

Tonewheel

A tonewheel drawbar organ with percussion, key click, scanner vibrato / chorus, valve drive and a rotary speaker built in.



Overview

Tonewheel is a drawbar organ in the classic tonewheel style. 91 tonewheels spin all the time and stay locked together, as on the real thing; nine drawbars from 16' to 1' mix their harmonics, with the classic foldback at the top and bottom of the range.

It has the parts that make the sound: percussion on the 2nd or 3rd harmonic (single-trigger - it only strikes again once all keys are lifted), the key click of the contacts, the scanner vibrato and chorus (V1 - V3, C1 - C3), a valve preamp DRIVE, TONE and the SWELL pedal.

The rotary speaker is built in: the GFX Rotary cabinet, a treble horn and a bass drum each spinning up and slowing down at its own pace, after SWELL and before the ROOM, as the organ feeds its cabinet. The mod wheel or the sustain pedal switches it between slow and fast, and it can be switched out for the dry organ.

Reach for it for

- Jazz, soul and gospel organ parts
- Rock organ with overdrive and a fast rotary
- Reggae bubble and other percussive comping
- Soft flute and ballad registrations
- Swell-pedal dynamics from an expression pedal (CC11)

Playing it

Tonewheel is an instrument: it has no audio input and makes its sound from MIDI.

1. Insert Tonewheel on a track (as the first plug-in, or after a MIDI effect).
2. Arm the track for recording and set its input to your MIDI keyboard (or draw notes in a MIDI item).
3. Pull the drawbars, or pick a registration from PRESETS.
4. Play. The MIDI IN light shows notes arriving, and the MIDI section shows how many keys are down.
5. Use the mod wheel (up = fast) or the sustain pedal (each press switches) to change the rotary's speed as you play.

Tonewheel responds to the expression pedal (CC11 moves SWELL), the mod wheel and sustain pedal (the rotary's speed, each with a switch under SPEED) and all-notes-off (CC120 and CC123). Velocity does not change the level, as on a real organ. All MIDI is passed on down the chain.

Controls

The header

PRESETS, arrows and display

PRESETS (or a click on the display) opens the list of drawbar registrations; the ◀ / ▶ keys step through them. The display shows the preset name. Choosing one sets the drawbars, percussion, vibrato / chorus, CLICK, DRIVE and the rotary's

	speed (it switches the rotary in); TONE, SWELL, TUNE, DRIFT, the cabinet and OUTPUT are left as they are. The last entry resets everything to the defaults.
MIDI	Lights when a note arrives or keys are held.
S / M / L	Panel size: small, medium or large. The panel also scales to fit the plugin window.
?	Opens a pop-up with the design credit, the GFX website address, the address of this manual, and MAINS / EQUATOR PROXIMITY (see below). Click outside it to close it.

DRAWBARS

Nine drawbars, left to right: 16', 5 1/3', 8', 4', 2 2/3', 2', 1 3/5', 1 1/3' and 1'. The two brown ones are the sub-harmonics, the white ones the octaves of the note and the black ones the fifths and the third. Drag a drawbar down to pull it out (0 to 8), or use the mouse wheel over it. Each step is about 3 dB; 0 is off. A short stub of each drawbar's stalk always shows, even when it is pushed fully in.

PERCUSSION

ON	Switches the percussion on (lit): a decaying ping on the 2nd or 3rd harmonic at the start of each phrase. It is single-trigger: it only strikes again once all keys are lifted, so play detached for percussion on every chord. While it is on, the 1' drawbar is silent (the percussion borrows it).
HARMONIC: SECOND / THIRD	The ping on the 2nd harmonic (an octave up) or the 3rd (an octave and a fifth up).
VOLUME: NORMAL / SOFT	NORMAL: loud percussion, and the drawbars drop by about 3 dB to make room for it. SOFT: softer percussion, the drawbars at full level.
DECAY: FAST / SLOW	A short ping or a longer decay.

The lit key of each pair is the one chosen; they only change the sound while ON is lit.

SCANNER

ON	Switches the scanner vibrato / chorus in (lit) or out; switching it back on brings back the last setting.
VIBRATO: V1 / V2 / V3	Scanner vibrato, from shallow (V1) to deep (V3).
CHORUS: C1 / C2 / C3	Scanner chorus: the vibrato mixed with the straight sound, from shallow to deep.

VOICE

CLICK	The key click, 0 - 100% (40% by default): how fast the contacts switch on and off, plus a little contact noise. Turn it down for a smooth, soft attack; up for a percussive spit.
DRIVE	The valve preamp, 0 - 100% (15% by default). Low settings add warmth; high settings break up into growl.
TONE	Brightness, 0 - 100% (70% by default): a low-pass that rolls the top off, from about 2 kHz at 0% to 12 kHz at 100%.
SWELL	The expression pedal, 0 - 100%. It follows a squared curve, like a real swell pedal. MIDI CC11 moves it.
TUNE	Fine tuning, -50 to +50 cents.

ROOM

SIZE	The size of the room around the organ, 0 - 100% (40% by default).
MIX	How much of the room you hear, 0 - 100% (off by default).

MIDI

CHANNEL	The MIDI channel Tonewheel listens to: OMNI (all) or CH 1 to CH 16.
MIDI IN	Lights when a note arrives or keys are held. Below it, the number of keys down.
PANIC	Lets go of every held key at once.

MASTER

DRIFT	0 - 100% (25% by default). The motor speed wanders slowly, so the whole organ drifts a little in pitch (up to 20 cents at 100%), TONE drifts a little brighter and darker, the scanner's speed wavers and the rotary's motors wander slightly. The tonewheels always stay locked together, so the organ never goes out of tune with itself.
SAT	Band saturation on the way out, 0 - 100%: only the lows and highs are saturated (the mids stay clean), with a soft curve that loosens as the level rises.
OUTPUT	Output level, -24 to +12 dB.
OUT meters	Output level as two bars, L and R side by side, with a floating peak. Click a meter to clear the peaks.

The output is softly clipped at -0.3 dBFS, so peaks never go over.

ROTARY

IN	Switches the rotary speaker in (lit, the default) or out, crossfaded over 15 ms. Out, ROTARY and CABINET are drawn greyed and the organ goes straight to the ROOM.
Rotor window	Shows the treble HORN and the bass DRUM turning, with their speeds in Hz, and what the cabinet is doing: CHORALE (slow), TREMOLO (fast), SPEEDING UP / SLOWING DOWN while the rotors change speed, or BRAKE.
SLOW / FAST	The half-moon switch: click its left half for SLOW, its right half for FAST. The horn is up to speed in under a second; the heavy drum takes a few seconds, as in a real cabinet.
STOP	Brakes both rotors (lit while stopped); click it again to start them at the last speed.

CABINET

BALANCE	Horn against drum, -6 to +6 dB (0 dB by default): + is more horn.
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DISTANCE	How far the mics are from the cabinet, 0 - 100% (50% by default). Close mics hear more of the swell; far ones more of the cabinet.
SPREAD	The angle between the two mics, 0 - 100% (70% by default): from mono to wide stereo.

SPEED

MOD WHEEL	Lit (the default): the mod wheel switches the speed - up is FAST, down SLOW.
PEDAL	Lit (the default): each press of the sustain pedal switches between SLOW and FAST.

Mains and Equator Proximity

The ? pop-up holds the unit's power supply and its climate. Both start OFF and NEAR, where the unit sounds exactly as it always has.

MAINS: OFF / UK / US	The mains the unit is plugged into. UK and US add a mains hum, very faint (about -83 dBFS: at the edge of hearing), at 50 Hz or 60 Hz with its own overtones. Each instance's hum wanders slowly in phase, so many of them never pile up into one note. The supply also sags when you play hard with a faint ripple that grows with the load. UK is tight and recovers quickly; US sags deeper and recovers more slowly.
EQUATOR PROXIMITY	The room's climate, from FAR (a cold northern room) to NEAR (the tropics: always warm). Away from NEAR, the unit starts cold and warms up over a few minutes of use - about five at FAR. A cold organ is a little duller, quieter and grittier in its preamp and rotary amp; the tone wheels themselves stay in tune, because their motor runs locked to the mains. Hover over the dial to see how long it takes; double-click (or Ctrl-click) for NEAR.
WARMTH	The lamp shows how warm the unit is. The heat is saved with the project: reopen it a minute later and the unit is still

warm; leave it overnight and it has cooled. While REAPER bypasses the unit, it cools (about a minute to cold at FAR).

Presets

Every preset switches the rotary in: FAST on Full Organ, Gospel and Rock Overdrive, SLOW on the others.

Soul Jazz	888000000 with third-harmonic percussion (normal, fast) and C3.
Memphis Groove	888800000, no percussion, C3 and a little more drive.
Full Organ	All drawbars out, C3, more drive.
Gospel	886800008 - the 1' on top - with C3 and more drive.
Modern Jazz	838000000 with soft, slow third-harmonic percussion, no vibrato and almost no drive.
Jazz Ballad	808000000, gentle C1 chorus, a soft click.
Rock Overdrive	888888000, C3, a sharper click and heavy drive.
Reggae Bubble	008800000 with soft, fast second-harmonic percussion and no vibrato.
Flute	The 8' alone with V1 vibrato, a very soft click and no drive.
Slow Perc	888000000 with slow third-harmonic percussion and C3.
Reset all to defaults	Every control back to its starting value.

Tips

- Drawbar numbers read left to right: 888000000 means the first three drawbars fully out.
- For percussion on every chord, lift all keys between chords; held legato notes will not re-strike it.

- Switch the rotary from SLOW to FAST at the end of a phrase or into a chorus: the drum takes a few seconds to catch up with the horn, which is the classic sound.
- Switch the rotary out to use your own rotary or amp after Tonewheel.
- Map an expression pedal to CC11 for SWELL: it is the most expressive control on an organ.
- If the organ sounds harsh with lots of upper drawbars, bring TONE down rather than pushing the drawbars back in.

File: gfx-g-tonewheel.jsfx