

DTW 90

One finger, a whole chord: the chord-memory stab of early-90s Detroit techno, house and dub, chopped into rhythm by a 16-step pattern.

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

DTW 90 (Detroit's airport code, and the early 90s) is a polysynth built for one job: the chord stab. Every key you play sounds a whole chord - a shape picked from the CHORD menu, or one you teach it with LEARN - so a one-finger line becomes a moving chord progression, the way the chord-memory polysynths of the late 80s were played on so many techno, house and dub records.

Each note of the chord is two oscillators (saw, square, pulse or a drawbar-like organ) and a sub, through a four-pole ladder filter and its own envelopes. The 16-step PATTERN can

take over the playing: hold the keys and it strikes the chord on each lit step, with accents, gate length and swing, locked to REAPER's tempo. After the voices come DRIVE and the effects - CHORUS, a DELAY with its own filters, SPACE with the classic 500 Hz cut - and FFAT, a one-knob squash, before the GFX output stage, which soft-clips anything above -0.3 dBFS. There are no samples: every sound is synthesised.

Playing it

1. Insert DTW 90 on a track as an instrument and choose a preset.
2. Play single notes: each one plays the chord shown on the CHORD display, built up from the key you press. Up to 16 voices sound at once.
3. To use your own chord: click **LEARN** (it flashes), play the chord with all its notes held together, and let go. Its shape is stored and CHORD switches to MEMORY; from then on every key plays that shape, its lowest note on the key you press.
4. For stabs in time: light **ON** in PATTERN and hold keys. The chord is struck on every lit step. With REAPER playing, the pattern locks to the timeline; stopped, it runs at the project tempo from the first key. PATTERN is never switched on by a preset.
5. Pitch bend covers ± 2 semitones. The sustain pedal (CC64) holds notes, CC120 / CC123 release them, and held notes are released when the transport stops. MIDI is passed on.

DRIFT

DRIFT makes it play like an old analogue polysynth. Each note of the chord wanders out of tune on its own (about ± 20 cents, slowly) and starts a little off true (± 6 cents), and every hit varies slightly in filter cutoff (± 0.3 octave) and attack time (± 30 %). In a PATTERN it also humanises the playing: each stab lands up to 8 ms late and its velocity varies by up to ± 12 %. 50 % (the default) is the standard amount; 0 is perfectly steady and 100 % twice the standard.

Reach for it for

- Detroit techno and deep house chord stabs
- Dub techno chords washed through the delay and space
- Rave and garage stabs, organ hits
- Gated, rhythmic pads from a held chord
- Turning a one-finger bass line or melody into a chord progression

Controls

Drag a knob up or down (Shift for fine moves), or use the mouse wheel. Double-click or Ctrl-click returns a knob to its default. Values show while you hover. Keys with a word on them (MIN 7, SAW, LP 24, 1/16 ...) open a menu.

The top bar

PRESETS	Opens the preset list.
◀ / ▶	Steps to the previous or next preset, wrapping round.
Preset display	Shows the preset's name. Click it for the preset list too.
OS	Oversampling for the DRIVE: each click cycles 1x, 2x, 4x (grey, amber, red). Higher settings keep a hard drive cleaner at the top (less aliasing) and add a little latency (31 samples at 2x, 37 at 4x), which REAPER compensates. 1x by default; the switch dips the sound for a moment, it never clicks.
S / M / L	Panel size: small, medium or large.
?	Opens a pop-up with the design credit, the GFX website, the address of this manual, and MAINS / EQUATOR PROXIMITY (see below). Click outside it to close it.

CHORD

LEARN	Click, play a chord (notes held together), let go: the shape is stored as MEMORY. The display shows the notes as you play them.
Chord menu	The shape every key plays: MEMORY (the learned one), SINGLE (just the note), MAJOR, MINOR, SUS 2, SUS 4, 7TH, MAJ 7, MIN 7, MAJ 9, MIN 9, MIN 11, ADD 9, DIM, FIFTHS, OCTAVES or DUB MINOR.
Display	The chord's name (and inversion) and the notes it plays on the last key.
INVERT	-3 to +3: moves the lowest notes up an octave (or the highest down), for smoother voice-leading. The "0" mark is root position.

SPREAD

0 to 100 %: fans the chord across the stereo field, lowest note left, highest right.

OSCILLATORS

1 / 2 wave keys

The wave of oscillator 1 and 2: SAW, SQUARE, PULSE or ORGAN (five drawbar-like sine harmonics). Changes dip for 5 ms, so they never click.

Display

The two waves mixed, as one cycle, with oscillator 2's tuning.

SEMI

Oscillator 2's tuning, -24 to +24 semitones (12 = an octave up, 7 a fifth).

DETUNE

Oscillator 2 detuned, 0 to 50 cents: thickness and beating.

1 > 2

The balance between oscillator 1 and 2.

PW

Pulse width, for the PULSE wave (greyed when neither oscillator is on PULSE).

SUB

A square an octave below oscillator 1.

ENVELOPES

AMP A D S R

The level envelope of each note: attack 0.5 ms - 5 s, decay and release 1 ms - 10 s, sustain 0 - 100 %. Short decay and no sustain gives a stab; long attack and release a pad.

FILTER A D S R

The same for the filter's envelope (how far it moves is ENV in FILTER).

FILTER

Mode key

LP 24 (the classic four-pole low-pass), LP 12, BP (band-pass) or HP 24.

CUTOFF

20 Hz - 20 kHz.

RESO

Resonance: from smooth to a ringing peak.

ENV	How far the filter envelope moves the cutoff, up (right) or down (left); "0" in the centre.
KEY	Key tracking: how far the cutoff follows the note you play.

PATTERN

ON	Lit: held keys no longer sound on their own; the chord is struck on each lit step. A preset never switches it.
RATE	The step length: 1/4, 1/8, 1/8T, 1/16, 1/16T or 1/32.
LENGTH	1 to 16 steps; steps beyond it are drawn dark.
STEP keys	Click to light or clear a step. The lamp under each step follows the playhead.
ACC keys	Accent: that step plays louder and brighter.
GATE	How long each stab is held, 5 - 100 % of a step.
SWING	Delays the off-steps, 0 - 75 %, for shuffle and garage feel.

CHORUS, DELAY, SPACE and 500 Hz CUT

CHORUS MIX	A stereo chorus for shimmer and width.
DELAY SYNC	Lit: TIME is a note value at REAPER's tempo (1/1 to 1/32, dotted and triplet). Dark: 10 - 2000 ms. Time changes glide.
DELAY PING	Lit: ping-pong (the repeats bounce left and right). Dark: stereo.
TIME / FDBK / MIX	The delay time, how many repeats (feedback), and how loud they are.
HPF / LPF	Filters inside the repeats' loop, so each echo is thinner (HPF, 20 Hz - 2 kHz) and darker (LPF, 1 - 20 kHz) than the last. The defaults are 120 Hz and 5 kHz.
SPACE SIZE	The size of the room, from ROOM through CHAMBER and HALL

	to CATHEDRAL (shown beside the title). It glides.
DECAY / DAMP / MIX	How long the reverb rings (0.2 - 12 s), how fast its highs die away, and its level. The reverb hears the delay too.
500 Hz CUT	The classic studio trick on a reverb send: OFF, -3, -6 or -9 dB at 500 Hz, with a 140 Hz high-pass and a 5 kHz low-pass, on the reverb only. It clears mud out of the tail so the chords stay clear. Changes glide.

LFO

Lamp	Pulses with the LFO.
Shape key	SINE, TRI, SAW, SQUARE or S&H (random steps). Square and S&H are smoothed, so they never click.
SYNC	Lit: RATE is a note value at REAPER's tempo (4 bars to 1/32), locked to the timeline while REAPER plays. Dark: 0.02 - 20 Hz.
RATE	The LFO's speed.
CUTOFF	How far the LFO moves the filter, up to ± 3 octaves.
DETUNE	Pulls oscillators 1 and 2 apart and together, up to 50 cents: a slow detune is a lush pad.
PAN	Swings the whole chord left and right.

DRIVE

IN	Switches the drive in or out (it fades over 15 ms). The knobs grey out when it is out.
Type key	TUBE (soft and warm, with even harmonics), FUZZ (hard clipping that splutters as it is pushed), RECT (a rectifier: an octave-up edge) or CRUSH (fewer bits and a lower sample rate: lo-fi grit). A change dips the sound for 5 ms.
DRIVE	How hard it is driven, 0 - 10. The drive is level-matched, so turning it changes the character, not the loudness.

MIX

Blends the driven sound with the clean one, 0 - 100 %. Under 50 % is a good starting point: the chord keeps its body and gains bite.

FFAT**FFAT**

A one-knob squash, the same as in GFX Ffat: as you turn it up, the threshold drops, the ratio rises and the make-up gain follows, so the sound gets denser, fatter and louder. 0 is off.

MASTER**Display**

How many voices are sounding and the output peak.

CLIP

Lights when the output stage is catching overs above -0.3 dBFS.

LOW / HIGH

Shelving EQ, ± 12 dB (below about 200 Hz and above about 4.5 kHz).

VELO

How much velocity changes the level and brightness: 0 = every note the same.

DRIFT

0 - 100 %, 50 % by default (see above).

VOL

Output level, -24 to +6 dB.

OUT

The output meter. Click it to clear the peak hold.

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 synth starts flat (about 12 cents, oscillator 2 a little further) and wanders, its filter a little closed and its level a touch low; it pulls into tune 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

Every preset loads a pattern but leaves PATTERN on or off as it is, so you can audition them either way. Through the pattern they are level-matched to within about a decibel. Most start with DRIVE in at a low MIX and a little FFAT.

Init	A plain minor seventh: two detuned saws through LP 24, a short stab envelope. The clean starting point (no drive, no FFAT).
Detroit Minor 9	The classic: a minor ninth, two saws a little wider, a darker filter with some resonance, a touch of tube drive, ping-pong delay and the -3 dB 500 Hz cut.
Dub Chord	The dub techno chord: the DUB MINOR shape on square and pulse, a dark resonant filter, dotted-eighth delay with long feedback and thinned, darkened repeats, a big space with the -6 dB cut, and the LFO panning it slowly in time.
Organ Stab	A minor seventh on the organ wave, oscillator 2 an octave up, bright and fast - the house organ hit, warmed with tube drive.
Rave Stab	A minor chord with oscillator 2 an octave up and wide detune,

	a resonant filter snap, fuzz drive and accents in the pattern.
Pulse Stab	A major chord on two pulses with a sub, a heavy chorus - the bright, wide pop stab.
Garage Minor 11	A minor eleventh with a short, plucky envelope and a swung pattern (55 % swing).
Fifths Pluck	Open fifths with a resonant, plucky filter, rectifier drive and a 1/16 triplet pattern.
Deep House Chord	A minor ninth on square and saw with a softer attack and a longer release, a slow LFO detune for movement, and a larger space.
Trance Gate	A major chord with oscillator 2 a fifth up, all 16 steps lit and the LFO sweeping the filter in time: a gated, driving pad.
Bright House	A major seventh on organ with a saw an octave up, open and bright, with a little bit-crush grit.
Sus Pluck	A sus 4 chord with a resonant pluck and a 1/16 pattern, with darker delay repeats.

Tips

- Play the bass line you want with one finger: the chord follows it, and INVERT keeps the voicing from jumping around.
- For dub techno: DUB MINOR or MIN 7, a dark filter, PING delay at 1/4 dotted with plenty of feedback and a low LPF in the delay, a big space with the 500 Hz cut, and the LFO on PAN.
- LEARN a chord with notes spread over two octaves for voicings the menu doesn't have.
- In the pattern, accent a few off-steps and add SWING for a shuffling garage stab.
- Ride CUTOFF (or automate it in REAPER) through a pattern: the classic filter-sweep build.
- With a hard FUZZ or CRUSH, try OS at 2x if the top end sounds harsh.

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