

# Panther Series – CGS721 Super Psycho LFO



The Panther CGS7xx Series are authorised re-releases of the popular Cat Girl Synth Series of modules from Ken Stone. Each module is revisited to determine if any improvements can be added to the original design and has been adjusted, where applicable, to fit the smaller profile of the EuroRack module size.

## The CGS721 Super Psycho LFO

This module is a much expanded version of the Psycho LFO, featuring six free-running oscillators, each variable between LFO and audio ranges, two of which can be switched to have triangular wave outputs. Each oscillator can be switched between low and high ranges, as well as off, and also has a rate LED, to allow visual determination of the frequency at which it is running.

The mixed outputs of the oscillators is then fed through a Level control and Glide circuit.

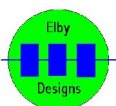


### A little on how it works:

The Super Psycho LFO is a fairly simple circuit with a lot of repetition. The circuit consists of several distinct blocks. The first are the oscillators, each based on a section of a 40106 hex schmitt inverter and their associated components. The switch allows extra capacitance to be added, reducing the speed of the oscillator to a lower range. The same switch allows the capacitor to be bypassed to the negative rail via a protection resistor, disabling the oscillator, and setting its output to near 0 volts. The RATE controls allow the upper frequency range to extend over a large portion of the audio spectrum, and in the lower frequency position, to extend from sub-audio to low audio frequencies.

Two of the oscillators (5 & 6) are equipped with voltage followers that follow the, roughly, triangular shape of the waveform present on the oscillator capacitors. The 100k and 360k resistors on the output, when coupled to the virtual-ground summing node of the following mixer, via the switch, correct the amplitude and offset of the triangle wave.

The next block is a traditional op-amp inverting mixer stage. Signals from the six oscillators are mixed through 470k resistors, the overall gain controlled by a 100k pot in the feedback path of the op amp.



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What is interesting here is that in order to keep the output signal of the mixer positive without the need for an additional inverting stage, the chip used to build the six oscillators is powered from the negative rail, it's positive power pin connected to 0V and its earth pin connected to -15V. Take special note of this, because it is an unusual way to power a digital chip, and inadvertent poking with a logic probe powered from the positive rail could cause you grief!

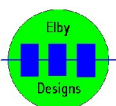
The final stage is a simple glide circuit consisting of a potentiometer, a capacitor and unity gain voltage follower. The switch is to allow easy switching in and out of a pre-adjusted glide setting.

**NOTE:**

Users should be aware that switching of oscillator 5 or 6 whilst they are in the triangle output mode will result in a DC offset being applied to the mixed output. It is recommended that you always return these two oscillators to the square output when not being used.

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Power Requirements	+12V @ 10mA, -12V @ 45ma
Module Width	22HP



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