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Another Papakura Radio Club Project T8100 V4.32 VFO Operation Manual

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2024

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Version: 1.03

Programming the Tait 8100 VFO

How to Operate

There are basically 2 modes of operation.

1. VFO Mode this is indicated by lack of M number on the bottom right of the display.

2. Memory mode this has the M number on bottom right of the display.

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To change from VFO to Memory or from Memory to VFO, short press on button A.

To program, use the push buttons, starting from the left to right, first button is A, then B, C, D and E. See photo in trouble shooting on page 9, for easy reference, I have marked the buttons in red.

S Meter shown in dBm

The lower half of the screen, showing the displayed dBm number is the actual measured signal level received. It is the same as an S meter but just in different numbers.

VFO Mode

This is where you can change the frequency, power level, repeater offset etc. To change the frequency, push the Volume control knob briefly, that will allow adjustment of the frequency. Adjustments are made by using the Volume control knob. You can take 1MHz steps by short press on button B, small steps by long press on the button B,
6/25kHz steps this is the step frequency take as the rotary encoder is turned the default is 25kHz but can be changed to 6.25, 25 or 100kHz the step size will be displayed on the bottom left of the display and if unchanged will be used by the rotary encoder, to change this setting, a long push on button B is required, then release and a long push again on button B to move to next step size.

Long push on button E, to enter menu to set power output, use the Volume knob to change values.

Short push button E, to select repeater offset, Volume knob to change.

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Short push button E, to set CTCSS on TX, Volume knob to change, short push on Volume knob to select RX CTCSS.

Short push button E, to set scan channels, short push on Volume knob to select channel/scan number and using the Volume knob to make all changes.

Short push on button E to set scan delay, use Volume knob to change. This is the delay after losing signal before resume scan,

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Short push button E to set bandwidth, 12.5kHz is narrow 25kHz is wide. (25kHz is default)

Short push button E to exit menu.

Once all settings are done, this can be saved to a memory channel by long press on button A.
Use the Volume knob to select the channel number.

The memory channel number will display on bottom right of the display, if there is a ‘ * ’ after the number, this indicates the channel is unused.
Long press on button A to save the selected information to channel number.

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Memory Mode

Memory mode, this is active when the Memory number is shown on bottom right of the display M xx. When you exit memory mode, the contents of the current memory is copied into the VFO.
In this mode RF output, can be changed by a short push on button B, each push rotates through power levels X, (1w) L, (5w) M, (10 w) and H (25w). This is not saved in the memory.

Long push on button C, will delete the channel from Memory.

Short push E, if repeater channel. This will reverse TX and RX frequency R will be displayed, push again to select normal frequency.

Short Push on button D, will start scan function.

Long push on button D, will add the displayed channel to the scan list. The scan list number and channel will be displayed on the bottom line of the display, the scan list number selected will be the first non-used location in the scan list if an empty memory number is saved the scan will ignore that channel.

During scan the scan will stop on a busy channel and restart after loss of signal and delay time, if this is an unwanted channel it can be temporarily removed from the scan by long push on button D, it will be restored to the scan list when restarting scan.

During Scan, if the PTT is pressed, the Scan will stop but radio will not go in to transmit. You will need to release the PTT and press again to transmit. Scan will not resume after PTT is released.

When the scan has been stopped with a signal, the only options are to stop the scan by briefly pushing button D, remove the channel from scan list. Long press button D, or change using the volume knob.

If PTT, is pressed when scan has stopped or during delay time, the radio will go into transmit and the scan will stop.

The scan list can be edited in the setup function with a long push on button E, then short pushes until display shows SN>00 Mem Ch 01 or in VFO mode long push on button E will also enter list edit.

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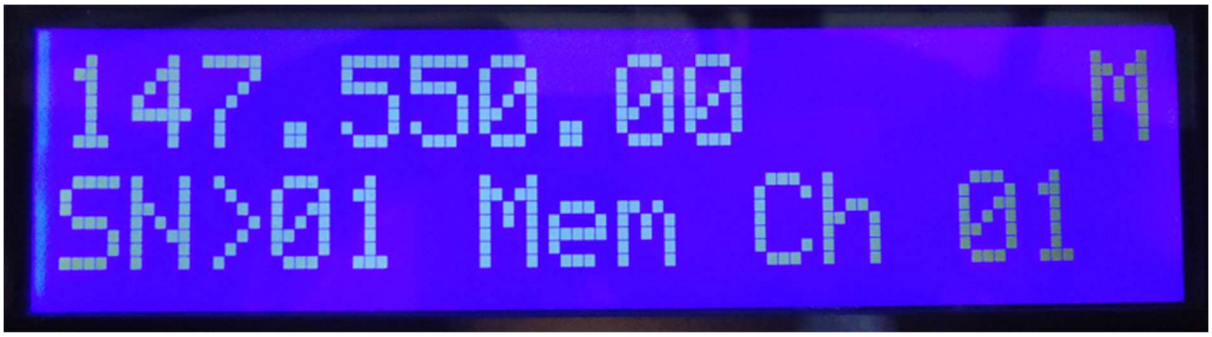

SN is the scanning list number which is only used as a reference and CH is the channel saved in that list number. Use the Volume knob to change the SN number. If CH is 00, then no channel information is saved by pushing the Volume knob, the '>' will move to 'CH>' this indicates that adjusting the Volume knob will change the channel number. Long push on button C, will put 00 into channel location, any other button will exit in VFO mode Push button E, several times to exit in setup mode.

If all SN locations are allocated to channels, the next save will report 'SN Full' you will need to delete a channel from the list to add a new channel.

The function of the Volume knob will default to Volume adjustment after a short delay and no activity on the Volume knob.

CTCSS

CTCSS can be set separately on TX and RX, in setup VFO mode by a long push on button E.

Short pushes on button E, until CTCSS TX, is displayed. The Volume knob will change value if active and 't' will be displayed after the frequency on the top line of the display.
Short push on the Volume knob to select CTCSS RX, Volume knob top will change the value if active and 'r' will be displayed after the frequency on the top line of the display.

If a channel has CTCSS set on Receive and that channel is busy PTT, it will not transmit, this is called BCL Busy Channel Lockout, the reason for this, is you may not hear audio on the channel and assume it is not in use when in fact it is.

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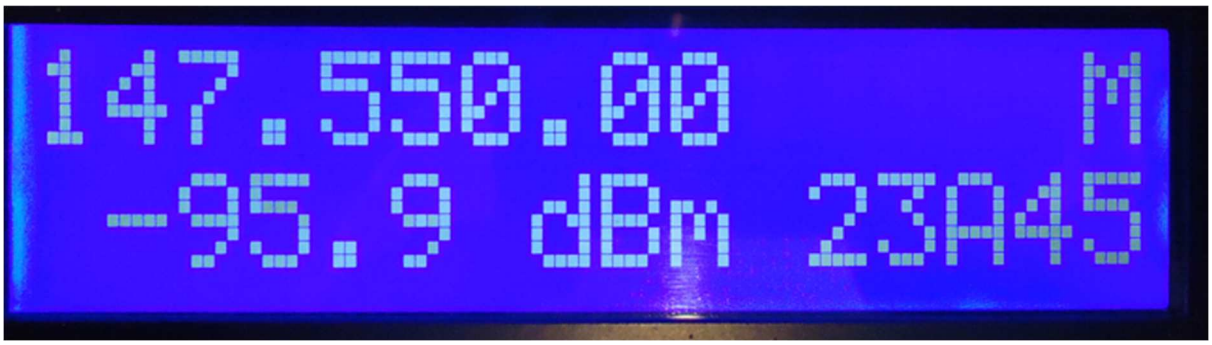
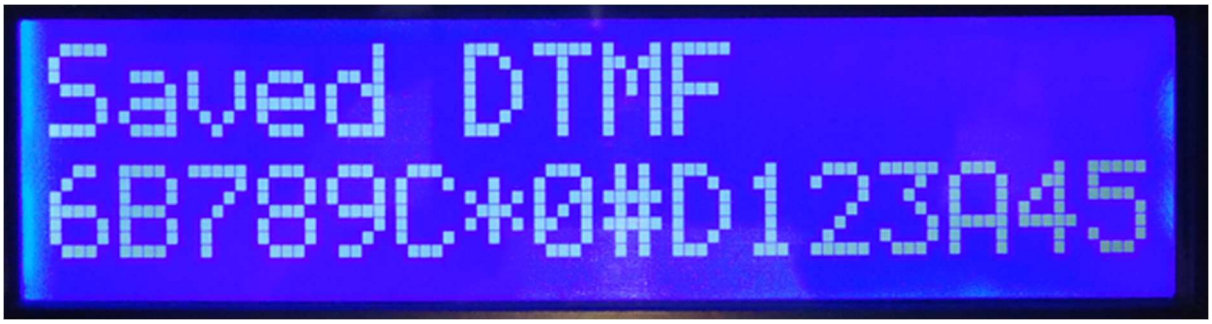
The display has a built in DTMF decoder, it will display any received DTMF tones on the bottom right part of the display, last 6 digits received.



In VFO mode a short push on button C, will display last 16 digits received. A long push on button C, to delete this list.



When in set up and in Bandwidth selection, a long push on button E, will take you in to a TX RX frequency setup to allow entry of different repeater splits. This is only required for unusual systems. The display will show a # in place of the + or – do not use this function unless you are sure the repeater requires this.
A long push on the Volume knob is most modes will turn the radio off/on.
If the DC power is disconnected and then re-applied the radio will start up in the same mode before the power was removed.
If you need to reset the display to use on UHF or VHF turn radio off, a long push on volume knob and wait for at least 15 seconds, then a long push on button C, to start in the selection menu.
From power off, a short push on the Volume knob will start and display sign on messages. A long push will start directly into the frequency display.

The function of the volume knob will default to volume adjustment after a short delay and no activity on the volume knob.

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Error Messages

If you see 'Comm error' on the display, this means that the radio has not responded to a command sent from the display board, try disconnecting the DC power and wait a few seconds and then re-apply the DC power, this will also appear if you have tried to select a frequency outside of the radios band. You will need to either re-select a frequency in the band or power off and reset via long push on button C.

For those interested there is a function in the set up long push on button E, then long push on button A, this will display the reply code sent from the radio each time a command is sent to the radio. This can help if a Comm's error is displayed and the code will point to the error.

RJ45 Mic Pin Connections

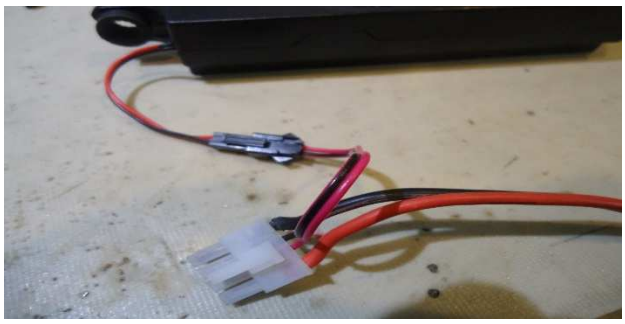
- **Pin 1.** This is connected to Pin1 on J13 which can be connected to Pin 1 of the connector, on the front of the radio. (bottom left of the connector) this will provide a headset with low level Audio, after the volume control.
- **Pin 2.** is connected to the output of an 8V regulator limited current is available. (less than 50mA)
- **Pin 3.** is not connected.
- **Pin 4.** PTT.
- **Pin 5.** Microphone audio this has DC to power an electric condenser microphone.
- **Pin 6.** Ground, pin 4 of J13 is also connected to ground.
- **Pin 7.** Not used and is connected to pin 3 of J13.
- **Pin 8** Not used and is connected to pin 2 of J13.

Trouble Shooting

No Sound

The radio will need and external speaker as the internal one was fitted on the original front panel. This is no longer available.

NOTE: It is recommended to use a plug and socket for the external speaker connection. Do not just use bare wires as if these wires touch or short out, it will do damage to the radio.



The connection for the external speaker is on the unused connections on the power cable plug radio end. (see photo on left)
The speaker pins, Molex Mini-Fit-Jr. The mating housing is 5557-04R2 These terminals belong to the 5556 series.
Another version that will fit are M1561TL. This is the Molex number for the female pin.

Fit an inline plug and socket on the other end of the cable so that it will make it easier if you want to remove the speaker.

Errors on Power Up.
Tait VFO 1st time power up. If the backlight is on but nothing displayed adjust the contrast control on the back of the PCB to show initial display If the display shows “Com Error” on 1st power on,

1. Power off by pushing and holding the rotary control knob
2. Power on by push and hold the DTMF button
3. Usually push button VFO for VHF and then 1MHz button for active volume control.

The display will go off then power back on by pushing rotary control knob this will reset radio to some defaults you will need to setup all settings in the setup menu (Push and hold REV button to enter setup menu)

This error is due to the EEPROM contents set to “55” it should have been erased which would set contents to “FF”

Photo 18.

If EEPROM has been erased 1st power will go directly to VHF/UHF selection. Refer to photo 18 to program the radio for VHF/UHF selection.
Once you select your radio’s type, (VHF or UHF) you then need to press B to accept your choice.

Blue Screen only, No Display If you only have the backlight on, and showing a blue screen with no info up on the screen, when you, 1st power it up, you will need to adjust RV1 the 10K trimpot. This pot should adjust the contrast up and start showing the text up on the screen once you start turning the trimpot. This adjustment will be almost at maximum adjustment.

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A-Z QUICK OPERATION GUIDE

You must start every action from within the VFO Mode.
To access all menu functions, press the volume knob (rotary control knob) and/or hold or press one of the five item buttons A, B, C, D or E.
For all actions… Long Push (**Hold**) is more than 3 seconds, short Push (**Push**) is less than 3 seconds.

MENU LIST	DESCRIPTION	OPTIONS
CTCSS	Hold E, Push E for CTCSS menu, adjust volume knob to set, Push E until exit	Push volume knob TX/RX, adjust, volume knob to select Tone
DTMF	The VFO also has a DTMF decoder. When a signal is present any valid DTMF tone pair will be displayed on the bottom left of the display. The last 6 digits are displayed a total of 16 digits is stored.	This can be displayed by going to VFO mode and pressing the DTMF button it is not necessary to delete then as any future DTMF will be saved and the older digits are lost.
Erase Memory	Push A for memory menu, adjust volume knob for memory #, Hold C, Push A, continue	Memory erased, memory channel # has * after #, now available to reprogram new frequency.
Exit Memory, No Changes Made	Push A for memory menu, adjust volume knob to set #, Hold A, Hold A, continue	Memory not written or changed.
Memory Mode	Enter Memory mode, Push A until M displays, continue	Now in memory mode
Memory SN/CH	Hold E, Push E for menu, adjust volume knob to search, Push E until exit.	Push volume SN/Ch, adjust volume control knob for number.
Memory Write	Push A for memory menu, adjust volume knob to set Channel frequency, Hold button A,	Frequency written to memory.
Power Levels	Power can be set for each individual frequency in memory	Adjust power level X, L, M, H power level to suit
Power On/Off	Push rotary control knob to turn radio On. Long push to turn OFF	Powers radio On or Off
Power Output	Hold E for RF Power Out menu, adjust, volume knob to set, Hold E to exit	Adjust volume knob to select power output. X = 1 Watt L = 5W, M = 10W, H = 25W

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MENU LIST (Continued)	DESCRIPTION	OPTIONS
Repeater Reverse Shift (Input of repeater)	Push E, Reverse frequency, displays the input of repeater, Push E to return back to frequency	R displayed in top right corner
Scan Add	With Memory # set, Hold D to add the Scan List, Push A to exit	Adds memory to set scan list
Scan Delay	Hold E, Push E for SN/Mem Ch menu, adjust volume knob to set, Push E until exit	Turn volume knob to select 0 - 60 seconds
Scan Memory Channels	Push D starts Scan if stored, Push D to stop scan if running, continue	Or If PTT, is pressed, scan will stop or during delay time.
Set Up	Hold E, Push E to move thru options… Push E until exit	RF Out, TX split, CTCSS, SN/Mem, Delay, VFO Step
TX Split	Hold E, Push E for TX Split menu, adjust volume knob to set, Push E until exit	Adjust volume knob to set - + or None
VFO Entry	Enter VFO Mode, Push A until no M displays, continue	Now in VFO mode
VFO Step	Hold E, Push E for Bandwidth, adjust volume knob for 25K or 12.5k, Push E to exit	12.5K n (Narrow) after frequency, 25K (Default)
VFO 6/25 Steps	Hold B, hold B 6.25, hold B 100, hold B 25, Push B 1M, Hold E to exit	Steps… 25, 100, 6.25, 1M

NOTES

For full details on this Tait VFO project, please visit https://zl1rjs.co.nz/vfo.html
Any errors or changes to this manual, please contact **Rob ZL1RJS** via the website above.