User's Guide

T2020
Mobile Radio

CONNECTIVITY • RELIABILITY • FLEXIBILITY

TAIT T2000 MOBILES

Contents

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

Safety Warnings

FCC RF Exposure Limits

This product generates radio frequency energy during transmissions. This device must be restricted to work-related use in an occupational/ controlled exposure environment.

The radio operator must have control of the exposure conditions and duration of all persons exposed to the antenna of this transmitter to satisfy FCC RF exposure compliance. This device is not approved for general population use.

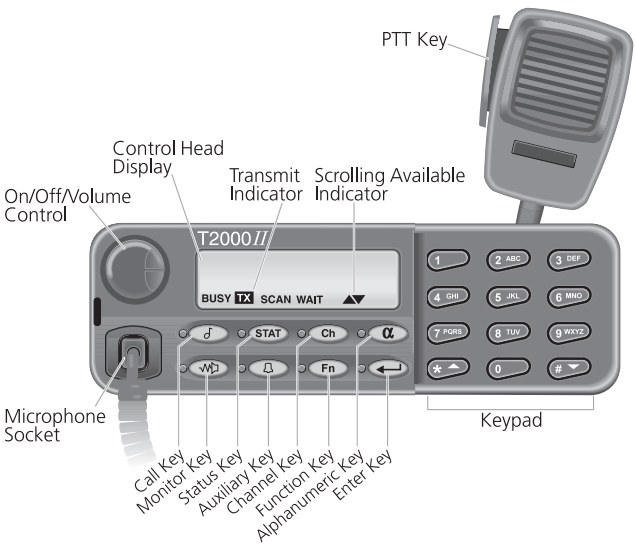
- It must only be used with authorized accessories and antennas.
- The operator must ensure that the minimum safe distance of 35 inches (0.9 m) between persons and the antenna is maintained during transmissions.
- Do not exceed a duty cycle ratio of 50% transmit mode to stand-by or receive modes. The radio is in transmit mode when the PTT key on the microphone is pressed and the transmit indicator (TX) shows on the control head display.

Additional Safety Warnings

- Switch the radio off at petrol filling stations or near flammable liquids or gases.
- Switch the radio off in the vicinity of explosive devices and blasting zones.
- Using a handheld microphone or a radio while driving a vehicle may violate the laws and legislation that apply in your country or state. Please check the vehicle regulations in your country or state.

Variation in Radio Setup

Your T2020 mobile radio has been programmed to suit your communication needs. If you are unsure of which of the features described in this manual are available on your radio, consult your system manager or the person who programmed your radio.



T2020 Control Head

Radio Controls and Indicators

Your T2020 radio controls and indicators include the on/off/volume control, control head keys and display indicators.

On/Off/ Volume Control

Rotating the on/off/volume control clockwise turns on the radio and increases volume. This also controls the volume level of audible indicators and confidence tones.

Key Functions

Key functions are outlined in the table below. Functions marked with a * must be programmed in order to operate.

Symbol	Key Name	Function
♪	Call	* Activates 5-tone dialing mode. You can make 5-tone calls to other users. * Long press: Sends a preset 5-tone call programmed for the currently selected channel.
STAT	Status	* Activates status entry mode. You can select programmed status messages to indicate your current status, such as "EN ROUTE" or "AT LUNCH" (see "Status Messages" on page 23).
Ch	Channel	Activates channel selection/entry mode so that you can change to another channel or scan group. * Long press: Turns repeater talkaround on and off (see "Repeater Talkaround" on page 45).
α	Alphanumeric	* Activates alphanumeric entry mode (see "Alphanumeric Entry Mode" on page 32).

Symbol	Key Name	Function
	Monitor	* Controls the signaling mute and RF squelch control of your receiver (see "Monitor" on page 15). * Long press: Turns squelch override on and off.
	Auxiliary	* Activates emergency mode or sends a one touch 5-tone or DTMF call. * Controls an internal hardware option (e.g. a scrambler).
	Function	* Activates user function menu entry mode, where some radio features can be customized (see "User Function Menu Options" on page 34).
	Enter	Completes dialing entries (channel entries, 5-tone calls, DTMF dialing, alphanumeric entries and option selections).
	Star/Up	Star: For 5-tone and DTMF dialing. Up: When the scrolling available indicator (▲▼) shows on the control head display, this key is used to scroll through a list of options.
	Pound/Down	Pound: For 5-tone and DTMF dialing. Down: When the scrolling available indicator (▲▼) shows on the control head display, this key is used to scroll through a list of options.
0 to **9**		Dials numbers when the LED (light emitting diode) beside the alphanumeric key is not illuminated (○).
[**ABC**] to [**WXYZ**]		Dials letters when the LED beside the alphanumeric key is illuminated (☼).

Radio Indicators

In combination, the radio's LED indicators and control head display indicators provide you with visual information on the state of your radio. The radio indicators are summarized in the following tables.

LED Indicators

Indicator	Name	Meaning
☼♪	Call LED	Steady: Your radio has received a 2-tone or 5-tone call. Flashing: Your radio received a call which was not answered.
☼STAT	Status LED	Your radio is ready for you to select a status code relating to your current activity.
☼Ch	Channel LED	Steady: Your radio is ready for you to enter information to select a new channel. Flashing: The current channel is in repeater talkaround mode.
☼α	Alphanumeric LED	You can enter information, such as an alpha symbol label, from the keypad.
☼	Monitor LED	Steady: The signaling mute (if this option has been programmed) has been overridden. This may be because the microphone is off the microphone clip, or because you have pressed the monitor key. Flashing: Monitor key has been pressed for long enough to override RF squelch. Note that when the radio is operating normally, this indicator is off.

Indicator	Name	Meaning
☼ (Aux)	Auxiliary LED	Indicates the state of the auxiliary options switch. The programmed configuration of the auxiliary options switch determines whether this indicator is displayed continuously , not displayed continuously, or is only displayed when the auxiliary key is pressed.
☼ Fn	Function LED	Steady: You can change user programmable options. Flashing: There is a queued 5-tone call.
☼ ↵	Enter LED	You have pressed the enter key.
○ ♪ ○ STAT ○ Ch ○ α ○ Fn	Call, Status, Channel, Alphanumeric and Function LEDs	When none of these LEDs are illuminated, the radio is operating in DTMF mode (see "DTMF Calls" on page 29).

Control Head Display Indicators

Indicator	Name	Meaning
BUSY	Busy Indicator	There is activity on the current channel. If the selective call mute is active (see the monitor key function description on page 15), you may not hear the traffic until you lift your microphone off the microphone clip.
TX	Transmit Indicator	Your radio is transmitting. This message is displayed when you press the PTT key. This message is also displayed briefly when you make a 5-tone, G-STAR, DTMF or alpha symbol call.

Indicator	Name	Meaning
SCAN	Scan Indicator	Your radio is sampling each of a group of channels for any activity. When it detects traffic on a channel, scanning halts on the active channel.
WAIT	Wait Indicator	The channel you are using is busy and your call has been deferred to a queue. The radio indicates the channel is available with a beep.
▲▼	Scrolling Available Indicator	Scrolling is available and you are able to use the up and down scroll keys (/) to move through a list of options. To select an option, press the enter key ( ).

Basic Operation

This section describes the basic operation of your radio, including turning the radio on and off, adjusting volume, selecting channels, transmitting calls and receiving calls.

Turning the Radio On and Off

Rotating the on/off/volume control clockwise turns on the radio and increases volume. Rotating the control counterclockwise decreases volume and turns off the radio.

Adjusting the Volume

1. Turn the radio on and rotate the on/off/volume control clockwise to about one third of its maximum setting. A power-up message may appear in the control head display.
2. Press and hold the monitor key () until the monitor LED flashes (). The radio then gives two short beeps.
3. Adjust the on/off/volume control, if necessary, and depress the monitor key briefly to return the radio to the quiet state.
4. You may need to finally set the volume level when you receive your first call.

Operating Modes

Once the power-up sequence is complete, your radio may enter the mode last used when the radio was previously turned on. Alternatively, the radio may be programmed to enter the same mode each time it powers up, for example channel selection/ entry mode.

Selecting a Channel

1. Press the channel key () to enter channel selection/entry mode. The scrolling available indicator () appears in the control head

display, along with the current channel name e.g. **REGION2**.

2. Press the up and down keys (/) to scroll through the list of available channels, until the control head display shows desired channel name or

   use the keypad (**0** to **9**) to enter the new channel number.

3. Press the enter key ( ) to initiate the call.

Note: You cannot change channels while transmitting.

Selecting a Group

A group is a collection of channels grouped together for scanning or voting. Select a group the same way as a channel.

Receiving a Call

Your radio remains muted until there is valid traffic on the channel your radio is currently on.

The **BUSY** indicator in the control head display appears when there is traffic on the channel, although the radio's squelch and programmed mute features may prevent you from hearing the traffic. See "What You Hear on a Channel" on page 14.

Consult your system manager or the person who programmed your radio about the special signaling options programmed in your radio.

Making a Call

1. Select the desired channel or group.

   If the **BUSY** indicator appears, the channel is active with traffic and you must wait until the channel is available. If you attempt to transmit while the **BUSY** indicator is displayed, the **WAIT** indicator appears. The radio sounds a warning beep when the channel is available.

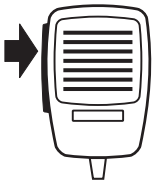
2. Lift the microphone off the microphone clip once the channel is available.

   You may also have to press the monitor key () briefly, depending on the options fitted to your radio.

3. Hold the microphone about 2 inches (5 cm) from your mouth and press the PTT key, located on the side of the microphone (Step 1).

4. Speak clearly into the microphone.

5. Release the PTT key when you have finished talking (Step 2).



Step 1

Step 2

Transmit Timer

Your radio is fitted with a transmit timer that limits the amount of time you can transmit continuously. If the radio gives three beeps, the transmit timer is about to expire. You must release the PTT before you can transmit again. The radio may be programmed to prevent transmission for a period after the transmit timer has expired.

What You Hear on a Channel

What traffic you hear on a channel depends on how your radio was programmed. Your radio can be programmed so that you hear all conversations on a channel, or your user group may be segregated from others, using various types of signaling (CTCSS, DCS, 2-tone or 5-tone).

When special signaling is active, you are not able to hear other groups talking on the current channel unless the monitor function is active (see "Monitor" on page 15). If the channel is busy, the **BUSY** indicator appears in the control head display.

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

- CTCSS and DCS mute,
- selective call mute, and
- RF squelch.

Note: RF squelch is always programmed to operate in your radio, but the CTCSS, DCS and selective call mutes are dependant on the way your radio is programmed.

CTCSS and DCS mute

CTCSS (continuous tone controlled subaudible signaling) and DCS (digitally coded squelch) signaling use subaudible tones to isolate your calls, so that

your radio only unmutes if the call carries the sub-audible tone or code specific to your fleet or group.

Selective Call Mute

2-tone decoding and 5-tone signaling use audible tones to isolate your calls, so that your radio only unmutes if the call carries the tones specific to your fleet or group.

RF Squelch

The radio's RF squelch allows reception of a signal only when it is above a factory-set threshold, so that only intelligible signals are made audible. Your radio can be programmed to override RF squelch using the monitor key (), allowing all activity on a channel to be heard, including noise.

Activating squelch override allows you to hear weak but intelligible transmissions.

Monitor

The monitor key () can be programmed to override one or more of the muting controls. In the most common configuration, monitor operates in the following way:

1. Press the monitor key briefly (less than one second) to override CTCSS/DCS or selective call mute, or both. Press the monitor key again to reactivate CTCSS/DCS or selective call mute.

   Note: If hookswitch monitoring is programmed, lifting the microphone off the microphone clip has the same effect.

2. Press and hold the monitor key for longer than one second to activate RF squelch override.

Press the monitor key again to reactivate RF squelch.

Muting an External Device

Your radio may be fitted with the ability to mute another device, such as a car stereo, so that received or transmitted messages are heard.

Scanning and Voting Groups

A series of channels may be grouped together so that the radio can scan through them looking for activity. When a busy channel is detected in a group and the signaling is valid (see "What You Hear on a Channel" on page 14), the **SCAN** indicator flashes, and the radio stops on that channel. The name of the captured channel is then displayed, rather than the group name, and you can now hear the transmission. Scanning resumes when the channel is no longer busy or the signaling is no longer valid.

You may be able to change the channels included in your group (see "Programmable Scanning and Voting Groups" on page 42).

Activating Scan Mode

1. Place the microphone on the microphone clip.

   Note: Your radio may be programmed to scan whenever the microphone is off the microphone clip. Check with the person who programmed your radio.
2. Select the required group the same way as you select a channel (see "Selecting a Channel" on page 11). The group name and **SCAN** indicator are shown in the control head display.

3. To cancel scanning, select a non-scanning channel. The **SCAN** indicator disappears from the control head display

Making a Call in Scan Mode

If you wish to make a call when the radio is in scan mode, lift the microphone off the microphone clip to suspend scanning. If the radio has halted scanning to monitor the traffic on a channel, it remains on that channel when you lift the microphone off the clip. If scanning has not halted, the radio reverts to the programmed default transmit ("home") channel.

Priority Scanning

One or two priority scan channels may be set. These channels are scanned more often than other channels and are scanned periodically when a non-priority channel is busy.

Voting

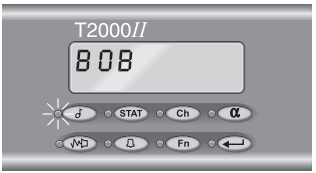
Voting works the same way as scanning, except the group's member channels carry the same traffic and the radio searches for and stops on the channel with the strongest signal.

5-Tone Signaling

5-tone (also known as multi-tone) signaling is selective calling that segregates a group of users from others on a channel, using a set of audible tones. Each radio has a unique identity and you can direct calls to individuals within your own group and make different types of calls. An emergency call may also be programmed.

Receiving a 5-Tone Call

When a call is received that contains your radio's identity, the radio gives a ringing tone and the call LED flashes.



Note: Your radio may be programmed to display the caller's identity when a call is received. This can be either a name or a number. Contact your system manager or the person who programmed your radio for more information.

To accept the call, press the PTT key and begin speaking.

Clearing a Call

If you do not wish to answer the call, press any of the control head keys to cancel the ringing tone and clear the call. The function associated with the key you press will not be invoked.

Receiving a 5-Tone Group Call

If you receive a 5-tone group call, your radio only sounds a single sequence of the ringing tone (burr burr). The caller then broadcasts a message to all members of your group. There is usually no need to respond to 5-tone group calls.

Making a 5-Tone Call

There are two ways to make 5-tone calls on your T2020:

- preset 5-tone calls, and
- dialed 5-tone calls.

Preset 5-Tone Calls

There are two different types of preset 5-tone calls that may be programmed for your radio.

- A one touch 5-tone call may be assigned to the auxiliary key ( ). To make the call, press the auxiliary key.
- A 5-tone call may be associated with each channel that has 5-tone programmed. To make one of these calls, change to the desired channel, and press and hold the call key ( ) for longer than one second.

The transmit indicator (TX) appears briefly and the radio may give a short beep, as the call is transmitted. When the called party responds, proceed with your conversation.

Dialing 5-Tone Calls

If you are unsure what numbers you can dial, consult your system manager or the person who programmed your radio.

1. Switch to a channel that has 5-tone programmed and press the call key ( ) to enter 5-tone dialing mode. The last number dialed may appear.

2. If the number displayed is the one you wish to call, press the enter key ( ) to send the call.

   The transmit indicator (TX) appears briefly and the radio may give a short beep, as the call is transmitted.

3. To call a different number, use the keypad to enter a new 5-tone number. Once all the digits are entered, press the enter key ( ) or the star key ( ) to send the call.

   The transmit indicator (TX) appears briefly and the radio may give a short beep, as the call is transmitted.

4. When the called party responds, proceed with your conversation.

In the following example, you wish to make a 5-tone call to number 27587. The sequence of key-strokes, and the corresponding characters that appear in the control head display, are shown in the table below.

Example: Making a 5-tone call to number 27587

Press Key	Display Reads	Meaning
	REGION2	Current channel
	12345	Enter 5-tone dialing mode. The last 5-tone number dialed appears.
2 ABC	**2**	First digit of the number.
7 PQRS	**27**	Second digit of the number.
5 JKL	**275**	Third digit of the number.
8 TUV	**2758**	Fourth digit of the number.
7 PQRS	**27587**	Fifth digit of the number.
	27587	Call transmitted.

Call Acknowledgement

After you have made a 5-tone call, you may hear an acknowledgement tone, beep, or series of tones from your radio, indicating that your call has been received. If you do not hear a tone, either:

- the called radio is incapable of generating an acknowledgement, or
- the called radio is turned off, or
- the called radio is out of range of your call.

Your radio may also be programmed to display the status of the called radio:

Display Reads	Meaning
NO ACK	No acknowledgement sequence from the called radio was detected.
NO STAT	An acknowledgement sequence was detected but no status information was decoded.
a status message e.g. **AT LUNCH**	An acknowledgement sequence was detected and the decoded status number can be identified.
a status number e.g. **21**	An acknowledgement sequence was detected but the decoded status number cannot be identified.

Note: If any control head activity is detected before any of the above messages are displayed, the acknowledgement sequence is no longer expected, and any acknowledgement messages received will no longer be displayed.

Making a 5-Tone Group Call

Your radio may be programmed so that you can make 5-tone calls to a group of radios. When a group call is sent, there is no acknowledgement tone from any of the other users.

Dialing 5-Tone Group Calls

The way you dial 5-tone group calls depends on the way your radio was programmed. Group calls can be dialed using the # character, the * character, or both. If you are unsure what characters you can use for dialing 5-tone group calls, consult your system manager or the person who programmed your radio.

- You may be able to dial the digits common to all members of the group and then dial the # character (key), as a substitute for all the remaining digits.

  For example, dialing 12# sends the number 12GGGG (six digit 5-tone identity).

- You may be able to dial the group tone individually, using the * character (key).

  For example, dialing 12*4# sends the number 12G4GG (six digit 5-tone identity).

In the following example, you wish to make a 5-tone group call to all numbers beginning with 37 (five digit 5-tone identity). The sequence of keystrokes, and the corresponding characters that appear in the control head display, are shown in the table below.

Example: Making a 5-tone group call to 37???

Press Key	Display Reads	Meaning
	REGION2	Channel REGION2 selected.
	27587	Enter 5-tone dialing mode. The last 5-tone number dialed appears.
3 DEF	**3**	First digit of the group call.

Press Key	Display Reads	Meaning
7 PQRS	**37**	Second digit of the group call.
#	**37GGG**	The group character (G) is substituted for the remaining digits.
↵	**37GGG**	Call transmitted to all 37??? users.

Wait a few seconds after the transmit indicator (TX) disappears from the control head display, and then broadcast your message. Phrase your message in such a way that it requires no acknowledgement, since the other users cannot all reply at once.

5-Tone Emergency Calling

One of the preset 5-tone calls programmed for your radio may be an emergency call. If programmed, emergency mode is activated by pressing the auxiliary key (🔔), or by operating a hidden switch. An emergency call is then sent to a predetermined location, such as your dispatcher.

For a description of emergency mode, see "Emergency Mode" on page 44.

Status Messages

Depending on how your radio was programmed, you may be able to attach a pre-defined status message to some calls. If the radio receiving your message has been programmed with the same status messages, it will decode and display your message.

The message can be up to eight characters long, indicating your current activity or location, such as "EN ROUTE" or "AT LUNCH". Up to 100 status messages may be defined at radio programming time.

You may be able to transmit a status message with:

- preset 5-tone calls, or
- 5-tone numbers that have variable status programmed, or
- alpha symbols (see "Alphanumeric Entry Mode" on page 32 for further information on alpha symbol calls).

Status Message Display

Your status message may be displayed as either a number or a label, depending on how your radio is programmed. You may also be able to switch between the two. See "User Function Menu Options" on page 34.

If the status message is displayed as a number, then the currently selected channel is also displayed on the left-hand side of the screen, truncated to six characters. In the following diagram the current channel is REGION2 and the status number is 88.

Assigning a Status Message

1. Press the status key (STAT) to enter status entry mode. The scrolling available indicator (▲▼) appears in the control head display and the currently selected status number or status label is displayed.

2. Use the up and down scroll keys (/) to move through the list of status messages until the required message is displayed, or

   enter the status number using the keypad.

3. Press the enter key ( ) to confirm your choice. The status message selected may be sent with your next 5-tone call.

Other 5-Tone Features

Other 5-tone features that may be programmed are:

- call diversion,
- call queuing,
- deferred calling,
- immediate callback, and
- unanswered call alert.

Call Diversion

Call diversion allows the radio user to divert received calls to a third party. The calling radio recognizes the diversion message from the called radio and switches to the requested diversion channel. See "Call Diversion" on page 38 for further details.

Call Queuing

Your radio may be programmed to queue up to 10 incoming calls. If this feature is enabled, the caller's number is put in the queue after the ringing stops. All other call indicators are cleared when the received call has been queued. See "Call Queuing" on page 36 for further details.

Deferred Calling

If the channel you are making a call on is busy, the radio may be programmed to store the call and send it again once the channel is free.

If the call is being resent and you wish to cancel it, press any key.

Immediate Callback

If you did not answer a call, and the call is not queued, the call LED remains flashing (☼♪). The caller's number and status may also be displayed. If the caller's identity is displayed, you can call back the caller by a press of the enter key (⏎).

Unanswered Call Alert

If you do not answer the call within a short time, the ringing tone stops. The radio may then be programmed to switch on another alerting device, such as a car horn, to attract your attention.

G-STAR ID Encoding

G-STAR signaling is used with conventional systems to identify individual radio users by assigning a unique G-STAR ID to each radio. This ID is transmitted each time the radio makes a G-STAR call, and is decoded by the dispatcher, giving a visual identification of the radio in use. A total of 16,384 individual ID codes are available. An emergency call may also be programmed.

Making a G-STAR Call

There are two ways to make G-STAR calls on your T2020.

- A one touch G-STAR call may be assigned to the auxiliary ( ) key. To make the call, press the auxiliary key.
- A G-STAR call may be associated with each channel that has G-STAR encoding programmed. To make one of these calls, change to the desired channel and press the PTT key. Depending on the way your radio is programmed, the G-STAR ID is sent when the PTT key is pressed, when the PTT key is released, or at both press and release of the PTT key.

The transmit indicator (TX) appears briefly and the radio may give a short beep, as the call is transmitted. When the called party responds, proceed with your conversation.

G-STAR Emergency Calling

The one touch G-STAR call programmed for your radio may be an emergency call. If programmed, emergency mode is activated by pressing the auxiliary key ( ), or by operating a hidden switch. An emergency call is then sent to a predetermined location, such as your dispatcher. For a description of emergency mode, see "Emergency Mode" on page 44.

2-Tone Decoding

2-tone signaling is used with conventional systems to selectively call either individual or groups of radios, using two sets of programmed decodes. Your radio may be programmed to decode 2-tone calls.

Receiving a 2-Tone Call

When a 2-tone encoded call is received, the radio gives a beep, indicating which type of 2-tone call has been decoded.

- When receiving a 2-tone individual call, the radio gives a long beep.
- When receiving a 2-tone group call, the radio gives two medium beeps.
- When receiving a 2-tone super group call, the radio gives three short beeps.

To accept the call, press the PTT key and begin speaking.

DTMF Calls

DTMF (dual tone multiple frequency) is the tone-based system used in the world's telephone networks. If your system has access to the PSTN (public switched telephone network) or other networks that make use of DTMF tones, your radio can make a call to a telephone or send control codes to a remote device.

There are two ways to make DTMF calls on your T2020:

- preset DTMF calls, and
- dialed DTMF calls.

Preset DTMF Calls

There are two different types of preset DTMF calls that may be programmed for your radio.

- A single one touch DTMF call may be assigned to the auxiliary key (). To make the call, press the auxiliary key.
- A DTMF call may be associated with up to 20 programmed alpha symbols. See "Alphanumeric Entry Mode" on page 32 for further details.

The transmit indicator (TX) appears briefly and the radio may give a short beep, as the call is transmitted.

Dialed DTMF Calls

Consult your system manager or the person who programmed your radio for what DTMF strings you can dial. They consist of DTMF tones 0 to 9, * and #, and may include tones A to D.

Dialing Tones A to D

If you wish to dial tones A to D, your radio may be programmed so that you can use the PTT key as a

"shift" key in conjunction with the numeric keys, as follows:

PTT + 2 ABC = A
PTT + 5 JKL = B
PTT + 8 TUV = C
PTT + 0 = D

For example, pressing the PTT key, holding it, then pressing the 2 ABC key enters tone A in the DTMF string.

Dialing Type

Your radio may be programmed for either normal or buffered dialing.

- Normal dialing: The digits are transmitted as you dial them and the transmit indicator (TX) appears briefly as each digit is pressed.
- Buffered dialing: The digits are transmitted once the string has been entered in full and you have pressed the enter key (⏎). The transmit indicator (TX) appears for the duration of the transmission.

Note: Pressing any of the keys on the keypad causes the corresponding DTMF tone to sound, but this does not indicate whether or not the tone has actually been transmitted. Watch your radio's display to see if the transmit indicator (TX) appears.

You may be able to switch between buffered and normal dialing in the user function menu (see "User Function Menu Options" on page 34).

Dialing a DTMF Call

1. Press any illuminated mode keys to deactivate the function (☼♪, ☼STAT, ☼Ch, ☼α or ☼Fn). The radio is now in DTMF dialing mode and the last call dialed may appear.
2. If the number displayed is the one you wish to call, press the enter key (⏎) to send the call.

   The transmit indicator (TX) appears briefly and the radio may give a short beep, as the call is transmitted.
3. To call a different number, use the keypad to enter the new DTMF string.

   Depending on the way your radio was programmed, the digits may be transmitted as you dial them or once the string has been entered in full. See "Dialing Type" on page 30 for further details.
4. Once all the digits are entered, press the enter key (⏎) to send the call.

   The transmit indicator (TX) appears briefly and the radio may give a short beep, as the call is transmitted.

Alphanumeric Entry Mode

Alphanumeric entry mode allows you to select and execute up to 20 programmed command sequences called alpha symbols. An alpha symbol can:

- change to a specific channel or scan group,
- dial a 5-tone or DTMF call,
- change the radio's status, or
- any combination of these tasks.

Note: Programmed alphanumeric entries are required before this option is available.

Selecting an Alpha Symbol

1. Press the alphanumeric key (α) to enter alphanumeric entry mode. The scrolling available indicator (▲▼) appears in the control head display, along with the last alpha symbol executed.
2. Use the up and down scroll keys (/) to move through the list of alpha symbols until the required label is displayed, or

   enter the alpha symbol label using the keypad. A star appears in the display as you type each character, until you have entered enough characters for the radio to recognize the label. The radio then displays the label in full.
3. Press the enter key ( ) to execute the associated sequence of commands.
4. Press the channel key (Ch), and the display changes from the label to the channel name. The radio may be programmed to display the channel name automatically.

In the following example, you wish to call your base, which monitors a channel called REGION2 and has the 5-tone number 24624. The sequence of keystrokes, and the corresponding characters that appear in the control head display, are shown in the table below.

Example: Searching for alpha symbol BASE

Press Key	Display Reads	Meaning
α	**CHARLIE**	Enter alphanumeric entry mode. The last alpha symbol executed appears.
2 ABC	*	2 represents A, B and C. The radio cannot yet determine a unique label.
2 ABC	**	The radio cannot yet determine a unique label.
7 PQRS	**BASE**	The unique label has been identified.
⏎	**24624**	Channel REGION2 is selected and the 5-tone number is transmitted.
Ch	**REGION2**	The channel associated with the alpha symbol BASE is displayed.

User Function Menu

The user function menu allows you to personalize the way your radio operates. Two types of menu options can be accessed using the user function menu:

- options that change between two settings, and
- options that take you into another operating mode.

User Function Menu Options

The user function menu options are described in the following table. Some or all of these options may be programmed for your radio.

Display	Settings	Meaning
ELIT	**DIM/OFF**	Sets the backlighting level of the control head display to either dim or off when the radio is in economy mode.
LITE	**FULL/DIM**	Sets the backlighting level of the control head display at power-up.
HUSH	**ON/OFF**	Sets whether an external device can be muted when a call is transmitted or received. The necessary hardware interface must be installed.
HORN	**ON/OFF**	Switches the external alert function on and off when a received call is unanswered. The necessary hardware interface must be installed.
BEEP	**ON/OFF**	Turns keypress confidence tones on and off. Keypress confidence tones are the beeps heard when a key is pressed.
BEEP	**HI/LOW**	Changes the level of keypress confidence tones.
STAT	**NRM/FIX**	Switches the 5-tone status display between a status label or a number.

Display Settings	Meaning
DTMF BUF/NOR	Switches the DTMF dialing type between buffered (tones sent together) and normal (tones sent as each key is pressed).
CALL QUE	Accesses call queue entry mode. See "Call Queuing" on page 36.
DIVERT	Accesses call diversion setup mode. See "Call Diversion" on page 38.
PROG SIG	Accesses signal programming mode. See "Programmable Channel Signaling" on page 40.
PROG GRP	Accesses group programming mode. See "Programmable Scanning and Voting Groups" on page 42.

Altering User Options

If you are not sure what user function menu options are available, enter user function menu entry mode, and scroll through the list of menu options.

Note: The menu options **CALL QUE**, **DIVERT**, **PROG SIG** and **PROG GRP** allow you to access user programmable features. The table above gives reference pages for these features.

Accessing the User Function Menu

1. Press the function key (Fn) to enter user function menu entry mode. The scrolling available indicator (▲▼) appears in the control head display.
2. Use the up and down scroll keys (/) to move through the list of menu options.
3. To leave user function menu entry mode, press another mode key (function, call, status, channel or alphanumeric).

Changing an Option Setting

1. Press the function key (Fn) to enter user function menu entry mode. The scrolling available indicator (▭) appears in the control head display, along with the last item viewed in user function menu entry mode.
2. Use the up and down scroll keys (/) to move through the list of menu options until option you want to change is displayed.
3. Press the enter key ( ) to change the status of the menu option. For example, if the display reads **ELIT DIM**, pushing the enter key changes it to **ELIT OFF**.

Call Queuing

If you are unable to answer your incoming calls immediately, your radio may be programmed to store up to 10 incoming 5-tone calls, so that you can return the calls later. 5-tone hardware must be installed in the radio and call queuing must be programmed before this option is available.

A call is queued and the caller number and the channel of the received call is put in the call queue when:

- the call remains unanswered when the ringing tone stops, or
- if another call is received before the previous unanswered call is queued or answered.

Note: After the incoming call has been queued, it is automatically cleared when answered, and the radio resumes what it was doing prior to receiving the call.

Call Queue Not Empty

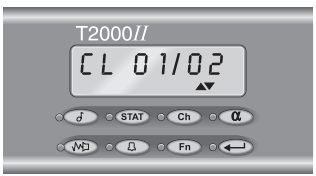
When a call has been queued, the radio automatically switches to user function menu entry mode after a period of user inactivity. When this happens, **CALL QUE** appears in the control head display and the function LED flashes (☼Fn).

Accessing the Call Queue

1. Press the function key (Fn) to enter user function menu entry mode. The scrolling available indicator (▲▼) appears in the control head display, along with the last item viewed in user function menu entry mode.
2. Use the up and down scroll keys (/) to move through the list of menu options until the **CALL QUE** option is displayed.

   Note: The **CALL QUE** option only appears if there are calls queued.

3. Press the enter key (↵) to enter call queue entry mode, and the first call in the queue is displayed.



   The display shows the call's position in the queue (**01**) and the number of calls in the queue (**02**).

4. Press the enter key (↵) to display the caller's number and use the up and down scroll keys

(/) to move through the list of call queue entries.

5. Press the enter key () to return a call. The radio switches to the channel the call was received on and sends the call. The entry is then automatically removed from the call queue.
6. Press the zero key () to delete an entry from the call queue without returning the call.

Exiting Call Queue Entry Mode

To leave the call queue, press another mode key (function, call, status, channel or alphanumeric). If the last entry in the call queue has been returned or deleted, the radio automatically exits from call queue and reverts to the user function menu.

Call Queue Full

Whenever the queue is full, the radio continues to receive calls, but does not resume what it was doing prior to receiving the call. Calls are only received on the active channel. Subsequent calls that are received overwrite the information about the previous call.

Call Diversion

This feature enables the radio to be put into call diversion mode, where any valid incoming 5-tone sequence causes the radio to transmit another user defined 5-tone or DTMF sequence on the programmed call diversion channel. The sequence to be transmitted and the call type (5-tone or DTMF) can be entered by the user while in call diversion setup mode.

5-tone hardware must be installed in the radio and call diversion must be programmed before this option is available.

Activating Call Diversion

1. Press the function key (Fn) to enter user function menu entry mode. The scrolling available indicator (▲▼) appears in the control head display, along with the last item viewed in user function menu entry mode.
2. Use the up and down scroll keys (/) to move through the list of menu options until the **DIVERT** option is displayed.
3. Press the enter key ( ) to enter call diversion setup mode. The last selected diversion call type, either **5-TONE** or **DTMF,** is displayed.
4. Use the up and down scroll keys (/) to switch between the two options.

   Note: If DTMF hardware has not been installed and the radio programmed appropriately, the DTMF call type is not available.
5. Press the enter key ( ) to confirm the call type selected, and the last selected sequence is displayed. If the last selected sequence is no longer valid, the default sequence is displayed.
6. If another sequence is required, use the keypad to enter the new diversion sequence.
7. Press the enter key ( ) to confirm the diversion sequence and to put the radio into call diversion mode.

Exiting Call Diversion Mode

To leave call diversion mode or call diversion setup mode, press another mode key (function, call, status, channel or alphanumeric).

Receiving a Call During Call Diversion

When a standard incoming call is received by the radio in call diversion mode, the programmed auto-acknowledgement sequence is transmitted, as for a normal call. However the programmed diversion status is transmitted instead of the normal acknowledge status, to inform the caller that the call has been diverted.

The radio then switches to the programmed call diversion channel and transmits the sequence that has been set up for the call diversion, without indicating to the user that an incoming call has been received (no ringing). After executing the diversion transmission, the radio reverts to the channel it was on prior to the call diversion.

Calling a Radio in Diversion Mode

Your radio may be programmed to respond to a diversion status report when making a call. When it detects the diversion status in the acknowledgement from the radio it has called, it displays **DIVERT**, to indicate that the call has been diverted. It then switches to the programmed diversion channel.

Programmable Channel Signaling

Your radio may be programmed so that you can change the subaudible signaling (CTCSS/DCS) used on a channel. Up to 20 signaling presets may be defined at radio programming time.

Changing the Channel Signaling

1. Press the function key (Fn). The item last viewed while in user function entry mode appears in the control head display.
2. Use the up and down scroll keys (/) to move through the list of menu options until the **PROG SIG** option is displayed.

   Note: The **PROG SIG** option does not appear if no subaudible signaling presets were defined at radio programming time.
3. Press the enter key ( ) to enter signal programming mode. The name of the first channel programmed in your radio is then displayed.
4. Use the up and down scroll keys (/) to move through the list of channels until the channel you wish to change is shown.
5. Press the enter key ( ) again to access the list of signaling preset labels.

6. Use the up and down scroll keys (/) to move through the list of signaling presets.
7. When the preset you wish to apply to the channel is displayed, press the enter key ( ).

   The channel is then updated with the new signaling.

Exiting Signal Programming Mode

To leave the signal programming session, press another mode key (function, call, status, channel or alphanumeric).

Programmable Scanning and Voting Groups

Your radio may be programmed so that you can change the mix of channels that belong to your scanning and voting groups.

You can:

- remove channels from the group,
- add new channels, or
- change the home channel.

Starting a Group Programming Session

1. Press the function key (Fn). The item last viewed while in user function entry mode appears in the control head display.
2. Use the up and down scroll keys (/) to move through the list of menu options until the **PROG GRP** option is displayed.

   Note: The **PROG GRP** option does not appear if no groups were specified as user programmable at radio programming time.
3. Press the enter key ( ) to enter group programming mode. The name of the first user programmable group is displayed and the top row of LEDs illuminates.
4. Use the up and down scroll keys (/) to move through the list of user programmable

groups and press the enter key ( ) again to start editing the group.

The name of the first channel programmed in your radio is displayed.

5. Use the up and down scroll keys (/) to move through the list of channels.

   The **SCAN** indicator appears when the channel displayed is a member of the group you wish to reprogram.

   The **SCAN** indicator flashes when the channel displayed is the home channel of the group you wish to reprogram.

Changing a Channel's Group Membership

1. Press the enter key ( ) to add or delete a channel from the group.

   Note: A group can contain up to 16 channels but must have at least two channels.

2. Press and hold the enter key ( ) for longer than one second to redefine the home channel. The **SCAN** indicator then flashes.

   Note: The home channel cannot be deleted from a group. To delete a home channel, first define a new home channel. The original home channel can then be deleted.

Exiting a Group Programming Session

To leave the group programming session and save the new group information, press the function key ( ). The radio then returns to the user function menu.

Economy Mode

Economy mode conserves battery power when there is no activity on the radio by turning off some internal circuitry after a programmed period of inactivity.

While economy mode is active, the control head display backlighting may dim or switch off. This feature of economy mode may be turned on and off using the function menu (see "User Function Menu" on page 34).

Operating any of the control head controls, or the PTT key, returns the radio to the fully active state.

Emergency Mode

Emergency mode is activated either by a hidden switch or by giving a press of the auxiliary key (). An emergency 5-tone or G-STAR encoded call is then sent out to a predetermined location, such as your dispatcher. Your radio must have either 5-tone or G-STAR signaling installed and be programmed appropriately.

Once emergency mode is activated, your radio may repeatedly transmit the emergency sequence. During this time, you may be able to make calls using the PTT key and hear incoming traffic. The radio can be reset to normal operation at any time by turning the radio off, then on.

Stealth Emergency

When emergency mode is activated, all radio indicators will remain unchanged, you will not hear any channel traffic and you may not be able to make PTT transmissions. Stealth Emergency is a programmed option. The radio can be reset to normal

operation at any time by turning the radio off, then on again.

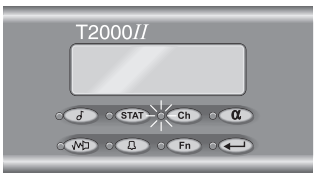
Emergency Cycling

This begins after emergency mode is activated and the emergency sequence has been transmitted. The radio cycles between transmitting and receiving so that any activity near the radio can be heard by the party receiving the emergency call. Emergency cycling is a programmed option. The radio can be reset to normal operation at any time by turning the radio off, then on again.

Repeater Talkaround

If the repeater is busy or you are out of range of the repeater, you can communicate directly with another radio by using repeater talkaround. While repeater talkaround is active, all transmissions are made on the receive frequency of the channel you are on.

Give a long press of the channel key (Ch) to activate repeater talkaround. While repeater talkaround is active, the channel LED flashes.



Select the required channel and proceed with your call in the usual manner.

To turn off repeater talkaround, give a long press of the channel key again, or change to another channel.

Maintenance and Troubleshooting

Basic Maintenance

Your T2020 requires no regular maintenance other than ensuring that cables and connections are secure and that no damage has occurred to the antenna or wiring.

Trouble-shooting

If you are experiencing difficulty operating your radio, review "Basic Operation" on page 11 and check the following items:

- Is the power connector plugged into the rear of the radio?
- Are the in-line fuses in good condition?
- Is the power cable securely connected to the vehicle battery or power supply?

If all appears to be in order but your radio still fails to operate properly, consult your local dealer for assistance.

www.taitworld.com/

CANADA
Toll Free: 1-800-890 TAIT (8248)
E-mail: canada@taitworld.com

USA
Toll Free: 1-800-890 TAIT (8248)
E-mail: usa@taitworld.com

LATIN AMERICA
E-mail: latinamerica@taitworld.com

AUSTRALIA
E-mail: australia@taitworld.com

NEW ZEALAND
E-mail: headoffice@tcl.tait.co.nz

EUROPE
E-mail: sales@tait.co.uk

HONG KONG
E-mail: hongkong@taitworld.com

BEIJING
E-mail: beijing@taitworld.com

SINGAPORE
E-mail: singapore@taitworld.com

THAILAND
E-mail: thailand@taitworld.com

CORPORATE HEAD OFFICE
NEW ZEALAND
Tait Electronics Ltd
P O Box 1645, Christchurch
E-mail: tait@taitworld.co.nz

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