



## TR-8 RECEIVER MANUAL






PB-010101, REVISION E



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## BASIC ORIENTATION AND IDENTIFICATION


The TR-8 is a hand-held scanning receiver for use with conventional VHF tracking beacons. Each TR-8 covers the entire band from 138MHz to 235MHz. The receiver is intuitive and user friendly, and an integrated pulse-detector automatically measures pulse strength and pulse rate to allow easy direction finding and status monitoring.





### POWER/BACKLIGHT KEY






Press and hold  to turn the TR-8 on or off. If you try to turn on the TR-8 when the battery is dead, the red LED comes on.

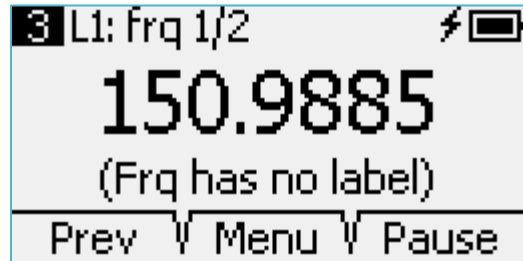
To turn on the backlight (for the display and all the keys) without impacting the current operation of the TR-8, press . Be careful not to hold it down too long or the TR-8 will turn off.

To force the backlight to remain on continuously, press  twice. A light-bulb icon appears in the display to indicate the setting. To restore normal backlight operation, press  twice again. The light-bulb icon disappears, and the backlight automatically turns off after several seconds.

### SOFT KEYS

The top row of buttons on the TR-8 keypad are soft keys. The lower portion of the display indicates the current functions of the left, middle, and right soft keys.

For example, in this screenshot,  goes back to the previous frequency in the list,  opens a menu, and  pauses the scanner.




### NUMERIC KEYS

From the Home screen, use the numeric keys to enter a frequency directly.

When editing a label for a list or frequency, use the numeric keys to type in a label (T9 entry).

On menu screens, the '1', '2', and '3' buttons move the selection up, and the '4', '5', and '6' buttons move the selection down. Note that the knobs also move the selection up and down on menu screens.

### ENTER KEY

When entering a frequency with the numeric keys,  lets you tune to the frequency immediately without having to type in the trailing zeros. For example, you can tune to 151.0000 MHz by entering '1', '5', '1', Enter.

If you're on the screen for editing a label, the Enter button saves the label and exits the editing screen.

On menu screens, the Enter button selects the currently highlighted menu item.

### GAIN KNOB: RF GAIN AND AUDIO VOLUME

The TR-8 has separate settings for RF gain and audio volume, but both are controlled by the gain knob. Normally, the gain knob controls RF gain. However, if you click the gain knob, its function toggles between RF gain control and volume control, as indicated by an underline marking on the display. In the screenshot



on the left, the gain knob controls RF gain. In the screenshot on the right, the gain knob controls the audio volume.

Note that volume control is a temporary function, and the gain knob automatically reverts to RF gain control a few seconds after you finish adjusting the volume.

The TR-8 provides separate volume settings for headphones and for the internal speaker. When headphones are attached, “H.Vol:” is displayed instead of “S.Vol:”.

On menu screens, turning a knob moves the selection marker up or down, and clicking a knob selects the menu item.

#### TUNE KNOB: FINE TUNE AND SCROLL FREQUENCY LIST(S)


Normally, the tune knob allows small adjustments to the current frequency, known as fine tuning. However, if you click the tune knob, its function toggles between fine tuning and scrolling through the active frequency list(s), as indicated by an underline marking on the display. Note that scrolling is a temporary function, and the tune knob automatically reverts to the fine-tune function a few seconds after you stop scrolling.



On menu screens, turning a knob moves the selection marker up or down, and clicking a knob selects the menu item.

#### BACKLIT DISPLAY

The LCD display is sunlight readable and backlit. In low-light conditions, the TR-8 automatically turns on the backlight whenever you press any button or turn any knob. The backlight is auto-dimming based on the amount of ambient light. The backlight automatically turns off after several seconds, unless you activate the continuous backlight. For more information, see the power/backlight key (above).

If you activate the continuous backlight, you may need to update the brightness occasionally to keep up with any changes in ambient light. Press the backlight button  once to induce the automated brightness adjustment.

#### USB-C PORT

The USB-C port is used for powering the TR-8 and charging the TR-8 battery. The USB-C port is also used for communications with a Windows PC to allow simple configuration of frequency lists stored in the TR-8. You don't need a USB-C port on your PC for this connection—any USB port will do.

The USB-C connector is more convenient than older USB connectors because there is no wrong orientation for inserting the cable.

## LED INDICATORS

The TR-8 uses a multi-color LED to indicate specific conditions. When the TR-8 is off and connected to USB power, the LED indicates when charging is underway (red) or complete (blue). When the TR-8 is on, the LED indicates when an RF pulse (blue) or an over-gain condition (red) is detected.

## FREQUENCY LISTS

The TR-8 stores 25 frequency lists, each containing up to 99 frequencies. Each frequency can be assigned its own unique label to help you identify the corresponding transmitter. Each list also has its own label.


From the Menu, you can choose which lists are active at any given time, and multiple lists can be active at the same time. When a list is active, you can easily tune the receiver to any of the list's frequencies using one of the following methods instead of entering the frequency on the keypad:

- Scroll through the list(s) using the Tune knob (click the Tune knob first)
- Manually scan the list(s) using the "Next" and "Prev" soft keys
- Automatically scan the list(s) using TR-8 auto scanning
- Jump directly to a frequency by entering its position in the current list (e.g., enter "3" for the option to jump directly to the third frequency in the current list)

The TR-8 keeps each list sorted so you can navigate quickly to a specific frequency on the list. You can choose whether a list is sorted by frequency or by label from the List Maintenance menu.

Depending on how you navigate the list(s), the TR-8 may (or may not) skip frequencies marked for skipping, as described in the remainder of this section.

### SKIP (MARK/UNMARK) FREQUENCY

To mark a frequency on a list for skipping, press the "Skip" (zero) button . An "S" icon appears as shown here. Press the button again to unmark the frequency and restore it to the scanning sequence.

Press *and hold* the "Skip" button to unmark all of the frequencies on the active list(s). The "Skip" button also works the same way in the List Maintenance menu, any time the TR-8 is displaying the contents of a list.



During auto-scanning, the TR-8 skips frequencies marked for skipping. During manual scanning, the TR-8 optionally skips these frequencies.

### SCROLLING THROUGH LISTS

Normally, the tune knob allows small adjustments to the current frequency, known as fine tuning. However, if you click the tune knob, its function toggles between fine tuning and scrolling through the active frequency list(s), as shown by an underline marking on the display. Note that scrolling is a temporary function, and the tune knob automatically reverts to the fine-tune function a few seconds after you stop scrolling. Scrolling never skips frequencies, even those marked for skipping.

Scrolling is available anytime at least one list is active and the TR-8 is on the home screen. Scrolling works even when auto-scanning.

### MANUAL SCAN

When at least one frequency list is active, use the "Next" and "Prev" soft keys to step through the frequencies on the list(s). These buttons can optionally skip frequencies marked for skipping. Press and



hold either button to change the function of both buttons to skip, or not to skip, those marked frequencies. The behavior of the Next/Prev soft keys can also be changed in the User Preferences menu.

## AUTO SCAN

During auto-scanning, the TR-8 uses a timer to advance automatically to the next frequency in the active list(s). This method of scanning always skips frequencies marked for skipping.

Auto-scanning steps through all the active lists in order, and then repeats that process until you stop auto-scanning. Typically, you would use the Skip button to mark a frequency for skipping once you have located the transmitter and have collected any data required. The scanner will then skip that frequency until you remove the mark for skipping.

The scanning interval is set in the menu, under User Preferences. Note that the TR-8 uses the same scanning interval for all frequencies in the list. Use the pause button if you need to spend more time on a particular frequency. Alternatively, you could store that frequency multiple times in the list to extend the scan interval.

During auto-scanning, if you make adjustments to the gain (or volume) or tuning, the scanning timer re-starts for the current frequency.

Use the “Prev” soft key to go back to the previous frequency in the list. Use the “Pause” soft key if you need to spend more time on a particular frequency. The “Pause” soft key then becomes “Resume”, and the time remaining changes to 1 second. Press “Resume” when you are ready to move on to the next frequency and resume auto scanning. Press the pause soft key twice (which is a Pause and Resume operation) to skip to the next frequency quickly.

During auto-scanning, if you mark a frequency for skipping, the time remaining changes to 1 second and the TR-8 moves quickly to the next frequency not marked for skipping. If you mistakenly mark a frequency for skipping, use the “Prev” soft key to go back to the channel so you can remove the marking.

To stop auto-scanning, use the menu. Auto-scanning also stops if you use the numeric keys to tune to a frequency not on any active list or if you use the menu to deactivate all active lists.

## JUMP DIRECTLY TO A LIST POSITION

To jump directly to a specific frequency on the active list, use the numeric keys to enter the frequency’s position number in the list (1-99) and then press the matching soft key. When more than one list is active, the position number applies only to the current list, as identified at the top of the home screen.

You can jump directly to a list position anytime at least one list is active and the TR-8 is on the home screen. Jumping works even when auto-scanning.

## LABELS

Each list has a label, and each frequency on a list has its own label too. The easiest way to set and manage the labels is using the TR-8 Editor software on a PC. But you can edit labels directly on the TR-8 if needed. When editing a label on the TR-8, use the soft key “123” to switch to numeric entry mode. The same soft key changes to “abc” which allows you to switch back to alphanumeric entry mode. In alphanumeric mode, the ‘1’ button includes punctuation marks, and the ‘0’ button includes symbols.

## HIDING FREQUENCIES IN LISTS

The TR-8 can optionally hide the actual frequencies stored in the frequency lists. Instead of displaying the current frequency, the TR-8 displays the tuning offset from the stored frequency. The frequency label appears as usual.

Only the TR-8 Editor PC software can enable and disable this option.

When this option is enabled, the TR-8 imposes other restrictions as follows.

- The List Maintenance menu is not available
- The “Save” soft key is not available
- Modifying stored frequencies and labels is not possible
- Fine tuning is limited to +/- 1000 Hz from the stored frequency
- User must provide a password for the TR-8 Editor PC software to read lists from the TR-8

## USB FEATURES

The USB port can power the TR-8, charge the battery, and link to a PC. Any USB port on your PC will work, even if it doesn't use the new USB-C connector.

## BATTERY CHARGING

When connected to any type of USB power (computer, power pack, wall charger, etc), the TR-8 attempts to charge the battery automatically, whether the TR-8 is on or off. When the TR-8 is off, the display shows the charging status, and the LED turns from red to blue when the battery reaches full charge. When the TR-8 is on, the charging icon (a lightning bolt) disappears when the battery is full.

## OPERATION ON USB POWER

The TR-8 has an advanced battery circuit that allows the USB port to power the TR-8 and charge the battery at the same time, typically with no reduction in charging time. This is especially useful if you forget to charge the TR-8. You could connect a USB power pack for this purpose, which avoids the environmental impact of disposable batteries. For extended field work, consider using widely available solar chargers along with a USB power pack.

## CONFIGURATION

The "TR-8 Editor" software is the easiest way to set up frequency lists. It can import TPFs for Telonics transmitters, and it can even interpret lists you've made in Excel. Find it at <https://www.telonics.com/products/vhfReceivers/tr-8.php>. Use any USB-C cable to connect the TR-8 to your Windows PC, and be sure to turn on the TR-8 so it will communicate with the PC.

## FIRMWARE UPDATES

There is a significant amount of software ("firmware") inside the TR-8. From time to time, Telonics will make updates available to your TR-8 to add features or fix bugs. The same TR-8 Editor software used for configuring the TR-8 also automatically keeps the TR-8 firmware up-to-date. To check for updates, run the TR-8 Editor software while the PC has internet access. Then attach the TR-8 to the PC so the TR-8 Editor software can install any updates. Be sure to turn on the TR-8 so it will communicate with the PC.

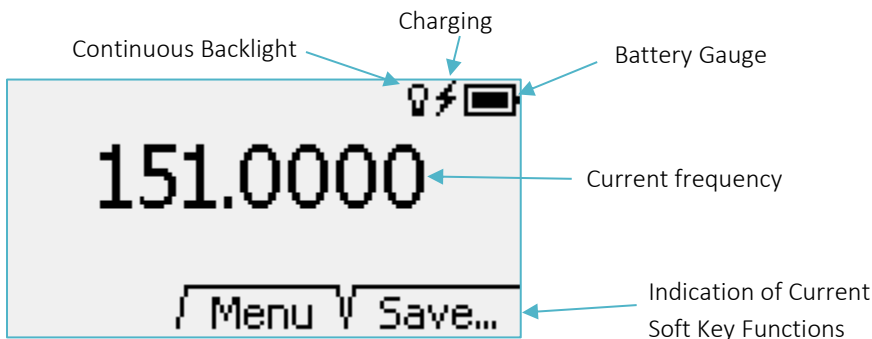
## HOME SCREEN

The home screen is used for finding and tracking VHF transmitters, so you'll spend a lot of time there. From the home screen, you can always access the main menu by pressing the "Menu" soft key. You can also always enter a frequency using the numeric keys to tune to that frequency.

The home screen changes appearance slightly depending on how you are using the TR-8.

### NO LISTS ACTIVE

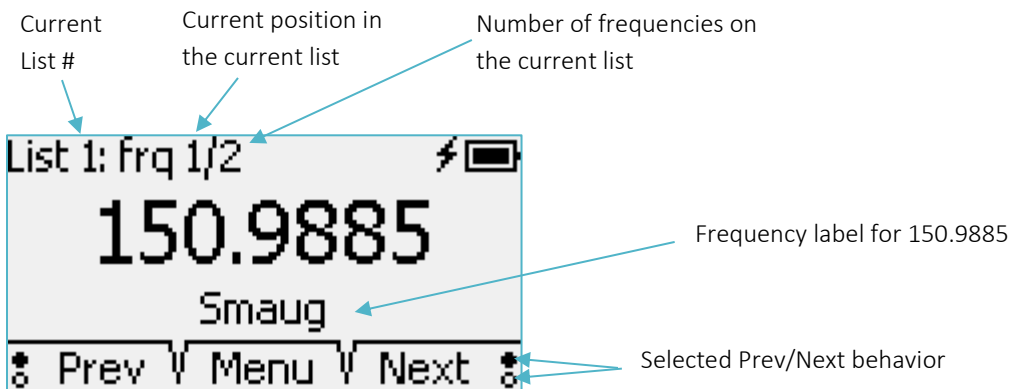
With no frequency lists active, the home screen contains only basic elements.



You can activate one or more list(s) from the menu. To save the current frequency, press the "Save" soft key and choose a list. As a convenience that list then becomes active.

### LIST(S) ACTIVE

With at least one frequency list active, the home screen adds a few additional elements as shown below.



Frequency lists are easy to navigate from the home screen. You can scroll through the list using the tune knob, you can jump directly to a list position using the numeric keypad, or you can use the "Next" and "Prev" soft keys. See Frequency Lists (page 8) for details.

As described in the Manual Scan section, "Next" and "Prev" can optionally skip frequencies marked for skipping. The home screen indicates the selected behavior using a small symbol near "Prev" and "Next". If

the upper bubble is filled in, the buttons do not skip frequencies marked for skipping. If the lower bubble is filled in, the buttons do skip the frequencies marked for skipping.

If you use the fine-tuning knob to modify a frequency on a list, the home screen indicates the modification with an asterisk next to the list position number, as shown here. To update the list entry and save the change, use the Menu and select “Quick Save”.

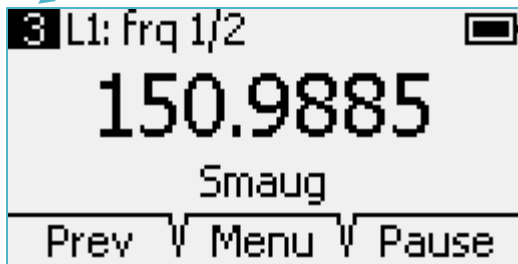


You can start auto-scanning by pressing the “Menu” soft key and choosing Start auto-scanning.

#### LIST(S) ACTIVE AND AUTO-SCANNING

When auto-scanning is on, the home screen adds one more element.

Time remaining (in seconds) until scanner advances to the next frequency.

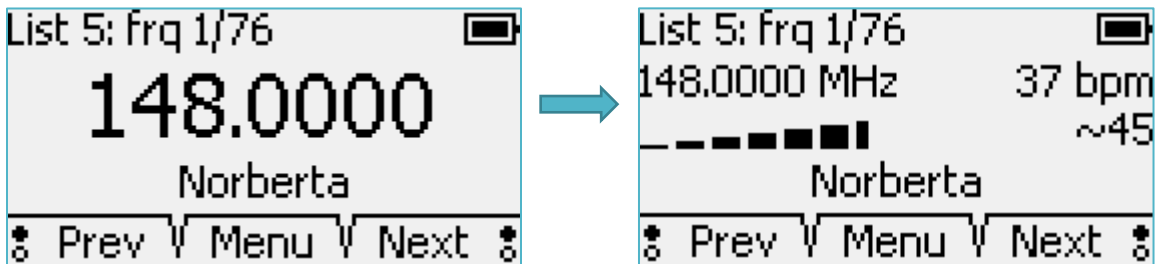


If you pause the scanner, the time remaining changes immediately to 1 second left, and the home screen indicates the pause condition in two ways. First, the “Pause” soft key changes to “Resume”. Second, a pause symbol appears alongside the “1” in the time-remaining indicator.

See the Auto Scan section for more information about using the scanner.

#### SIGNAL DETECTED

When the TR-8 detects a transmitter, the home screen automatically displays a signal-strength meter and pulse measurements.

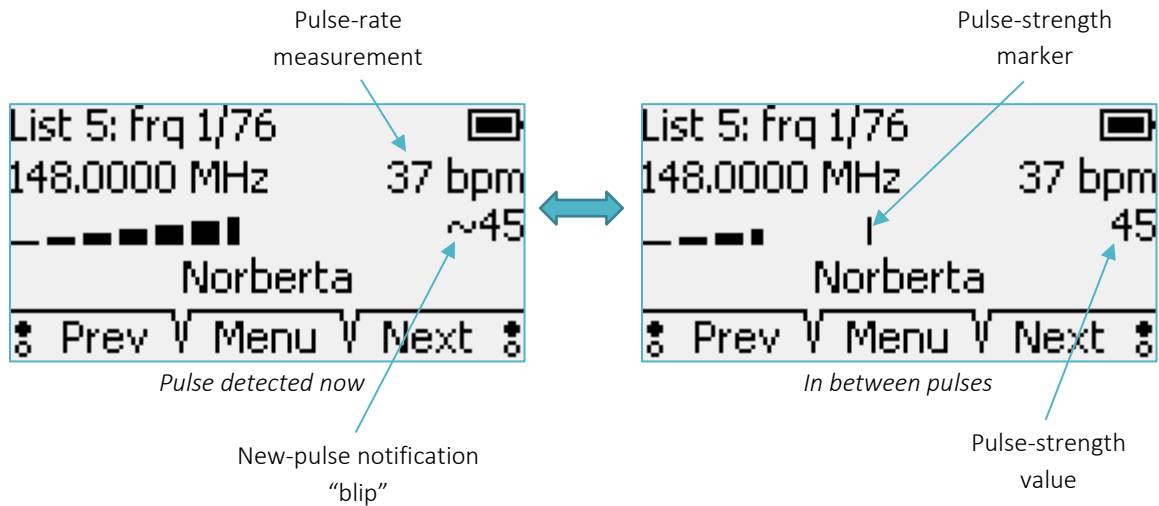


*No signal detected*

*Signal Detected*

The signal-strength meter remains active until you move to a different frequency. The meter remains active during fine tuning of the current frequency. The meter remains active even if the signal is lost.

In between pulses, the signal-strength meter displays a marker to indicate the strength of the most-recent pulse detected. A numeric indication of the marker's position also appears, next to the meter. The marker and the value are indications of the pulse strength at the current RF gain setting. The meter and the pulse-strength value both have 1 dB resolution.



The display also shows the pulse rate associated with the most-recent pulse, shown in beats per minute. The value shown corresponds to the most-recent pulse period only, not an average of multiple pulse periods.

If the transmitter signal is lost, the pulse measurements disappear. However, the signal-strength meter remains active.



## USER PREFERENCES

The User Preferences menu lets you customize some TR-8 features.

### SCANNING INTERVAL

When auto-scanning is on, this setting determines how long the TR-8 stays on each frequency. Note that the TR-8 uses the same scanning interval for every frequency in the list, and for every list.

### BACKLIGHT BRIGHTNESS

This setting determines the brightness of the backlight. Brighter backlight settings deplete the battery faster. The TR-8 has an ambient-light sensor, so the backlight only comes on when needed. All of the brightness settings include the auto-dimming feature that adjusts brightness based on the amount of ambient light.

### AUDIO FILTER

This setting determines the range of audio frequencies the TR-8 delivers to the speaker/headphones.

#### **500 – 1300 Hz** *Default (Recommended) Setting*

RF pulses will be heard best at a frequency of about 900 Hz. This filter reduces background noise and audio tones that are outside of the 500-1300 Hz range. For most users, this setting sounds the best.

#### **350 – 1800 Hz** *Wide Band Setting*

RF pulses will be heard well over a wider frequency range, which makes it easier to ‘find’ older crystal-controlled transmitters that are more likely to be slightly off frequency. The received background noise level will be significantly ‘louder’ in this setting, and may result in more ‘listening fatigue’ than other audio bandwidth settings.

#### **800 – 1600 Hz**

RF pulses will be heard best at a frequency of about 1200 Hz. This filter reduces background noise and audio tones that are outside of the 800-1600 Hz range. This setting has the same audio bandwidth as the 500-1300 Hz setting, but you must tune the receiver to hear the transmitter at a slightly higher pitch.

### NEXT/PREV SOFT KEYS

This setting determines whether the “Next” and “Prev” soft keys skip frequencies that have been marked for skipping.

### AUTO OFF WHEN IDLE

This setting determines how long the TR-8 can remain idle before it automatically turns off. This feature helps you avoid draining the battery if you accidentally leave the TR-8 on. The TR-8 is considered idle when you are not pressing any keys or turning any knobs. Note that the TR-8 ignores the idle condition when connected to a PC.

## ABOUT THIS TR-8...

When you select 'About this TR-8...' from the main menu, the TR-8 displays the following important information about your receiver:

- Firmware Version ("TR-8 vX.XX YYYY.MM.DD")
- CTN (electronic serial number)
- FCC Regulatory Compliance Information (scroll up and down to see the entire statement)



## TROUBLESHOOTING

This section offers helpful tips when something isn't going right with the TR-8.

### RF OVER-GAIN

If an incoming radio signal is very strong, or if there is strong nearby interference, or if you set the RF gain too high, the receiver may overload. While this condition will not damage the TR-8, audio quality may suffer, and you may not be able to distinguish variations in signal level. The TR-8 automatically detects this condition, and in response, the red LED blinks, and the display indicates an over-gain condition. Turn down the gain until the red LED is no longer blinking. This will ensure that the receiver audio levels change proportionally with the incoming RF signal strength and will generally facilitate direction finding.

Note: If you are hearing a weak signal, but the TR-8 still identifies an over-gain condition (blinking red LED) it may indicate that the receiver is either not tuned properly for best reception of the incoming signal or that there is a strong interfering signal on a nearby frequency. In this case, reduce the receiver gain until the red LED is no longer blinking, then use the fine-tune adjustment to search for the strongest received signal (or interference).

### SIGNAL-STRENGTH METER

The TR-8 automatically displays the signal-strength meter when all of the following conditions are present:

- The Home Screen is active (not a menu or prompt)
- No over-gain condition is present during RF pulses
- RF pulses have a signal level above the TR-8 detection threshold (relative to the noise level)
- The TR-8 identifies a pulse rate of 12 bpm or higher

If the meter does not appear but you can hear pulses, the signal level of the pulses may be too close to the received noise level for the TR-8 to detect the pulses and for the meter to be useful.

### SYSTEM RESET

If the TR-8 ever becomes unresponsive, you may need to reset it. Press and hold the tune knob for about 10 seconds. If the TR-8 still won't respond, connect to USB power and try again.

The TR-8 attempts to maintain all user settings and frequency lists during system reset.

## TR-8 EDITOR PC SOFTWARE

The “TR-8 Editor” software can be downloaded for free from the Telonics Website:

<https://www.telonics.com/products/vhfReceivers/tr-8.php>

Use any USB-C cable to connect the TR-8 to your Windows PC, and be sure to turn on the TR-8 so it will communicate with the PC. The PC charges the TR-8 whether the TR-8 is on or off, but the TR-8 Editor can communicate with the TR-8 only if the TR-8 is on. The menu bar of the TR-8 Editor says “TR-8 Off / Not Connected” if the TR-8 is connected while off.

The screenshot shows the TR-8 Editor software interface. The window title is "TR-8 Editor - screenshot config.tr8 - Telonics, Inc.". The menu bar includes "File", "CTN: 000001A", "Read From Receiver", "Send To Receiver", and "Help". Below the menu bar, there is a section titled "Select a Frequency List to View or Edit".

| #  | Frequency List Name | Count |
|----|---------------------|-------|
| 1  | Unicom              | 40    |
| 2  | Sasquatch           | 6     |
| 3  | Pterodactyls        | 22    |
| 4  | Dragons             | 14    |
| 5  | Ghosts              | 75    |
| 6  |                     | 0     |
| 7  |                     | 0     |
| 8  |                     | 0     |
| 9  |                     | 0     |
| 10 |                     | 0     |
| 11 |                     | 0     |
| 12 |                     | 0     |
| 13 |                     | 0     |
| 14 |                     | 0     |
| 15 |                     | 0     |
| 16 |                     | 0     |
| 17 |                     | 0     |
| 18 |                     | 0     |
| 19 |                     | 0     |
| 20 |                     | 0     |
| 21 |                     | 0     |
| 22 |                     | 0     |
| 23 |                     | 0     |
| 24 |                     | 0     |
| 25 |                     | 0     |

Form fields on the right side of the window:

- List #: 4 Name: Dragons
- Number of Frequencies: 14 # Skipped: 2
- Sort Order Within List:  By Frequency  By Label

Buttons: [Sort Now](#), [Add Range...](#), [Skip All](#), [Skip None](#)

|     | Frequency | Label     | Skip                                |
|-----|-----------|-----------|-------------------------------------|
| 1   | 166.0000  | Puff      | <input type="checkbox"/>            |
| 2   | 166.0100  | Toothless | <input type="checkbox"/>            |
| ▶ 3 | 166.0200  | Smaug     | <input checked="" type="checkbox"/> |
| 4   | 166.0300  | Norberta  | <input type="checkbox"/>            |
| 5   | 216.4000  | Tag #3319 | <input type="checkbox"/>            |
| 6   | 216.4100  | Tag #3320 | <input type="checkbox"/>            |
| 7   | 216.4200  | Tag #3321 | <input type="checkbox"/>            |
| 8   | 216.4300  | Tag #3322 | <input checked="" type="checkbox"/> |
| 9   | 216.4400  | Tag #3323 | <input type="checkbox"/>            |
| 10  | 216.4500  | Tag #3324 | <input type="checkbox"/>            |
| 11  | 216.4600  | Tag #3325 | <input type="checkbox"/>            |
| 12  | 216.4700  | Tag #3326 | <input type="checkbox"/>            |
| 13  | 216.4800  | Tag #3327 | <input checked="" type="checkbox"/> |
| 14  | 216.4900  | Tag #3328 | <input type="checkbox"/>            |

Bottom of the window:

- Do not display actual frequencies on TR-8
- [Copy Selected](#) [Copy All](#) [Paste](#) [Import From TPF File...](#)

## KEEPING SOFTWARE UP TO DATE

The “TR-8 Editor” automatically downloads and installs updates if you run the program while connected to the Internet. If you plan to program a TR-8 in the field where an Internet connection might not be available, consider first running the TR-8 Editor at a location with reliable Internet to ensure the TR-8 Editor is up-to-date. When you send a configuration to a TR-8, the TR-8 Editor updates the firmware onboard the TR-8 Receiver if a newer version is available.

## CONFIGURING TR-8 RECEIVERS

The TR-8 Editor has just a few menu choices to communicate with the TR-8 and work with config files.

The **Read From Receiver** menu choice closes the config file you currently have open and loads the TR-8 Editor with the frequency lists that are currently on the connected TR-8 receiver.

The **Send To Receiver** menu choice sends the currently displayed frequency lists in the TR-8 Editor to the connected TR-8, overwriting any lists currently onboard that TR-8 Receiver. If the TR-8 receiver is running outdated firmware, the TR-8 Editor upgrades the firmware automatically.

The TR-8 Editor can save a config file (.tr8 extension) to your computer that holds the lists of frequencies, list labels, frequency labels, and whether each frequency in a list is currently “Skipped”. There are menu choices to create a new config file (empty lists), open an existing config file, or save the currently displayed config file to your computer. The Window’s title indicates the name of the currently open config file (*screenshot config.tr8* in example). Using config files, you can easily configure multiple TR-8 receivers with the same frequency lists. If you intend to loan your TR-8 to colleagues working on other projects, consider saving your config file to your computer in case they decide to change the frequency lists on your receiver.

## ENTERING FREQUENCY LISTS

To add or edit frequencies within the TR-8 Editor, first select the list that you would like to modify. This section covers the different ways to enter frequencies within the selected list.

### Entering Frequencies and Labels Manually

The TR-8 Editor displays the list of frequencies as a table. The first column is the frequency’s position within the list. This column is not editable since lists are always sorted on the TR-8 receiver, either by frequency or by label. The TR-8 Editor displays frequencies within this table in whatever order you enter them, and then sorts the entries if you click **Sort**, **Send to Receiver**, or change the **Sort Order Within List**.

- To edit a frequency or label, click the corresponding cell and type the new value or label.
- To add a frequency, click the frequency or label cell of the very last row and start typing.
- To delete a frequency, select the whole row by clicking in the first column. You can select a range of rows by holding the Shift key and clicking another row. You can select multiple individual rows by holding the Ctrl key and clicking each row. After selecting the row (or rows), press the Delete key on your keyboard or right-click the row and choose Delete from the context menu.
- The Skip column of the table indicates whether this frequency is currently marked for skipping during scanning. To mark or unmark a frequency for skipping, simply click that cell within the table. To mark or unmark all frequencies within the list, click the **Skip All** or **Skip None** links.

### Import From TPF File

If you are adding transmitters manufactured by Telonics, you can use the transmitters’ programming file (.tpf extension) to import the frequencies. Click the **Import From TPF File** link, browse to the TPF file, and click Open. The TR-8 Editor then adds all frequencies from that TPF file and labels each frequency with the transmitter’s CTN (Telonics Serial Number).

### Add a Range of Frequencies

Transmitters are often evenly spaced out over a range of frequencies. To add a block of evenly spaced frequencies, click the **Add Range** link. Type in the starting frequency, channel spacing, and number of channels you would like to add and click Add. For example, adding 10 frequencies with a starting frequency of 150 MHz, and a channel spacing of 100 kHz would add the following frequencies:

150.0, 150.1, 150.2, 150.3, 150.4, 150.5, 150.6, 150.7, 150.8, and 150.9 MHz.

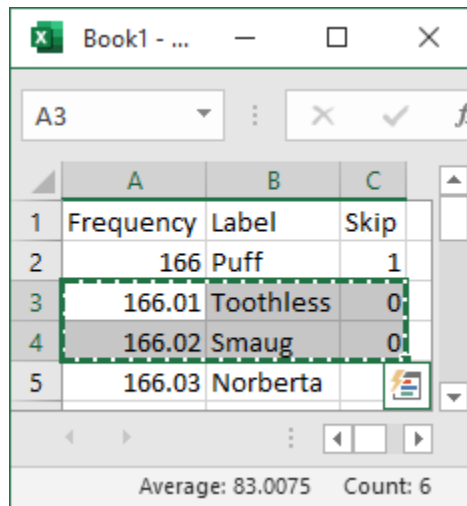
No label is set for these newly added frequencies, so if you would like to assign frequency labels you would do that manually.

### Copy and Paste

The TR-8 Editor supports copying and pasting frequencies (and labels) within the TR-8 Editor and with Microsoft Excel. To copy all frequencies within the selected list, click the **Copy All** link. To copy a specific frequency, select the row by clicking in the first column in that row. You can select a range of rows by holding the Shift key and clicking another row. You can select multiple individual rows by holding the Ctrl key and clicking each row. After selecting the row (or rows), click the **Copy Selected** link, type Ctrl+C, or right-click the row and choose Copy from the context menu to copy the rows.

After copying the desired frequencies from one list, select the frequency list where you would like to add those frequencies. Then click the **Paste** link, click inside the frequency table and type Ctrl+V, or right-click the frequency table and choose Paste from the context menu to paste the rows. Note that Pasting frequencies (from another list or from Microsoft Excel) always adds frequencies to the selected list, even if some (or all) of the pasted frequencies already appear in the list. If you are pasting into a list that already had some frequencies, you may want to remove duplicate entries before or after pasting.

After copying frequencies in the TR-8 Editor, you can optionally paste those frequencies into Microsoft Excel if you would like to use that program to add or edit your frequencies and labels. Enter the frequency in MHz, followed by the label and skip columns. A value of 1 in the skip column is marked for skipping, 0 is unmarked. After making your list changes in Excel, select the desired rows in Excel and copy them (Ctrl+C or Copy from Ribbon/Context menu). Then follow the Paste instructions in the previous paragraph to add those frequencies to the currently selected list within the TR-8 Editor.



|   | A         | B         | C    |
|---|-----------|-----------|------|
| 1 | Frequency | Label     | Skip |
| 2 | 166       | Puff      | 1    |
| 3 | 166.01    | Toothless | 0    |
| 4 | 166.02    | Smaug     | 0    |
| 5 | 166.03    | Norberta  |      |

Average: 83.0075    Count: 6

## FIXING LIST ERRORS

The TR-8 Editor doesn't allow you to send a config to the TR-8 if you have entered frequencies outside the supported range (137.99 – 235.01 MHz) or if a list or frequency label is too long for the TR-8 to display. The TR-8 Editor displays error icons to help you find and fix errors within your frequency lists.

Icon indicating the list has at least one error

Description of the first error in the selected list

Invalid frequency (out of range)

Invalid label (too long)

The screenshot shows the TR-8 Editor window with the following elements:

- Menu Bar:** File, CTN: 000001A, Read From Receiver, Send To Receiver, Help.
- Frequency List Selection:** A table with columns '#', 'Frequency List Name', and 'Count'. List 2, 'Sasquatch', has a red error icon next to its count of 6.
- List Details:** List #: 2, Name: Sasquatch, Number of Frequencies: 6, # Skipped: 0. Sort Order Within List: By Frequency (selected).
- Frequency List Table:**

|   | Frequency | Label                     | Skip                     |
|---|-----------|---------------------------|--------------------------|
| 1 | 137.0000  |                           | <input type="checkbox"/> |
| 2 | 164.0100  | Frequency Label too long! | <input type="checkbox"/> |
| 3 | 164.0200  |                           | <input type="checkbox"/> |
| 4 | 164.0300  |                           | <input type="checkbox"/> |
| 5 | 164.0400  |                           | <input type="checkbox"/> |
| 6 | 164.0500  |                           | <input type="checkbox"/> |
| * |           |                           | <input type="checkbox"/> |
- Bottom Bar:**  Do not display actual frequencies on TR-8, Copy Selected, Copy All, Paste, Import From TPF File...

## HIDING ACTUAL FREQUENCIES ON TR-8

If you check the option **Do not display actual frequencies on TR-8**, the receiver displays only the frequency label and the tuning offset from the stored frequency in all lists. The TR-8 Editor prompts you to set a password for this TR-8 when sending a config with this option enabled, and then the TR-8 Editor will not read the frequency lists from this receiver until the user enters the correct password. To disable this feature on the TR-8, send a config to the receiver with this option unchecked.

## TRACKING TIPS

The TR-8 is intuitive and user friendly, but VHF tracking can be tricky. Here are some pointers.

### SETTING THE TUNE AND GAIN/VOL CONTROLS

The TR-8 has one setting for audio volume, and a separate setting for RF gain. Refer to the section called “Gain Knob: RF Gain and Audio Volume” to learn how to access these settings.

First, set the volume. The volume control allows you to adjust the listening level to match your style of headphones, or your listening distance from the speaker, and to compensate for sounds nearby (vehicle engine, conversation, moving water, etc). Once set, there’s typically no need to adjust volume as part of your tracking strategy, even if you have traditionally done so with other receiver models. Many users find they can set the volume to “Max” and never think about it again. If the audio is too loud, turning down the RF gain works perfectly well to reduce the audio levels.

Next, turn up the RF gain until noise is audible (but not uncomfortable) on the speaker or headphones. This ensures that your receiver gain is sufficient to detect the weakest signals. The gain setting you choose depends on environmental RF noise levels, receiving antenna, and other factors.

When you hear transmitter pulses, adjust the ‘tune’ knob for the strongest (loudest) signal and then adjust the gain control until the pulses are at a comfortable listening level. To assist in proper gain setting, the TR-8 monitors incoming signal strength and flashes the red LED and adds some audio distortion when the incoming signal level is too high for proper signal reception. If this happens, simply turn down the gain until the red LED quits flashing.

As you get closer to the transmitter the received signal will generally get stronger. Keep turning the gain down as needed to maintain a comfortable listening level.

Always remember that listening to any audio at high levels for long periods of time can cause permanent damage to your hearing. Be safe!

### USING THE SIGNAL-STRENGTH METER AND PULSE MEASUREMENTS

The signal-strength meter and pulse measurements are helpful in direction finding and status monitoring. These home-screen elements are described in the Home Screen: Signal Detected section.

The signal-strength meter includes a graphical *marker* that holds the position of the most-recent pulse. The meter also provides a digital *value* for the strength of the most-recent pulse. With a directional antenna, you can use the pulse-strength *marker* and the pulse-strength *value* to identify the direction of the strongest signal. Both the marker and the value convey the same information, one graphically and the other numerically. Both have resolution of 1 dB, and both change with the RF gain setting.

The pulse-rate measurement can indicate status information about the transmitter. To get a good, clean measurement, make sure the pulses you hear correlate one-to-one with the blue LED for a complete pulse period. If the blue LED blinks for something other than a transmitter pulse, or if the blue LED fails to blink for a valid transmitter pulse, the measurement for the current pulse period is spoiled and you should ignore it. Note that the pulse-rate measurement is taken from the most-recent pulse period only; it is not an average of multiple pulse periods.

## SPECIFICATIONS

|  |   |
|--|---|
| <b>General</b>                                 | Synthesized direct-conversion receiver  |
| <b>Frequency coverage</b>                      | 138 to 235 MHz continuous coverage  |
| <b>Frequency selection</b>                     | Direct entry via keypad or rotary knob  |
| <b>Frequency resolution</b>                    | 100 Hz  |
| <b>Center frequency accuracy</b>               | ± 1 ppm at 20 °C  |
| <b>Frequency stability</b>                     | ± 2 ppm from -20 to +70 °C (referenced to frequency at 20 °C)   |
| <b>Long term frequency drift</b>               | (after one-minute stabilization) ±100 Hz  |
| <b>Audio bandwidth (-3dB)</b>                  | Three user-selectable ranges:<br>[500-1300 Hz]<br>[350-1800 Hz]<br>[800-1600 Hz]                                  |
| <b>Acceptable modes of operation</b>           | pulse amplitude modulation (PAM), pulse period modulation (PPM), continuous wave (CW), and single side band (SSB) |
| <b>Pulse detection and notification</b>        | Minimum pulse width: 10 milliseconds<br>Minimum pulse rate: 12 beats per minute                                   |
| <b>Low battery indication</b>                  | Battery gauge on display  |
| <b>Power supply</b>                            | Internal: 4.2V/3300mAh rechargeable Li-Ion cell<br>External (battery charger input): 5V via USB-C port            |
| <b>Typical operating lifetime (@ 20°C)</b>     | 15 hours with automatic LCD backlight usage<br>12 hours with LCD backlight 'locked on' (medium level)             |
| <b>RF input impedance</b>                      | 50 Ohms   |
| <b>Noise figure</b>                            | <4 dB typ with 50Ω source impedance   |
| <b>Sensitivity for 10 dB S+N+D/N</b>           | Better than -130 dBm typical (500-1300 Hz audio bandwidth setting)  |
| <b>Typical minimum discernible input level</b> | -150 dBm (0.007 microvolt)  |
| <b>Opposite Sideband Suppression</b>           | 40 dB typ   |
| <b>Audio gain control range</b>                | 18 dB typ   |
| <b>RF gain control range</b>                   | 177 dB typ  |
| <b>Total gain control range</b>                | 195 dB typ  |
| <b>Audio output impedance</b>                  | 16Ω (headphone jack)  |
| <b>Internal speaker cut out</b>                | Internal speaker is muted when plug is inserted in headphone jack   |
| <b>Audio output jack</b>                       | 1/8 inch (3.5mm) stereo or monaural phone plug  |
| <b>Programming / Charging connector</b>        | USB-C port  |

|                                    |  |
|------------------------------------|--|
| <b>RF input connector</b>          | BNC jack   |
| <b>Display</b>                     | 3 x 5 cm 128 x 64 pixel LCD display with auto-dimming backlight  |
| <b>Keypad</b>                      | Backlit silicone keypad with 3 multi-function 'soft' keys.   |
| <b>Gain control</b>                | Rotary encoder with pushbutton controls both RF gain and audio volume  |
| <b>Tune control</b>                | Rotary encoder with pushbutton adjusts frequency in 100 Hz steps and scrolls quickly through frequencies stored in scan memory   |
| <b>Multipurpose LED</b>            | <p>Front panel LED has multiple functions:</p> <p>With TR-8 off</p> <p style="padding-left: 40px;">Red: battery charging</p> <p style="padding-left: 40px;">Blue: battery fully charged</p> <p>With TR-8 on</p> <p style="padding-left: 40px;">Red (pulsed): over-gain warning indicator</p> <p style="padding-left: 40px;">Blue (pulsed): RF pulse detected</p> |
| <b>Scan memory</b>                 | 2,475 frequencies (organized in 25 lists with up to 99 frequencies each)   |
| <b>Programming</b>                 | <p>Frequency lists and labels may be modified:</p> <ol style="list-style-type: none"> <li>1. Via PC application connected via USB</li> <li>2. Directly on the TR-8 with user-friendly interface</li> </ol>   |
| <b>Operating temperature range</b> | -20 to +70 °C  |
| <b>Dimensions</b>                  | 15.9 x 6.3 x 3.0 cm (6.3 x 2.5 x 1.2 in) [excluding knobs and connectors]  |
| <b>Weight</b>                      | 285g typ   |



**Suppliers Declaration of Conformity**

**Product Description:** Telonics Inc - TR-8 VHF Tracking Receiver

**Product Model Number:** TR-8

**FCC Compliance Statement:**

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

**Industry Canada Compliance Statement:**

This device contains a license-exempt receiver that complies with Innovation, Science and Economic Development Canada's license-exempt RSS(s). Operation is subject to the following two conditions:

- 1. This device may not cause interference.
- 2. This device must accept any interference, including interference that may cause undesired operation of the device.

**Responsible Party:**

*Telonics (Telemetry Electronics Consultants) Inc*

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