

Oakley Sound Systems

5U Oakley Modular Series

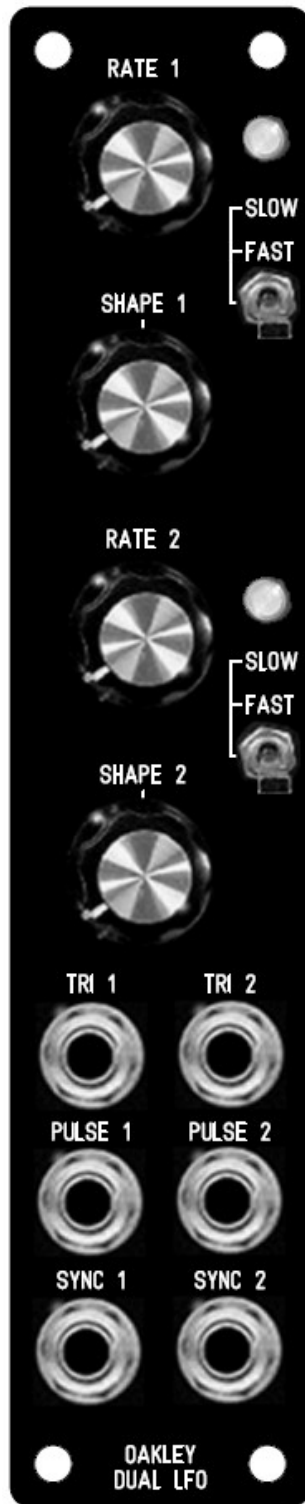
Dual-Low Frequency Oscillator

D-LFO issue 1 & 1.1

User Manual

V1.2

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The suggested panel layout in MOTM format.

Introduction

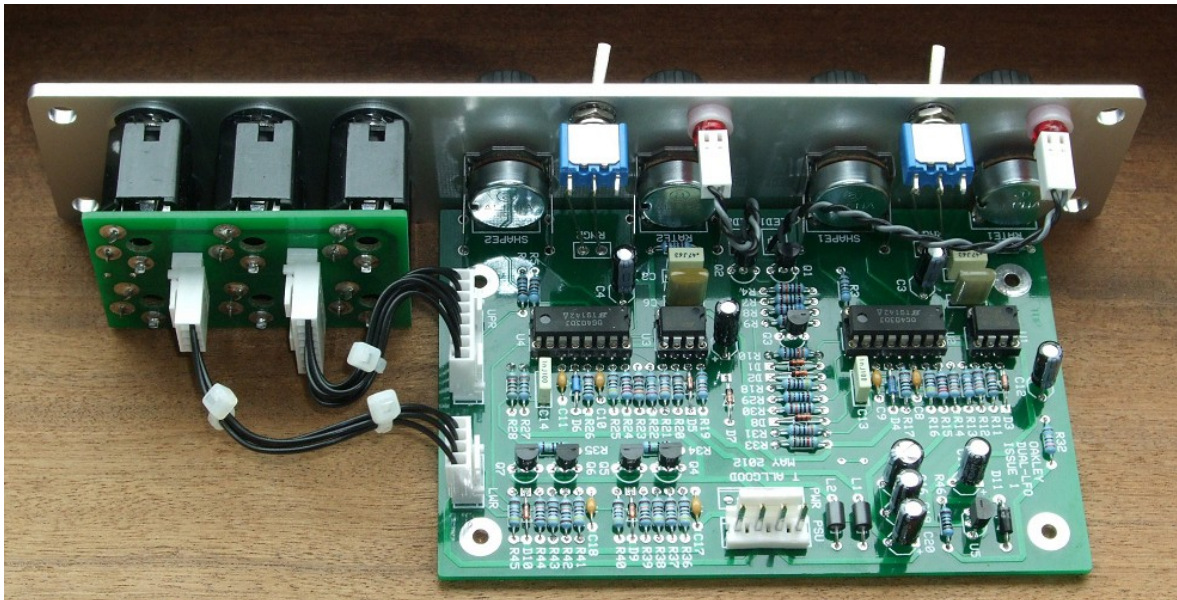
This is the User Manual for the Dual Low Frequency Oscillator (Dual-LFO) 5U module from Oakley Sound. This document contains an overview of the operation of the unit.

For the Builder's Guide, which contains a basic introduction to the board, a full parts list for the components needed to populate the board or boards, and a list of the various interconnections, please visit the main project webpage at:

<http://www.oakleysound.com/d-lfo.htm>

For general information regarding where to get parts and suggested part numbers please see our useful Parts Guide at the project webpage or <http://www.oakleysound.com/parts.pdf>.

For general information on how to build our modules, including circuit board population, mounting front panel components and making up board interconnects please see our generic Construction Guide at the project webpage or <http://www.oakleysound.com/construct.pdf>.



The prototype issue 1 Dual-LFO module behind a natural finish 1U wide Schaeffer panel.

The Oakley Dual-LFO

The Oakley Dual-Low Frequency Oscillator is a single width 5U high module that features two highly useful low frequency oscillators.

This is an updated version of the low frequency oscillator from a classic Japanese vintage analogue synthesiser. It features two output waveforms, triangle and pulse. But, the design also incorporates a 'Shape' control that affects the rise and fall times of the triangle waveform, and mark-space ratio of the pulse waveform. Therefore, you can get sawtooth and reverse sawtooth from the triangle output by using the Shape control.

The Dual-LFO uses an integrated FET switch IC to enhance the original design. It also allows the use of waveform synchronisation. This is where the output waveform is reset back to zero when a SYNC pulse arrives from another module. If this SYNC pulse is the GATE output of a midi-CV convertor, then you can use the Dual-LFO as a linearly sloped repeating envelope generator.

An LED lights on each LFO to indicate when the respective triangle wave output is falling.

A range switch on each LFO allows for a wide range of output frequencies to be generated. The module accommodates either our standard Oakley/MOTM power header or a Synthesizers.com power header. The current consumption is around +30mA and -10mA.

Specifications:

Operating frequency: 0.3Hz – 30Hz (fast) & 0.03Hz – 3Hz (slow)

Pulse wave output level: 0V (low state), 9V (high state)

Pulse wave output impedance: 2.4K

Triangular wave output level: +/- 4.5V peak

Triangular wave output impedance: 1K

Sync input threshold level: +3V

Power supply requirements

The design requires plus and minus 15V supplies. The power supply should be adequately regulated. Current draw is approximately +30mA and -10mA.

Power is routed onto the PCB by a four way 0.156" MTA156 type connector or the special five way Synthesizers.com MTA100 header.

Power connections – MOTM and Oakley

The PSU power socket is 0.156" MTA 4-way header. This system is compatible with MOTM.

<i>Power</i>	<i>Pin number</i>
+15V	1
Module GND	2
Earth/PAN	3
-15V	4

The earth/pan connection has been provided to allow the ground tags of the jack sockets to be connected to the powers supply ground without using the module's 0V supply. Earth loops cannot occur through patch leads this way, although screening is maintained. Of course, this can only work if all your modules follow this principle.

Power connections – Synthesizers.com

The PWR power socket is to be fitted if you are using the module with a Synthesizers.com system. In this case you should not fit the PSU header. The PWR header is a six way 0.1" MTA, but the pin in location 2 is removed. In this way location 3 is actually pin 2 on my schematic, location 4 is actually pin 5 and so on.

<i>Power</i>	<i>Location number</i>	<i>Schematic Pin number</i>
+15V	1	1
Missing Pin	2	
+5V	3	2
Module ground (0V)	4	3
-15V	5	4
Socket Ground *	6	5

+5V is not used on this module, so location 3 (pin 2) is not actually connected to anything on the PCB.

If fitting the PWR header and using it with a standard MU power distribution system, you will also need to connect together the middle two pads of the PSU header on the main board. This link connects the socket and panel ground with the module ground. Simply solder a solid wire

hoop made from a resistor lead clipping, or bit of solid core wire, to join to the two middle pads of PSU.

* The later issue 1.1 Dual-LFO boards connect the normally unused pin 6 of the MU connector to socket ground. With the link on PSU not fitted, and using an Oakley MU Dizzy distribution board with a five way power cable, will allow the socket ground to be kept separate from module ground to prevent ground loops.

Final Comments

I hope you enjoy using the Oakley Dual-LFO

If you have any problems with the module, an excellent source of support is the Oakley Sound Forum at Muffwiggler.com. I am on this group, as well as many other users and builders of Oakley modules.

If you have a comment about this user manual, or have found a mistake in it, then please do let me know.

Last but not least, can I say a big thank you to all of you who helped and inspired me. Thanks especially to all those nice people on the Synth-diy and Analogue Heaven mailing lists and to those at Muffwiggler.com forum.

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