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Another Papakura Radio Club Project T8100 V4.35 VFO Operation Manual

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Another Papakura Radio Club Project
T8100 V4.35 VFO Operation Manual

Version: 1.07 26-04-25

Programming the Tait 8100 VFO - How to Operate

When You First Power Up

Upon power up if you encounter a blank blue screen or any errors, please refer to the trouble shooting section below. (Pg. 11.)

Rotary Control Knob

This VFO has a rotary control which is used as a multi-function control. To turn On and Off, push the rotary control to turn On and to turn Off push for 3 seconds. It is also used by turning the knob to adjust the setting. E.g. Frequency, Volume and when in set-up mode, to adjust setting.
The function of the rotary control knob will default to Frequency adjustment.
You have 5 push switches on the Tait, shown in photo 1.

Photo 1.

These buttons in white show the normal operation to operate the radio.

To program, use the push buttons, starting from the left to right, first button is A, then B, C, D and E. See photo 1 above, for easy reference, I have marked the buttons in red.
You will use these buttons when programming. (These are not shown on the radio). You will need to visualise these letters “A to E”

VFO Mode

There are basically 2 modes of operation. VFO mode and Memory mode.
VFO Mode this is indicated by lack of the M plus channel number on the bottom right of the display

Photo 2.

Photo 2 shows that you are in VFO mode.

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Memory Mode

Photo 3.

Photo 3 shows in Memory mode, this has the M number on bottom right of the display and channel number “M 05”.
To toggle between VFO to Memory or from Memory to VFO, by a short press on button A.

Photo 4.

S Meter shown in dBm

The lower half of the screen, showing the displayed dBm number in Photo 4. is the actual measured signal level received. It is the same as an S meter but just in different numbers.

S-point	Microvolt	dBm
S9+10	= 160.00 µV	= - 63 dBm
S9	= 50.15 µV	= - 73 dBm
S8	= 25.13 µV	= - 79 dBm
S7	= 12.60 µV	= - 85 dBm
S6	= 6.31 µV	= - 91 dBm
S5	= 3.16 µV	= - 97 dBm
S4	= 1.59 µV	= - 103 dBm
S3	= 0.79 µV	= - 109 dBm
S2	= 0.40 µV	= - 115 dBm
S1	= 0.20 µV	= - 121 dBm

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VFO Mode

When in VFO mode, this is where you can change the volume, frequency, power levels, repeater offset etc. To change the volume, push the rotary control knob briefly, that will allow adjustment of the volume. Adjustments are made by using the rotary control knob, this will display the “Vol level” and adjust by turning the knob. After a few seconds it will revert back to frequency.

Volume Mode

To activate and adjust the volume,
a short press on the rotary control knob will display Vol xx and turn control to adjust. No activity on the Volume knob, after 3 seconds it will default back to Frequency adjustment.

Frequency or Memory Adjust

To change the frequency or Memory channels, turn the rotary control knob, this is set as the default setting.

Frequency Steps

You can take 1MHz steps by short press on button B. Smaller steps can be done by a long press on button B. With every long push of “B” will toggle 25k, 100k and 6.25k steps. The default is 25k but can be changed if required. Each step size will be displayed on the bottom left of the display and if unchanged, this will be used by the rotary encoder. To change this setting back, a long push on button “B” is required, then released and a long push again on button “B” to move to next step size.

Programming the Memory Channels

To program in a memory, **you MUST be in the VFO mode**. Follow the steps below which shows step by step what appears on the screen with each short button press of “E” using the rotary control knob to adjust each setting.

To Program a Repeater in Memory

Select and dial the frequency required.

Photo 5.

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Long push on button E, to enter menu to set power output, shown in the top right of screen.
Use the rotary control knob to change values.
Photo 5 shows “M” (Mid) has been selected for 10W’s Operation.
Adjustment of power output levels can be done by adjusting the rotary control knob.
Power outputs are 1 Watt (X), 5 Watts (L), 10 Watts (M) or 25 Watts (H).

Next Short push on button E, to select repeater – or + offset, or blank for simplex operation. Use the rotary control knob to change.
Photo 6 shows a negative split

Photo 6.

Short push again on button E, to set CTCSS on TX, use the rotary control knob to change if required, Not all repeaters use a CTCSS tone.
To toggle the CTCSS for RX a short push on the rotary control knob to select CTCSS RX if required.

Photo7.

Photo 7 shows that no CTCSS TX is being used as “OFF” is displayed.

Photo 8.

Photo 8 shows the CTCSS RX is being used as “OFF” is displayed.

Short push button E, to set scan channels, short push on rotary control knob to select channel/scan number and using the rotary control knob by turning it to make all changes.

Photo 9.

Photo 9 shows the scan number and memory Channel number “SN 01 Mem Ch 01”

Short push on button E to set scan delay, use rotary control knob to change. This is the delay after losing signal before resume scan, adjust by turning the control knob. Photo 10 shows the scan delay is set to 5 seconds.

Photo 10.

Short push button E to set bandwidth, 12.5kHz is narrow 25kHz is wide. (25kHz is default)
Photo 11 below shows the bandwidth is default. (25k Steps) Adjust using the rotary control knob as required. Short press on button “E” to skip without change.

Photo 11.

Short push again on button “E” to exit menu.

Photo 12.

Once all settings are done, this can be saved to a memory channel by long press on button A.
In the bottom left of the display Mw01 is displayed. Long press of button “A” again will write the memory to channel.
Use the rotary control knob to select the channel number. You **MUST** make sure when saving a frequency to memory, to select memory channel 01 as your first saved frequency.

Photo 13.

Photo 13 shows 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. This will display "Memory written" Press button A again to return back.

Memory Mode

When in Memory mode, this is active when the Memory number is shown on bottom right of the display M xx. In this mode the 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. It will allow you to temporary change the power setting, but changing the memory channel will revert back to original power setting.

Reverse Input

When you are on a repeater channel a short push "E" will show "R" on the top right of the display. This will allow you to monitor the input of the repeater to see how strong the other station is or if they can be heard, if you wanted to go simplex. **WARNING** When the "R" is shown, the reverse of TX and RX frequency will happen so if you were to transmit the repeater will no longer trigger as you would be transmitting on the output of the repeater and no longer on the input.
A short push on "E" will remove the "R" and select normal frequency operation.

Photo 14.

Photo 14 shows the "R" (Reverse Frequency) up in the top right of the display.
DO NOT TRANSMIT WHILE IN THIS MODE.
It is purely there to listen on the input of the repeater. **Be Warned…**

Scanning of Channels

The Tait has 99 memory channels and you can only scan the memory channels up to 31 memories.

Short Push on button "D", will start scan function in VFO or Memory mode.
To stop the scan a short push on button "D" or 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.
If PTT, is pressed when scan has stopped or during delay time, the radio will go into transmit and the scan will stop.

Long push on button D, will allow the scan list to be edited, the display shows SN>00 Mem Ch 01. 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 rotary control knob to change the SN number. If CH is 00, then no channel information is saved by pushing the rotary control knob, the '>' will move to 'CH>' this indicates that adjusting the rotary control 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, to exit edit 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.

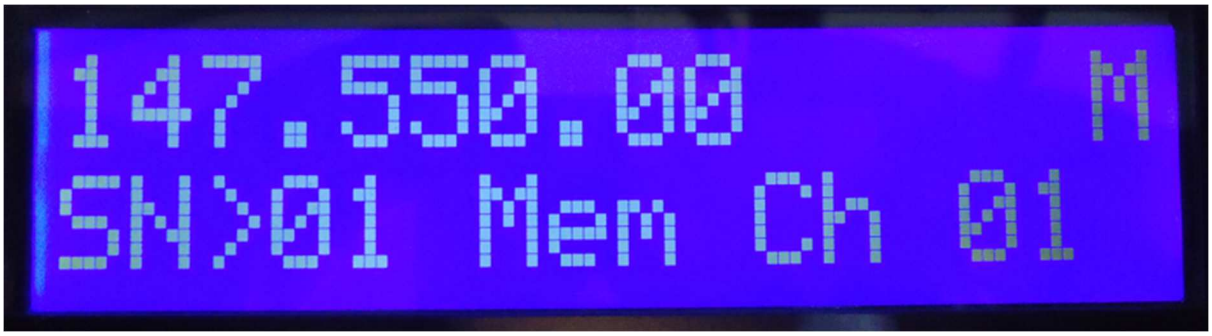

Photo 15.

Photo 15. Shows the frequency 147.550 with medium power setting and the scanning list number SN 01 and memory channel Ch01.

Nuisance Scan Channel Delete

It is possible while you are in scan mode to temporary remove a scanned channel.
to do this simply press the delete button "C" once it has stopped on the scan channel. This will remove the unwanted scan. Once you exit the scan mode and re-start the scan the memories will be restored.

CTCSS Tones

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

Short pushes on button E, (3 times) CTCSS TX OFF, is displayed. The rotary control knob will change value if active and 't' will be displayed after the frequency on the top line, right side of the display.

Short push on the rotary control knob to select CTCSS RX OFF, is displayed. The rotary control knob will change the value if active and 'r' will be displayed after the frequency on the top line, right side of the display.

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Photo 16.

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

In photo 16 this example of CTCSS tones are shown and added for both TX and RX, this is shown by "t" TX and "r" for RX. If you set a tone for RX, unless the correct CTCSS tone is being transmitted on the frequency when receiving, you will not hear any sound.

Special Repeater Splits

When in set up mode and it displays 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.

Loss of Power

If the DC power is disconnected and then re-applied the radio will start up in the same mode before the power was removed.

VFO Reset

If you need to reset the display to use on UHF or VHF turn radio off, a long push on rotary control 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 rotary control knob will start and display sign on messages. A long push will start directly into the frequency display.

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 first 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.

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Trouble Shooting

Errors on Power Up.
For the 1st initial power up, you may have only a blue screen with no text displayed on the screen. If you encounter this, then by adjusting RV1, on the main board will bring up the text contrast. The adjustment of RV1 will almost be at maximum.
Coms Error or full Memory Erase.
If the display shows a "Com Error" on 1st power on, this error is due to the EEPROM contents set to "55" it should have been erased which would set contents to "FF"

1. Push and hold "E", to enter **Set-Up.**
2. Next push and hold the "C" DTMF button. The display will show "EEPROM ERASE. CONFIRM ERASE". If you have any programs saved in the memory, these will all be erased.
3. **Confirm Erase.** Next **push** and **hold** the "C" DTMF button again to confirm erase, this will now erase the memory
4. Once it has erased the display will show as in photo 17. When you see this screen select your radio type, button "A" for VHF or "B" for UHF. You will need to select A or B here. or "E" for no change.

Photo 17.

5. Next it will display Volume Control A for No or B for Yes – Select "B" if you are using sound.
6. Once you make a choice the radio will power down. Push the rotary control knob to turn on.
7. You should now be all good to go and ready to use and start to program your memory channels.

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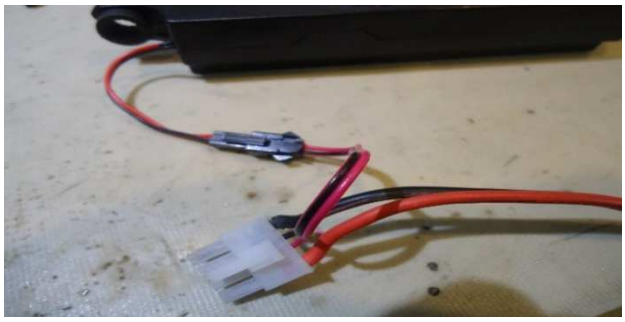
No Sound

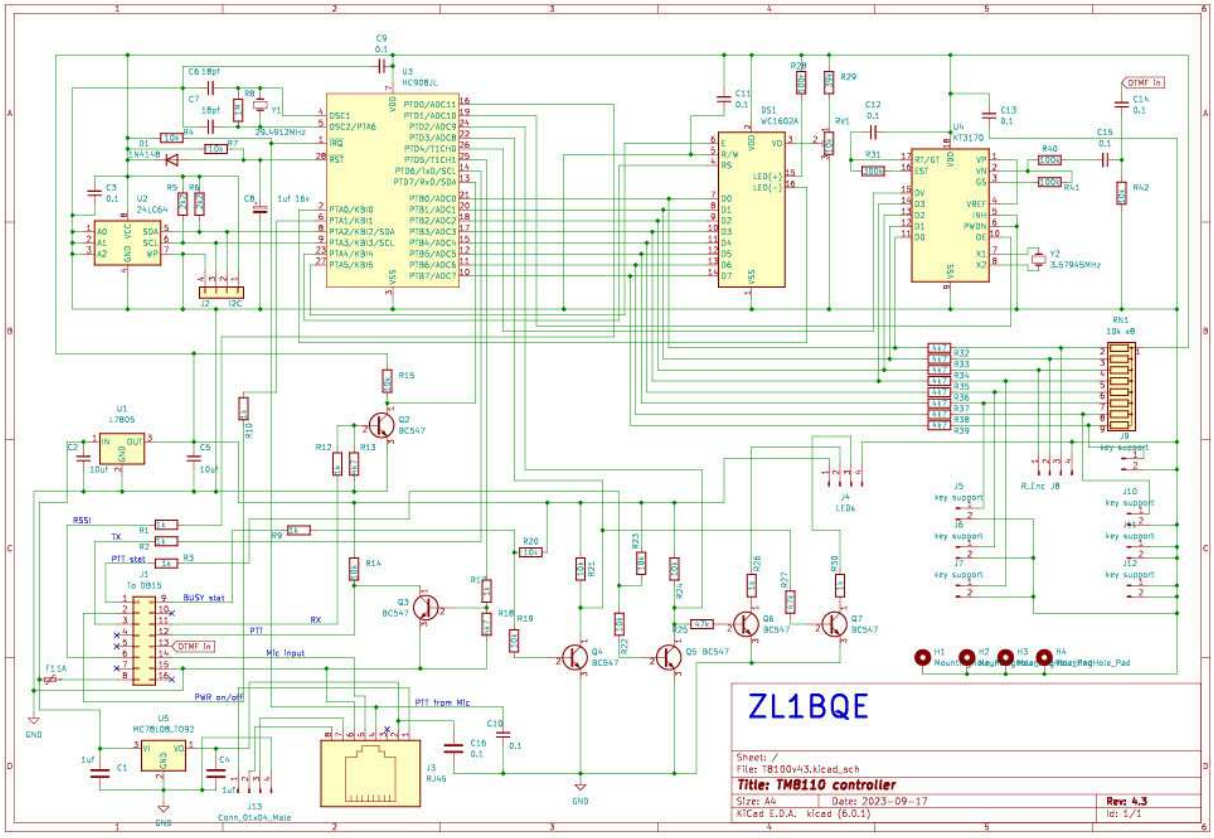
The radio will need and external speaker as the internal one was fitted on the original front panel. This is no longer available.

NOTE: It is recommended to use a plug and socket for the external speaker connection. You can fit an inline 3.5mm socket if you are not using same plug and socket in the photo below. **Do not** 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 2 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.

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



Circuit Diagram of VFO

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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 rotary control knob (referenced below as volume 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 **DO NOT TRANSMIT WHILE IN THIS REVERSE MODE.** Refer to manual for more info.
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