Ffat

A fat multi-effect: drive, two resonant filters, a band filter, the magic low-end EQ, a flanger, a compressor and a one-knob squash in one.

> **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

Ffat (the "ff" is fortissimo: very loud) is a multi-effect for making things bigger, dirtier and more alive. It used to be called Phat. The signal goes through a drive and two resonant filters, in the order you choose; an LFO and an envelope follower move the filters. Then come the BAND filter, the MAGIC low-end EQ, the FLANGER and the COMP compressor, each switched in by the round lamp beside its name; the FFAT squash fattens up the end, and the output stage, a soft clipper that keeps peaks under -0.3 dBFS, finishes it.

The drive has four characters: TUBE (soft and warm, with even harmonics), FUZZ (hard and gated), RECT (a rectifier that adds an octave up) and CRUSH (fewer bits and a lower

sample rate, aliasing on purpose). TUBE, FUZZ and RECT are level-matched, so DRIVE changes the character rather than the loudness. The OS key runs the drive oversampled (2x or 4x) for an even cleaner top end.

Every switch is click-free: drive and filter types, routing and order dip the output for about 3 ms; the section lamps, BYPASS and OS crossfade or dip smoothly. There is no latency at 1x; 2x adds 31 samples and 4x 37, reported to REAPER.

Reach for it for

- Wobble and squelch on synth bass (LFO or envelope on a resonant low-pass)
- A bigger, deeper bottom end on bass and kick (MAGIC)
- Fattening and roughening drums or loops (drive, COMP and FFAT)
- Jet-plane sweeps and metallic flanging
- Lo-fi radio, telephone and bit-crushed textures (CRUSH and BAND)
- Rhythmic, tempo-synced filter chopping and random steps

Controls

The top bar

PRESETS	Click it for the preset list.
◀ / ▶	Step to the previous or next preset, wrapping round.
Preset display	Shows the preset's name. Click it for the list too.
BYPASS	Lit = bypassed: crossfades (15 ms) to the untouched input, kept in time with the latency - use it instead of REAPER's own switch for a click-free comparison.
OS	Oversampling for the drive: click to go 1x (grey, default) → 2x (amber) → 4x (red). Higher settings cut aliasing on hard drive; the output dips for 5 ms as it changes.
S / M / L / ?	Panel size, and ? for the credits, this manual and MAINS / EQUATOR PROXIMITY (see below).

Every knob shows its value while you hover over it or turn it. Double-click or Ctrl-click a knob to return it to its default; hold Shift while dragging for fine moves; the mouse wheel works too.

DRIVE

TUBE	A soft, biased curve: warm, with even harmonics.
FUZZ	Hard clipping with a dead zone that opens as DRIVE goes up: sputtery and gated at high settings.
RECT	A rectifier blended with a soft stage: adds an octave up.
CRUSH	Bit and sample-rate reduction: DRIVE takes it from 16 bits down to about 3, and from every sample to holding each one for up to 24.
DRIVE	0 - 10 (default 3). How hard the chosen type is pushed.
MIX	0 - 100 % (default 100). Blends the driven sound with the clean one (lined up, so the blend doesn't comb).

FILTER 1 and FILTER 2

Type	Click the box for the menu: OFF, LP 12, LP 24, HP 12, HP 24, BAND or NOTCH (FILTER 1 default LP 24, FILTER 2 OFF). LP is low-pass, HP high-pass; 12 and 24 are the slope in dB per octave.
CUT	The cutoff, 20 Hz to 20 kHz (defaults 1.8 kHz and 400 Hz).
RES	0 - 10. Resonance: a sharper, louder peak at the cutoff. It stops short of self-oscillation.
LFO	±4 octaves (default 0). How far the LFO moves the cutoff, up or down.
ENV	±4 octaves (default 0). How far the input's envelope moves the cutoff: positive opens it as you play louder, negative closes it.

LFO

FREE / SYNC / FLOW	FREE: RATE in Hz. SYNC (the default): locked to the project's timeline. FLOW: a tempo rate whose phase runs on freely through loops.

SINE / TRI / SQR / RND	The shape: sine, triangle, square, or random steps.
Scope	Two cycles of the shape, with a dot showing where the LFO is now.
RATE	In FREE: 0.02 - 20 Hz (default 1 Hz). In SYNC and FLOW: a note value from 4 bars down to 1/32, with dotted and triplet values (default 1/4).
SMOOTH	0 - 10 (default 3). Rounds the square's corners and glides the random steps.
WIDTH	0 - 180° (default 0). Moves the right channel's LFO out of step with the left, so the filter sweeps across the stereo field.

ENV

SPEED	0 - 10 (default 4). How quickly the envelope follower reacts: low is fast (2 ms attack, 30 ms release), high is slow and smooth (about 64 ms attack, 1 s release).
Meter	The bar shows the envelope as it moves.

The display

Response	The filters' curve (and BAND's, when it is in) from 20 Hz to 20 kHz and +24 to -36 dB, live: it moves with the LFO and the envelope. Coloured markers show each filter's cutoff.
Read-outs	Each filter's type and cutoff, the routing (SERIES / PARALLEL) and the order (DRV-FLT or FLT-DRV).

BAND

A resonant 12 dB high-pass and low-pass in series, to frame the sound - from gentle tidying to a narrow, honky band. Switched in by its lamp (off by default).

HPF	20 Hz - 2 kHz (default 20 Hz). The yellow knob.
RES	0 - 10 (default 0). The high-pass's resonance: a peak just above the cutoff.

LPF	200 Hz - 20 kHz (default 20 kHz). The black knob.
RES	0 - 10 (default 0). The low-pass's resonance.

MAGIC

The low-end EQ: it works on the mono low end and adds the result to both sides. Switched in by its lamp (off by default).

WEIGHT	0 - 100 % (default 50). A low shelf (up to +4 dB around 90 Hz) plus the bass's own 2nd and 3rd harmonics, so the bass reads on small speakers and sits forward.
DEPTH	0 - 100 % (default 30). A subharmonic an octave below the bass notes (from about 40 - 150 Hz): a round sine-like sub that follows the bass's level. At 100 % it is about as loud as the note itself.

FLANGER

A stereo flanger, the two sides swept a quarter-cycle apart. Switched in by its lamp (off by default).

RATE	0.02 - 10 Hz (default 0.25 Hz). The sweep's speed.
DEPTH	0 - 100 % (default 60). How far it sweeps: up to an octave either side of DELAY.
DELAY	0.2 - 10 ms (default 2 ms). The centre of the sweep: short is metallic and high, long is chorus-like.
FEEDBACK	-95 to +95 % (default +50). Sharper, ringing notches; negative feedback gives a hollower tone.
MIX	0 - 100 % (default 50). 50 % gives the deepest notches.

COMP

The over-easy compressor from Tandem: an RMS detector with a soft 10 dB knee, both sides linked. The attack depends on the music (about 15 ms for 10 dB over, 5 ms for 30 dB) and the release recovers at a steady 120 dB a second. Switched in by its lamp (off by default).

THRESHOLD	-60 to 0 dB (default -20). Where it starts working (the red knob).
RATIO	1:1 to INF:1 (default 2:1). The yellow knob.
GAIN	-20 to +20 dB (default 0). Make-up gain (the blue knob).
GR	The bar shows the gain reduction, up to 20 dB.

FFAT

FFAT	0 - 10 (default 0, off). A one-knob squash at the end: as you turn it up the threshold falls (to -32 dB), the ratio rises (to 6:1) and the make-up gain rises with them, with a soft knee.
Meter	The bar beside the knob shows the gain reduction, up to 12 dB.

OUTPUT

SERIES / PARALLEL	How the two filters are joined: one after the other, or side by side and blended.
DRIVE 1ST / FILTERS 1ST	The order: drive into the filters, or filters into the drive (the drive grabs the resonant peak).
OUTPUT	-12 to +12 dB.
DRY/WET	0 - 100 % (default 100). Blends the whole effect with the untouched input (kept in time at every OS setting).
L / R meter	The output level, -42 to +3 dBFS, with a floating peak hold. Click it to clear the peaks.

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 unit is a little duller, quieter and grittier; it settles as it warms. 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

Init	The defaults: TUBE at 3, FILTER 1 a 24 dB low-pass at 1.8 kHz, the new sections off.
Wobble Bass	A resonant 24 dB low-pass at 300 Hz swept 3 octaves by an eighth-note sine.
Acid Squelch	Heavy TUBE into a very resonant 250 Hz low-pass that the envelope opens by 3.5 octaves.
Lo-Fi Radio	CRUSH into a resonant band-pass at 1.4 kHz and a 250 Hz high-pass, squashed with FFAT.
Ffat Drums	TUBE at 5 blended at 70 %, a gentle low-pass at 12 kHz and plenty of FFAT.
Slow Sweep	A 12 dB low-pass at 900 Hz swept slowly by a triangle, the two sides 90° apart.

Filter Chop	A 150 Hz low-pass opened 4 octaves by a sixteenth-note square: rhythmic gating.
Fuzz Notch	FUZZ into a resonant notch swept by a half-note sine.
Octave Lead	RECT for the octave up, between a 180 Hz high-pass and a 6 kHz low-pass.
Random Steps	A resonant band-pass jumping to random sixteenth-note steps.
Twin Formant	Two resonant band-passes in parallel moved in opposite directions: vowel-like.
Crushed Pump	CRUSH into a low-pass that closes as the input gets louder, with heavy FFAT.
Desert Jet	TUBE at 4 into a slow, deep flanger with strong feedback: the jet-plane sweep.
Big Bottom	MAGIC with WEIGHT 60 % and DEPTH 45 %, then COMP at -24 dB: a heavier, deeper low end.
Band Squeeze	BAND from 300 Hz to 3 kHz with some resonance, squeezed by COMP at -30 dB.

Tips

- For wobble, start from a resonant LP 24 with a low CUT and raise FILTER 1's LFO amount; set RATE to a note value in SYNC.
- MAGIC's DEPTH works best on a bass line or a clean kick - on full mixes keep it low.
- Use 2x or 4x OS for heavy FUZZ or RECT on bright material; leave it at 1x for CRUSH's deliberate aliasing.
- Negative FLANGER FEEDBACK with a long DELAY gives a hollow, tube-like sweep.
- Pull DRY/WET down to blend a heavily crushed or fuzzed sound under the original.

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