

# Dave Jones Design

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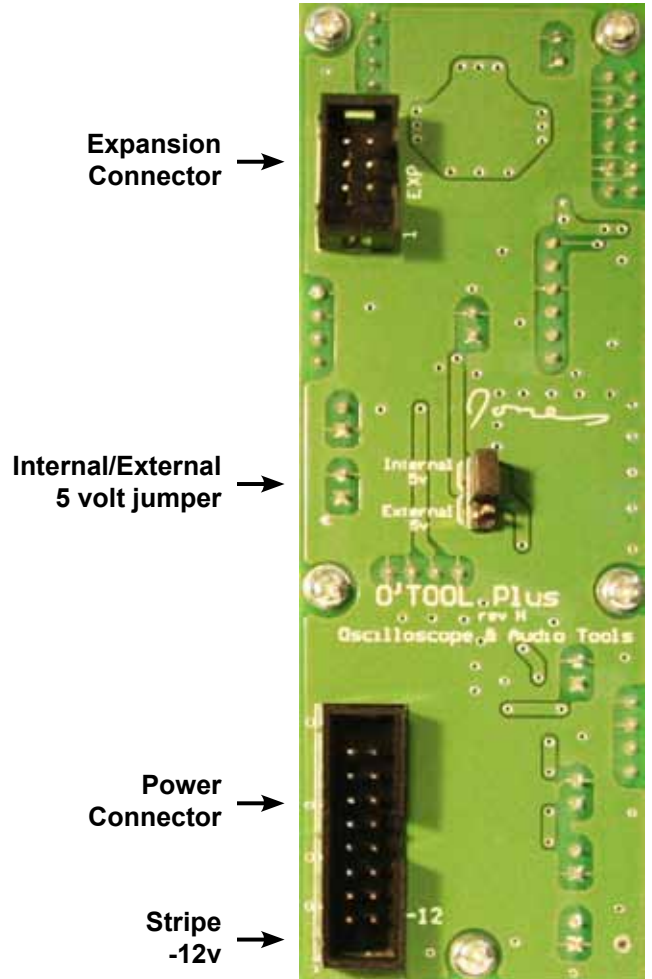
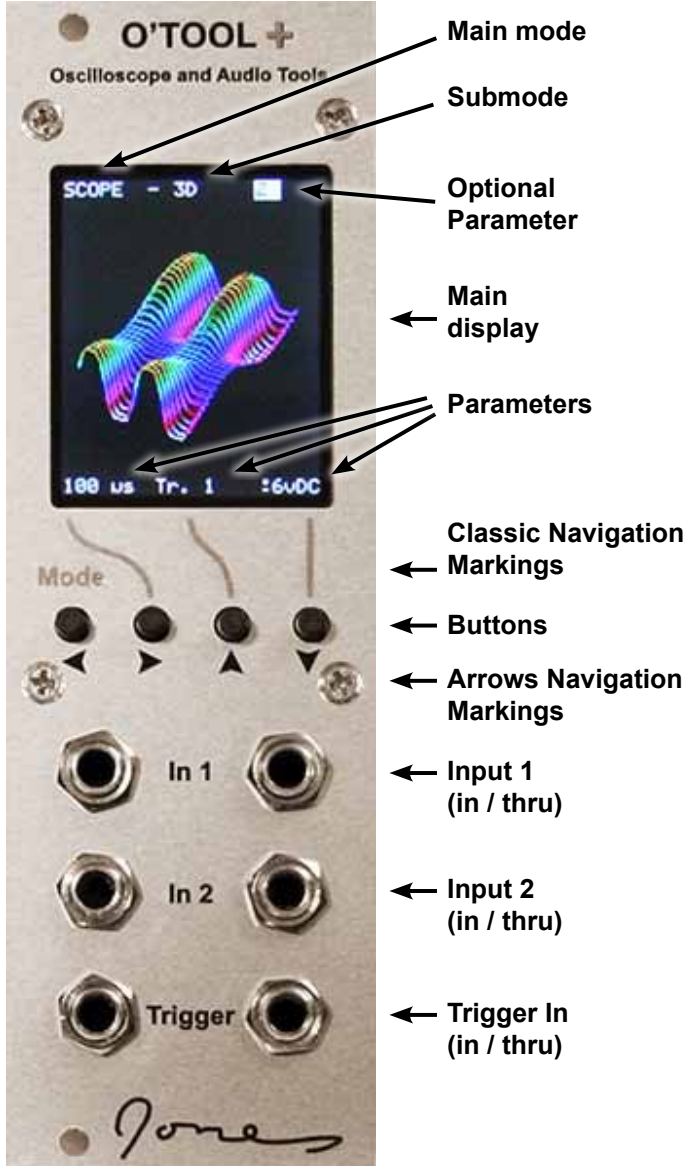
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## O'Tool Plus - User Manual

Manual v1.00a  
June 1, 2016  
for firmware vers. 2.00

NOTE: New modules are shipped with a film covering the display to prevent scratches during shipping. Remove that film after installation.



### Introduction

The O'Tool Plus is a eurorack visual display module that can show information about signals within your modular system. It includes an oscilloscope, X/Y display, levels and VU meters, frequency meter & tuner, spectrum analyzer, spectrogram, BPM meter, and a metronome.

There are three inputs, marked **In 1**, **In 2**, and **Trigger**. Each has two connections that are connected as passive multiples. This allows you to pass signals through the O'Tool and on to another module without interrupting the signal flow. Either jack can be used as the input, and the other can be used to pass the signal on to another module. Some modes use only In 1, some modes use In 1 and In 2. The scope modes can optionally use the Trigger input as an external trigger for the display.

Width: 8HP  
Depth: 40mm

With rear jumper set to **Internal 5v** you supply no external five volts.

Power: 80ma +12v  
22ma -12v

Internal 5v {  
External 5v {

With rear jumper set to **External 5v** you supply five volts on the power ribbon, as well as +/-12v.

Power: 12ma +12v  
70ma +5v  
22ma -12v

Internal 5v {  
External 5v {

There is a color LCD screen with four buttons below it. The screen displays information about the signals being monitored as well as information used to set parameters for the different modes of the O'Tool. The buttons are used to change between the different modes, and to change the various parameters within each mode.

## Navigation

There are two styles for navigation around the screen and the buttons act differently in each style. There are also two sets of markings around the buttons representing these two styles of navigation.

**Classic** navigation is the style of navigation that was used in the original version of the O'Tool. It is represented by the light gray markings above the buttons. In some ways this style of navigation is simpler, in that each button has a specific purpose and simply cycles between the choices. But in most cases it also means that you might have to hit the buttons many more times than in the newer **Arrows** navigation. In Classic navigation the left button is pressed to cycle between the various modes and the other buttons are used to cycle between the values of the parameters shown at the bottom of the screen. This is indicated by the word **Mode** printed above the left button and the gray lines above the other three buttons that point towards the bottom of the screen.

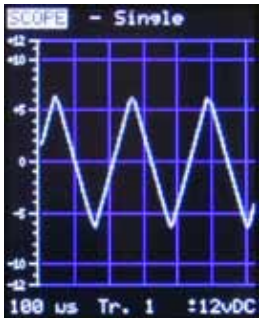
Different modes have different numbers of parameters available to set, so not all of the three buttons pointing to the bottom of the screen are used in all modes. The disadvantage of Classic navigation is that in most cases pressing the buttons advances you through the list of choices for the mode or parameters, but only goes in one direction. So if you go past the choice you wanted, you will have to continue hitting the button over and over until you get all the way back around to the correct selection. In some modes this can be a long list of choices that you have to step through.

As shipped, the O'Tool Plus is set for the new **Arrows** navigation style. The rest of this guide will assume that style of navigation is being used. You can change to Classic navigation style in the manual configuration menu.

The markings for Arrows navigation are printed in black below the buttons as a set of arrows pointing in the four directions. With Arrows navigation you use left & right arrow buttons to move a highlight around the screen between various choices, and then use up & down arrow buttons to change the value of the selection. Unlike Classic navigation, where all modes are accessed one after the other, in Arrows navigation the modes are divided into four main modes, each with several submodes.

The main modes are **Scope**, **Levels**, **Frequency**, and **User**. The Scope mode includes **Single**, **Layered**, **Stacked**, **3D**, and **X/Y**. Levels includes **Bars**, **VU/Peak**, and **Voltmeter**. Frequency includes **Freq. Meter/Tuner**, **Spectrum Linear**, **Spectrum Log**, **Spectrogram**, **BPM**, and **Metronome**. User mode is for user configuration and contains a number of settings and various screens with options, rather than specific submodes.

Main mode is highlighted



To change modes, use the left/right arrow buttons to highlight the mode in the top left corner of the screen. The highlight displays the text as black text in a white box instead of the normal white text on a black background. Then use the up/down arrows to change to the desired main mode. Next hit the right arrow to move the highlight to the submode and then use the up/down arrows to change to the desired submode. Now you can use the left/right arrows to move the highlight to one of the parameters within that mode, and use the up/down arrows to change that parameter.

When you move from one main mode to another, you move to whatever submode you were last in within that main mode. That makes it easy to jump between specific scope, levels or frequency modes that you are using frequently. Such as jumping back and forth between the tuner and the VU meter. Or the scope and the voltmeter. For example, lets say that you start out in the 3D submode of the Scope main mode and you change to the Levels main mode, and then change to various submodes within the Levels main mode. If you then change the main mode back to the Scope main mode you will go directly back to the 3D submode since that was the last submode you were in before leaving the Scope main mode.

## Power on Mode

The O'Tool can remember a specific mode as your favorite mode for power up. Then every time it powers up it will power up with that specific mode being displayed. It can also remember all of your favorite individual parameter settings within that mode, and every other mode. That way you can customize your settings in each mode once and store them, rather than have to change them every time you turn the system on.

After you have adjusted settings in the various modes to the way that you like them, go to the mode that you wish to see at power up. Push down and hold the two left buttons for at least five seconds. You will then see a message telling you that the settings have been saved. The next time you turn your system on, you will be returned to the mode you are in now, and the setting in this mode and all other modes will be as they are now. The choice of which mode is seen at power up, as well as all of the parameters for every other mode within the O'Tool Plus can be changed in the User configuration settings section.

Similarly you can push and hold the two right buttons for at least five seconds to store the parameters for only the current mode. It won't change which mode is seen at power up, and won't change the stored settings for any other modes. But it will save the current parameter settings for the current mode and after the next time that you power up, once you navigate to the current mode the parameters will be set as they are now.

## Users

The O'Tool Plus can save settings for three different users. Each user has their own saved power on mode, and their own saved parameter settings for all modes within the O'Tool Plus. You can use these to save settings for different ways of working, such as at home, in a studio, and at a performance. Or perhaps for three styles of music, or three different ways that you create your music, or three different moods that you get in while you work. Or it could even be for three actual different people who use the same system.

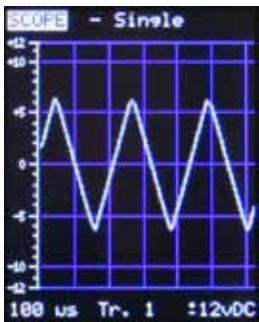
You can change which user is the current user on the User configuration screen. You can select a specific user number that will be the user the next time the O'Tool powers up, or you can switch to a different user temporarily, and have it change back to the previous one the next time the power comes on.

The User configuration page also allows you to manually change all of the saved settings for each user. It is also the only place where you can change between Classic and Arrows navigation styles. Navigation style can be set differently for each user, as can all of the other parameters. Note also that there is one parameter that can not be reached in Classic navigation style, and can only be set within the configuration menu if you are using Classic navigation. That is the color setting for the 3D scope mode. The reason is that there are too many parameters in that scope mode for the number of buttons. So in Classic navigation there isn't a fifth button available to be able to change that parameter. This isn't an issue in Arrows navigation since you simply move the highlight around to that parameter to change it. But if you are using Classic navigation you must go into the configuration menu to change that one parameter. That is the only parameter like that in the whole module. In all other modes you can change all parameters using either navigation style.

## Main Mode: SCOPE

The Scope main mode contains several submodes for displaying one or two waveforms. The Single submode is a classic single trace oscilloscope. The Layered submode is a dual trace oscilloscope with the two traces displayed in two colors on the same space. The Stacked submode is also a dual trace oscilloscope, but with the two traces displayed separately above and below each other. The 3D submode is a single trace oscilloscope with multiple traces displayed across time, similar to the classic display of the Fairlight CMI. The X/Y submode displays 2D shapes and patterns like an oscilloscope X/Y mode or a vector display.

The Single, Layered, Stacked, and 3D submodes all share the same settings for their parameters (except for the color parameter used exclusively by the 3D submode). This means that if you change any of the parameters in one submode and then change to a different one of those submodes, the parameters will be set the same as in the previous submode. These four scope submodes are the only submodes within the O'Tool that share parameters.



### Submode: Single

The Single scope submode displays an oscilloscope style display showing the voltage of input 1 going in the vertical axis and a specific period of time going horizontally left to right. The first parameter on the left determines the **Timebase**, or the period of time between divisions horizontally on the screen. This can be set from 100 microseconds to 5 seconds per division. With a little more than six divisions on the screen from left to right, at the slowest setting it is displaying a bit over 30 seconds across the screen. In the fastest setting the screen is displaying less than a thousandth of a second (actually about 1/1600).

The right most parameter is the voltage setting, which defines the vertical scale of the display. It can be set to +/-6vDC, +/-12vDC, +/-12vAC, 0-6vDC, and 0-12vDC. The original O'Tool had scales going to 5 and 10 volts while the Plus goes to 6 and 12 volts to allow for a little more headroom in the display, since waveforms might come too close to the 5 and 10 volt levels. The old scales would clip the waveforms, but these new scales allow waveforms that go slightly above/below the normal range without clipping.

The middle parameter is the Trigger setting. The various scope submodes (except the X/Y submode) require a trigger to have a stable display. The Trigger parameter determines the source of the trigger. You can trigger the display with the signal from input 1 or input 2, or using the external trigger input. You can also select to have no trigger, which causes the display to run continuously without triggering on a specific signal.

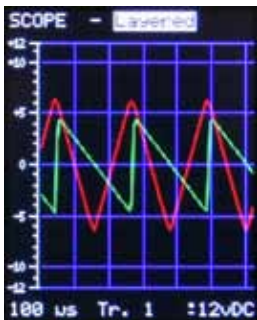
Triggering is the most misunderstood aspect about an oscilloscope to a new user. Oscilloscopes need a trigger to display their trace. If they expect a trigger and don't get it, the scope will pause momentarily waiting for that trigger. Eventually, if it never gets a trigger, it will switch over to auto-trigger mode which is the same as **No Trigger**. In other words it will eventually just start drawing the traces anyway, but they won't start at any specific part of the waveform. For them to start and repeat from a specific part of the waveform they need a trigger.

A trigger happens when the signal falls below a certain voltage and then rises above a different voltage. What those voltages are depends on what the voltage scale setting is for the scope, and what the trigger setting is. The threshold voltage that the signal must cross to create the trigger is different for the various trigger sources and for the different voltage range settings of the scope. If you trigger using input 1 or 2 when the voltage range is bipolar (+/-6v or +/-12v) then the signal must go down a specific amount below zero volts and then go back up above zero volts in order to create the trigger. In the unipolar voltage ranges (0-6v, 0-12v), triggering on input 1 or 2 happens when the signal goes down a little above zero volts and then rises up from there a certain amount. That amount changes with the range.

The thing to understand from that is if you are triggering on input 1 or 2 with a signal that never goes below ground, but have the input voltage range set to a bipolar range such as +/-12v, then the scope won't trigger. You need to choose a voltage range appropriate for the signal you are looking at. And if the signal varies a lot, sometimes going below zero volts, sometimes not, you might be better off triggering off of a separate signal going into the Trigger input. Otherwise the scope will pause every time it misses the trigger.

This table describes the approximate voltages that must be met in order to reliably cause the scope to trigger for each of the different trigger sources and voltage ranges. Note that the voltages defined for the AC input voltage range are based on the DC voltages that are created by the signal after it has been AC coupled inside the O'Tool. So a waveform with a 50% duty cycle typically must be at least about 2 volts peak to peak in order to cause the trigger for an AC signal triggered from In 1 or In 2, however a non-uniform signal might go further below the zero volt line even if it is not as large and might still cause a trigger. Also note that the External trigger thresholds allow triggering off of very small signals. The Ext. 0v setting is used for bipolar signals that are near zero volts while the Ext. 1v setting is useful for unipolar signals above zero volts.

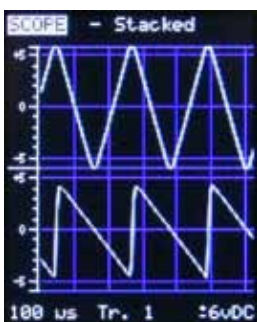
Trigger Source	Voltage Range	Must first go below:	Then must go above:
In 1 or In 2	+/-6vDC	-0.45v	+0.1v
	+/-12vDC or AC	-0.9v	+0.1v
	0-6vDC	+0.35v	+0.8v
	0-12vDC	+0.75v	+1.7v
Trigger In	Ext. 0v	-0.25v	-0.1v
	Ext. 1v	+1.0v	+1.15v



### Submode Layered:

The Layered scope submode displays two traces from the two inputs, In 1 and In 2. The signal from In 1 is displayed in red and the signal from In 2 is displayed in green. They are displayed on top of each other and where they overlap the display looks yellow.

All of the other settings and parameters in the Layered submode are the same as described above for the Single submode. And all of the settings for the parameters are shared with the Single, Stacked, and 3D submodes, so moving between those submodes leaves the parameters the same.



### Submode Stacked:

The Stacked scope submode displays two traces from the two inputs, In 1 and In 2. The signal from In 1 is displayed in the top half of the screen and the signal from In 2 is displayed in the bottom half of the screen.

All of the other settings and parameters in the Stacked submode are the same as described above for the Single submode. And all of the settings for the parameters are shared with the Single, Layered, and 3D submodes, so moving between those submodes leaves the parameters the same.



### Submode 3D:

The 3D submode pays homage to the 3D display originally seen in the old Fairlight CMI synthesizer of the 1980s. It is a 3D representation of multiple scope traces taking place over time, with older traces placed behind the newer ones going back in 3D space.

The 3D submode has a unique parameter that the other scope submodes don't have. It has a setting for the color of the display. This parameter is shown up in the upper right corner of the screen and can only be changed within this mode when using the Arrows navigation style. If using the Classic navigation then this parameter can only be set in the manual configuration menu because there aren't enough buttons to change it in Classic navigation.

The color choices allow the image to be displayed in black & white, or in a rainbow of colors where the colors change across one of the axis of the 3D display. In the X axis the colors change side to side, in the Y axis they change up and down, and in the Z axis they change with the depth (traces further back in time).



### Submode X/Y:

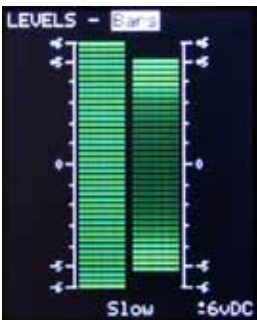
The X/Y scope submode is a different type of display compared to the other scope submodes. It simulates a type of display that is found on some oscilloscopes, and also found on some other types of test equipment generally called a vector display or X-Y display. It is called that because two voltages are used to position a dot on the screen where one voltage defines the X position (side to side) and the other voltage is used to define the Y position (up and down). In this case In 1 is used for the X and In 2 is used for the Y.

The X/Y submode has the same choices for input voltages as the other scope modes, but doesn't share those settings with the other submodes. So whatever voltage is selected in this submode only changes the voltage for this submode.

The time period parameter in the X/Y submode defines a period of time during which the input signals are sampled. That period can be between 1 millisecond and 200 seconds. This allows fast or slow changing signals to be seen moving around the screen. It's not always obvious whether a fast or slow sampling time is going to give a better result for a specific type of signal, so sometimes it is worth experimenting with different times.

## Main Mode: LEVELS

The Levels main mode consists of three submodes that display signal levels in different ways. Two graphically and one numerically.



### Submode Bars:

The Bars level submode is a unique display that simulates a multi-LED display showing the voltage levels of the signals going into In 1 and In 2. The intensity of each bar represents the average amount of time that the signal spent at a given voltage level. So, for example, with a square wave signal that spends all of its time being at either a specific high voltage or a specific low voltage there will generally be only two bars illuminated. One near the top and one near the bottom of the voltages where the square wave spends its time. The bars between will be dark. However if the signal spends some time transitioning between those levels, such as a trapezoid shape, then the middle bars will glow a bit.

A triangle wave transitions uniformly from one voltage to another, so the bars are all evenly lit. But a sine wave travels quickly in the middle and slows down near the top and bottom, so the bars will be darker in the middle than they are at the top and bottom.

There is a parameter to adjust the range of the input voltage, similar to the voltage range used on the scope modes. There is also a speed parameter that can be selected for fast or slow. This allows you to choose if the display is an average of a long period of time or a short period of time. With slow moving signals and this parameter set to slow, the moving bars will leave visual trails as they move.



### Submode VU/Peak:

The VU/Peak levels submode shows a classic VU meter and Peak meter. There is one parameter to choose the nominal signal level being measured. You can select between +4dBu, which is widely used as the standard for professional audio levels, or you can select +/-5v or +/-2.5v. These are common voltages used in Eurorack modular systems as the normal signal and control voltage levels from various manufacturers.

The VU meter always displays in dBvu, with the 0dB point being the value of the range that you selected. The Peak meter scale changes to show either dBu or volts, depending on the range that you select. And the nominal peak level in each range aligns with the 0dBvu level of the VU meter side of the display. There is a blue line going between the two displays to show that alignment.



### Submode Voltmeter:

The Voltmeter levels submode contains several different types of readings for each of the two inputs. It displays the top and bottom peak voltages as well as the peak to peak voltage of the waveform. It also displays the average DC voltage. As a waveform moves up and down, its value crosses the various thresholds of the internal A-D converter inside the O'Tool. The highest and lowest of those over a given period of time are saved and displayed. The p-p display is the peak-to-peak, or the difference between the top peak and the bottom peak. Because the A-D converter has a specific number of thresholds, and the waveform must move across one to be sensed as being higher or lower than any other previous peak, the peak values change in voltage steps that represent the size of the steps in the A-D converter.

The Average DC reading is an average voltage calculated by averaging tens of thousands of samples of voltages from the waveform. Because it is an average of so many different samples it can actually create a number that is much more accurate, and has a much finer resolution than the steps of the A-D converter. So the numbers displayed for the average DC voltage display with a much higher precision than the voltages for the peaks.

There is one parameter that can be set for the Voltmeter submode. That is the amount of time that the voltages are sampled over. This can be set between 1 second and 20 seconds. For the peak voltages this means that the top and bottom peak voltages shown are the highest and lowest voltages detected during the past x number of seconds. For the average DC reading it means that the number shown is an average of samples taken in the past x number of seconds. So if you have it set to 20 seconds, and a single peak happened at 10 volts 19 seconds ago, the top peak will show that even if there have been no other peaks since then that are anywhere near that voltage. Likewise, the average will include samples going back that far, so something that happened 10 or 15 seconds ago is included in the average even though the voltage that is happening right now might be very different. So be aware of how that time is set when you look at the resulting voltages.

## Main Mode: FREQUENCY

The frequency main mode consists of a number of different ways of looking at the frequencies and beats involved in your signals. This includes numerical frequency readings, notes, graphical spectrum displays, and even a graphical simulation of a metronome.



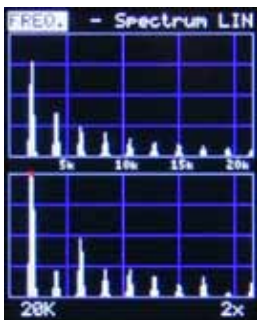
### Submode Meter/Tuner:

The Meter/Tuner frequency submode combines two types of display. It is a frequency meter with a numerical readout of the frequency of the signal going into In 1 and/or In 2, as well as the equivalent of a guitar tuner type of display that shows the note and cents for that frequency. The cents are displayed both numerically as well as graphically with a sliding scale so you can quickly see if a note is exact or not, and to see if it matches between the two channels.

The first parameter lets you select the input being displayed. Either In 1, In 2, or both. It does not default to showing both because if no signal is going into one of the inputs the meter will spend a long time waiting for that signal while it tries to measure its frequency. So if you only want to measure the frequency of one signal, don't set it to both.

The second parameter lets you choose the tuning scale for the tuner to be either the standard 440 scale or the 432 scale. The numerical reading of the frequency doesn't change, but the notes displayed are changed to match the tuning scale.

The third parameter is the speed of sampling the frequency. You can choose fast or slow. At very low frequencies this won't make much difference because it takes a long time to measure slow frequencies anyway. But at higher frequencies it allows you to get results quicker by sampling fewer cycles of the signal to calculate the frequency. But be aware that when set to fast sampling it is also slightly less accurate because it is doing the calculations using fewer cycles. So set it to fast to get quicker results, but set it to slow to get more accurate results.

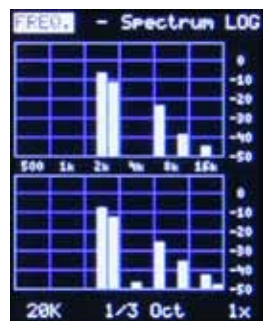
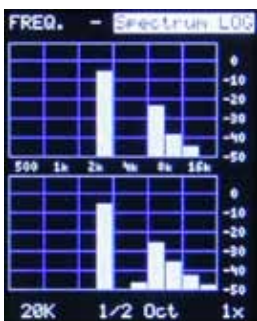


### Submode Spectrum LIN:

The Spectrum LIN frequency submode is a linear spectrum analyzer that displays the frequency spectrum graphically with a linear display of frequencies going left to right (low frequencies on the left) and a linear display of the amplitude going up and down.

The first parameter lets you choose the top frequency being displayed, which can range from 20KHz down to 2.5KHz.

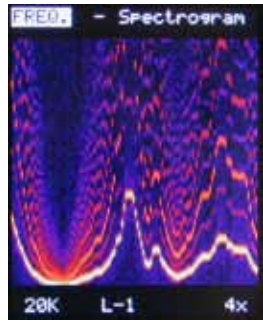
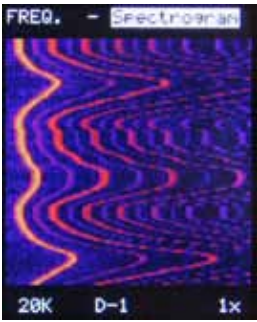
The second parameter lets you adjust the scale of the amplitude by multiplying the amplitude up to 64 times its normal size. This allows you to boost the signal to see frequencies buried in the noise, or that are weak within a complex signal.



### Submode Spectrum LOG:

The Spectrum LOG frequency submode is similar to the Spectrum LIN submode, except that the display shows the frequencies in a logarithmic display of frequencies from left to right and a logarithmic display of amplitude going up and down. The strength of the signal is shown in dB to show relative strength.

It has the same parameters for selecting the top frequency being displayed, between 20KHz and 2.5KHz, and amplitude scaling between 1x and 64x. It also has a parameter to select between the display showing the frequencies divided into 1/2 octave or 1/3 octave divisions.

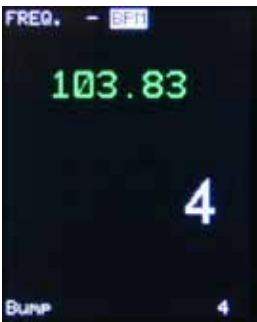


### Submode Spectrogram:

The Spectrogram frequency submode adds the element of time to the spectrum analysis display. It displays the amplitude of the frequencies using a range of colors going from dark colors representing low amplitude to bright colors representing high amplitude. It then displays the frequencies and time in the X and Y axis. The time can scroll in either the horizontal or the vertical axis. The color palette chosen is similar to that used by Adobe and other common audio software having spectrogram displays.

The Spectrogram has the same top frequency parameter and amplitude scale parameter that the linear and log spectrum analyzer submodes have.

It also has a parameter to set the direction and speed of scrolling in time. It has four speeds of scrolling from top to bottom and four speeds of scrolling from right to left. They are represented with D-1 through D-4 for down speeds 1 through 4 (1 being fastest), and L-1 through L-4 for scrolling left at four speeds (1 being fastest). Scrolling side to side is the more traditional type of display for a spectrogram. But the LCD in the O'Tool has built in hardware that allows fast scrolling vertically, so the O'Tool has additional vertical scrolling modes which are faster than the horizontal scrolling modes. The vertical scrolling speeds range from about 5 to 18 seconds to get from top to bottom of the screen, while the horizontal scrolling speeds range from about 14 to 33 seconds to get from the right to the left of the screen.



### Submode BPM

The BPM frequency submode is a special type of frequency meter that measures very low frequencies and translates the frequency into beats per minute. A 1Hz oscillation has one cycle per second, therefore 60 cycles per minute and hence 60 BPM. The BPM meter reads the signal going in to In 1, and it should be a simple waveform, not a complex wave. It can not extract the beat out of a complex waveform such as a complex audio signal. It is expecting a low frequency BPM clock. The BPM meter can read BPM between 20 BPM and 1000 BPM.

The BPM meter includes a beat counter. This is a number that displays on the screen, counting from one to a specified number that you choose between 2 and 16. It increments as each beat of the beat clock arrives. So if you select it to be 4, then the number counts 1, 2, 3, 4, 1, 2, 3, 4, etc... changing as each pulse

of the beat clock arrives.

There is a second parameter that is not a setting, but is a momentary control to skip a beat in the beat counter. It is called **Bump**. You use the Bump control to manually skip a beat in the beat counter. With Arrows navigation you can bump the beat count up or down by one. With Classic navigation you can only bump the beat count up.



### Submode Metronome:

The Metronome frequency submode is a visual representation of an old fashioned mechanical metronome. The O'Tool does not have any way to output a pulse to represent the click or beat of a metronome, so this is a visual only display. It shows a swinging arm, like a mechanical metronome. As the arm crosses the center point it briefly flashes white to represent the moment when a metronome would make the click sound. At that same moment a beat count displayed on the screen is incremented.

The beat count in the metronome works the same as the beat count in the BPM meter described above. You select a number between 2 and 16 and the beat counter will count from one to the number you select, and then repeat. The number changes every time the metronome arm crosses the mid point.

There is a parameter to set the speed of the metronome. It can be adjusted between 20 BPM and 400 BPM.

## Main Mode: USER

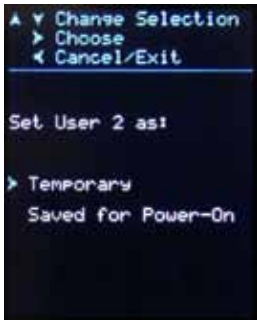


The User main mode is for configuration. It does not display any information about the signals plugged into the O'Tool. It is used to change users and to set configuration settings.

### Submode Config:

There is only one submode in the User main mode. It shows which user number is the current user, and which user number is set as the power on user. You can use this submode to change the user or to enter the configuration menus. First a user number is selected in the left parameter and then you either choose the center option to change the current or power-on user to that selected user, or you choose the right option to change the configuration settings for that selected user number. All subsequent configuration pages after this one use Arrows navigation, no matter what navigation style is set for the O'Tool.

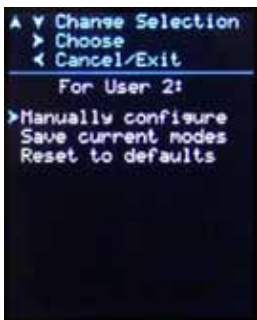
All of the configuration pages past the User Config submode page use Arrows navigation. The purpose of the arrows are shown at the top of the screens and are similar in most screens. When there are multiple choices, the up and down arrows allow you to change which choice you will be working with. The right arrow in most cases is used to select the option, or to go deeper into the selection tree. The left arrow is used to either cancel or exit from a selection, or to show that you are done with the current selections.



### Switch User

When you select a user number on the User Config submode screen, and then choose the **Switch** option, as long as the selected user number is not already the current user or the power-on user, then you will be taken to a screen to choose whether to set that new user as the current user (which will be reset back after the power goes off), or set that user as the power-on user so that user will be the new user the next time the O'Tool is powered up. Choose Temporary if you only want to switch to that user until the power is turned off and then go back to the old power-on user the next time the power is applied.

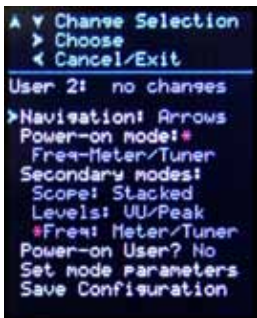
If the selected user is already the power-on user but not the current user then choosing to switch to that user will simply change the current user without any intermediate screen. On the other hand if the selected user is already the current user but not the power-on user, then you will be asked if you want to save that user as the power-on user.



### Configure

When you select a user number in the User Config submode screen, and then choose the **Config** option, you are taken to a screen with three choices. You can either manually configure the settings for that user number, or save all of the current modes and parameters within the O'Tool for that user number, or you can reset all of the saved parameters and settings for that user number to their factory defaults.

Saving the current modes and parameters is similar to what happens when you press and hold the left two buttons down for 5 seconds while in one of the O'Tool main modes and submodes, except that because it doesn't know which specific mode you want to save for power-up it will then pop up a screen asking you that before it saves all of the modes and parameters.



### Manually Configure

When you choose **Manually Configure** from the previous screen, you are taken to a screen with several choices for manually configuring options for that specific user number.

- **Navigation** - Choose between Classic and Arrows navigation styles
- **Power-on mode** - Select the mode that will be seen first after power comes on
- **Secondary modes** - The submode within each of the three main modes that you will first go to when jumping between the main modes. These are remembered at power on, but only last until you navigate to a different submode within that same main mode. Note: you can't select a submode for the main mode that is used in the power-on mode, since the power-on mode already defines one.
- **Power-on User** - Sets whether this user number is set as the power-on user
- **Set mode parameters** - Use this to go deeper into the configuration and manually set individual parameters for every mode/submode within the O'Tool
- **Save Configuration** - Choose this after changing things on this page to save those changes

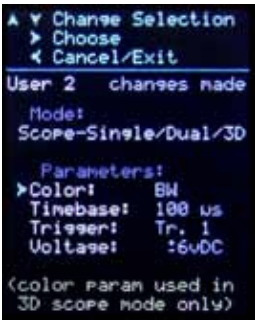


### Set Mode Parameters

When you select **Set Mode Parameters** from the Manually Configure menu page you are taken to a page that lets you select a specific main mode and submode. Below it are listed the parameters for that submode. Use the up and down arrows to change to the various modes/submodes and the parameters will be shown below.

Once you are at a mode/submode that you wish to change a parameter for, hit the right arrow and the cursor will move down to the list of parameters.





### Choose a Parameter

With the cursor now at the group of parameters, again use the up and down arrows to move to a specific parameter and then hit the right arrow to select that parameter.



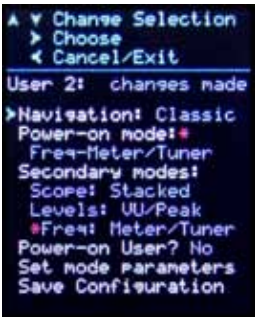
### Change the Parameter

After selecting the specific parameter the cursor will move to the right, next to the current value for that parameter. You then use the up and down arrows to change the value for that parameter.

Once you are done you either hit the right arrow to save the new value or hit the left arrow to cancel and go back without making a change to the value.

You can then continue to change other parameters for that submode by moving the cursor up and down and selecting another parameter, or exit this submode by hitting the left arrow.

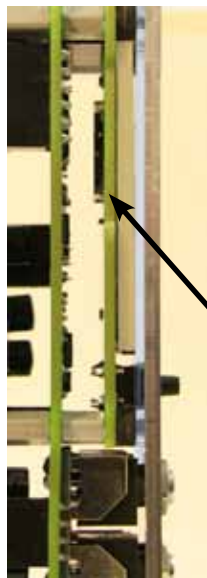
You can continue to move back through the pages by hitting the left arrow until you get back to the Manual Configuration page, where you first started to change the mode parameters.



### Saving Changes

If you make changes to the options in the Manual Configuration page, or any of the mode parameter pages, you will see the status near the top of the screen change from No Changes to be Changes Made. If you wish to keep those changes and save them for the next time power is applied to the module, navigate down to the bottom of the screen and select the Save Configuration option. The changes you made will then be saved for the specified user number.

You can leave the Manual Configuration page by hitting the left arrow button. If you do that, and changes have been made but not saved, you will be presented with a warning page telling you that changes were made but not saved. You will then be given the option of either returning to the Manual Configuration page by hitting the right button, so that you can save those changes, or to exit without saving by again hitting the left button.



### Firmware Updates:

If there are ever any firmware updates for the O'Tool Plus they will be uploaded at [www.jonesvideo.com/otool](http://www.jonesvideo.com/otool)

You should download the update onto a standard micro-SD memory card (the cheap HC style, not the super fast fancy kind) and then:

- Power off the O'Tool
- Insert the memory card in the slot behind the LCD
- Power on the O'Tool
- Wait while it tells you to wait
- After updating, power off the O'Tool and remove the card (just push in on the card again and it will pop out enough to grab it)