a Radio

To read a radio, the radio must first be connected to the PC.  
Once the radio is connected:

select [Radio>Read](#) or

select the Read button from the tool bar

As the programming database is read from the radio, the application indicates the radio type and tier, and the database, hardware and software version numbers. If you get an error indicating that the correct COM port is not selected, you can change the COM port by selecting the [File>Preferences](#) command.

Once the radio's programming database has been read, you can begin changing data. Click on the name of a form in the forms tree. See "[The Forms Tree](#)" on page 20 for more information.

## Opening a Radio Programming Database

To open a radio [programming database](#) file saved to disk:

select [File>Open](#) or

select the Open button from the tool bar

Once the data has been loaded, you can begin changing data. Click on the name of a form in the forms tree. See "[The Forms Tree](#)" on page 20 for more information.

## Creating a New Database

To create a new database when you first launch the application, start changing the default data in the various forms. See "[The Forms Tree](#)" on page 20 for more information.

To begin a new database from an existing database, select [File>New](#).

To save the database, select [File>Save](#).

# The Application Interface

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The application interface consists of:

Menus: A series of menus along the top of the window. See [“Menu Commands” on page 15](#).

Toolbar: A series of buttons. See [“The Toolbar” on page 20](#).

Forms tree: A list of forms. See [“The Forms Tree” on page 20](#).

## Menu Commands

The bar along the top of the main window shows the following menus:

[File](#)

[Radio](#)

[Tools](#)

[Internet](#)

[Help](#)

Keyboard: Select a menu by pressing the Alt key, then the first letter of the menu’s name. Use the up and down arrow keys to scroll through the list of commands, and press the Enter key to select a command. Select another menu using the left and right arrow keys. Press the Esc key to close a menu; the menu bar remains selected. Press the Esc key again to return to the main window.

Mouse: Select a menu by clicking on it, then clicking on the required command.

## File Menu

The commands available from the File menu are:

[New](#)

[Open](#)

[Save](#)

[Printer Settings](#)

[Print](#)

[Preferences](#)

[Exit](#)

### **New**

Selecting the File>New command loads the application’s default data. Warning: default data should not be programmed to a radio.

## **Open**

Selecting the File>Open command opens an existing file.

If a file was saved with comments, the comments will be displayed in the Comments window and the radio information will be displayed in the Radio Information window.

## **Save**

Selecting the File>Save command opens the Save file window. If the file has not previously been saved, the application uses the radio's serial number to suggest a file name.

Any comments you enter in the Comments window will be saved with the file, together with the information displayed in the Radio Information window.

## **Printer Settings**

Selecting the File>Printer Settings command opens the Print Setup dialog in which you can select the printer you wish to print to.

## **Print**

Selecting the File>Print command opens the Print Selections window. You can then select one or more forms using the > button (select highlighted form) or >> button (select all forms), and print data in those forms using the Print button.

If you wish to print data from the current form only, you can select the Print button at the bottom of that form.

## **Preferences**

Selecting the File>Preferences command opens the Preferences form. The options are:

[Select Application Language](#)

[Communication Port](#)

[WWW Addresses](#)

Select the Advanced button to change Advanced Options, which are:

[Startup Mode](#)

[Prompt to warn about losing data on read/write](#)

[Highlight factory only fields as they become editable](#)

### *Select Application Language*

Select the language the application will be displayed in. Changing the application language will cause the default data file to be loaded, so ensure you save any data files before changing languages.

### *Communication Port*

Select the port used for communicating with radios.



## *WWW Addresses*

If you wish to change the URL used when the options in the **Internet** menu are selected, enter the new information in the appropriate WWW Address field.

Tait World Address: The address used when the Internet>**TaitWorld** command is selected

Tait Support Address: The address used when the Internet>**Tait Support** command is selected

Tait Application Upgrade Address: The address used when the Internet>**Tait Update** command is selected

## *Startup Mode*

The Startup Mode options determine whether the application starts up in Customer or Factory mode.

If you wish to be prompted to run in Factory mode when you launch the application, tick the box. If not, untick the box and select a Default Startup Mode. There are three options:

Save On Exit: The application starts in the mode in which it was last running.

Customer: The application will always start in Customer mode.

Factory: The application will always start in Factory mode. Note that a DBYXY Security Key must be attached to the PC's Parallel Port to run the application in factory mode.

## *Prompt to warn about losing data on read/write*

When this option is ticked, the application will warn you when:

the Radio>**Read** command has been selected and the application's current data will be overwritten

the Radio>**Program** command has been selected and a radio's programming database is about to be overwritten.

If you do not wish to be warned upon selecting these commands, untick this box.

## *Highlight factory only fields as they become editable*

When this option is ticked, factory only fields that can be edited will be displayed as white text on a black background.

## **Exit**

Selecting the File>Exit command exits the application. You will be asked to confirm your decision.

## **Radio Menu**

The commands available from the Read menu are:

[Read](#)

[Program](#)

### **Read**

Selecting the Radio>Read command reads the radio's programming database and loads the relevant information into the application's forms. If there are errors in the programming database, the application will display a log of those errors, including the actions taken to correct the information.

### **Program**

Selecting the Radio>Program command programs the radio's programming database with the settings in the application's forms.

## **Tools Menu**

Selecting another Tait application from the Tools menu launches the application. If the application cannot be found, you will be prompted to locate the executable (\*.exe) file. If you browse for and select a new executable file, the path for that application will be updated and the application will be launched. Next time you select that application from the Tools menu the new path for the executable file will be used.

The other option in the Tools menu is Radio Messages. Selecting the Radio Messages command opens the Radio Messages form. In the Radio Messages form, you can change the display messages that the radio is programmed with. You must enter a password before you can change messages. If you do not have a password, contact your local Tait office.

Select the language for which you wish to change messages. The Description field tells you where the Radio Message is used. Each message is restricted in length; you cannot enter more characters than permitted for a message.

Select the OK button to save the changed radio messages and exit the form or the Cancel button to discard changes and exit the form. Selecting the Restore Original Radio Messages button changes all radio messages to their default values.

## **Internet Menu**

The commands available from the Internet menu are:

[TaitWorld](#)

[Tait Support](#)

[Tait Update](#)

### **TaitWorld**

Selecting the Internet>TaitWorld command launches your default browser and loads the TaitWorld web page. Enter the address used in the [Preferences](#) form (File>Preferences).

### ***Tait Support***

Selecting the Internet>Tait Support command launches your default browser and loads the Tait support request web page. Enter the address used in the [Preferences](#) form (File>Preferences).

### ***Tait Update***

Selecting the Internet>Tait Update command launches your default browser and loads the Tait technical issues web page. Enter the address used in the [Preferences](#) form (File>Preferences).

If you do not have a Username and Password, contact your local Tait office.

## **Help Menu**

The commands available from the Help menu are:

[Contents](#)

[Search For Help On...](#)

[About](#)

For context-sensitive help, press the F1 key.

### ***Contents***

Selecting the Help>Contents command launches the online help, open at the Contents tab.

### ***Search For Help On...***

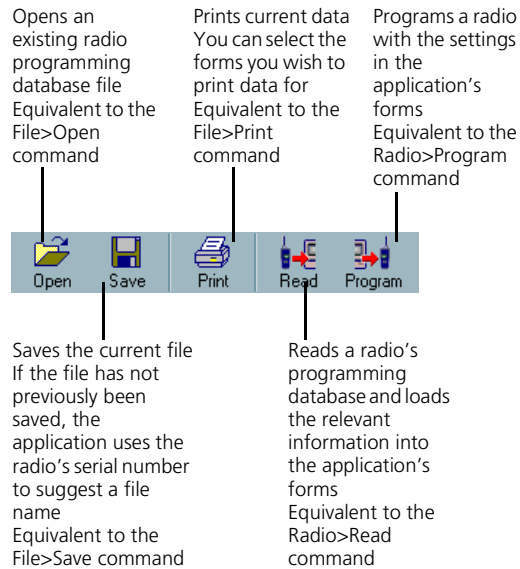
Selecting the Help>Search For Help On... command launches the online help, open at the Search tab.

### ***About***

Selecting the Help>About command displays information about the application.

## The Toolbar

The toolbar commands are as follows.



## The Forms Tree

The forms tree on the lefthand side of the main window lists the forms available.

Two options, Selcall and Status and Channels Setup, have a + beside them. Selecting either option displays additional forms.

**Keyboard:** Scroll through the forms using the up and down arrow keys. Press the Enter key or the spacebar to open the form, or, in the case of the Selcall and Status and Channels Setup options, display additional forms.

**Mouse:** Click on the name of a form to open it and begin changing data, or on the Selcall and Status and Channels Setup options to display additional forms.

The buttons along the bottom of each form are as follows.

**OK:** Saves the form data and exits the form. Pressing the Esc key or Alt-O also saves data and exits the form.

**Cancel:** Discards any changes made and exits the form. Pressing Alt-C also discards changes and exits the form.

**Print:** Sends data from the current form directly to the printer selected in [Printer Settings](#). Pressing Alt-P also prints current data. If you wish to print data in other forms, select File>[Print](#).

**Help:** Displays online help for the form. Pressing F1 or Alt-H also displays online help for the form.

## Changing Data

If a field's data is greyed out, then that data is displayed for information only and cannot be changed. If a field name is greyed out, then that option is not available for the radio being programmed. For information on a field that is greyed out, select the Help button at the bottom of the screen, then select the name of the field you want information on.

Keyboard: Use the Tab key to move between fields.

Mouse: Click on a field.

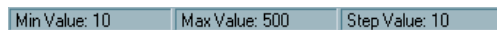
How you change the data for each field depends on how that data is displayed. There are three options:

[text box](#)

[combo box](#)

[tick box](#)

Where a range of possible numeric values is available for a field, then that range is shown in the bottom righthand corner of the form.



## Text Box

A text box is used for numeric and alphanumeric data.

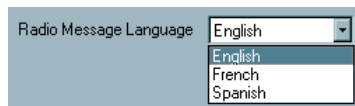


Keyboard: Select a text box using the Tab key. Enter the required data.

Mouse: Select a text box by clicking on it with the mouse. Enter the required data.

## Combo Box

A combo box is used for fields that have a range of possible values and appears as a box with an arrow at the righthand side.

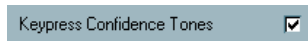


Keyboard: Select a combo box using the Tab key. You can then display the options available by pressing the Alt key and the down arrow key at the same time. Use the up and down arrow keys to scroll through the options until the required value is displayed, then press the Enter key.

Mouse: Select a combo box by clicking on it, which displays the list of values. Select the required value from the combo box.

## Tick Box

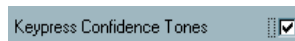
A tick box is used for fields that are either enabled or disabled. If the box is ticked, the field is enabled; if the box is blank the field is disabled.



Keyboard: Select a tick box using the Tab key. Use the spacebar to enable and disable the field.

Mouse: Select a text box and change its value by clicking on it with the mouse.

When the field is selected, a dashed box appears next to the tick box.



## Using Arrays

An array is used where many lines of data are required, each containing the same type of information. The data in an array is displayed in [text boxes](#) and [combo boxes](#). Combo boxes in an array appear to be text boxes until they are selected, when an arrow appears on the righthand side.

Forms that contain arrays also contain additional buttons:

**Add:** Adds a new row enabling data entry. Pressing F2 also adds a new row.

**Insert (Channels form):** Inserts a new row using the next available ID, then reorders all rows by ID number.

**Repeat:** Duplicates the data from the selected row, giving it a new name.

**Delete:** Removes the currently selected row of data. Pressing F3 also deletes the selected row.

Keyboard: Select the different fields in an array using the Tab key or the right and left arrow keys. Pressing the up or down arrow keys moves up or down a row of data.

Mouse: Click on the required field.

## Part 2: Basic Radio Settings

This part contains detailed information on changing basic radio settings.

### Forms

[Specifications Form](#)

[Subaudible Signalling Setup Form](#)

[Receive Monitoring Form](#)

[Transmitter Setup Form](#)





# Specifications Form

The Specifications form shows basic radio information such as the radio model and the frequency band. You can also set various radio interface options in this form, including the [power-up message](#), the [security PIN](#) and the radio message language. The Specifications form is shown below.

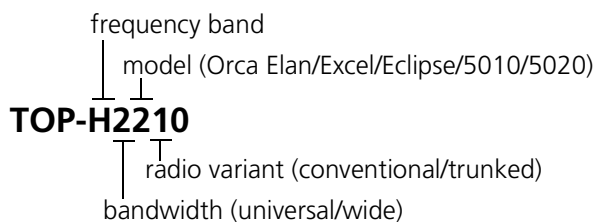
The screenshot shows a 'Specifications' dialog box with the following fields and options:

- Radio Model Information:** Product Code (TOP-H2610), Band (H 400-470 MHz), Model (5020).
- Hardware Options:** Default Microphone (Top), Receive Signal Tracking (checkbox).
- Radio Serial Number:** 10000000
- User Security PIN:** NONE
- Power-up Message:** Line 1 (TAIT ORCA), Line 2 (SERIES RADIO)
- Radio Message Language:** English
- Default Mode:** Channel
- List Operations:** Wrap Around
- Channel Entry Lock:** checkbox
- Channel Reversion Timer:** 0 sec

Buttons at the bottom: OK, Cancel, Print, Help.

## Radio Model Information

The radio model information fields show the radio product code and information contained in the product code (e.g. TOP-H2210) that is particularly relevant to radio programming.



You cannot directly modify the [Product Code](#) field. However, if you change [Band](#) and/or [Model](#), [Product Code](#) is updated to reflect the new values. Fields that are not relevant to the different [Band](#) and/or [Model](#) are automatically set to their default values.

You may wish to read data from a radio of a different type and use the settings as a template for programming radios of

another variant. If so, change the values of [Band](#) and/or [Model](#) after loading the template file but before changing any other radio settings.

## Product Code

The Product Code field is automatically read from the radio's memory and shows the radio's model number, which you can find on the back of the radio. However, if the radio has been upgraded, the model number on the back of the radio will not match that read from the radio.

## Band

The Band field sets the frequency band the radio operates at and is indicated by the fourth position (first after the hyphen) in the [Product Code](#) number.

**TOP-H2210**  
|  
 frequency band

This letter indicates the frequency band as outlined in the table on the right.

The Band field must be set correctly in order to validate channel settings, and changing the value of Band will:

- amend the [Product Code](#) field to reflect the different frequency band
- set the values of [Rx and Tx Frequencies](#) ([Channels](#) form) to 0, as any frequency values previously entered are invalid for the new Band

Band	Frequency Range
A	66-88 MHz
B	136-174 MHz
C	174-225 MHz
D	220-270 MHz
E	270-310 MHz
F	290-340 MHz
G	336-400 MHz
H	400-470 MHz
I	450-530 MHz
J	806-870 MHz
K	896-941 MHz

Note: Contact your local Tait office for information on the availability of different frequency bands.

## Model

The Model field indicates the radio model, which is indicated by the sixth position (third after the hyphen) of the product code.

**TOP-H2210**  
|  
 radio model

- 1 = [Orca Elan](#)
- 2 = [Orca Excel](#)
- 3 = [Orca Eclipse](#)
- 4 = [Orca 5010](#)
- 6 = [Orca 5020](#)
- 7 = [Tait Radio Modem](#)

The Model field must be set correctly as not all programmable features are available for all radio models. Changing the value of Model will:

amend the [Product Code](#) field to reflect the different model

make selectable fields relevant to the new Model that were greyed out for the previous Model

grey-out fields not relevant to the new Model

## Radio Serial Number

The Radio Serial Number is automatically read from the radio's memory. It is used for identification only and so the data in the field is greyed out. The Radio Serial Number has no effect on the normal operation of the radio.

## User Security PIN

The User Security PIN field does not apply to [Orca Elan](#) and [Orca 5010](#) radios.

User Security PIN sets the [PIN number](#) the user is required to enter during the power-up sequence. Enter a number up to five digits long, or NONE if no PIN number is required.

## Power-up Message

The Power-up Message fields set the [power-up message](#), which can be up to 24 characters chosen from:

A to Z 0 to 9 ! @ # \$ % ^ & \* + - = { } ( ) [ ] < > : ; ? | ,  
. \_ " ' space

Enter up to 12 characters in each box, including leading spaces if you want the message to be centred.

Although [Orca Elan](#) and [Orca 5010](#) radios do not display a power-up message, the Power-up Message fields can be programmed as an aid to identifying radios.

## Radio Message Language

The Radio Message Language field does not apply to [Orca Elan](#) or [Orca 5010](#) radios.

The Radio Message Language field sets the language radio messages appear in. Select from the languages listed.

## Default Mode

The Default Mode field sets the mode the radio reverts to at power up and after 10 seconds of no user activity. The modes available and the radios they are available on are outlined in [Table 1 on page 28](#).

If Default Mode is set to NONE, the radio powers up in the mode selected when the radio was last on.

### security PIN

*A security PIN (personal identification number) is a number up to five digits long the user is required to enter when the radio first powers up. When a security PIN is required, the radio displays the message ENTER CODE and then waits for the correct PIN to be entered before displaying the power-up message. The radio cannot be used until the correct PIN has been entered.*

### power-up message

*The power-up message is the message displayed after the radio is turned on.*

Table 1: Default modes available for Tait Orca conventional radios

Option	Elan	Excel	Eclipse	5010	5020	Description
Channel						Channel Entry Mode. In channel entry mode, or channel selection mode, the user can change to a different channel or scan group. Channel entry mode is automatically available on all radios.
DTMF						DTMF Dialling Mode. In DTMF dialling mode, the user can dial DTMF strings. DTMF dialling mode is available when the Manual DTMF Dialling field in the DTMF form is enabled.
Selcall						Selcall Dialling Mode. Using Selcall dialling, the user can dial Selcall sequences using the keypad.
Status						Status Entry Mode. In status entry mode, the radio user can change the status to reflect their current activity. The corresponding status digit is sent with Selcall sequences that include a variable status.
Alpha Symbol						Alphanumeric Entry Mode. In alphanumeric entry mode, the user can select and execute up to 20 alpha symbols.
Menu						User Function Menu Entry Mode. In user function menu entry mode, the user can customise radio options. For Orca Eclipse radios, the user defined menu is set up in the User Selectable Parameters Form. For Orca 5020 radios, the user defined menu is set up in the User Defined Menu Form.
None						No Default Mode. When no default mode has been programmed, the radio powers up in the mode selected when the radio was last on.

## List Operations

The List Operations field does not apply to [Orca Elan](#) and [Orca 5010](#) radios.

The List Operations field determines the behaviour of scrolling lists. There are two options.

**Wrap Around:** The list is treated as a continuous loop, with the first and last entries adjacent. The next entry displayed after the last is the first, and vice versa.

**Stop at End of List:** The list movement stops when the first or last entry is reached.

The setting of List Operations does not apply to volume selection, which is always Stop at End of List.

## Channel Entry Lock

The Channel Entry Lock field applies to [Orca Excel](#) and [Orca 5020](#) radios.

Channel entry lock prevents the user from selecting a new channel from the keypad when a valid channel has already been selected from the [16-way selector](#). When the user tries to enter a new channel, the radio gives a long, low-pitched beep to indicate that the action is invalid.

If channel entry lock is enabled, the radio user needs to change to a position on the 16-way selector for which no channel or [scan group](#) has been programmed in order to select a channel from the keypad. If channel entry lock is enabled and you wish the user to be able to select channels greater than 16 from the keypad, be sure to leave at least of one of positions 1 to 16 blank.

## Channel Reversion Timer

The Channel Reversion Timer field applies only to [Orca Excel](#) and [Orca 5020](#) radios. Set the [channel reversion timer](#) to a time from 10 to 250 seconds in steps of one second.

You can also set this field to 0, which disables the [channel reversion timer](#). Disabling the channel reversion timer is not recommended since it may cause confusion for the user as the channel the radio is on does not always correspond to that indicated by the [16-way selector](#).

## Default Microphone

The setting of the Default Microphone field determines which microphone operates during normal operation. Select Top or Bottom. While the radio is in [handset mode](#), the bottom microphone operates, regardless of the setting of this field.

If the radio being programmed is not capable of supporting this feature, the Default Microphone feature is set to Bottom when the radio is programmed. Radios with a blue function key 1 support this feature.

## Received Signal Tracking

The Received Signal Tracking field sets the [received signal tracking](#) option.

It is recommended that this feature only be enabled when operating universal band radios on a wideband system and where there is noticeable distortion in the received audio due to a frequency offset in the received signal. Enabling received signal tracking improves the quality of the received audio by allowing the radio to track directly onto the received frequency.

### 16-way selector

*The 16-way selector is the larger of the two switches on the top of Orca Elan, Orca Excel, Orca 5010 and Orca 5020 radios. Each position on the 16-way selector can denote a channel or a scan group.*

### channel reversion timer

*The channel reversion timer determines how long the radio remains on a channel selected from the keypad after a period of inactivity. When the channel reversion timer expires, the radio reverts to the channel indicated by the position of the 16-way selector.*

### handset operation

*Tait Orca radios can be operated as a normal radio where the user holds the radio with the microphone about 15 cm away from the mouth or it can be operated like a telephone handset. Handset mode is useful in noisy environments, when privacy is required or in quiet environments when the lowest volume setting seems too loud.*

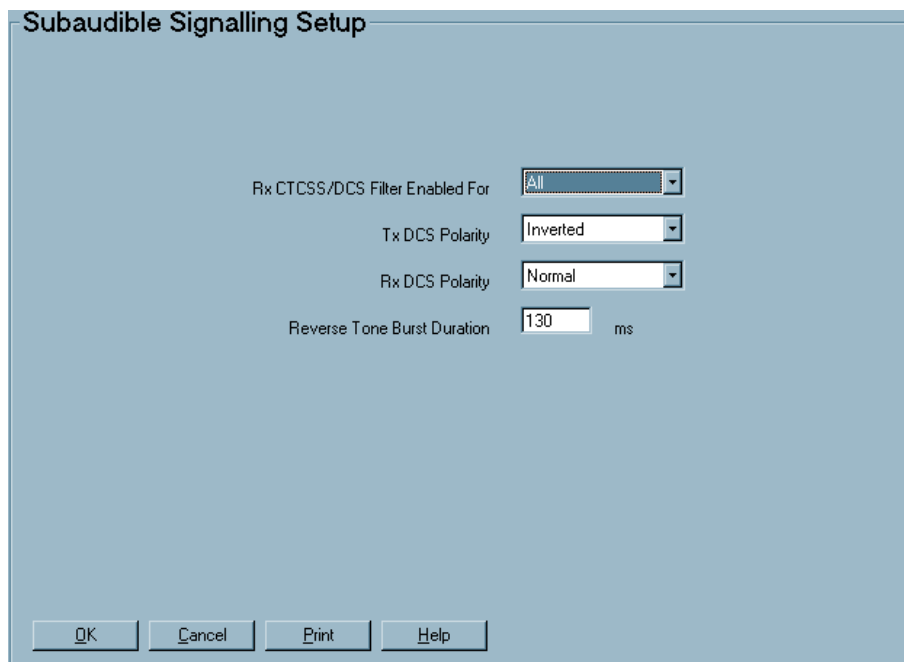
### received signal tracking

*Received signal tracking eliminates any frequency offset between the incoming signal and the radio's receiver, making the radio more tolerant of frequency errors in other radios.*

If the radio being programmed is not capable of supporting this feature, it is disabled when the radio is programmed.

# Subaudible Signalling Setup Form

The fields in the Subaudible Signalling Setup form determine settings for **CTCSS** and **DCS** transmissions. CTCSS and DCS for individual channels are set in the **Channels** form (**Rx** and **Tx Signalling** fields). The Subaudible Signalling Setup form is shown below.



For more information on subaudible signalling, see:

[“Squelch and Signalling: Filtering Out Unwanted Noise and Traffic” on page 129](#)

[“Signalling” on page 130](#)

## Rx CTCSS/DCS Filter Enabled For

The Rx CTCSS/DCS Filter Enabled For field determines the settings for the radio’s **CTCSS/DCS filter**. The filter can be automatically switched off for channels that do not have **CTCSS** or **DCS**.

All: The filter is active on all channels, regardless of whether they are programmed with CTCSS or DCS.

CTCSS/DCS: The filter is active only on channels that have CTCSS or DCS programmed for the receive frequency.

## Tx DCS Polarity

The Tx DCS Polarity field sets the polarity of all transmitted **DCS** codes defined in the **Channels** form. Some systems require the DCS code to be inverted when transmitted. Select Normal or Inverted.

### CTCSS/DCS filter

The CTCSS/DCS filter removes any CTCSS or DCS tones that may be present on the received audio. The filter limits the range of frequencies the radio passes from the incoming signal to the speaker and so in some situations affects signal quality. Filtering can be automatically switched off for channels that do not have CTCSS or DCS.

### DCS polarity

DCS signals are susceptible to polarity inversion at various points in the signal path from originator to recipient. On some systems, consistent inversions can be compensated for by forcing the radio to decode the inverse of every codeword.

## Rx DCS Polarity

The Rx DCS Polarity field sets the polarity of all received DCS codes defined in the Channels form. Select Normal or Inverted.

## Reverse Tone Burst Duration

The Reverse Tone Burst Duration field specifies how long a CTCSS reverse tone burst is transmitted. Reverse tone burst transmission increases the speed of receiver shutdown in some repeaters and associated equipment.

Set a value from 0 to 250 ms in steps of 1 ms. Setting this field to 0 disables reverse tone burst transmission.

The recommended value is 130 ms, which works for all CTCSS tones between 67.0 and 250.3 Hz. It should not be necessary to deviate from 130 ms unless your system has specific requirements.

### **reverse tone burst**

*Reverse tone bursts can be used when CTCSS subaudible signalling is used. When reverse tone bursts are enabled, the phase of the generated tones is reversed for a number of cycles just before transmission ceases, which can increase the speed of receiver shutdown in some repeaters and associated equipment. The phase reversal occurs after any ANI transmission.*



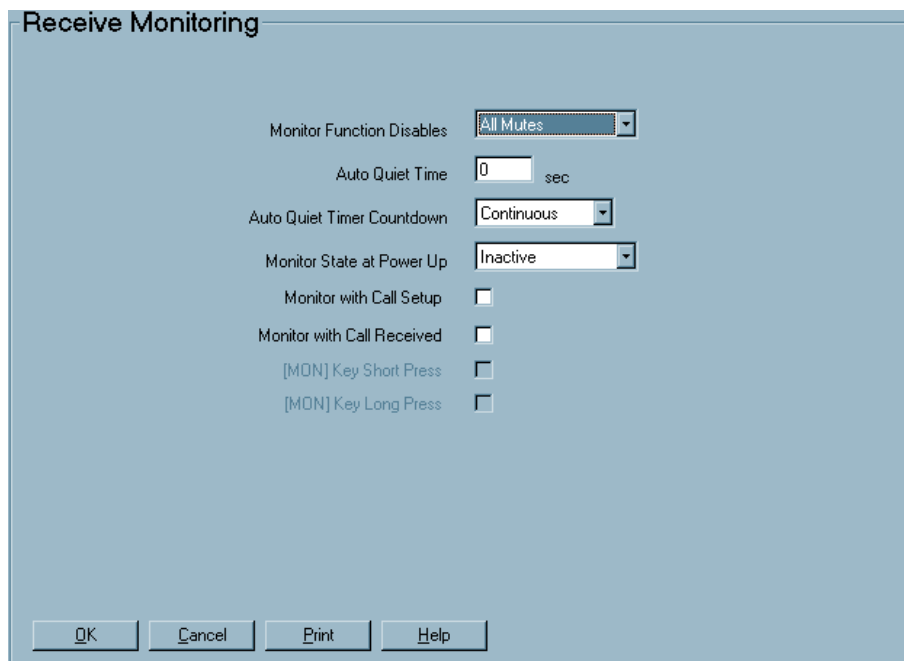
# Receive Monitoring Form

The fields in the Receive Monitoring form set properties related to the operation of the radio's **monitor** function. Four other fields specific to Selcall affect monitor:

[Third Tone Monitor Reset](#) and [Appended C Tone Monitor Reset](#) in the [Selcall Features](#) form

[RMR Sequence](#) and [Selcall Muting](#) in the [Selcall Identity \(Rx\)](#) tab.

The Receive Monitoring form is shown below.



For more information on monitor, see:

[“Monitor: Listening In On Channel Traffic” on page 132](#)

## Monitor Function Disables

The Monitor Function Disables field determines whether **monitor** disables the [Selcall](#) signalling **mute** or the Selcall signalling **mute** and the [subaudible signalling](#) mutes.

**All Mutes:** Both the Selcall signalling mute and the subaudible signalling mute ([CTCSS](#) and [DCS](#)) are disabled when monitor is activated. The radio user is able to hear all traffic.

**Selcall Mute:** Only the Selcall signalling mute is disabled when monitor is activated. The radio user only hears traffic that has valid subaudible signalling.

### **monitor**

*Monitor allows the radio user to override a channel's signalling and so hear all traffic on a channel. Note that monitor is not permitted in some countries.*

### **mute**

*A mute controls the circumstances under which a received signal is passed to the radio's speaker. When a mute is active, the radio's speaker only unmutes under certain conditions, determined by the type of signalling operating on a channel.*

## Auto Quiet Time

The Auto Quiet Time field sets the duration of the [auto quiet timer](#). When the programmed duration of the auto quiet timer expires, [monitor](#) deactivates and the radio resumes quiet operation. Enter a value between 1 and 255 seconds in steps of 1 second, or 0 to disable the auto quiet timer.

## Auto Quiet Timer Countdown

The Auto Quiet Timer Countdown field determines whether the auto quiet timer resets or continues its countdown after being suspended.

Continuous: The auto quiet timer resumes from the point at which it was suspended.

Reset: The auto quiet timer resets to its programmed value ([Auto Quiet Time](#) field) and begins counting down once again.

## Monitor State at Power Up

The Monitor State at Power Up field determines whether [monitor](#) is inactive or active when the radio is turned on.

Active: Monitor is activated when the radio is turned on.

Inactive: Monitor is not activated when the radio is turned on.

## Monitor with Call Setup

The Monitor with Call Setup field determines whether [monitor](#) is activated when an outgoing Selcall call is made.

Enabled: Monitor is activated when a Selcall call is successfully sent.

Disabled: The radio can transmit Selcall calls without activating monitor. Monitor must be activated via another method before communication commences.

Selcall must be enabled ([Enable Selcall](#) field, [Selcall Identity \(Rx\)](#) tab) before this field can be enabled.

## Monitor with Call Received

The Monitor with Call Received field determines whether [monitor](#) is activated when a Selcall call is received that matches one of the radio's RxDecode sequences and has no control status attached.

Enabled: Monitor activates upon the receipt of an appropriate Selcall call.

Disabled: The radio user has to press a radio key to answer the call before monitor is activated.

### auto quiet timer

*The auto quiet timer determines how long monitor remains active. The auto quiet timer is suspended while the radio is transmitting or while there is valid activity on a channel. Once a transmission is complete or when the radio is switched to another channel, the auto quiet timer either begins counting down once again (continuous) or resets to the programmed duration of the auto quiet timer (reset).*

### Rx decode sequence

*The Rx decode sequence is the radio's unique identity on a Selcall system. When the radio's Rx decode sequence is decoded as the receiver identity in an incoming Selcall sequence, the radio recognises the sequence as intended for it and responds appropriately.*

## [MON] Key Short Press

The [MON] Key Short Press field applies only to [Orca Excel](#) and [Orca Eclipse](#) radios.

Enabled: A brief press of the monitor key toggles [monitor](#) on and off.

Disabled: A brief press of the monitor key only disables monitor.

## [MON] Key Long Press

The [MON] Key Long Press field applies only to [Orca Excel](#) and [Orca Eclipse](#) radios.

When [MON] Key Long Press is enabled, a long press of the monitor key activates the [squelch override](#) function. This can be useful where there is activity in marginal areas and the signal is too weak to be reliably heard.

If squelch override is already active when the monitor key is pressed, then squelch override is deactivated and monitor is activated.

### **squelch override**

*Squelch override allows the user to disable the radio's squelch and so hear all activity on a channel, including noise.*

# Transmitter Setup Form

---

Transmitter options are set in the Transmitter Setup form. The Transmitter Setup form is shown below.

Transmitter Setup

Transmit Timer Duration  sec

Transmit Lockout Duration  sec

Tx Inhibit

Repeater Talk Around

OK Cancel Print Help

## Transmit Timer Duration

The Transmit Timer Duration field sets the duration of the [transmit timer](#). Enter a value between 1 and 250 seconds in steps of 1 second, or 0 to disable the transmit timer. However, it is recommended that you do not disable the transmit timer as frequent lengthy transmissions, whether intentional or accidental, could damage the radio's transmitter and can be a nuisance to others. The recommended value is 60 seconds.

Once the transmit timer expires, the radio may be prevented from transmitting for the duration of the transmit lockout timer, which is set in the [Transmit Lockout Duration](#) field.

## Transmit Lockout Duration

The Transmit Lockout Duration field sets the duration of the [transmit lockout](#) timer. Enter a value between 1 and 250 seconds in steps of 1 second, or 0 to disable the transmit lockout timer. The recommended value is 30 seconds.

## Tx Inhibit

The Tx Inhibit field sets the [transmit inhibit](#) conditions. There are three options:

### transmit timer

*The transmit timer determines the longest continuous transmission permitted by a radio. When the transmit timer expires, the radio emits a series of warning tones before returning to the receive state.*

### transmit lockout

*The transmit lockout feature prevents the radio from transmitting once the transmit timer has expired.*

### transmit inhibit

*The transmit inhibit feature determines under what conditions a press of the PTT results in the radio not transmitting.*

None: The radio always transmits when the PTT is pressed, even when there is traffic on the channel.

Busy: The radio does not transmit when the PTT is pressed if there is activity on the channel, whether it is [valid](#) or [invalid](#).

Mute: The radio does not transmit when the PTT is pressed, unless there is [valid activity](#) on the channel. If [monitor](#) has been activated, the radio transmits regardless of valid or invalid activity.

If [Selcall muting](#) has been enabled ([Selcall Tone Options](#) tab) for the channel's [Selcall system](#), then the radio user cannot initiate a call by pressing the PTT, regardless of the setting of Tx Inhibit. A Selcall call initiation (via the press of a function key or the call key) follows the conditions set in Tx Inhibit.

#### **Selcall muting**

*When Selcall muting is enabled, the radio only unmutes when a valid Selcall sequence is received. The radio user cannot initiate calls using the PTT unless monitor is active, but can only make Selcall calls.*

## **Repeater Talk Around**

When the Repeater Talk Around field is enabled, a long press of the channel key ([Orca Excel](#) and [Orca Eclipse](#) radios) activates [repeater talkaround](#). This field must be enabled before [Repeater Talk Around](#) can be assigned to a function key setting ([Key Settings I](#) tab).

#### **repeater talkaround**

*Repeater talk around allows the radio user to bypass repeater operation and so communicate directly with other radios. While repeater talk around is active, all transmissions are made on the receive frequency programmed for the channel.*



# Part 3: Setting Up Channels and Scan Groups

This part contains detailed information on setting up channels and scan groups.

## Forms

[Channels Form](#)

[Birdie Channels Form](#)

[Scan Groups Form](#)

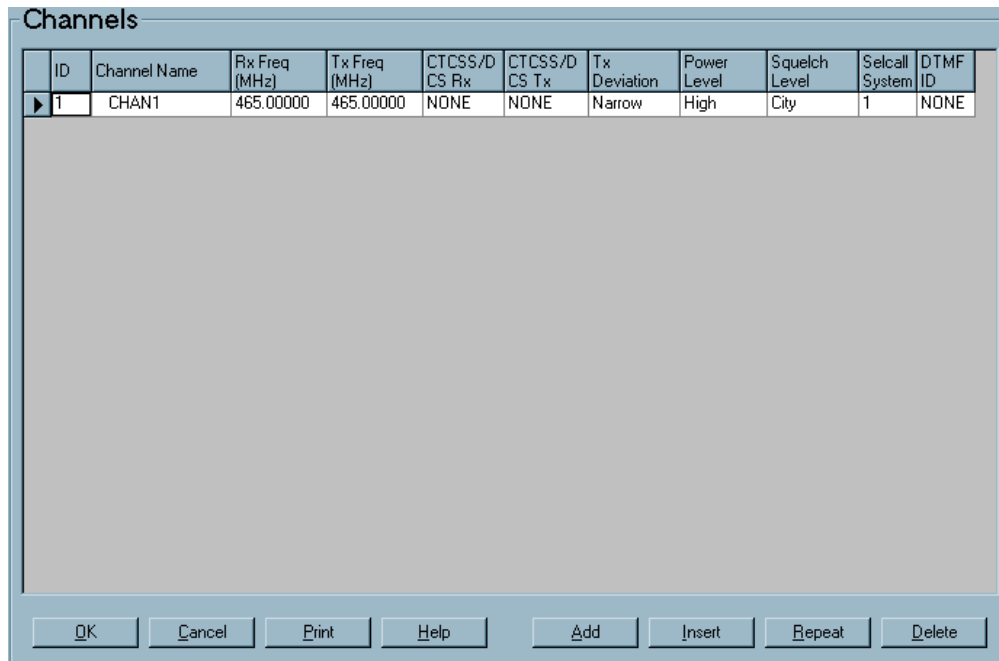
[Channel Signalling Presets Form](#)





# Channels Form

The main settings for [channels](#) are set up in the Channels form. The Channels form is shown below.



The screenshot shows a window titled "Channels" containing a table with the following data:

ID	Channel Name	Rx Freq (MHz)	Tx Freq (MHz)	CTCSS/D CS Rx	CTCSS/D CS Tx	Tx Deviation	Power Level	Squelch Level	Selcall System	DTMF ID
1	CHAN1	465.00000	465.00000	NONE	NONE	Narrow	High	City	1	NONE

At the bottom of the form are buttons for: OK, Cancel, Print, Help, Add, Insert, Repeat, and Delete.

The Channels form contains default values for one channel. Select the Add button or press the F2 key to add a new channel at the end of the list, or the Insert button to insert a new channel then reorder all rows by ID number. Select the Delete button or press the F3 key to delete the currently selected channel, or select the Repeat button to duplicate the current channels settings, except for the Channel ID and Name. You can also access the Add, Insert, Repeat and Delete options by right-clicking on the form.

## channel

*A channel is a pair of radio frequencies, one used for transmitting and one used for receiving.*

The number of channels permitted depends on the [Model](#) as follows:

- [Orca Elan](#): up to 16 channels
- [Orca Excel](#): up to 100 channels
- [Orca Eclipse](#): up to 510 channels
- [Orca 5010](#): up to 16 channels
- [Orca 5020](#): up to 510 channels

The maximum number of channels possible is affected by the number of [Selcall systems](#) programmed.

For more information on channels, see:

[“Squelch and Signalling: Filtering Out Unwanted Noise and Traffic” on page 129](#)

## Channel ID

The Chan ID field sets the channel number, which must be unique. Because channels and [scan groups](#) are both accessed the same way, no channel or group can share the same identity number. Set a Channel ID between 1 and 510.

For [Orca Elan](#), [Orca Excel](#), [Orca 5010](#) and [Orca 5020](#) radios, channels numbered from 1 to 16 are accessible from the [16-way selector](#).

## Channel Name

This field sets the channel name, which appears on the display for [Orca Excel](#), [Orca Eclipse](#) and [Orca 5020](#) radios, when the radio is in channel entry mode.

Enter a name of up to 8 characters from:

A to Z 0 to 9 ! # \$ % ^ & \* + - = { } ( ) [ ] < > : ; ? | , . \_  
" ' space

Ensure that you do not allocate the same name for different channels or scan groups since both are accessed in the same way. A default name is generated from the channel ID. For example, the first channel defaults to CHAN1.

### channel entry mode

*In channel entry mode, or channel selection mode, the user can change to a different channel or scan group. Channel entry mode is automatically available on all radios.*

## Rx and Tx Frequencies

The Rx Freq (MHz) field sets the receive frequency for the channel, and the Tx Freq (MHz) field sets the transmit frequency.

For each [channel](#), enter a frequency within the radio's frequency band that is a multiple of either 5 kHz or 6.25 kHz. The letter in the fourth position (first after the hyphen) in the product code (see the [Specifications](#) form or the back of the radio) indicates the radio's frequency band as outlined in the table below.

Note that the range of frequencies permitted for bands J and K are different for Rx Freq (MHz) and Tx Freq (MHz).

## Rx and Tx Signalling

The CTCSS/DCS Rx field sets the [subaudible signalling](#) the radio must receive before the activity is regarded as valid and the mute opened. The CTCSS/DCS Tx field sets the subaudible signalling that accompanies each transmission made on the channel.

For both fields, select the required CTCSS frequency or DCS code from the drop-down list. Note that when you select a signal from the list for CTCSS/DCS Rx, the CTCSS/DCS Tx field is changed to match CTCSS/DCS Rx. If you wish to use different transmit signalling, select the signal from the list. However, you cannot mix CTCSS and DCS on a channel.

Band	Receive Frequency (MHz)	Transmit Frequency (MHz)
A	66-88	66-88
B	136-174	136-174
C	174-225	174-225
D	220-270	220-270
E	270-310	270-310
F	290-340	290-340
G	336-400	336-400
H	400-470	400-470
I	450-530	450-530
J	851-870	806-870
K	935-941	896-941

Leave these fields set to NONE if no subaudible signalling is used on the channel.

If once subaudible signalling has been assigned for a channel you wish to change the signalling type, first set either Rx or Tx Signalling to NONE, then selected the required type of signalling.

The tables on [page 131](#) show the CTCSS frequencies and DCS codes Tait Orca radios support.

## Transmit Deviation

The Tx Deviation field sets the transmitter deviation. It can be set to:

Wide: maximum deviation 5 kHz

Medium: maximum deviation 4 kHz

Narrow: maximum deviation 2.5 kHz. This option is only available if the channel spacing has been set to Universal Band (see below).

Set Tx Deviation according to the system [channel spacing](#). Channel spacing is indicated in the number in the fifth position (second after the hyphen) in the product code (see the [Specifications](#) form or the back of the radio).

1 (Wide Band): The radio can be programmed for operation on 20 and 25 kHz channels only (select a Tx Deviation of Wide or Medium).

2 (Universal Band): The radio can be programmed for operation on 12.5, 20 and 25 kHz channels (select a Tx Deviation of Wide, Medium or Narrow).

## Power Level

The Power Level field sets the transmit power level. Select a power level setting within the limits permitted for the region in which the radio operates.

Off (O): When set to off, the radio cannot transmit on that channel.

Low (L): 1 watt VHF, UHF, 800/900 MHz

Medium (M): 2.5 watts VHF, UHF, 2 watts 800/900 MHz

High (H): 5 watts VHF, 4 watts UHF, 3 watts 800/900 MHz

The transmit power can be temporarily reduced by use of the low power transmit feature, which is a way of conserving battery life. When low power transmit is active, all transmissions are made at the low power level rather than at the programmed power level. When low power transmit is deactivated, transmissions are made at the programmed power level.

See [“Function Key Option: Low Power”](#) on page 116 for more information.

## Squelch Level

The Squelch Level field sets the [squench threshold](#). There are two options:

**Country:** 12 dB SINAD

**City:** 16 dB SINAD

### squench threshold

*The squench threshold is the level the signal must reach before it is regarded as intelligible and the radio's mute is opened. Tait Orca radios can operate at two different squench thresholds: city and country squench.*

## Selcall System

The Selcall System field sets the [Selcall system](#) the channel uses. Selcall systems are set up in the [Selcall Identity and Setup](#) form and the number of a particular system is indicated by the field in the bottom lefthand corner of the Selcall Identity and Setup form. See [“Selcall Identity and Setup Form”](#) on page 57 for more information.

Setting Selcall ID to NONE disables Selcall for this channel.

### Selcall system

*A Selcall system is the call sequence formats and tone options the radios on that system must use to communicate with one another.*

## DTMF ID

The DTMF ID field sets the DTMF preset associated with a particular channel. DTMF presets are defined in the [DTMF](#) form. Enter the [DTMF ID](#) from the [DTMF Presets](#) tab for the preset call string you wish to be associated with this channel. Enter NONE if you do not wish to associate any DTMF call string with this channel.

If a channel has a DTMF preset assigned to it, the preset can be transmitted by pressing an assigned function key (on all

### DTMF preset

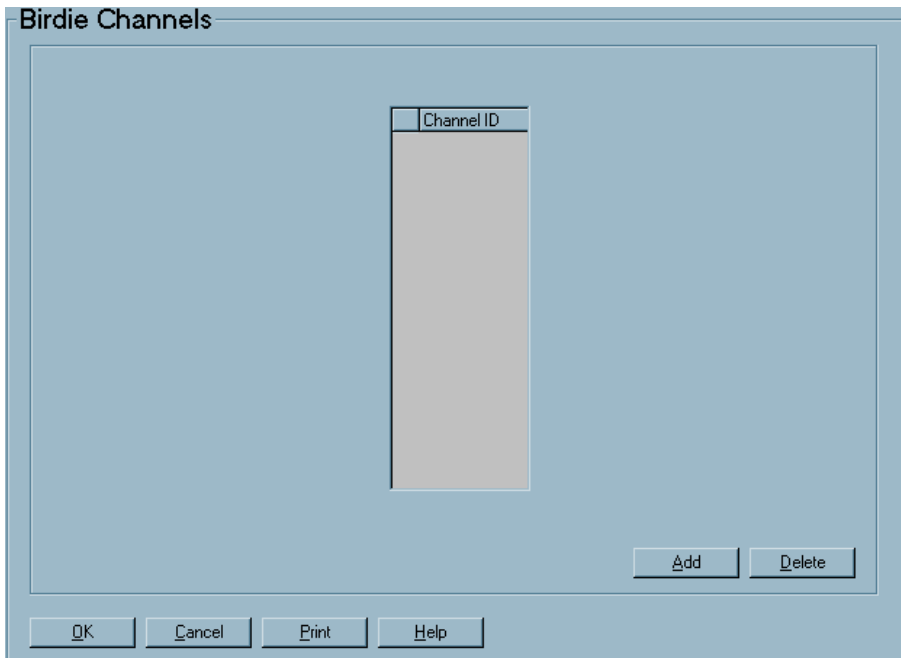
*A DTMF preset is a string of DTMF tone pairs defined for a radio at programming time.*

radios) or by pressing the DTMF key ([Orca Excel](#) and [Orca Eclipse](#) radios).

# Birdie Channels Form

---

Birdies are identified in the Birdie Channels form. The Birdie Channels form is shown below.



The screenshot shows a software window titled "Birdie Channels". Inside the window, there is a large, empty rectangular area. In the center of this area is a smaller, vertical rectangular box with the label "Channel ID" at the top. To the right of the main area, there are two buttons labeled "Add" and "Delete". At the bottom of the window, there are four buttons labeled "OK", "Cancel", "Print", and "Help".

A birdie channel is a channel on which the receiver sensitivity is degraded by internal interference. This interference usually manifests itself as a hum or whistle (a birdie). A birdie killer is the internal circuitry that when enabled eliminates the birdie.

To set a birdie killer for a channel:

1. Select the Add button or press the F2 key.
2. Enter the afflicted channel's channel ID in the Channel ID box.

To delete a birdie, select the Delete button or press the F3 key.

If a channel the radio software identifies as having a birdie is added to the birdie channels list, the birdie killer is disabled for that channel.

# Scan Groups Form

---

[Scanning](#) and [voting](#) groups are set up in the Scan Groups form. The Scan Groups form is divided into two tabs.

Set general scanning and voting rules in the [Scan Groups](#) tab.

Set up scanning and voting groups in the [Scan Group Members](#) tab.

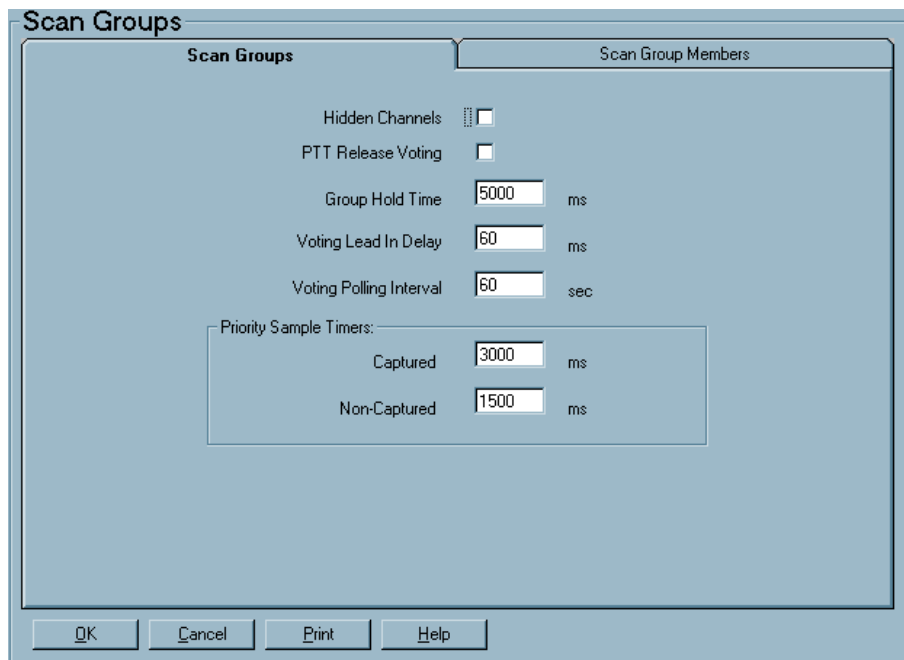
For more information on scanning and voting groups, see:

[“Introduction to Scan Groups” on page 132](#)

## Scan Groups Tab

Set general scanning and voting rules in the Scan Groups tab.

The Scan Groups tab is shown below.



The screenshot shows a software window titled "Scan Groups" with two tabs: "Scan Groups" (selected) and "Scan Group Members". The "Scan Groups" tab contains the following settings:

- Hidden Channels:
- PTT Release Voting:
- Group Hold Time: 5000 ms
- Voting Lead In Delay: 60 ms
- Voting Polling Interval: 60 sec
- Priority Sample Timers:
  - Captured: 3000 ms
  - Non-Captured: 1500 ms

At the bottom of the window are four buttons: "OK", "Cancel", "Print", and "Help".

## Hidden Channels

Scan groups contain anywhere from 2 to 16 channels, and normally these channels can also be accessed individually.

When the Hidden Channels field is enabled, channels that are assigned to a scan group are hidden from the user and so cannot be selected individually. This setting has the effect of making a group of channels appear as one channel. If you wish to access channels via groups and individually, disable the Hidden Channels field.

## PTT Release Voting Request

When the PTT Release Voting Request field is enabled, the voting sequence is initiated whenever the PTT key is released.

## Group Hold Time

The Group Hold Time field specifies the pause before scanning resumes once valid channel activity has ceased.

Enter a time between 0 and 25,000 ms in steps of 100 ms. If set to 0, the hold timer is disabled regardless of channel activity and scanning resumes immediately after a channel becomes invalid, which would not allow for any pauses in a conversation.

## Voting Lead In Delay

The Voting Lead In Delay field sets the delay between the radio detecting activity on a channel in a voting group and voting taking place. The voting lead in delay gives the repeaters in the system time to come to full power.

Enter a value between 0 and 2550 ms in steps of 10 ms.

## Voting Polling Interval

The Voting Polling Interval field sets the time between votes when channels are carrying invalid activity. Enter a value between 1 and 250 seconds in steps of 1 second.

## Priority Sample Timers

The priority sample timers determine how often a priority channel is scanned in preference to other channels in a scan group.

Non-Captured Priority Sample Timer: Applies when no channel has been captured.

Captured Priority Sample Timer: Applies when a channel has been captured.

For both timers, set a value from 500 to 5000 ms in steps of 100 ms.

In some systems, setting the priority sample timers too low interferes with Selcall decoding and in such cases you should not set these timers lower than the default values of 3000 ms (Captured) and 1500 ms (Non-Captured).

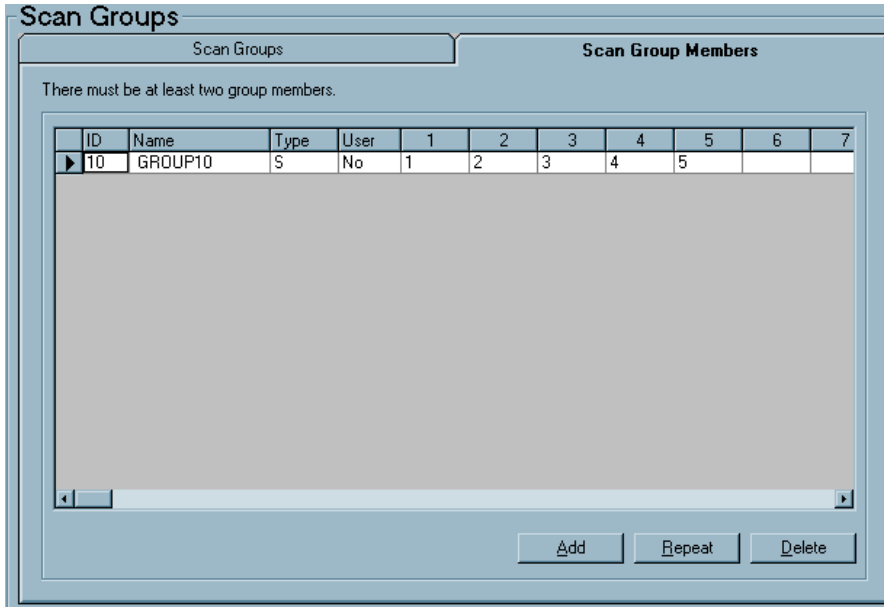
### voting

*Voting is the systematic sampling of a group of channels (a scan group) for the channel with the greatest signal strength. There are three variations of normal voting: voting with signalling, double voting and double voting with signalling.*



# Scan Group Members Tab

Scanning and voting groups are set up in the Scan Group Members tab. The Scan Group Members tab is shown below.



Select the Add button or press the F2 key to add a scan group, select the Delete button or press the F3 key to delete the currently selected scan group, or select the Repeat button to duplicate the current scan group's [Group Type](#) and [User](#) fields and the [Group Membership List](#).

On [Orca Elan](#) and [Orca 5010](#) radios, up to 16 scan groups can be defined.

On [Orca Excel](#), [Orca Eclipse](#) and [Orca 5020](#) radios, up to 20 scan groups can be defined.

When a scan group is added, group members 1 and 2 are set to NONE.

## Group ID

The ID field sets the group number, which must be unique. Because channels and scan groups are both accessed the same way, no channel or group can share the same identity number. Set an ID between 1 and 510.

For [Orca Elan](#), [Orca Excel](#), [Orca 5010](#) and [Orca 5020](#) radios, groups numbered from 1 to 16 are accessible from the [16-way selector](#).

## Group Name

The Name field cannot be edited for [Orca Elan](#) and [Orca 5010](#) radios.

This field sets the group name, which is displayed when the radio is in [channel entry mode](#). Enter a name of up to 8 characters from:

A to Z 0 to 9 ! # \$ % ^ & \* + - = { } ( ) [ ] < > : ; ? | , . \_  
" ' space

Ensure that you do not allocate the same name for different channels or scan groups since both are accessed in the same way. A default name is generated from the group ID. For example, if three channels are defined, then the first scan group defaults to GROUP4.

## Group Type

The Type field sets the type of scanning/voting used for the group. The options available are:

[Scanning \(S\)](#)

[Priority Scanning \(PS\)](#)

[Dual Priority Scanning \(DPS\)](#)

[Voting \(V\)](#)

[Voting With Signalling \(VS\)](#)

[Double Voting \(DV\)](#)

[Double Voting With Signalling \(DVS\).](#)

See pages 133 and 135 for descriptions of the different group types.

## User

The User field applies only to [Orca Eclipse](#) and [Orca 5020](#) radios and determines whether the scan group can be reprogrammed by the radio user.

Yes: The radio user can reprogram the group.

No: The scan group can only be changed by reprogramming the radio.

## Group Membership List

Member channels are added to scan groups in the group membership list.

Enter a valid channel ID. There must be at least two and no more than 16 entries for each scan group, and a channel can appear in a particular scan group only once. There can be no gaps in the list of member channels.

If you have used the DOS-based Programming System for Tait Orca Radios, note that it is not necessary to press the F4 key to add a new member channel; simply enter the channel's channel ID.

For scanning groups (Group Type S, PS or DPS), the first channel in the group membership list is the home channel. For priority scanning (PS), the first channel is the priority channel. For dual priority scanning (DPS), the first and second channels are the priority channels, and the first channel listed has higher priority than the second.

For voting groups (V, VS, DV and DVS), the first channel in the group membership list is the home channel if no other channel has been voted as the home channel.

# Channel Signalling Presets Form

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The Channel Signalling Presets form defines the signalling pairs the radio user selects from when using the [programmable channel signalling](#) feature. Programmable channel signalling is available only on [Orca Eclipse](#) and [Orca 5020](#) radios. The Channel Signalling Presets form is shown below.

Preset Labels	Rx Signalling	Tx Signalling
C71.9	C71.9	C71.9

Buttons: Add, Repeat, Delete

Buttons: OK, Cancel, Print, Help

Select the Add button or press the F2 key to add a new signalling pair, select the Delete button or press the F3 key to delete the currently selected signalling pair, or select the Repeat button to duplicate the current signalling pair's [receive and transmit signalling](#).

Up to 20 signalling pairs can be defined.

## Preset Label

The Preset Label field sets an alphanumeric name to label each pair of Tx/Rx signalling codes. Each label must be unique. Enter a name of up to 8 characters from:

A to Z 0 to 9 ! # \$ % ^ & \* + - = { } ( ) [ ] < > : ; ? | , . \_  
" ' space

## Rx/Tx Signalling

The Rx and Tx Signalling fields set the subaudible signalling that is associated with a channel when the signal pair is selected.

The Rx Signalling field sets the [subaudible signalling](#) the radio must receive before the activity is regarded as valid and

the mute opened. The Tx Signalling field sets the subaudible signalling that accompanies each transmission made on this channel.

For both fields, select the required CTCSS frequency or DCS code from the drop-down list. Note that when you select a signal from the list for Rx Signalling, the Tx Signalling field is changed to match Rx Signalling. If you wish to use different transmit signalling, select the signal from the list. However, you cannot mix CTCSS and DCS on a channel.

Leave these fields set to NONE if no subaudible signalling is used.

If once subaudible signalling has been assigned for a signalling pair you wish to change the signalling type, first set either Rx or Tx Signalling to NONE, then selected the required type of signalling.

The tables on [page 131](#) show the CTCSS frequencies and DCS codes Tait Orca radios support.

