

RON16

A 16-channel summing mixer that gives each stem its own room by frequency, time and depth.

A Lab plug-in. The Lab is where new GFX plug-ins are built in the open: they may change sound or controls between versions.



Overview

RON16 adds up eight stereo stems, listens to all of them at once and moves them gently out of each other's way. It is clean unless you engage its TONE section, which brings in SIFON's parallel saturation.

It makes room in three ways:

- **By frequency (UNMASK).** Each stem has a *home band*, the part of the spectrum where it lives. Where one stem is loud in a band that another stem needs more, the one that matters less steps back a little there, usually 1 - 2 dB. A stem is never cut in its own home band.

- **By time (TRANSIENT).** When one stem hits, the others dip for a moment in the bands it lives in, so the attack speaks first and the sustains fill in behind it.
- **By depth (DEPTH).** Stems you set to BACK lose a little air and have their attacks rounded off, so they sit further away. RON16 never uses delays for this, so stems that share a source (two drum mics, a DI and an amp) never comb.

Every change is small, glides in and out, and only happens while it is needed. A stem playing on its own is never touched. Nothing delays the audio: the latency is zero, unless you NUDGE a pair earlier (see the channels). With every MAKE ROOM dial at 0 the output is the plain digital sum of the 16 inputs, bit for bit.

RON16 has no DRIFT: a summing mixer should do the same thing every time.

Reach for it for

- Mixes where the parts are good but crowd each other
- Keeping a lead vocal or a lead line clear without carving every other track by hand
- Drums that punch through sustained pads and guitars
- A front-to-back picture: lead up front, pads and reverbs behind

Setting up in REAPER

1. Make a bus track and set it to 16 channels first (ROUTE > Track channels), then put RON16 on it.
2. Send each stem to its own pair on the bus (1/2, 3/4 ... 15/16) and turn off the stems' master / parent send.
3. The mix leaves on 1/2; outputs 3 - 16 are silent.
4. If RON16 went on the track before it had 16 channels, REAPER may feed channels 1 / 2 to every input. RON16 notices (see COPY GUARD below): open its pin connector (the "2 in 2 out" button) and press Reset.

Controls

The header

PRESETS / < > / display

The preset list (click the display too) and previous / next, wrapping round. "Reset all to defaults" at the end of the list

	also resets the PLACE, MONO, SOLO, MUTE and NUDGE settings and FAST (the names stay).
BYPASS	The key's top lights amber when bypassed: the output crossfades (15 ms) to the plain sum of the 16 inputs, with SOLO and MUTE still applied (but not the nudges), so you can compare with and without RON16 without a click.
OS	The oversampling for TONE's saturation (see TONE).
S / M / L / ?	Panel size. The ? pop-up has the credits, this manual's address and the MAINS settings (below).

The channels (one strip per pair, each in its own colour)

Name box	Click it and type a name (up to 16 characters), then press Enter or click elsewhere; TAB moves on to the next pair's name (Shift+TAB back); Esc drops the change. The name is saved with the project and also labels the pair's column in the ROOM MAP.
Signal LEDs	One green LED per channel, lit when there is signal.
FRONT / MID / BACK	One key: each click moves it on, FRONT, MID, BACK and round again (MID by default). It lights brightest at FRONT and dimmest at BACK. It sets how much the pair matters. FRONT pairs give way last and push the others aside; BACK pairs give way first and, with DEPTH, sit further back. A BACK pair can never push a FRONT pair aside.
MONO	The pair is folded to mono (glides, no click).
SOLO	Hear only the soloed pairs, exactly as they sit in the mix. RON16 keeps listening to all eight, so you hear the room each pair was given.
MUTE	The pair leaves the mix and RON16 stops listening to it, so the other pairs get its room back.
NUDGE - / +	Moves the pair earlier (-) or later (+) against the others, 3 ms a click, up to 30 ms either way: for lining up a stem that drags or rushes, or two mics on one source. The readout between

the keys shows the move ("NUDGE" at 0); double-click it (or Ctrl-click) to go back to 0. RON16 listens to the pairs as nudged. Moving a pair later simply delays it. Moving a pair earlier delays every other pair instead, so RON16 then reports that much latency to REAPER (the most any pair is moved earlier) and the track stays in time; with no pair moved earlier the latency stays at zero. A move crossfades over 15 ms; a change in the latency dips the sound for 5 ms.

COPY GUARD

A pair that carries exactly what 1-2 carries is left out of the listening and never moved. Its strip turns amber with "COPY OF 1-2", and the ROOM MAP says "reset the pin connector".

The ROOM MAP

Six bands (110 Hz at the bottom to 11 kHz at the top) by eight pairs. Each cell lights in its pair's colour with the pair's level in that band. A white dot marks each pair's home band. A dark bar growing from the right shows a pair making room in that band (the whole cell = 4 dB). A white flick along the top is a transient dip.

MAKE ROOM

UNMASK

0 to 10 (glows ice blue, default 5): how much room is made by frequency. RON16 judges each band over a wide 900 ms window, so it follows the parts of the song, not single notes. Cuts reach up to 4 dB at 10 (usually 1 - 2 dB), and never more than 3 dB of a pair's level in all. They come in over about 30 ms and, once the clash has left the 900 ms window, let go over about 150 ms.

FAST

The square red lamp key under UNMASK: a faster release, for more transparency on parts that come and go. With FAST lit, RON16 also listens with a quick 80 ms ear and the cuts let go over 40 ms, so when a clash ends the band is given back within about a quarter of a second instead of about a second. Off by default; switching it glides.

TRANSIENT

0 to 10 (glows gold, default 3): how much the other pairs dip when one pair hits, up to 2.5 dB, following the attack (in 3 ms, out over 60 ms).

DEPTH	0 to 10 (glows violet, default 5): BACK pairs only. Up to 1.5 dB of air off (a shelf from 8 kHz) and attacks softened by up to 2 dB.
FOCUS	MID to WIDE (glows mint, default the middle): where the room is made. In the middle, the pairs that give way give it across their whole stereo picture. Towards MID, they give it only in the centre, so the pair that matters comes through clear in the middle. Towards WIDE, they give it only at the sides, so the mix opens out around it. A mono stem has no sides, so WIDE leaves it alone.

TONE (on the whole mix)

The COLOUR section of the GFX Sifon bus processor: LOW and HIGH, each with its TEXTURE dial, and the DIP keys. RON16 is clean unless you engage TONE: with LOW and HIGH off it adds nothing to the sound.

LOW + TEXTURE	LOW (sky blue) runs the lows (below 300 Hz) through a parallel saturation and adds back only its harmonics, mostly the 2nd: warmth and weight, never a level drop. TEXTURE drives it harder (0 to +18 dB) and also lifts the lows: a shelf up to +1.25 dB, then from TEXTURE 5 a 120 Hz lift up to +2.3 dB, with a 30 Hz subsonic filter to keep it tidy. TEXTURE is greyed while LOW is off.
HIGH + TEXTURE	HIGH (coral) does the same on the top, from 3 kHz (reaching down to 1 kHz as TEXTURE goes up), high-passed so the top gains sheen rather than grit. TEXTURE also lifts the top: a shelf from 4.7 kHz up to +3.1 dB, then from TEXTURE 5 a 15 kHz shelf up to +3 dB of air.
DIP 220	Works with LOW on: a narrow dip at 220 Hz that cuts only while that region stands out from the whole mix (half the excess, up to 6 dB; in 5 ms, out over 120 ms), and a fixed dip in LOW's harmonics there. Clears mud only when there is mud.
DIP 3K	Works with HIGH on: the same at 3 kHz, broad, for harshness.
OS (top bar)	1x / 2x / 4x: TONE's saturation oversampled, so the top's harmonics never fold back as aliasing. Click to step through. 1x (grey, the default) has no latency; 2x (amber) adds 31

samples, 4x (red) 37, reported to REAPER, with BYPASS and DELTA kept in time. Changing it dips the sound for 5 ms.

Pushed hard (both TEXTURES near 10), TONE's lifts add several dB. With MATCH on (the default) that level comes back off over a few seconds, so the mix stays as loud as the plain sum and the peaks stay put. With MATCH off, use TRIM: RON16 never clips.

OUTPUT

MATCH	On by default. RON16 only ever takes level away, so it would come out slightly quieter than the plain sum. MATCH works out how much was taken (over 3 s) and makes up the difference, never more than 1.5 dB. It also matches TONE: whatever TONE adds or takes in level (K-weighted, over 3 s) comes back off, so TONE changes the colour, not the loudness. That makes BYPASS a fair test of clarity and colour, not of level.
DELTA	Hear only what RON16 takes out (the plain sum minus the result), crossfaded in 15 ms. If DELTA sounds like music, it's working too hard.
Meter	L and R rows of LEDs, -42 to +3 dBFS in 3 dB steps. The peak holds 1.2 s, then falls; click to clear.
TRIM	-3 to +3 dB in 0.5 dB steps (glows green, lit outwards from 0).

MAINS (in the ? pop-up)

OFF / UK / US mains (a very faint hum, a little supply sag and ripple) and EQUATOR PROXIMITY (how the circuit warms up). The default, OFF and NEAR, leaves the sound untouched. Nothing on the front panel but BYPASS.

Knobs: drag (hold Shift for fine moves) or use the mouse wheel; double-click or Ctrl-click returns to the default. Values show while you hover. Every move glides, so nothing clicks.

Presets

Presets set the MAKE ROOM dials and FAST, TONE, MATCH and TRIM. They leave the PLACE, MONO, SOLO and MUTE keys, the nudges and the names alone, as those belong to the mix.

Init	UNMASK 5, TRANSIENT 3, DEPTH 5: the everyday setting.
Clean Sum	Everything out: the plain sum.
Light Touch	Half the Init amounts, with FAST, for mixes that are nearly there.
Clear	More UNMASK, FOCUS towards MID, HIGH with DIP 3K: a clear centre.
Deep Stage	DEPTH 9 and LOW with DIP 220: a deep front-to-back picture with clean weight.
Punch Through	TRANSIENT 7.5, FOCUS towards MID, with FAST: hits that cut through and room that comes straight back.
Full Separation	UNMASK 9, TRANSIENT 5.5, DEPTH 7, LOW and HIGH with both dips: everything in its own place.

Tips

- Start by setting FRONT / MID / BACK: put the lead vocal or the lead line on FRONT and pads, reverbs and backing parts on BACK. Most of what RON16 does follows from those keys.
- Name the strips: the ROOM MAP then shows at a glance who is making room for whom.
- Use DELTA to check the amount: you should hear thin slivers, not whole parts.
- Use SOLO on a stem to hear how much room it gave: RON16 still listens to the whole mix while you solo.
- Compare with BYPASS while MATCH is on: the difference you hear is clarity, not level.
- Put RON16 on the bus that the stems feed, before any bus compression or limiting.

Latency: none at OS 1x (2x: 31 samples, 4x: 37), plus the most any pair is nudged earlier; always reported.

File: gfx-lab-ron16.jsfx