



PitCrewRacing® Scanner
(UHF/VHF+FM)
MODEL: PCR-1

User Guide

 PitCrewRacing.com

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User Guide

Thank you for purchasing the PitCrewRacing® Scanner! This Scanner is an advanced light weight and compact RF scanner that is ideal for listening to race track, police, fire, rescue, private and commercial communication channels. The PitCrewRacing® Scanner is available for the VHF or UHF frequency band. In addition, the PitCrewRacing® Scanner includes an internal integrated FM Broadcast Radio receiver.

BATTERY INSTALLATION

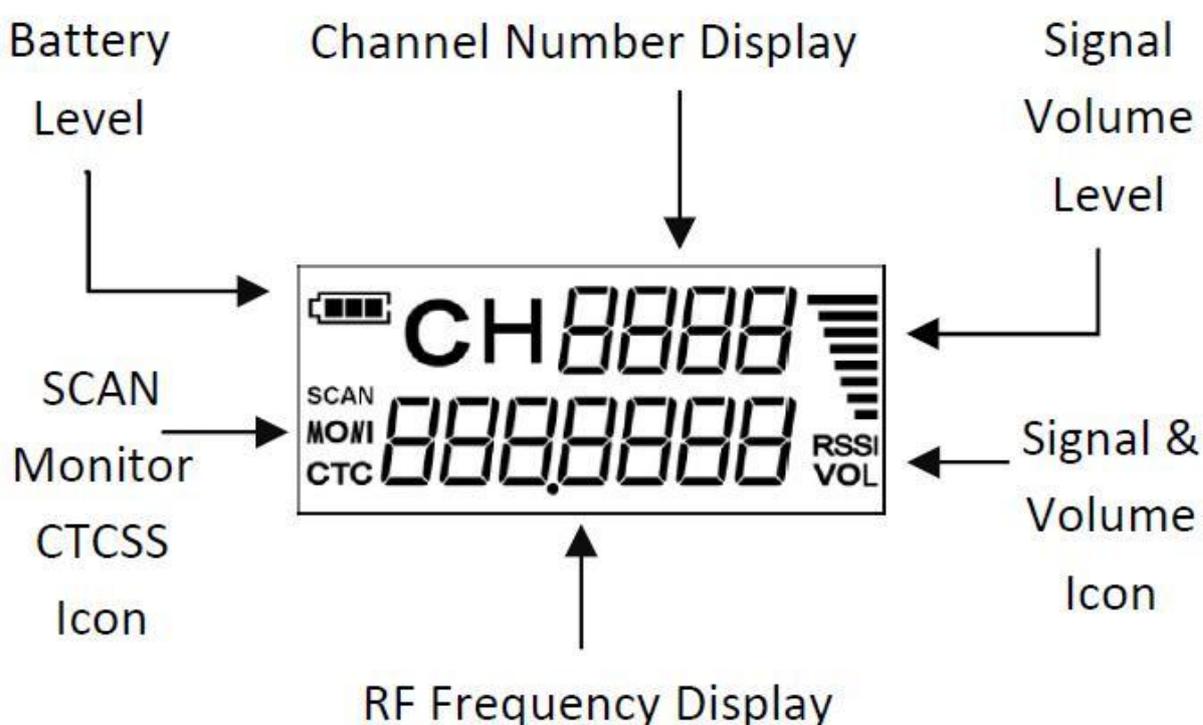
Open the back cover of the Scanner and insert two good quality AAA alkaline batteries as shown inside the Scanner. The Scanner will turn on when the battery is inserted. When using the Scanner, check the Battery Level indicator periodically for the amount of battery power left. The battery will last several days depending on usage. It is suggested to remove the battery from the scanner when not in use for extended periods of time. The Scanner will automatically turn OFF in 1 hour if not used.

EARPHONE ATTACHMENT

Plug the Earphone or Headset into the 3.5mm jack located on the left side of the Scanner.

LCD LAYOUT

The following diagram shows the layout and meaning of the various parts of the LCD display:



OPERATION

The PitCrewRacing® Scanner is controlled by six buttons. These buttons are labeled 1, 2, 3, 4, 5 and 6 as shown in the diagrams below. Buttons 1 and 2 have two functions. These functions are selected by pressing a button for less than 1 second (**short press**), or by pressing a button for longer than 2 seconds (**long press**). This allows these two Scanner buttons to have two functions each.

SCANNER ON-OFF

To turn the scanner ON, press and hold Button 1 down (long press) until the LCD screen appears. To turn the Scanner OFF, press and hold Button 1 down (long press) until the LCD screen is blank.

SCANNER KEY-LOCK

The six Scanner buttons can be temporarily disabled by activating the Scanner Key-Lock function. The Scanner Key-Lock can be toggled ON or OFF by pressing Buttons 1 and 2 (long press) at the same time until the LCD display blinks. In the Scanner Key-Lock condition, all Scanner keys will be disabled except the ON-OFF Button 1. Scanner Key-Lock operates in all Scanner Modes. Scanner Key-Lock is always OFF when the Scanner is first turned on.

SCANNER MODES

The PitCrewRacing® Scanner has three operational modes.

- Mode 1 is the Normal Mode.
Mode 2 is the Channel Mode.
- Mode 3 is the FM Broadcast Radio Mode.

The Scanner Mode is changed by pressing Button 1 (short press). The **CH** icon will change according to the selected mode. The diagrams and paragraphs below show the functions available in each mode.

NORMAL MODE Note: CH icon is always ON



| BUTTON | BUTTON SHORT PRESS | BUTTON LONG PRESS |
|--------|-----------------------|-------------------------|
| 1 | Scanner Mode Change | Scanner ON-OFF |
| 2 | Scan Skip/Scroll | Toggle Auto Scan ON-OFF |
| 3 | Volume Down | --- |
| 4 | Default Channel | --- |
| 5 | Toggle Monitor ON-OFF | --- |
| 6 | Volume Up | --- |
| 1+2 | --- | Toggle Keylock |

The Normal Mode is used for adjusting volume and turning the Monitor function ON or OFF. This mode is also used to select the Default Channel and for automatic or manual scanning of the programmed channels in the Channel List.

ADJUSTING VOLUME

While in the Normal Mode, Buttons 3 and 6 may be used to decrease or increase the volume of the audio. The volume level and **VOL** icon are displayed on the right side of the LCD.

DEFAULT CHANNEL

The Default Channel, sometimes called the Jump Channel, is a user programmable channel in the scanner. This channel is often programmed to the MRN/PRN race channel, or any channel that is commonly used. The Default Channel may be selected while in the Normal Mode by pressing Button 4. The Scanner will immediately jump to this channel. To switch or jump back to the previous channel, press Button 4 again.

CHANNEL MONITOR

The Channel Monitor function allows the user to open or close the automatic noise squelch circuit. When Channel Monitor is active, the **MONI** Icon will appear on the left side of the LCD. Receiver squelch noise will be heard while in the Channel Monitor mode. Pressing Button 5 will toggle the Channel Monitor function ON or OFF. Please note that the Channel Monitor function can also be used to listen to a Channel that has CTCSS enabled. The received signal level is displayed on the left side of the LCD.

CHANNEL LIST

The Channel List is a list of channels that are set by the user. The Channel List allows the user to quickly switch between frequently used channels. The user may wish to set up the Channel List with all frequencies that are commonly used. Up to 50 channels may be custom programmed into the Channel List. The Channel List may be manually or automatically scanned.

MANUALLY SCAN CHANNEL LIST

While in the Normal Mode, press Button 2 (short press) to manually scroll thru the Channel List.

AUTOMATICALLY SCAN CHANNEL LIST

Automatic Scan operation scans all channels programmed into the Channel List. In the Normal Mode begin Automatic Scan by pressing Button 2 (long press) until the **SCAN** icon appears. When a signal is detected, channel scanning will stop, and the receiver will lock on the active channel. Automatic Scan will resume if a channel has no activity for 6 seconds. When the Automatic Scan operation is enabled, pressing Button 2 (short press) will force the receiver to SKIP the current channel and continue scanning the Channel List. To turn Automatic Scan off, press Button 2 (long press) until the **SCAN** icon disappears.

PRIORITY SCAN CHANNEL

If the Priority Scan Channel is enabled, the Priority Scan Channel will be active during Automatic Scan operation. The Priority Channel will be sampled every other channel while scanning.

CHANNEL MODE Note: CH icon is blinking



| BUTTON | BUTTON SHORT PRESS | BUTTON LONG PRESS |
|--------|---------------------|--------------------|
| 1 | Scanner Mode Change | Scanner ON-OFF |
| 2 | Scan Add-Delete | Set CTCSS/DCS Tone |
| 3 | Channel Down 1 | --- |
| 4 | Channel Down 100 | --- |
| 5 | Channel Up 100 | +-- |
| 6 | Channel Up 1 | --- |
| 1+2 | --- | Toggle Keylock |

The Channel Mode is used for setting the Channel and Frequency of the Scanner. This mode is also used to add or delete channels to the Channel List, and to enable or disable CTCSS tones or DCS codes if used.

SELECTING CHANNELS (Manual Scan)

While in the Channel Mode, Buttons 3 and 6 may be used to move the Scanner Channel Down or Up. The Frequency of the

Channel is always displayed below the Channel Number. Press Button 3 to move down in frequency by one channel. Press Button 6 to move up in frequency by one channel. Moving down or up 100 channels at a time may be accomplished by pressing Button 4 or Button 5. The Frequency or Channel Number may be calculated from the following formulas:

$$\text{UHF Frequency} = 440 + (\text{Channel Number} * 0.0125)$$

$$\text{UHF Channel Number} = (\text{Frequency} - 440) / 0.0125$$

$$\text{VHF Frequency} = 140 + (\text{Channel Number} * 0.0125)$$

$$\text{VHF Channel Number} = (\text{Frequency} - 140) / 0.0125$$

ADD/DELETE A CHANNEL TO THE CHANNEL LIST

Channels may be added or deleted from the Channel List at any time. In the Normal Mode, the Channel List may be viewed by pressing Button 2 (short press) while NOT scanning. Continue to press Button 2 to view all channels in the Scan List.

To add a channel to the Channel List, select the Channel Mode (**CH** blinking) and select the Channel to add by scrolling to the desired channel (use Buttons 3, 4, 5, and 6). When the LCD shows the correct Channel press Button 2 (short press) to save the Channel in the Channel List. The top line of the LCD will blink when the Channel is saved.

To delete a channel from the Channel List, first select the Normal Mode with Button 1. Then press Button 2 (short press) until the desired channel is displayed in the Channel List. Then switch to Channel Mode (**CH** blinking) by pressing Button 1 (short press). Now press Button 2 (short press) to delete the channel. The top line of the LCD will blink when the Channel is deleted.

CTCSS/DCS TONE ADD/DELETE

CTCSS tones and DCS codes are sometimes used to reduce channel interference when more than one user is occupying a channel. A CTCSS tone may be used on a Channel to ignore certain users that are not using the correct CTCSS tone. If a CTCSS tone is programmed for a specific Channel, other signals on this Channel will not be heard. The **CTC** icon will appear if a selected Channel is programmed with a CTCSS tone or a DCS code.

To program a CTCSS tone or DCS code for a particular Channel, first select the desired Channel. This can be done by manually scrolling thru the Channel List in the Normal Mode, or by selecting a Channel in the Channel Mode. Once the correct Channel is displayed, switch the Scanner to the Channel Mode (**CH** blinking). Now press Button 2 (long press) to display the CTCSS tones available. If a Channel is already programmed with a CTCSS tone, then the programmed tone will be displayed. Using Buttons 3 and 6, scroll DOWN or UP in the Tone List until the desired tone or code is displayed. Note that Tone 00.0 selects carrier only (no CTCSS tone) operation. After the desired CTCSS tone or code is selected, press Button 2 (short press) to update the Scanner's memory with the selected tone. The LCD will revert back to the Frequency display when the CTCSS tone or code is set in memory. The **CTC** icon will appear if a CTCSS tone or code has been programmed. To abort this programming operation so that no change is programmed, press Button 1.

Please see the end of this manual for more information on how to use DCS codes.

FM RADIO MODE Note: CH icon is OFF



| BUTTON | BUTTON SHORT PRESS | BUTTON LONG PRESS |
|------------|------------------------|-----------------------|
| 1 | Mode Change | Scanner ON-OFF |
| 2 | Scroll Preset Channels | Save-Delete Preset CH |
| 3 | Volume Down | --- |
| 4 | FM Frequency Down | --- |
| 5 | FM Frequency Up | --- |
| 6 | Volume Up | --- |
| 1+2 | --- | Toggle Keylock |

The FM Radio Mode (Mode 3) allows the user to select FM Broadcast channels, adjust the volume and add or delete FM channels from the FM Preset Channel List. The LCD shows the FM channel and Preset Channel number.

ADJUSTING VOLUME

While in the FM Radio Mode, Buttons 3 and 6 may be used to decrease or increase the volume of the audio. The volume level and **VOL** icon are displayed on the right side of the LCD.

FM CHANNEL UP/DOWN

Buttons 4 and 5 may be used to move the FM Channel down or up. The Frequency of the FM Channel is shown on the LCD display. Press Button 4 to move down in frequency. Press Button 5 to move up in frequency.

SELECT FM PRESET CHANNEL

Pressing Button 2 (short press) will scroll thru the user programmable FM Channel List. The FM Channel preset number will be displayed (P-1 to P-6).

PROGRAMMING FM PRESET CHANNELS

FM Preset Channels may be user programmed into the Scanner. To program a new FM Preset Channel, first select the FM channel that is to be added. Then press Button 2 (long press) until the new Preset Channel appears in the LCD display. Up to six FM Preset Channels may be saved in memory.

DELETING FM PRESET CHANNELS

To delete an FM Preset Channel, first press Button 2 (short press) to select the channel to delete. Then press Button 2

again (long press) until the Preset Channel goes blank on the LCD display.

PROGRAMMING MODE

The Programming Mode is used for setting various parameters in the Scanner. These parameters may be programmed by PC software using a USB programming cable or by manually entering the settings using the keypad.

While the Scanner is OFF, press and hold Buttons 1 and 2 together to enter the Programming Mode. When the LCD display appears the current firmware version of the Scanner is shown. Then release the buttons. P1-0 will appear in the LCD display. When finished programming the Scanner press Button 1 (long press) to turn off the Scanner. When the Scanner is turned on the next time the new features will be active.

PC PROGRAMMING

PC Windows Programming streamlines the programming of the Scanner. The RF Scanner Programmer software is available on line when purchased with the USB Programming Cable. Updates may also be downloaded.

Use this procedure to begin PC programming the Scanner:

1. Attach the USB Programming Cable to the jack on the left side of the Scanner.
2. Attach the other end of the Programming Cable to a USB port on your computer that is running Windows operating system.

3. Start the *RF Scanner Programmer* Software on your PC by selecting START: All Programs: RF Scanner Programmer: RF Scanner Programmer.

Please see the software help file (press F1) for complete instructions.

MANUAL PROGRAMMING

Manual programming is accomplished using the Scanner keypad and LCD display. Button 1 can be used to scroll to the programming option that you wish to set (P1-0, P1-X, P2-X,...). Button 3 and 6 are used to select the data. Button 2 is used to memorize the data entered and to program the selected function. The top line of the **LCD** will blink when a programming option is set.

P1-0 MEMORY RESET

The Scanner's memory can be restored to factory default settings. This feature is useful to quickly clear out the Scanner's memory rather than resetting each channel individually. To reset the memory, press Button 2 while the LCD shows P1-0. After pressing Button 2, the LCD will flash and update to the next programming option. To skip to the next programming option without resetting the memory, press Button 1.

P2-X BATTERY SAVE

Battery Save is a feature that extends the Scanner's battery life by a factor of 2. The only disadvantage of using Battery Save is that the receiver response time is slowed to $\frac{1}{2}$ second. The

default option is OFF. Press Button 6 to change the Battery Save status from OFF (**P2-0**) to ON (**P2-1**). Then press Button 2 to save the option. Notice that the **RSSI** icon will blink during normal operation indicating that the Battery Save operation is active. Battery Save does not operate during Automatic Scan operation.

P3-X SQUELCH THRESHOLD

This programming option will allow the user to set the receiver squelch threshold setting. This setting can be set from 2 – 8. The default value is 3 (**P3-3**). The higher number tightens the squelch setting and therefore requires a stronger signal to open the receive audio. If you are receiving a lot of interference, a higher number setting will improve the operation of the Scanner. Press Button 6 to change the squelch setting. When the desired setting is displayed, press Button 2 to save the option.

P4-X SCAN HOLD TIME

This programming option sets the amount of time the Scanner will hold on an active channel before resuming the scanning operation when the signal is gone. The default Scan Hold Time is 6 seconds (**P4-6**). This setting can be set from 1 – 9 seconds. Press Button 6 to change the scan hold time. When the desired setting is displayed, press Button 2 to save the option.

P5-0 DEFAULT CHANNEL PROGRAMMING

This option sets the Channel Number and Frequency of the Default Channel. To set the desired Channel or Frequency

Buttons 3, 4, 5, and 6 are used. Please see the **SELECTING CHANNELS** paragraph for how to use these buttons. When the correct Channel is displayed, press Button 2 to save the Channel. If a CTCSS tone is required, please see the **CTCSS/DCS Tone ADD/DELETE** section of these instructions.

P6-0 PRIORITY CHANNEL PROGRAMMING

This option sets the Channel Number and Frequency of the Priority Scan Channel. To set the desired Channel or Frequency Buttons 3, 4, 5, and 6 are used. Please see the **SELECTING CHANNELS** paragraph for how to use these buttons. When the correct Channel is displayed, press Button 2 to save the Channel. Programming Channel 0000 will disable the Priority Scan Channel. If a CTCSS tone is required, please see the **CTCSS/DCS Tone ADD/DELETE** section of these instructions.

P7-X LCD BACKLIGHT

LCD Backlight turns the LCD backlight LED ON whenever a key is pressed. The LCD Backlight will remain on for 10 seconds. The default option is ON. Press Button 6 to change the Battery Save status from ON (**P7-1**) to OFF (**P7-0**). Then press Button 2 to save the option.

DCS CODES

DCS codes are normally transmitted in either a 'normal polarity' or 'inverted polarity' mode. The Scanner displays normal polarity codes. If you wish to generate an 'inverted polarity'

code, then the corresponding 'normal polarity' code should be used. For example, to generate the DCS code '023' in normal polarity, select D-023. To generate the DCS code '023' with inverted polarity, select DCS code '047'. The following table shows normal polarity codes and their inverted code equivalents. Always start with the normal polarity code. If decoding is not possible, then try the inverted polarity code.

| Normal | Inverted | Normal | Inverted | Normal | Inverted | Normal | Inverted |
|--------|----------|--------|----------|--------|----------|--------|----------|
| 023 | 047 | 155 | 731 | 325 | 526 | 516 | 432 |
| 025 | 244 | 156 | 265 | 331 | 465 | 523 | 246 |
| 026 | 464 | 162 | 503 | 332 | 455 | 526 | 325 |
| 031 | 627 | 165 | 251 | 343 | 532 | 532 | 343 |
| 036 | 172 | 172 | 036 | 346 | 612 | 546 | 132 |
| 043 | 445 | 174 | 074 | 351 | 243 | 565 | 703 |
| 047 | 023 | 205 | 263 | 364 | 131 | 606 | 631 |
| 051 | 032 | 212 | 356 | 365 | 125 | 612 | 346 |
| 053 | 452 | 223 | 134 | 371 | 734 | 624 | 632 |
| 054 | 413 | 225 | 122 | 411 | 226 | 627 | 031 |
| 065 | 271 | 226 | 411 | 412 | 143 | 631 | 606 |
| 071 | 306 | 243 | 351 | 413 | 054 | 632 | 624 |
| 072 | 245 | 244 | 025 | 423 | 315 | 654 | 743 |
| 073 | 506 | 245 | 072 | 431 | 723 | 662 | 466 |
| 074 | 174 | 246 | 523 | 432 | 516 | 664 | 311 |
| 114 | 712 | 251 | 165 | 445 | 043 | 703 | 565 |
| 115 | 152 | 252 | 462 | 446 | 255 | 712 | 114 |
| 116 | 754 | 255 | 446 | 452 | 053 | 723 | 431 |
| 122 | 225 | 261 | 732 | 454 | 266 | 731 | 155 |
| 125 | 365 | 263 | 205 | 455 | 332 | 732 | 261 |
| 131 | 364 | 265 | 156 | 462 | 252 | 734 | 371 |
| 132 | 546 | 266 | 454 | 464 | 026 | 743 | 654 |
| 134 | 223 | 271 | 065 | 465 | 331 | 754 | 116 |
| 143 | 412 | 274 | 145 | 466 | 662 | | |
| 145 | 274 | 306 | 071 | 503 | 162 | | |
| 152 | 115 | 311 | 664 | 506 | 073 | | |
| 032 | 051 | 315 | 423 | | | | |

SPECIFICATIONS

| | |
|-----------------------|--------------------------------|
| Frequency Band UHF | 440.0000 - 469.9875 MHz |
| UHF | 420.000 – 449.9875 MHz |
| VHF | 140.000 – 196.9875 MHz |
| Number of Channels | 2400 (12.5 kHz step) |
| Receiver Sensitivity | -119 dbm for 12db sinad |
| Channel List | 50 channels programmable |
| Channel Scanning | Automatic and Manual |
| Automatic Scan Time | 10 channels/sec |
| Scan Hold Time | User programmable |
| CTCSS Decoding | Yes (38 standard tones) |
| DCS Decoding | Yes (82 standard codes) |
| User Controls | 6 Buttons + LCD display |
| Power Save Mode | Yes -50% duty cycle |
| Default Channel Mode | User programmable |
| Priority Scan Channel | User programmable |
| Programming | Manual and Windows PC |
| Programming Cable | Optional |
| Audio Output | 0.1 Watt / 16 ohms |
| Audio Distortion | 5% |
| Audio Connection | 3.5mm jack |
| Battery | Single AAA 1.5V alkaline |
| Size | 2.5"x1.8"x.75" |
| Warranty | 1 year |
| Accessories | Headsets, Earphones, Splitters |

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.
- (2) This device must accept any interference that may cause undesired operation.

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