



GO-5p-I

Electromechanical Organ

Overview

GO-5p-I is a Grand Organ with 5 Partial and a Leslie style speaker effect. GO-5p-I can be used to produce sounds from classic tonewheel and transistor organs – think Hammond and Farfisa. This is not an emulation but a new take on the electronic “rock organ” instrument. In keeping with the SSP-IV *dirty analog* feel the oscillators can carry special program dependent noise. While the Hammond uses 9 drawbars this instrument only offers 5 (less CPU) but with the addition of other Oscillator waveshapes then the pure Sine and the ability to tune the top 3 partials the sound possibilities are very wide. The Overdrive and Rotary Speaker effects add the finishing touches to the Grand Organ sound.

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Credits:

Scoofster for code - <http://scp.web.elte.hu/synthedit/modules.html>

Unkargherth for code - http://www.uv.es/~ruizcan/p_modules.htm

Drawbars

I'll start with a quick explanation of Drawbars and Partial. Organs are a form of Additive Synthesizer. Additive means that you start with the simplest tone – a Sine Wave and then add overtones to create a more complex waveform. Try this. Start with a Sine wave and push in all Drawbars. You will hear nothing. Now pull out the 32' bar all the way. You will have a simple bassy but dull tone. Add in some higher Drawbars to hear how the sounds becomes more complex and bright. Don't just pull all the Drawbars out to max but play with the subtle variations small moves and interactions with other Drawbar positions make. Also experiment with other Drawbar tunings to see how they affect the final wave and instrument sound.

Use Sine wave for tonewheel (Hammond) style sounds and other waveforms for transistor (Farfisa) style sounds.

OSC

- **Shape** – choose from Sine, Triangle, Pulse, Saw or Ramp (saw down)
- **Noise** – add noise generated from upper partials to add movement and sparkle to the basic sound
- **PWM** – adjust the width of the Pulse wave from Square to infinite (pin-thin)
- **Tune** – master fine tune the whole instrument
- **Glide** – introduce portamento to overlapping notes (legato)

Percussion – initial thump at note on

- **Chiff** – volume of the chiff or thump sound
- **Tone** – tone of the chiff or thump sound

Drawbars

Each Partial (Drawbar) is naturally tuned to 1 octave above the one before which is double the frequency. The top 3 Partial can be retuned to other intervals found in the common overtone scale.

- **32'** – Bass – add this as a Sub-Osc
- **16'** – Fundamental – root partial
- **8'** – 1st overtone
- **4'** – 2nd overtone
- **2'** – 3rd overtone
- **Overtone Tuning 1-3** – set the tuning for each of the overtones to:
 - ◆ -5th – 5 semitones below the set pitch
 - ◆ 0 – the natural pitch
 - ◆ +3rd – 4 semitones above the set pitch
 - ◆ +5th – 7 semitones above the set pitch

Overdrive

- **On** – toggle the Overdrive to active or bypassed
- **Drive** – set the amount of overdrive
- **Tone**– low-pass filter to smooth off the sound
- **Gain** – trim the sound level so clean and overdriven sounds are appropriately balanced

Speaker

Much of the electronic organ sound is created at the speaker so be prepared to spend time getting to know this section well.

My rotary speaker design (similar to a Chorus) does introduce a slight delay to the sound but this should be barely noticeable. It does however introduce other advantages in sound design.

- **On** – toggle the Speaker to active or bypassed
- **Delay** – sets the initial delay sound for the speaker – leave on Min till you understand this feature in conjunction with the Dry knob
- **Speed** – set the speed of the speaker rotation
- **Taper** – sets the time the speaker rotation takes to rise and fall when the unit is switched on and off. This is a commonly used feature for rock organists
- **Depth** – sets the amount of doppler pitch shift applied to the sound
- **Stereo** – set the width of the stereo spread
- **Dry** – you may add the dry organ sound back into the mix which takes advantage of the speaker's natural chorusing effect. Different Delay setting will affect the tone.

Master

- **Vol** – master volume for the instrument
- **Mono** – sets the instrument to respond only to the latest key pressed. Great for lead sounds

Once you start to really understand the depth of options and subtle variation available from an instrument like GO-5p-I then you will find that you can simulate other instruments like basses, strings, clavichords and harpsichords. If you see the Speaker as part of the instrument's core sound then you are well on your way to being a capable rock organist.

Have Fun

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