

MSP 80

Two fingers, two lines: the mid-70s duophonic lead, where the two oscillators can play two different notes.

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

MSP 80 is a lead synth in the spirit of the two-voice synths of the mid-70s. It is a mono synth at heart (one filter setting, one pair of envelopes), but its two oscillators can be split across two keys. Hold one key and both oscillators play it; hold two and the lower key goes to OSC 1, the higher to OSC 2. So two fingers give you lines in thirds, fifths or octaves, or a bass line under a melody. Switch KEYS to UNISON and both oscillators follow the last key, for a fat mono lead.

Each oscillator is a band-limited saw, square or pulse. OSC 2 can be hard-synced to OSC 1, and a ring modulator and noise sit in the mixer. Each oscillator has its own four-pole ladder filter (both on the same settings), so a two-note interval stays clean instead of the notes fighting in one filter. 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 MSP 80 on a track as an instrument and choose a preset.
2. Play one key: both oscillators play it (with OSC 2's SEMI and DETUNE). Play two keys together: the lower one goes to OSC 1, the higher one to OSC 2, and the KEYS display shows which note each oscillator is on. Hold more than two and the lowest and highest win.
3. With GLIDE turned up, each oscillator slides to its new note on its own, so the two lines move independently.
4. SINGLE trigger plays legato: a new key while another is held glides there without restarting the envelopes. MULTI restarts the envelopes on every new key.
5. Pitch bend covers ± 2 semitones and the mod wheel adds vibrato. 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 behave like an old analogue duophonic synth. The two oscillators wander out of tune against each other (each about ± 12 cents, slowly and on its own), each new note lands a little off true (± 4 cents per oscillator), the cutoff drifts slowly (± 0.3 octave), and every glide takes a slightly different time (± 25 %). 50 % (the default) is the standard amount; 0 is perfectly steady and 100 % twice the standard.

Reach for it for

- Prog and fusion leads, with glide between the notes
- Lines in thirds, fifths or octaves from two fingers
- A bass line and a melody from one synth
- Screaming sync leads and ring-modulated bells
- Flute, whistle, brass and reed solos
- Squelchy acid lines (UNISON, high resonance, SINGLE trigger)

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 (SAW, LP 24, DUO, SINE ...) 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.

OSCILLATORS

1 / 2 wave keys	The wave of oscillator 1 and 2: SAW, SQUARE or PULSE. Changes dip for 5 ms, so they never click.
SYNC	Lit: OSC 2 is hard-synced to OSC 1, so its cycle restarts with every cycle of OSC 1. Turn SEMI up for the classic tearing sync lead. Band-limited, so it stays clean at the top.
Display	One cycle of the two waves mixed, with OSC 2's tuning (and SYNC).
SEMI	OSC 2's tuning, -24 to +24 semitones (12 = an octave up, 7 a fifth). The "0" mark is in tune.
DETUNE	OSC 2 detuned, 0 to 50 cents: thickness and beating.

PW

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

FILTER

Mode key

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

Display

The filter's response from the knobs (without the envelope or key tracking).

HPF

A gentle high-pass before the filter, 20 Hz - 2 kHz, to thin the sound.

CUTOFF

20 Hz - 20 kHz.

RESO

Resonance: from smooth to a ringing, squelchy 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 notes you play (the middle of the two).

KEYS

DUO / UNISON

DUO: one key plays both oscillators, two keys split them (lower to OSC 1, higher to OSC 2). UNISON: both oscillators always play the last key, a mono lead.

SINGLE / MULTI

SINGLE: legato - a new key while another is held glides there without restarting the envelopes. MULTI: every new key restarts the envelopes.

Display

The note each oscillator is playing (in UNISON, the one note).

GLIDE

Portamento, 0 - 2 s, finer at the short end. Each oscillator glides on its own. From silence the first note never swoops in.

SPREAD

Pans OSC 1 left and OSC 2 right, 0 - 100 %.

OCT

The whole synth up or down, -2 to +2 octaves. The "0" mark is as played.

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).
Dark: 0.02 - 20 Hz.

RATE

The LFO's speed.

DELAY

0 - 3 s: the LFO fades in over this time at the start of each phrase (a new note from silence), so long notes bloom into vibrato the way a player does it. Legato notes don't restart it.

VIBRATO

How far the LFO moves the pitch, up to 100 cents.

PWM

How far the LFO moves the pulse width (for the PULSE wave).

CUTOFF

How far the LFO moves the filter, up to 3 octaves.

MOD WHEEL VIBRATO

How much vibrato the mod wheel adds at full, up to 100 cents (30 by default). It isn't delayed.

ENVELOPES**AMP A D S R**

The level envelope: attack 0.5 ms - 5 s, decay and release 1 ms - 10 s, sustain 0 - 100 %.

FILTER A D S R

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

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 150 Hz and 4.5 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 lead stays clear. Changes glide.

MIXER

OSC 1 / OSC 2	The level of each oscillator. Turn OSC 1 down with SYNC on to hear just the synced oscillator.
RING	A ring modulator (OSC 1 times OSC 2): metallic, bell-like tones that change with SEMI and DETUNE.
NOISE	White noise, for breath and chiff.

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 %.

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.
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MASTER

Display	How many keys are held 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 the filter's envelope: 0 = every note the same.
DRIFT	0 - 100 %, 50 % by default (see above).
VOL	Output level, -24 to +6 dB. Each preset sets it so they all play at about the same loudness.
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
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	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 (oscillator 1 about 15 cents, oscillator 2 about 9) and wanders, its filter a little closed; 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

The presets are level-matched: a played line sounds at about the same loudness on every one.

Init	Two slightly detuned saws in DUO through LP 24, with a little glide. The clean starting point (no drive, no FFAT).
Sync Lead	UNISON, OSC 2 synced and tuned up 9 semitones, delayed vibrato and a little tube drive and FFAT: the tearing sync lead.
Ring Bells	Two squares a fifth apart through the ring modulator, a fast decay with no sustain and a long release, and a bigger space.
Square Duo	Two squares in DUO, wide SPREAD, with tube drive: two-finger lines panned apart.
Pulse Vibrato	Two thin pulses in UNISON with delayed vibrato, PWM and chorus.
Fat Unison	UNISON saws, wide detune, an octave down, with a resonant filter, tube drive and FFAT: a big mono lead.

Thirds Lead	Two saws in DUO with glide, chorus and a touch of delayed vibrato: play two keys for lines in thirds.
Bass + Melody	A square (OSC 1) under a saw (OSC 2) with little glide: play a bass note with the left hand and the tune with the right.
Soft Flute	UNISON squares an octave apart through LP 12, a soft attack, a breath of noise and delayed vibrato.
Brass Duo	Two detuned saws with a slow filter attack: a brassy swell on each note, two-part in DUO.
Acid Line	UNISON saw an octave down, high resonance, a snappy filter envelope, SINGLE trigger (slides between overlapping notes) and tube drive.
Whistle	Squares an octave up through LP 12, almost a sine, with vibrato and a long space.
Fifth Stack	UNISON with OSC 2 a fifth up, chorus and delay: one key plays a power fifth.
Screamer	UNISON, OSC 2 synced 19 semitones up, glide, deep vibrato and fuzz drive.
Breath Pulse	Pulses with noise and a slow PWM, a soft attack and chorus: a breathy reed-like lead.
Slow Swell	Detuned saws with slow attack and release, wide spread, heavy chorus and a long delay and space.
Nasal Reed	Narrow pulses through the band-pass filter with the HPF up: an oboe-like reed.
Chip Duo	Square and pulse with an open filter, bit-crush drive and very little drift: two-part chip-tune lines.

Tips

- In DUO, hold a long note with one finger and play a moving line above it with another: OSC 1 keeps the drone, OSC 2 plays the tune.

- Set SEMI to 0 and play two keys for two-note harmony; set SEMI to 12 or 7 and play one key for a stacked sound.
- For the classic sync sweep, use SYNC and automate SEMI, or let the filter envelope do the work with ENV up.
- SINGLE trigger with GLIDE gives the slide-only-when-legato playing of the old leads: play detached for clean attacks, overlap the notes to slide.
- Raise the LFO DELAY so vibrato only comes in on long notes.
- With a hard FUZZ or CRUSH, try OS at 2x if the top end sounds harsh.

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