# Operator's Manual

**T3020 II**

# *Contents*

The Tait T3020*II* radio is a state-of-the art handportable radio offering outstanding communications flexibility in conventional mobile radio systems. The T3020*II* is a compact, rugged and reliable unit, with a wide range of accessories available to meet any mobile communications need. It is easy to use, and provides a range of innovative features that simplify your communications.

Antenna

Accessory connector

Busy/TX LED

Function keys

Speaker/microphone

Press to Talk key

Display window

**TAIT ELECTRONICS**
**T3020**

Volume keys

On/Off & Clear key

Channel key

Call key

Enter key

Alpha key

Status key

Alphanumeric keys

Menu key

Star key and left scroll key

Hash key and right scroll key

Microphone

## *Operating Modes*

The T3020*II* is a conventional (PMR) two-way radio featuring built-in CTCSS/DCS capabilities. CTCSS and DCS are systems that isolate your calls so that you only talk with a single group even though other users may be on the channel. They do this by screening out radio traffic that does not carry the correct signal.

Your T3020*II* may be further enhanced by adding optional Selcall (selective calling) facilities. Selcall permits fleet radios to be alerted individually to incoming calls.

DTMF (Dual Tone Multi Frequency) dialling capability is fitted when your communications system is provided with the ability to make telephone calls.

## *Warnings*

**WARNING
(EXPLOSIVE ENVIRONMENTS):**

**DANGER:** SWITCH THE RADIO OFF AT PETROL FILLING STATIONS

**DANGER:** SWITCH THE RADIO OFF IN THE VICINITY OF EXPLOSIVE DEVICES (such as in a quarry that uses blasting techniques)

**WARNING
(USERS IN THE UNITED KINGDOM):**

DO NOT OPERATE RADIO WHILE DRIVING

Use of a hand-held microphone or radio by the driver while in the act of driving contravenes Section 3 of the Radio Traffic Act. An offender could be charged under this Act with driving without due care or reasonable consideration to other road users.

## Features

- Small, rugged, reliable
- Handset operation
- Easy to use
- Conventional (PMR) operation

## Components

When you receive your T3020*II* radio check the contents to make sure that all the items you ordered are included. Typically, you should receive the following.
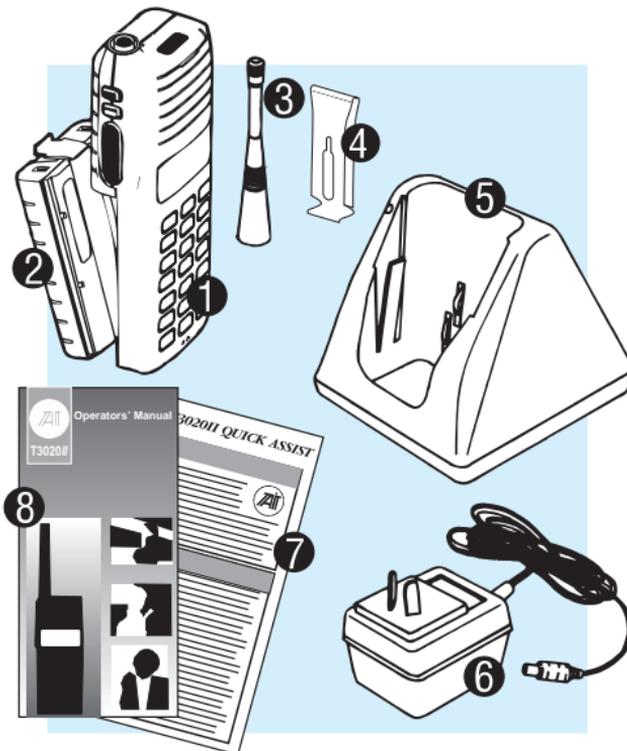


1. T3020*II* radio unit
2. Battery pack
3. Antenna
4. Belt clip
5. Charger
6. Plug pack (pins may vary to suit each country)
7. Quick Assist card
8. Operator's manual

If any parts are damaged or missing, report this to the delivery company immediately.

## Setup

Before using the radio, insert the antenna as illustrated. The antenna should screw easily into the socket at the top of the radio.

To ensure proper operation of your radio, you should fully charge the battery prior to initial use. See "Recharging the Battery" for instructions.

To fit the battery pack, offer it up to the chassis, locating the peg on its bottom edge in the slot at the bottom of the radio's chassis. Hinge the battery up until the spring latch clicks into place.

The first time you switch the radio on, factory settings are in effect. You may want to change some of these settings immediately, such as the volume level and menu options. Review this manual first, and make any necessary changes after referring to the appropriate section. Enter your current settings in the form provided in Appendix III.
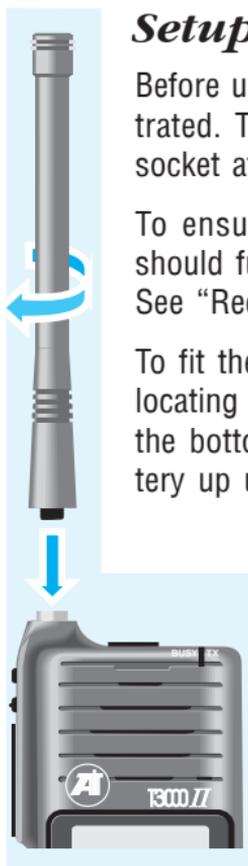
## Basic Operations

PTT key

Display window

Keypad
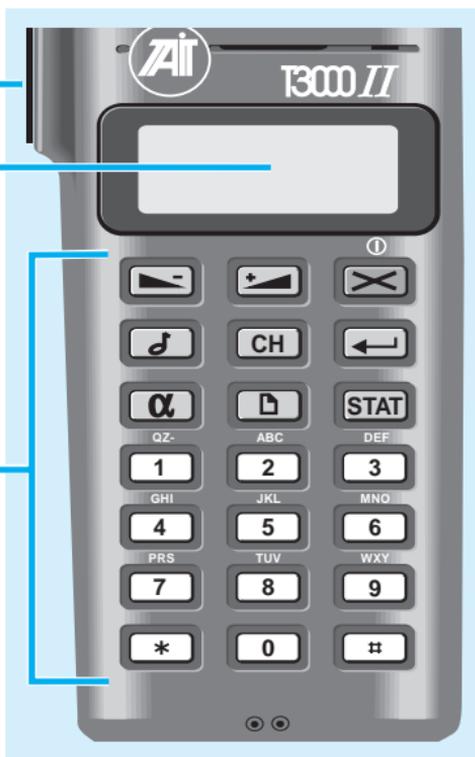
## *Controls*

The T3020*II* controls include the keypad, side panel keys, LCD window and the LED operations indicator.

### *KEYPAD*

Keypad functions are as follows:

| | | |
|---|---|---|
| ⓪ ⌧ | **On/Off** & **Clear** | Use to turn the radio on and off, and to delete the most recently entered character from the display. |
| ← | **Enter** | Use to terminate dialled entries and to select options from the menu. |
| **STAT** | **Status** | Use to select status entry mode. |
| ▯ | **Menu** | Use for customizing T3020*II* options. |
| α | **Alpha** | Use to activate alphanumeric entry mode. |
| ♪ | **Call** | Use to activate the Selcall function. |
| ▬ | **Volume** | Use to decrease/increase volume. |
| **CH** | **Channel** | Use to activate channel selection mode and to access the "repeater talk around" option on the current channel. |
| ∗ ♯ | **Left / Right** | Use to scroll through the items in a displayed list, such as the menu. |
| ∗ | **Star** | Use for DTMF dialling, if available. |
| ♯ | **Hash** | Use for DTMF dialling, if available. |
| 0 ↓ 9 | **0** to **9** **A** to **Z** | Use for dialling and (with the letters printed above each key) for entering alphanumeric data for labels. |
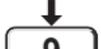
**Note:** The Status, Menu, Alpha, Call and Channel keys can also be used to access DTMF mode, if available.

## SIDE PANEL KEYS

**F1**     Function key 1.

**F2**     Function key 2.

Use to initiate special preprogrammed functions.

**PTT**     Press To Talk key. Use to make the radio transmit each time that you talk.

The function keys above the PTT key can be preprogrammed by your dealer to perform any of the following functions:

- Enter or leave Handset mode
- Turn on backlighting momentarily
- Enter or leave Low Transmit Power mode
- Switch an auxiliary device on or off
- Switch the Monitor facility on or off
- Initiate a preset call[1] (such as an emergency call)

Only two of these functions can be active in any radio; if you are not sure which functions have been preprogrammed for your radio, consult your fleet manager.

## DISPLAY WINDOW

The LCD window is optimised to provide rapid access to information and messages concerning the progress of your call and the status of your radio.

**Note:** Your T3020*II* features the ability to display messages in several languages.



---

[1] It may be necessary to hold the key for one second for the call to be initiated.

## *Switching the Radio On and Off*

### SWITCHING ON

Switch the radio on by pressing the ON/OFF (✕) key and holding it briefly until you hear two short tones.

The current volume setting is displayed. The number of bars indicates the setting, with a maximum of ten. (To change this value, see "Adjusting the Volume".)



The display identifies the active mode of operation and any operation controls that are in effect.

### SWITCHING OFF

Switch the radio off by pressing the ON/OFF (✕) key and holding it briefly until the display goes blank. If Key Beeps is enabled, a tone sounds before the radio shuts off.

The T3020*II* retains its volume setting and some other settings when it is turned off. When it is next turned on it uses these settings.

### ADJUSTING THE VOLUME

The volume display shows the current setting as a series of bars. If this is the first time you have used the radio, adjust the volume level to about the middle of its range (5 bars showing) using the Volume Adjustment (▬-, +▬) keys.



You may need to adjust the volume level for speech when you receive your first call. Note that the volume level of the confidence tones is also affected by the volume control.

## *Normal and Handset Operation*

Your T3020*II* is designed so that you may use it as a normal two-way radio or like a telephone handset.

### NORMAL OPERATION

To use the T3020*II* as a normal radio as shown in the diagram, hold it with its microphone about 15 cm from your mouth.

Press the Press-To-Talk (PTT) key and speak clearly, in a normal voice. The Transmit (Busy/TX) indicator illuminates each time you operate the key. When you have finished talking, release the key to hear a reply and the indicator will turn off.
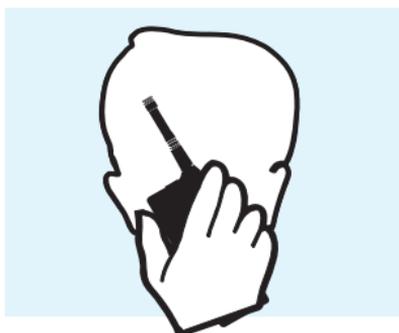
### HANDSET OPERATION

To use the T3020*II* like a telephone handset, select handset mode from the Menu options (see "Using the Menu") or use the pre-programmed function key. The handset (H.SET) indicator appears in the display window and the speaker volume is reduced. Lift it to about 15 cm from your face with the speaker beside your ear and the bottom of the radio beside your mouth as shown. Press and hold the PTT key each time you speak, as described above.

**CAUTION: DO NOT** hold the radio with its antenna close to or touching any part of your body, especially your face and eyes, when transmitting. Always hold the radio upright and approximately 15 cm from your head which will ensure that the radio achieves maximum operating range.

## *Standard Operations*

### *Selecting a Channel or Scan Group*

If channel selection mode is not already active (the CHANNEL indicator is not displayed), press the Channel (CH) key. There are two different methods of selecting the required channel:

- Press the scroll (←, →) keys until the display shows the identity of the required channel.

- Press the numeric key(s) that correspond to the required channel, then press the Enter (↵) key if necessary.

One or more *scan groups* (identified by VOTE, SCAN or PSCAN above the channel's label) may be included in the list of available channels. Scan groups are described in more detail in "Scanning Channels".

## *Making a Call*

Select the desired channel as previously described. If the BUSY indicator is lit, the channel is busy and you must wait until it is clear before proceeding. Your radio may be preprogrammed to prevent you from transmitting on a busy channel; in this case, it emits a low pitched warning tone if you attempt to transmit.

Hold the radio in the proper manner (see "Normal or Handset Operation") and squeeze the PTT key. Pause briefly[2,] then speak clearly, identifying yourself and the person you wish to contact by your call signs (for example "Mobile-9 to Base"). Release the PTT key when you have finished talking.

The radio is fitted with a preprogrammed timer to limit the maximum length of transmissions. When this time period is reached, a three tone warning is emitted and transmission is terminated.

## *Receiving a Call*

Your radio remains muted until there is activity on the channel to which it is tuned. Listen for your own call sign, and respond promptly when you hear it. The BUSY indicator lights a steady green whenever there is any activity on the channel. You may not hear this activity due to muting. To remove muting, one of the function keys may be programmed as a Monitor key. This key may be programmed to override one or more muting possibilities.

## *Monitor Key*

The Monitor key (a preprogrammed function key option) disables muting options installed on your radio.

There are three types of muting control which may screen your calls:

| | |
|---|---|
| **RF squelch** | Permits reception only if a call has a signal above a factory-set threshold. This ensures that only intelligible signals are made audible. |
| **CTCSS/DCS mute** | Permits reception only if a call carries an inaudible tone or code specific to your fleet or group. |

---

[2]*Pausing for up to one second ensures your first word is not cut off.*

**Selcall mute**    Permits reception only if a call carries a special (audible) tone sequence at the beginning which represents your identity number.

**Note:** RF Squelch is always programmed to operate in your radio, but CTCSS/DCS or Selcall mutes may also operate, depending on which options are fitted to your radio and the way your radio is preprogrammed.

Preprogrammed
Monitor key[3]
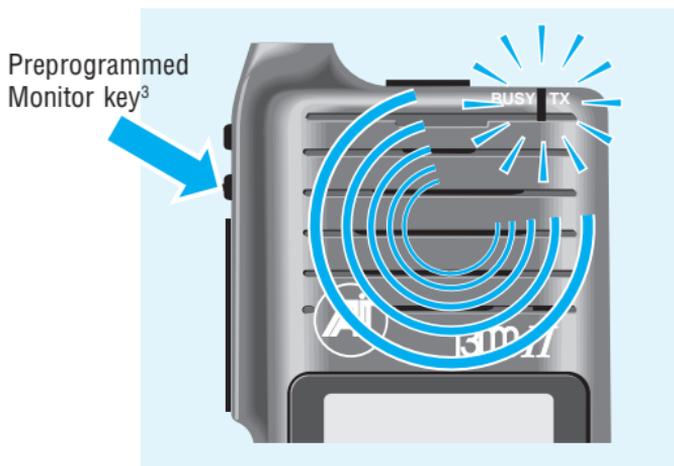


The most common Monitor configuration is as follows:

● Press the Monitor key briefly (less than one second) to override any Selcall or CTCSS/DCS signalling mute. The BUSY indicator flashes green and a short high-pitched tone sounds.

● Hold the Monitor key for more than one second to also override automatic RF squelch. The BUSY indicator continues flashing green and two more short high-pitched tones sound. You will hear the hiss of background channel noise.

In either case, pressing the Monitor key once more restores the muting system to normal operation. Note that your radio may have been preprogrammed without either or both of these facilities. If you are not sure how your T3020*II* has been programmed, consult your fleet manager or Tait dealer.

If you find your message is being cut off periodically by the muting system, you can disable it by pressing the Monitor function key and holding it until you hear three short tones and the BUSY indicator flashes.

---

[3]*Either of the two function keys may be programmed as the Monitor key.*

## *Scanning Channels*

Scanning is a facility which enables your radio to sequentially monitor a number of channels, pausing its search only when it detects activity on a channel.

### ACTIVATING SCANNING

To commence scanning, activate channel mode and select a channel (scan group, priority scan group or voting group) which is preprogrammed for the purpose. The appropriate scanning (SCAN, PSCAN or VOTE respectively) indicator appears in the display window. While the radio is scanning all member channels for activity, the name of the selected scan group is displayed. However when scanning is paused to monitor detected activity, the identity of the current channel is displayed. Whether or not you hear this activity will depend on the muting options which your radio uses. The Monitor key (if assigned) can override the CTCSS and Selcall mutes (but not the RF squelch) when the radio is scanning. If the Monitor is turned on, scanning will pause for any activity on any scanned channel, whereas in normal operation it will only pause for activity which carries the tones or codes specific to you.

### STOPPING SCANNING

Scanning of the current group can be stopped or changed by activating channel mode and pressing the scroll ($\leftarrow$, $\rightarrow$) keys to select a different channel or scan option, or by entering a new channel or scan group number.

### PRIORITY SCANNING

One or more priority scan groups (identified by a PSCAN label) may be available for selection from the list of available channels. A priority scan group is the same as a normal scan group except that one or two of the channels in the group are defined as priority channels.

During scanning of a PSCAN group a priority channel continues to be scanned for activity, even when activity is being monitored on a different channel. Activity on a priority channel is always monitored in preference to any other channel in the scan group.

## CUSTOM SCAN AND VOTING GROUPS

You can edit the channels that are included in your scan and voting groups, if your radio is programmed to allow this. Existing channels can be removed and new channels can be added, as required. In addition, certain characteristics of the channels can also be edited, for example you can choose a different priority channel for a priority scan group.

Scan group programming is performed as follows:

1 Press the Menu (🗐) key. Menu mode is activated and the MENU indicator is displayed.

2 Press the scroll ($\leftarrow$, $\rightarrow$) keys until the SET GROUP option is displayed.

3 Press the Enter ($\hookleftarrow$) key. The name of the first custom scan group appears in the display.



4 Press the scroll ($\leftarrow$, $\rightarrow$) keys until the identity of the group you wish to edit is displayed.

5 Press the Enter ($\hookleftarrow$) key.

The identity of the first available channel appears in the display, together with other pertinent information, as indicated by a character on the left-hand side of the display.

The attributes of this character are as follows:

- Y This channel is included in the group.

- N This channel is not included in the group.

- P This channel is included in the scan group and is defined as the priority channel. This attribute can be assigned only to one channel in a priority scan group.

- T This channel is included in the group and is defined as the default transmission channel. This attribute can be assigned only to one channel in a normal scan or voting group.

6 The attributes for the current channel can be edited as follows:

- Press the Enter (↵) key to toggle the attribute between the Y (included) and N (excluded) options.

- Press the Enter (↵) key for more than one second to assign the appropriate P or T attribute to the current channel.

**Note:** You cannot exclude a priority channel without first assigning the priority attribute to another channel.

7 When the current channel has been edited as required, press the scroll (←, →) keys until the next channel to be edited is displayed.

The selected channel can be edited as previously described.

8 When all channels have been edited as required, press the Menu (⬝) key to return to the menu options.

9 To switch to another mode press the respective mode key. If you make no selection the radio will return to its default mode after a few seconds.

### MAKING CALLS

If you wish to make a call whilst the radio is scanning you may operate the PTT key or make a Selcall call as described in the next section, which will interrupt scanning and usually returns the radio to the default transmit channel. However if the radio has paused on an active channel, then the radio will remain there and the call will be made on that channel (once it becomes clear of other traffic).

## *Voting groups*

One or more voting groups (identified by a VOTE label) may be available for selection from the list of available channels. Voting groups are similar to scan groups, except that the member channels usually carry the same traffic and are assessed purely for signal quality.

The channel offering the best conditions is monitored and is also adopted as the default channel for transmission. Member channels are periodically re-scanned to ensure that optimum reception/transmission conditions are maintained.

You may select a voting group in exactly the same way as any of the scan groups (see "Activating Scanning").

## *CTCSS and DCS Operations*

CTCSS and DCS isolate your calls so that you only talk with a single group, even though other users may be on the channel. They do this by screening out radio traffic that does not carry the correct signal. Either CTCSS or DCS is automatically available on any channel for which it has been programmed.

Transmitting and receiving using CTCSS or DCS is the same as transmitting and receiving in normal radio operation.

## *Selcall Operations*

Selcall functions are available only if a Selcall module is fitted. They may be preprogrammed on a per channel basis. You cannot make Selcall calls on a channel that does not have Selcall enabled.

## *Making a Call*

Choose a channel on which Selcall is enabled, then press the Call (ᴅ) key. The CALL indicator is displayed to confirm that Selcall is active and the last dialled number, if any, is shown.
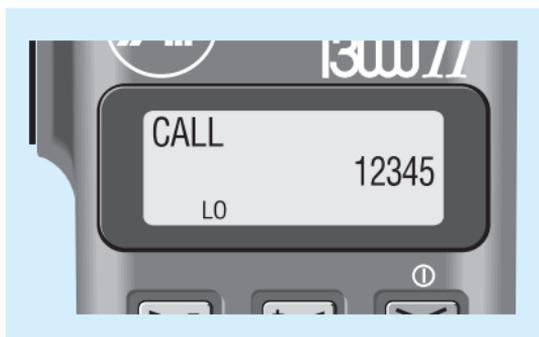
Enter the number of the required party using the numeric keypad.
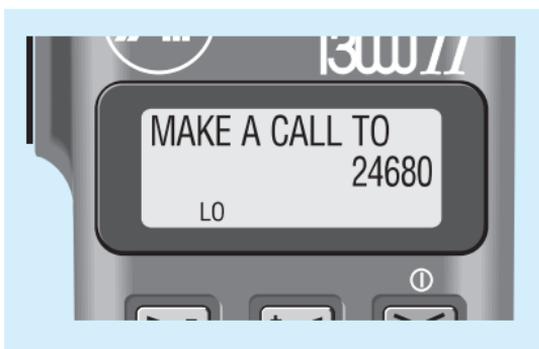


After entering the number, press the star ( ✳ ) key or the Enter (↵) key to initiate the call. You will hear a brief tone and the display message will change to CALLING.

When the called party responds you can proceed with your conversation.

**Note:** The radio may be preprogrammed with a preset call for each channel. Holding the Call ( ☎ ) key pressed for one second will send the call associated with the current channel.

## *Receiving a Call*

Your T3020 *II* will indicate that you are receiving a call by a ringing tone and a display message. The incoming call may be either a normal call or a group call.

### NORMAL CALL

A ringing tone sounds from the speaker and the display may indicate the caller's identity.

Accept the call by transmitting an acknowledgement (for example, "Mobile-9 receiving"); refer to "Calling Procedure". The monitor activates as soon as you respond to the call.

### GROUP CALL

The radio rings once, the monitor activates and the CALL message will be displayed. The caller will then broadcast a message to all members of your group. It is not normally necessary for you to reply.

# *Calling Procedure*

When you have established a connection, hold the radio with its microphone about 15 cm from your mouth and press the PTT key. Pause briefly[4], then speak clearly and release the key when you have finished talking. Remember to say "Over" when you finish speaking, so that the other party knows that you have finished. Similarly, wait for the other party to say "Over" before you press the PTT and begin speaking.

The maximum duration of a transmission is limited by your radio. If you continue to transmit for longer than the predetermined maximum duration, your radio normally sounds a series of tones and then stops transmitting.

## REESTABLISHING A CALL

When a call has been ended and the Selcall function is active, your T3020 *II* displays the identity of the last called party. This enables you to easily re-establish the call. If you initiated the last call, this is termed Redial. If the other party initiated the call and your radio is able to identify its number, it is Callback.

### Using Redial and Callback

When an incoming or an outgoing call is terminated, the other party's identity is stored and will be displayed whenever you press the call (♪) key.



To redial or call back this party, you can normally press the star ( ✳ ) key or the Enter (↵) key. After dialling, the call proceeds normally.

## UNANSWERED CALLS

If you are unable to answer an incoming call, your T3020 *II* may automatically store the identity of the incoming caller.

**Note:** Both your radio and the calling party's radio must be preprogrammed appropriately for this feature to operate.

---

[4]*Pausing for up to one second ensures your first word is not cut off.*

An unanswered call is displayed with the message CALL FROM and the calling party's identity. Any status message they may have included is shown on the second line of the display.
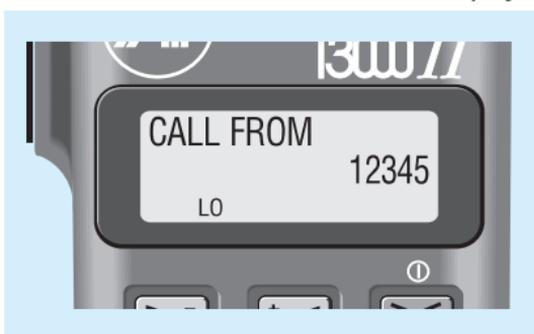


To return an unanswered call, simply press the Enter (↵) key.

## CALL QUEUING

If you are unable to answer your incoming calls immediately, you can have your T3020*II* save up to 10 call-return messages from other radios in a queue for later callback.

**Note:** This option must be preprogrammed into your radio.

As calls are received and queued, the radio defaults to the menu mode and the display shows the total number of calls in the queue.
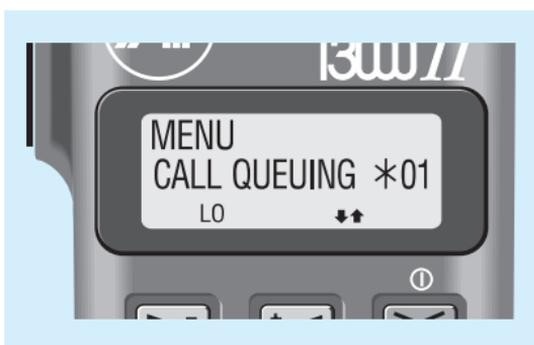


To view details of each call press the Enter (↵) key. The call position in the queue and the caller's Selcall identity will be displayed. The first call is always displayed until you scroll through the queue.



To return a call to the party currently displayed, press the Enter (↵) key.

To return a different call in the queue, use the cursor keys to scroll through the queue until the party you want appears, and then press the Enter (↵) key.

After you have returned a queued call, that entry is removed from the queue. To clear an entry from the queue without making the call, display it by scrolling, then press the Zero (0) key.

**Note:** An existing call queue remains intact if the radio is turned off, or if the battery is removed.

Call Queuing has no effect upon procedures for normal outgoing calls.

## *Emergency Operation*



Function key

Emergency transmission

Dial

Hidden switch

The T3020*II* can be set up to make an emergency call to a preprogrammed party (usually your base or despatcher). This facility may be accessible via one of the function keys, or a switch fitted externally to the radio.

You can dial the emergency number like any normal preset number, or it may be directly accessible on one of the function keys. If the radio is used in a vehicle with the Tait Mobile Conversion Kit, it may also be connected to a hidden emergency switch, which can initiate the emergency call directly.

To make an emergency call press the appropriate function key or, if provided, use the hidden switch. The radio then transmits an emergency code to the programmed destination, and enters a transmit/receive cycle with the contacted party that allows activity in the vicinity of the radio to be monitored. All displays and indicators on the T3020*II* remain unchanged and, with the exception of the ON/OFF (✂) key, all controls are disabled.

The radio is usually reset to normal operation remotely via a reset code transmitted by the contacted party, or by switching the radio off and then on again.

## DTMF Operations

If your T3020*II* is fitted with the DTMF option board you can use your radio to send tones to remote devices for interpretation as control codes. If your system has access to the Public Switched Telephone Network (PSTN) your radio can also be used to contact ordinary telephone numbers.

The DTMF functions of your radio (if available) can be accessed from any currently active mode of operation, by pressing the key that controls the active mode. Thus, if channel selection mode is active (the CHANNEL indicator is displayed), DTMF operations are accessed by pressing the Channel (CH) key. When DTMF mode is active the DTMF indicator is displayed.

**Note:** The radio can be restored to the previously active mode of operation by pressing the same mode key once more, or to a different mode of operation by pressing the respective key.

### Making a Call

Activate DTMF mode as described above. The DTMF indicator is displayed to confirm that DTMF mode is active and the last dialled number, if any, is shown.



Key in the required DTMF string using the numeric keypad, then press the Enter (↵) key to initiate the call. Depending upon how your radio is programmed, the digits may be transmitted separately with each individual key press, or the string may be transmitted in its entirety when the Enter (↵) key is pressed.

**Note:** Alternatively you can initiate a call to the most recently dialled number by pressing the Enter (↵) key.

After dialling, the call proceeds normally.

Most special features must be enabled during programming to allow you to use or change them.

## *Alphanumeric Entry Mode*

Alphanumeric entry mode allows you to select and execute up to 20 available pre-defined command sequences. Command sequences may have been set up to select a particular channel or scan group, to transmit a DTMF or Selcall sequence, or to set the radio's current status message. Each command sequence is assigned a unique alphanumeric label for selection purposes.

To use preset command sequences:

1. Press the Alpha (α) key to activate alphanumeric entry mode.

2. Locate the desired label by using the scroll (←, →) keys to scroll through the list until the label is displayed, or enter the label for the required command, using the keypad.



3. Press the Enter (↵) key to initiate the command sequence. If the sequence is a call, this is set up and conducted in the usual way.

## Using the Alphanumeric Keypad

*Each key corresponds to a set of numbers and letters (the 2 key may be used as a '2', an 'A', a 'B' or a 'C'). Sequentially press the keys that match the letters or numbers in the label.*
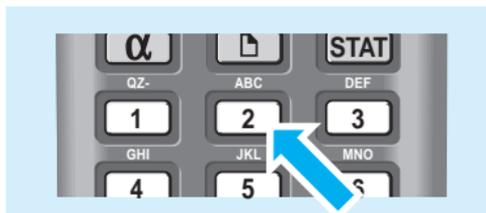


*A question mark appears in the display each time you add a character until you have entered enough for the radio to recognise the label. When the label is recognised, it is displayed in full.*

*Note that in choosing labels for preprogramming into your T3020II, you must avoid words which are indistinguishable to the radio. For example BASE and CAPE use the same key sequence[5].*

| C | A | P | E |
|---|---|---|---|
| B | A | S | E |
| **ABC** | **ABC** | **PRS** | **DEF** |
| 2 | 2 | 7 | 3 |
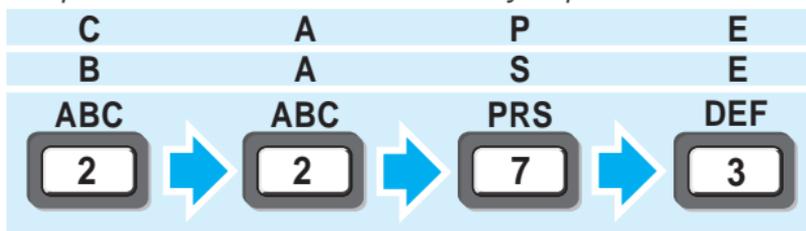
**Example:** You want to call your base despatcher who has been assigned the label, BASE . The keystroke sequence and display might appear as follows:

| Press Key | Display Reads | Explanation |
|---|---|---|
| α | VEHICLE 7 | Most recent selection displayed |
| ABC 2 | ? | Label not yet identified |
| ABC 2 | ?? | Label not yet identified |
| PRS 7 | BASE | New label identified |
| ↵ | 21 | BASE is called and the BASE number is displayed |

## *Status Calls*

If your radio is fitted with Selcall you may be able to attach one of a number of available pre-defined status messages to each call that you make, to indicate your present activity. For selection purposes, each available status message is assigned a unique number and alphanumeric label at the time your radio is programmed. Typically, your status message could be "Enroute," "At Lunch," or "At Home". Similarly, other parties can send status messages with their calls to let you know what they are doing.

There are a maximum of 100 status messages available, each of which is assigned a number in the range 00 to 99 and a label of up to eight alphanumeric characters. The status message is preprogrammed to each of the available numbers and may be a note, a job name, or an acronym.

**Note:** If your radio is programmed for status transmission then a status message (sometimes a preset one rather than one you select) is transmitted with all Selcall sequences.

### ASSIGNING A STATUS CODE TO YOUR CALLS

There are two ways to manually assign a status message to your calls:

- Selection of the required message from a list of available messages using the scroll (←, →) keys.

- Selection of the required message by keying in the number of the message.

## Manual Message Selection

To manually select a status message to accompany your calls:

    1. Press the STAT key.



    2. Use the scroll (←, →) keys to scroll through the list of messages until an appropriate message is displayed, and then press the Enter (↵) key to confirm your choice.

    The selected status will be sent with your outgoing calls, and with the automatic acknowledgement which your radio may send in response to incoming calls.

## Manual Number Selection

You can manually enter the number of the required status message using the keypad, and then press the Enter (↵) key to confirm your choice.

## RECEIVING A STATUS CALL

Status messages assigned to calls from other users are displayed as follows:
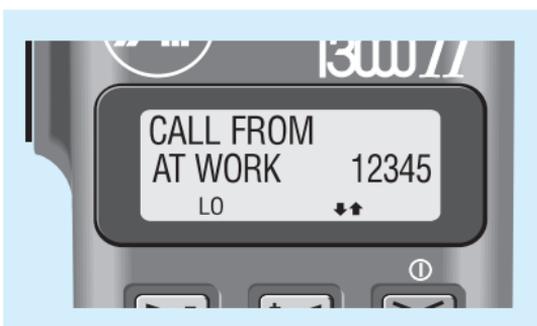


The upper line shows CALL FROM. The middle line shows the status message number (00 to 99) or the message (if the radio recognises the number) on the left.

The calling party's identity may be shown on the lower right of the display. You may be able to call the party that sent you the status message by pressing the Enter (↵) key.

## *Programmable Channel Signalling*

Your T3020*II* may have been preprogrammed with a selection of CTCSS tones and/or DCS codes. Each label defines a transmit tone or code and a receive tone or code as a pair. Any of these pairs may be assigned to a particular channel at any time. (For information on how these signalling systems affect the way your radio operates, see "Operating Modes" at the front of this manual.)

To apply a new tone or code pair to a channel, press the Menu (▯) key and use the scroll (←, →) keys to reach the PROG SIGNAL item.



Press the Enter (↵) key and then the scroll (←, →) keys to select the channel to which you wish apply the new signalling.

Then press the Enter (↵) key once more and then the scroll (←, →) keys to display the label for the signalling pair which you wish to apply. Press the Enter (↵) key to select this label.



The radio then returns to the channel selection display so that you may choose a new channel and signalling pair label.

When you have completed your changes press any mode key (Volume Adjust, Channel, Alpha, Menu or Status) to end the editing process.

**Note:** Changing the channel signalling effects a permanent change to the radio's settings. The original settings may be restored by reprogramming the radio using the external programming software.

## *Repeater Talkaround*

Repeater talkaround is a programmable option that allows the T3020*II* to transmit and receive in simplex on the receive frequency of the current channel. This feature can be used to talk to other participants on the channel without the use of the actual repeater, for example when you are out of reach of the repeater.

If the repeater talkaround function is available, it is activated on the current channel by pressing the Channel (CH) key for more than one second. While repeater talkaround is active RTA is shown in the top, right-hand corner of the display.

The radio can be reset to normal repeater operation by switching to another channel, or by pressing the Channel (CH) key for more than one second again.

## *Night Use*

The Night Use option automatically turns on the backlighting for the display window and keys when any key is pressed or when a call is received. Backlighting remains on for only a few seconds unless further activity is detected. To determine whether this feature is active in your radio, observe the display in subdued lighting and press any key.

To initiate Night Use mode, use the Menu to set the NIGHT USE option ON.

## *Low Power Transmission*

If you are operating near the party you wish to converse with  you can conserve battery power by reducing the output of your transmitter.

To switch on Low Power Transmission, use the Menu to set the TX LOW POWER option ON. When you return to normal operation from the menu, the LO indicator appears continuously in the bottom of the display. The LO indicator also appears for channels which have been preprogrammed for low power operation.

## *Economiser Mode*

The T3020*II* incorporates an Economiser mode which turns off some internal circuitry after a few seconds of inactivity, to conserve battery power. This is preprogrammed and may be customised to various interval and sensitivity options, or it may be disabled. Full radio activity is restored when any key is pressed or when the radio receives a signal (with your signalling tone, if CTCSS/DCS or Selcall is installed). When Economiser mode is active, the ECON indicator appears in the bottom of the display window.

The menu options enable you to personalise how your T3020*II* operates. Some or all of these options will have been made available to you by preprogramming. If you are unsure about what is available, you can enter Menu mode and review the entries.

To enter Menu mode, press the Menu ( ) key. The menu option last accessed appears in the display.



Use the scroll (←, →) keys to move between the available menu options. Most menu options have an ON and OFF setting. To change the current setting, press the Enter (↵) key. To leave the menu options and switch to another mode of operation by pressing the respective mode key.

The following table shows the options which appear in the menu (not all options may be available on your radio). Options marked with an asterisk (*) may be preprogrammed to a function key.

| Option | Setting | Description |
| --- | --- | --- |
| **AUXILIARY*** | ON/OFF | The Auxiliary option turns an installed auxiliary device ON or OFF. |
| **CALL QUEUING** | ✳ NN | Call Queuing provides a list of unanswered calls, NN being the number of calls currently stored. Press the Enter (↵) key then use the scroll keys to review individual calls. See "Call Queuing" for more information. |
| **DTMF AUTO TX** | ON/OFF | When this option is ON, each digit of a DTMF string is transmitted individually with each successive key press. Otherwise the entire string is transmitted when you press the Enter (↵) key. |
| **ECONOMY** | ON/OFF | Use this option to set your radio to the economy power saving mode. The radio remains in economy mode until you restore normal operation by de-selecting this option. See "Economiser Mode" for more information. |
| **HANDSET MODE*** | ON/OFF | Handset operation enables you to use the T3020*II* just as you would a telephone handset. For more detailed information see "Normal and Handset Operation". |

| Option | Setting | Description |
|---|---|---|
| **HARD SQUELCH** | ON/OFF | If this option is available it can be used to adjust the radio's squelch setting to accommodate different signal conditions on your current channel. The ON setting is best suited to strong signals or when interference is present, whereas the OFF setting may be used so that weak signals can be heard. |
| **INTERNAL MIC** | ON/OFF | This option allows you to switch the internal microphone on or off. |
| **INT. SPEAKER** | ON/OFF | This option is available when an external speaker is fitted to the T3020*II*. It allows you to switch between the internal and external speakers. |
| **KEY BEEPS** | ON/OFF | The Key Beeps option determines whether a tone will sound when keys are pressed. It does not affect the confidence tones (ringing, engaged and so on). |
| **KEYPAD LOCK** | ON/OFF | The Keypad Lock prevents accidental operation by locking the keypad so that only the ON, Volume adjustment and PTT keys are active. |
| | | Turn Keypad Lock on in the normal manner, using the Enter (↵) key. The radio leaves the Menu and reverts to normal operation with the keypad locked. Keypad lock can be removed at any time by pressing the ON key and holding it for at least one half second. |

| | | |
|---|---|---|
| **LOUD BEEPS** | ON/OFF | When this option is ON, audible tones from the radio are emitted at the current volume setting of the radio. When the option is OFF audible tones are emitted at a lower level. |
| **NIGHT USE**[6] | ON/OFF | The Night Use option turns on backlighting for the display and keys . The backlighting is activated by a keypress or an incoming call.  It will remain on for a short time after the call is completed. |
| **SET GROUP** | | This option is used to access the programmable scan and voting group function.  See "Custom Scan and Voting Groups". |
| **PROG SIGNAL** | | Programmable Channel Signalling allows you to alter the CTCSS tones or DCS codes applied to each channel.  A list of available tones/codes must be preprogrammed into your radio for you to choose from.  See "Programmable Channel Signalling" for more information. |
| **TX LOW POWER*** (Transmit  Low Power) | ON/OFF | The Transmit Low Power option lets you conserve battery power by reducing the output of your transmitter if you are near your targeted receiver. See "Low Power Transmission" for more information. |

---

[6] Selecting "NIGHT USE ON" increases power consumption.

Under normal usage your radio battery can be expected to last approximately eight hours before it requires recharging. If you spend a lot of time transmitting, this time will be reduced; if you rarely transmit it may be considerably longer.

When battery voltage is low, the (TX / BUSY) indicator flashes red and the radio sounds a low-pitched beep every 20 seconds. You can continue using the radio,  but you should recharge the battery as soon as possible to avoid reducing its life.

**Note:** Once the battery becomes too discharged to properly run the radio, the radio switches itself off.

The battery can be recharged while still attached to the radio, or it can be recharged separately.

## *Mounting the Radio in the Charger*

1. Turn the radio *off* using the front panel ON/OFF ($\times$) key. (The radio may be left on, but, if using a trickle charger,  full charge may not be achieved).

2. Place the radio, with its battery still fitted, into the charger.
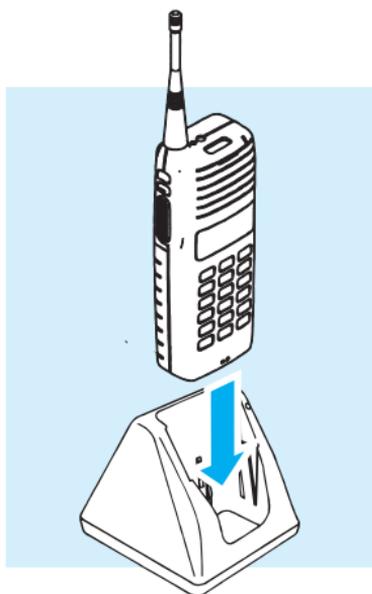


**Note:** Some Radio Regulatory Authorities forbid any transmissions while the radio is mounted in its charger.

3. Recharge according to the "Recharging" instructions following.

## *Mounting the Battery in the Charger*

1. Turn the radio *off* using the front panel ON/OFF (✕) key.

2. Remove the battery pack from the back of the radio by pressing down the spring latch in the middle of the radio back panel. Hinge the battery pack away from the chassis until it comes free.
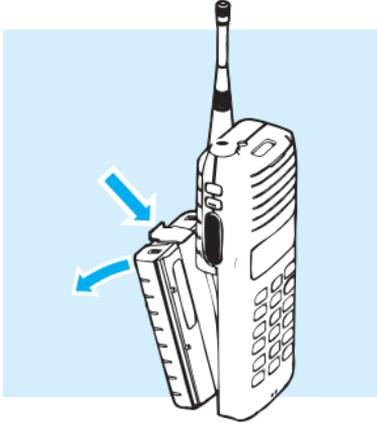
3. Place the battery in the charger pocket with the four silver contacts to the back. Lean the top forward as far as you can to seat the battery properly.
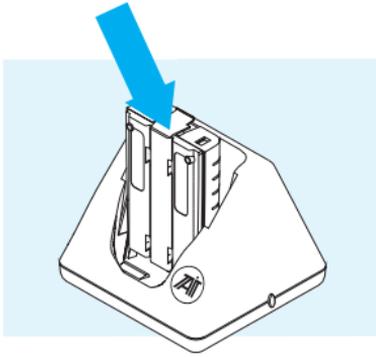
4. Tilt the battery back against the contacts until it snaps into place.
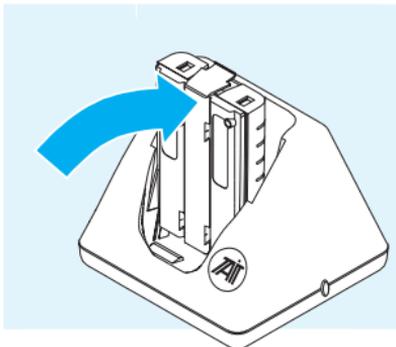
5. Recharge according to the instructions following.

# *Recharging*

To recharge using a Tait battery charger, perform the following steps:

1. Make sure the indicator at the top corner of the charger confirms that the battery pack is charging. If it does not illuminate red within a few seconds, check whether the battery is seated properly, the plug pack is properly connected to the charger and the mains outlet is switched on and live.

2. The battery pack (or radio) may be considered fully recharged when the indicator changes from red to green but it is recommended that the battery remain in the charger until it is required. (The T3001 trickle charger has no end of charge indication - it charges continuously.)

   **Note:** Trickle chargers are not considered suitable for recharging high capacity (Nickel-Metal Hydride) battery packs.

To refit the battery pack, offer it up to the chassis, locating the peg on its  bottom edge in the slot at the bottom of the radio's chassis. Hinge the battery up until the spring latch clicks into place.
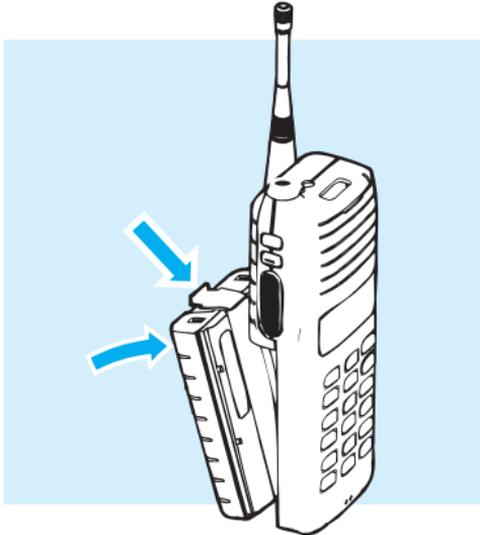


**Note:**  When using a trickle charger, recharging the battery pack with the radio attached *and* switched on will  reduce the amount of charge the pack receives.  To ensure that an exhausted battery pack is completely recharged, it should be charged for a full twelve hour period either separately, or with the radio switched off.

## *Maintenance and Troubleshooting*

### *Maintenance*

Your T3020*II* requires no regular maintenance, other than ensuring the battery has sufficient charge.

#### *CARE OF YOUR T3020 II*

- From time to time wipe the battery contacts and accessory connector contacts with a dry lint-free cloth to remove any dirt, oil or grease.

- To clean the radio's case use  a cloth dampened with clean water.

- To remove difficult marks the cloth may be dampened with a mild liquid soap solution.

- **DO NOT** allow the radio to come in contact with detergents, alcohol, aerosol sprays or petroleum-based products as they may permanently damage the case.

#### *TO PRESERVE BATTERY LIFE*

- Avoid storing the battery for extended periods without first fully recharging it.

- Avoid repeatedly recharging the battery when it has only had a small amount of use.

- Use only a Tait recommended charger.

- Maintain an ambient temperature of $5^0$ to $40^0$ C during recharging (optimum battery performance will be obtained between $15^0$ and $25^0$ C).

**CAUTION:  DO NOT** allow the battery pack contacts to become short-circuited or  dispose of the battery pack in a fire.

## AVOIDING HIGH TEMPERATURES

If the radio is left in strong sunlight, or exposed to high temperatures, the display may temporarily darken. If the temperature exceeds $80^0$C, the radio will cease to function until the temperature returns to a safe level.

Additionally, the high capacity battery pack is fitted with a thermal cutout which prevents operation above $70^0$ C. Temperatures above $90^0$ C cause permanent damage.

## *Troubleshooting*

If the display remains blank and no indicators light up when you turn the radio on, it is likely that no power is available.

If the radio turns on briefly then off again, or fails to operate properly, it is likely that the battery is discharged.

In either case, check the following:

- Is the battery firmly plugged into the rear of the T3020*II* ?
- Was the battery sufficiently charged after its last use?
- Is the battery charger working correctly?
- If using a high capacity battery pack, has it been subjected to very high temperatures[7]?

If all appears to be in order, or if the message ERROR XX appears in the display window, then contact your Tait dealer for assistance.

---

[7] The high capacity battery pack is fitted with a thermal fuse which operates at temperatures exceeding $90^0$ C and renders the pack unserviceable.

The indications refer to the abbreviated messages which appear in the bottom of the T3020*II* display window, the volume indications in the upper line of the display, and the LED indicator on the top front corner of the radio.

## *Display Window Indicators*

| | |
|---|---|
| ⬇⬆ | The cursor indicator appears when the radio is in one of the following modes: Channel Selection, Alphanumeric Entry, Status Label Selection or Menu. When this indicator appears, you can scroll through the list of options or entries. |
| **H.SET** | The Handset indicator indicates that the radio is in Handset mode. |
| **AUX** | Auxiliary indicates that your radio has an auxiliary device fitted and that it is active. |
| **LO** | Low Transmit Power indicates that the radio is operating with its transmitter power reduced. |
| **ECON** | ECON indicates that the radio is operating in economy mode. |
| **VOL = ▮▮▮▮** | The volume indicator shows the relative setting of the volume control. Full volume has 10 bars showing, lowest volume has one. |

## *LED Indicator*

The LED Indicator at the top of the radio provides a variety of indications as displayed in the following table.

| Indication | Condition | Meaning |
|---|---|---|
| **Steady Red** | TX | The radio is transmitting. This should occur each time you press the PTT key and automatically during call setup when you initiate a call. |
| **Flashing Red** | Low Battery | This is accompanied by a low-pitched beep every 20 seconds. The battery is nearly completely discharged. |
| **Steady Green** | Receiver Busy | Your radio has detected some activity on the channel. |
| **Flashing Green** | Monitor Active | You turned muting off and are able to hear any traffic on the channel. |

## *Appendix II Audible Indicators*

Following are some of the audible indicators provided by your radio.

### High Temperature Warning

A series of high-pitched tones when the radio is transmitting. The radio automatically switches to low power but you should stop transmitting and allow it to cool down.

### Battery Low

A series of low tones, with the LED indicator flashing red.

### Radio Ready

Two sharp tones that sound first when the radio is turned on.

### Incoming Call

A low-pitched ringing tone indicates a call received by your radio.

### Transmit Timer

Three short medium-pitched tones. (Your transmission has exceeded a preprogrammed time-limit.) The radio stops transmitting. Release the PTT key before transmitting again.

## *Appendix III Preset Options*

The following items may be preprogrammed in your radio:

- Alphanumeric call strings
- Status messages
- Function keys
- Selcall
- DTMF dialling
- Menu options
- Confidence tones
- Power-up message

You may wish to record your function key settings and other important information in the spaces provided.

### FUNCTION KEY SETTINGS

F1: _____

F2: _____

### SELCALL SETTINGS

#### Your Selcall

ID: _____

### COMMONLY USED CHANNELS / GROUPS

| Nº | Label | Preset Call | Scan/ Vote |
|----|-------|-------------|------------|
| \_\_\_ | _____ | _____ | ☐ |
| \_\_\_ | _____ | _____ | ☐ |
| \_\_\_ | _____ | _____ | ☐ |
| \_\_\_ | _____ | _____ | ☐ |
| \_\_\_ | _____ | _____ | ☐ |
| \_\_\_ | _____ | _____ | ☐ |
| \_\_\_ | _____ | _____ | ☐ |
| \_\_\_ | _____ | _____ | ☐ |
| \_\_\_ | _____ | _____ | ☐ |
| \_\_\_ | _____ | _____ | ☐ |

The following guidance is intended to help you get maximum life and trouble-free service out of your Tait rechargeable batteries.

## *Types of Batteries*

There are two types of rechargeable battery available for your Tait handportable radio, Nickel Cadmium (NiCd) and Nickel Metal Hydride (NiMH). The NiMH is the higher capacity battery. Each type has slightly different charging requirements and should be handled accordingly (see "Battery Charging").

Rechargeable batteries have a finite lifetime. Battery capacity reduces as the total number of charge and discharge cycles increases. A battery is considered to be approaching the end of its useful life when it can achieve no more than 80% of its rated full charge capacity. The number of charge and discharge cycles a battery can achieve depends upon its type and the way it is used. The lifetime of well cared for NiCd and NiMH batteries will be typically from twelve to eighteen months (400 to 600 cycles).

## *New Batteries*

Before first use (or after prolonged storage) you should ensure that your new battery is properly charged. Otherwise the battery may not start with its full charge and will not perform correctly until it has undergone several charge and discharge cycles. It is recommended that you charge your batteries before first use as follows:

| Tait Charger | NiCd | NiMH |
|---|---|---|
| **Trickle** (T3001, T3003) | For at least 12 hours[8]. | Not recommended. |
| **Fast** (T3002) or **Rapid** (T3004) | Until 2 hours after the green "full charge" light illuminates. | Until 2 hours after the green "full charge" light illuminates. |

---

[8] *If a trickle charger is being used with the battery fitted to the radio during this first charge, ensure that the radio is turned off.*

## Battery Use

Both NiCd and NiMH batteries perform best when they are not repeatedly recharged after only short periods of use - ie the battery should be allowed to substantially run down before recharging. To ensure a long and trouble-free battery life it is recommended that you get into the routine of using the radio until the "low battery" indication appears, before recharging it fully.

If your application makes it inconvenient to follow such a routine, you should still ensure that the battery is fully discharged and recharged at least once every week. This can be done either by using a suitable charger with inbuilt discharge function (see "Battery Problems"), or by using the radio until it switches itself off and then recharging the battery fully.

Both types of batteries will also self-discharge - ie if the battery is charged and then left to sit without being used, it will gradually discharge by itself. NiMH batteries can self-discharge in less than one week if left in warm moist air. NiCd batteries self-discharge more slowly. To prevent self-discharge, batteries may be left in the charger, after the green "full charge" light has illuminated.

## Battery Charging

Tait rechargeable batteries must only be charged using Tait specified charging equipment. There are several models of battery charger available which fall into two basic types, "trickle" and "fast".

Tait trickle chargers charge the battery slowly but do not sense when the battery has been fully charged. To avoid repetitive overcharging, it is important to avoid making a habit of recharging batteries after they have had only a small amount of use (see "Battery Use" above). Because of their susceptibility to damage from overcharging, it is recommended that NiMH batteries not be routinely subjected to trickle charging.

Tait fast chargers are fitted with a device that senses when the battery has reached full capacity and commences trickle charging thus eliminating the possibility of overcharging. They are therefore suitable for "topping up" partially discharged batteries of both types. Some models of fast charger (eg T3002) also have an inbuilt discharge function, which enables the battery to be periodically given a full discharge and charge cycle, quickly and without the need to use the radio to discharge the battery.

## *Battery Problems*

NiCd batteries sometimes exhibit a symptom commonly called "memory effect". This is a term used to describe the performance of a battery that has regularly only been partially discharged before recharging and seems to "remember" where it previously stopped discharging. When the battery reaches this discharge point, the voltage drops prematurely and the radio gives a "low battery" indication. Consequently, the battery only operates with a reduced capacity. While NiMH batteries suffer less from memory effect, it is recommended that both types of battery be subjected to regular full discharge and charge cycles, as outlined in "Battery Use" above.

A battery suffering from memory effect can often be restored to full capacity by deep-discharging using a suitable charger with an inbuilt discharge function (eg T3002). After discharge the battery will be immediately fast charged to capacity. In cases of severe memory effect it may take a number of discharge and charge cycles to restore the battery to full capacity. See your charger manual for full instructions. Alternatively the battery can be returned to your dealer or service agent for reconditioning using an approved battery analyser/reconditioner.

The performance and lifetime of both types of batteries may also be reduced by prolonged overcharging. NiMH batteries are most prone to damage from overcharging, but NiCd batteries can also have their life reduced.

Under certain environmental conditions, the terminals on the battery may exhibit tarnishing. This in turn may lead to unreliable operation, either while in use or during charging. Typical symptoms might be that the radio turns itself off for no apparent reason, or that it fails to charge properly. The tarnish can be seen as a dull discolouration on the terminal, which prevents it from connecting effectively to the radio or charger. In such cases, it is recommended that the tarnish be removed by gently rubbing the affected terminals with a standard pencil eraser.

## *Battery Storage*

Avoid storing the battery for extended periods without first fully recharging it. After prolonged storage (the battery should be fully recharged in accordance with the instructions for new batteries (see "New Batteries") before being put back into service. If initially you experience lower than normal battery capacity, this will usually correct itself in normal use after two to five full charge and discharge cycles.

If the battery capacity remains low, you may be able to restore it using the procedure outlined in "Battery Problems". If not, it is probably nearing the end of its useful life and needs to be replaced.

## *Disposal of Used Nickel Cadmium Batteries*

NiCd batteries contain a small amount of the metal Cadmium, which can produce potentially toxic waste if it is not disposed of correctly. When no longer in use, you should ensure that your NiCd battery is properly disposed of. Contact your local Tait sales/service outlet or dealer for details of where to send your "spent" battery for recycling. Do not burn or break the battery.

## *Optional Accessories for the T3000II Range of Radios*

- Trickle Charger
- Single Fast Charger
- Dual Rapid Charger
- Multi-way Rapid Charger
- Vehicle adaptor
- Remote speaker / microphone
- High Capacity Battery Pack
- Selcall (factory-fitted)
- DTMF (factory-fitted)

See your Tait dealer for more details.

*Tait Electronics has made every effort to ensure the accuracy of information in this manual. However, Tait Electronics reserves the right to update the radio and / or this manual without notice.*

**TAIT ELECTRONICS LIMITED**

**SOFTWARE LICENCE AGREEMENT**
This legal document is an Agreement between you, (the "Licencee") and Tait Electronics Limited ("Tait"). By opening this product package and/or using the product you agree to be bound by the terms of this Agreement.
If you do not agree to the terms of this Agreement, do not open the product package and immediately return the unopened product package to Tait. If you open the product package that will be deemed to be acceptance of the terms of this licence agreement.

**LICENCE**
In consideration of the payment of the Licence Fee which forms part of the price you paid for products you acquired from Tait or its subsidiary or agent (the "products") and our willingness to be bound by the terms of this agreement, Tait grants to you as Licencee the nonexclusive right to use the copy of a Tait software program included in the products, (the "Software").
In particular the Licencee may use the program on a single machine and if the software is supplied on a diskette, the licensee may:
(a) Copy the program into any machine readable or printed form for backup purposes in support of your use of the program on the single machine (Certain programs, however, may include mechanisms to limit or inhibit copying. They are marked "copy protected"), provided the copyright notice must be reproduced and included on any such copy of the Software.
(b) Merge it into another program for your use on the single machine. (Any portion of this program merged into another program will continue to be subject to the terms and conditions of this Agreement.);
The Licencee may not duplicate, modify, reverse compile or reverse assemble the Software in whole or part.

**TITLE TO SOFTWARE**
This agreement does not constitute a contract of sale in relation to the Software supplied to the Licencee. Not withstanding the Licencee may own the magnetic or other physical media on which the Software was originally supplied, or has subsequently been recorded or fixed, it is a fundamental term of this Agreement that at all times title and ownership of the Software, whether on the original media or otherwise, shall remain vested in Tait or third parties who have granted licences to Tait.

**TERM AND TERMINATION**
This Licence shall be effective until terminated in accordance with the provisions of this Agreement. The Licencee may terminate this Licence at any time by destroying all copies of the Software and associated written materials. This Licence will be terminated automatically and without notice from Tait in the event that the Licencee fails to comply with any term or condition of this Agreement. The Licencee agrees to destroy all copies of the Software and associated written materials in the event of such termination.

**LIMITED WARRANTY**
The Software is supplied by Tait and accepted by the Licencee "as is" without warranty of any kind either expressed or implied, including but not being limited to any implied warranties as to merchantability or fitness for any particular purpose. The entire risk as to the quality and performance of the Software vests in the Licencee. Should the Software prove to be defective, the Licencee (and not Licensor or any subsidiary or agent of the Licensor) shall assume the entire cost of all necessary servicing, repair or correction.
Tait does not warrant that the functions contained in the Software will meet the Licencee's requirements or that the operation of the Software will be uninterrupted or error free. However Tait warrants that the diskettes if any on which the Software is supplied to the Licencee shall be free from defects in material and workmanship under normal use and service for a period of ninety (90) days from the date of delivery to the Licencee.

**EXCLUSION OF LIABILITY**
Tait's entire liability and the Licencee's exclusive remedy shall be:
1. The replacement of any diskette not meeting Tait "limited warranty" and which is returned to Tait or an authorised agent or subsidiary of Tait with a copy of the Licencee's purchase receipt; or
2. If a diskette is supplied and if Tait is unable to deliver a replacement diskette which is free from defects in material or workmanship, the Licencee may terminate this Agreement by returning the Software to Tait.
3. In no circumstances shall Tait be under any liability to the Licencee, or any other person whatsoever, for any direct or consequential damage arising out of or in connection with any use or inability of using the Software.
4. Tait warrants the operation of the Software only with the operating system for which it was designed. Use of the Software with an operating system other than that for which it was designed may not be supported by Tait, unless otherwise expressly agreed by Tait.

**GENERAL**
The Licencee confirms that it shall comply with the provisions of law in relation to the Software.

**LAW AND JURISDICTION**
This Agreement shall be subject to and construed in accordance with New Zealand law and disputes between the parties concerning the provisions hereof shall be determined by the New Zealand Courts of Law. Provided however Tait may at its election bring proceedings for breach of the terms hereof or for the enforcement of any judgement in relation to a breach of the terms hereof in any jurisdiction Tait considers fit for the purpose of ensuring compliance with the terms hereof or obtaining relief for breach of the terms hereof.

**No Dealings**
The Licencee may not sublicense, assign or transfer the licence or the program except as expressly provided in this Agreement. Any attempt otherwise to sublicense, assign or transfer any of the rights, duties or obligations hereunder is void.

**No Other Terms**
The Licencee acknowledges that it has read this agreement, understand it and agree to be bound by its terms and conditions. The Licencee further agrees that this is the complete and exclusive statement of the agreement between it and Tait in relation to the Software which supersedes any proposal or prior agreement, oral or written and any other communications between the Licencee and Tait relating to the Software. (LS-589)