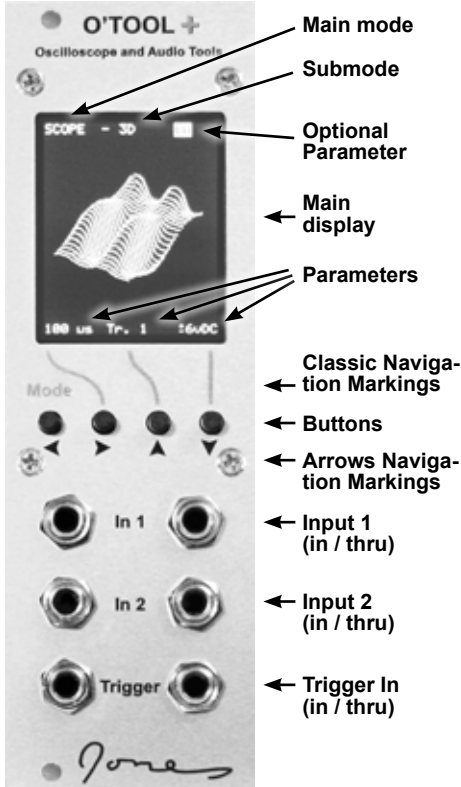# O'Tool Plus - Quick start guide

For a more complete user manual, go to www.jonesvideo.com/otool

Much of the O'Tool Plus is simple and intuitive. But some things are not obvious. It is worth spending a few minutes reading this guide to understand those things.

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

Main mode

Submode

Optional Parameter

Main display

Parameters

Classic Navigation Markings

Buttons

Arrows Navigation Markings

Input 1 (in / thru)

Input 2 (in / thru)

Trigger In (in / thru)

Width: 8HP
Depth: 40mm

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

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

Internal 5v
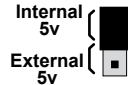
External 5v

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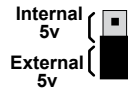
The O'Tool Plus is a eurorack visual display module that can show information about signals within your modular system. It includes an oscilloscope, X/Y display, levels and VU meters, frequency meter & tuner, spectrum analyzer, spectrogram, BPM meter, and a metronome.

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.

There is a color LCD screen with four buttons below it. There are two styles for navigation around the screen and the buttons act differently in each style. In **Classic** navigation they act as they did in the original O'Tool module, where 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.

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.

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.

To change modes, use the left/right arrows to highlight the mode in the top left corner of the screen. 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.

The O'Tool can remember a specific mode as your favorite mode for power up. It can also remember all of your favorite individual parameter settings within each 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 and 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.

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.

The O'Tool Plus can save settings for three different users. 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 you create your music, or three different moods that you get in. 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.

Details about specific modes:

Triggers:

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 scope modes have a choice of several trigger sources. They can trigger from input 1 or 2, or from the Trigger input. Or they can run with no trigger and simply draw the waveform as it happens, with no respect to starting the drawing at a specific part of the wave.

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. For more specific details consult the full user manual. But you should understand that 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, 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.

Scope parameters:

The Scope Single, Layered, Stacked, and 3D modes all share the same set of parameters. If you change any of the parameters in one of those modes, they change in all of those modes. For example, if you are using the Scope - Single mode and change the input voltage to be 0-12v and then go over to the 3D scope mode, the voltage setting there will be 0-12v. Those are the only modes in the O'Tool that share parameters. The X/Y mode, while technically a scope mode, has its own parameters and doesn't share them with the other scope modes because it is such a different style of display compared to the regular scope modes.

Frequency Meter/Tuner:

There is a parameter for slow/fast that allows quick readings at higher frequencies but it is a bit less accurate than the slow setting because it averages fewer samples to create the reading. For higher accuracy use the slower speed.

The 440/432 parameter changes the display of notes in the tuner section of the display. It does not effect the frequency readout itself.

If you have the frequency meter/tuner set to use both channels, but only have a signal going into one of the channels, there will be a long pause every time it tries to read the frequency of the channel with no signal. In that situation, switch to a single channel setting.

Spectrum Analyzers:

The linear spectrum analyzer displays a linear frequency display and a linear amplitude display. The log spectrum displays a log frequency display and a log amplitude display. The spectrogram displays a linear frequency display and a log amplitude display, shows as a range of colors and brightness, with darker colors being lower signal levels.

The spectrogram can display a scrolling image either vertically or horizontally. Traditionally a spectrogram is shown horizontally. The LCD in the O'Tool contains hardware that allows fast vertical scrolling of the image, so that was used to create a vertical scrolling version of the spectrogram that moves faster than was possible using only the software scrolling used for the horizontal scrolling display. So the four speeds of vertical scrolling are quicker than the four speeds of horizontal scrolling.

All three of the spectrum modes have a scale parameter to adjust the amplitude within the range between one times and 64 times the normal signal levels.

Voltmeter:

The voltmeter display shows several simultaneous figures about the signal. It shows the top and bottom peak voltages, the peak to peak voltage, and the average DC voltage. The peaks and peak to peak voltages appear less accurate than the average DC voltage because they only have the resolution of the A-D converter. As the peaks rise and fall they must cross each A-D threshold in order to be detected, and there is no way to guess if they are somewhere between thresholds. On the other hand the average DC voltage is the average of tens of thousands of samples of voltages, and therefore can result in a calculated voltage average that is far more precise than the measurements of the peaks.

Beat Counts:

Both the BPM meter and the metronome display a ***Beat Count***, which is a number that counts up from one to a specific number that you choose, between two and sixteen. For the BPM meter the beat count changes each time a new beat pulse arrives. For the metronome the beat count changes each time the metronome graphic crosses past the center of the screen. That is the same spot that a mechanical metronome would make it's clicking sound to sound the beat. This allows you to get a visual beat count on the screen to go along with the incoming signal for the BPM meter, or along with the visual movement of the metronome. The O'Tool does not have any outputs, so the metronome is a visual only tool. It flashes the arm white at the center position, and advances the beat count.

With the BPM meter it is possible to bump the beat count to get the count in sync with other events happening in your system. You push the bump button to skip or add a beat.

For more detailed information and links to demo videos, go to:
www.jonesvideo.com