

EA77

A listening post at the edge of the desert: a shortwave receiver, counter-rotating sine carriers played from the keys, mains hum, crackle and computer bleeps, opened up by an LCR delay and a flanger.

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

EA77 is a soundscape generator in the spirit of shortwave radio sweeps, interstellar static and otherworldly electrical hums. It has four sound sources, each with its own level and its own slow fade:

- **RECEIVER** - a shortwave band from 1 to 30 MHz. Tune through it and stations drift past as whistles that rise and fall with the tuning: steady carriers, morse, data chatter and garbled voices, over band static. A strong station pushes the static down, as a real receiver's automatic gain does.
- **CARRIER** - two sine waves per key, a set interval apart, slowly swept up and down by two loops. With COUNTER-ROTATE lit, one rises while the other falls and they circle the stereo field in opposite directions.
- **HUM** - mains hum, from a clean tone to the buzz of an old transformer.
- **POPS** - single clicks, crackle bursts and low thumps, each placed somewhere in the stereo field.

The EFFECTS page adds **BLEEPS** (short computer bleeps and boops in little phrases), a **FLANGER** and an **LCR DELAY** with separate left, centre and right lines. Some of the pops and all the bleeps go hard into the delay. Everything finishes in the

GFX output stage, which soft-clips anything above -0.3 dBFS. There are no samples: every sound is synthesised.

Playing it

1. Insert EA77 on a track as an instrument (it has no audio input; it plays from MIDI). Choose a preset.
2. Hold a key: the carrier sounds at that pitch (it swells in over about a third of a second and fades over a couple of seconds after you let go), and the receiver, hum, pops and bleeps fade in while any key is held. Up to eight keys sound at once; velocity sets each carrier's level a little.
3. Or light **RUN**: the whole soundscape runs on its own, with a drone carrier at the last key played whenever no key is held. RUN is never switched on by itself, and presets leave it as it is.
4. Pitch bend covers ± 2 semitones (on the carriers). The sustain pedal (CC64) holds notes, CC120 / CC123 release them, and held notes are released when REAPER's transport stops. MIDI is passed on.

DRIFT

DRIFT is the radio's weather. Every station swells and fades on its own (RF fading), the receiver's tuning wanders slowly, the mains frequency drifts (about $\pm 0.4\%$), the band crashes into a burst of static now and then, the static and hum breathe a little, and each carrier note starts slightly off true. 50 % (the default) is the standard amount; 0 is a perfectly stable signal.

Reach for it for

- Film and game ambience: radio rooms, space, deserts, abandoned stations
- A bed of slowly shifting texture under a track, played or left running
- Drones from the counter-rotating carriers
- Shortwave whistles, morse and voices as an effect layer
- Electrical hum, buzz and crackle for "old equipment" atmosphere
- Echoing sci-fi bleeps

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.

The top bar

SOURCES / EFFECTS	Switch between the two pages.
FADE lamps	Four lamps showing the fade LFOs as they move: carrier (green), receiver (amber), hum (yellow) and pops (red). They show on both pages.
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.
S / M / L	Panel size: small, medium or large.
?	Opens a pop-up with the design credit, the GFX website and the address of this manual. Click anywhere to close it.

RECEIVER

Tuning dial	A backlit dial from 1 to 30 MHz with the broadcast bands marked in metres (49 to 11 m) and the exact frequency shown. The red needle shows where the receiver is listening. Drag sideways in the window for a fine vernier (Shift: finer), or use the mouse wheel (10 kHz steps; Shift: 2 kHz).
SW TUNE	The tuning, 1 to 30 MHz. The tuning glides; a long jump quietly mutes the receiver while it travels.
BANDWIDTH	0 to 100 %: the receiver's filter. Narrow is thin and close; wide hears more stations, more hiss and a brighter top.
LEVEL	The receiver's level, 0 to 100 %.
FADE	0 to 100 %: how far the receiver's own slow LFO dips its level, so it drifts out of view and back. 0 is steady.
FADE RATE	The speed of that fade, 0.01 to 2 Hz.

CARRIER

COUNTER-ROTATE	Lit: the two sweep loops turn against each other - one sine rises while the other falls, and they circle the stereo field in opposite directions. Dark: locked, both move together.
Scope	Two dots circling, one per sine: they turn against each other when COUNTER-ROTATE is lit.
SINE SPREAD	The second sine's interval from the first (which is at the key's pitch), -24 to +24 semitones. 7 is a fifth, 12 an octave; small values beat slowly.
SWEEP RATE	0.01 to 2 Hz: how fast the loops sweep the pitch.
SWEEP DEPTH	0 to 12 semitones: how far they sweep.
LEVEL	The carriers' level, 0 to 100 %.
FADE / FADE RATE	The carrier's own fade LFO, as on the receiver.

HUM

FREQ	The mains frequency, 40 to 70 Hz, with 50 and 60 marked on the dial.
LEVEL	The hum's level, 0 to 100 %.
BUZZ	0 to 100 %: from a clean hum to the rasping harmonics of an old, overloaded transformer.
FADE / FADE RATE	The hum's own fade LFO.

POPS

POP DENSITY	How often a click, crackle burst or thump happens, from none up to about 40 a second (finely spaced at the low end).
POP	A lamp that flashes with each pop.
LFO DEPTH	0 to 100 %: a slow LFO on the density, so the crackle comes and goes.

LFO RATE

0.01 to 2 Hz.

OUTPUT

On both pages.

RUN	Lit: the soundscape runs on its own, with a drone carrier at the last key played while no key is held. Dark: it sounds only while keys are held.
SIGNAL	Lights with the strength of what the receiver hears.
OVERLOAD	Lights when the output nears the clip ceiling.
S-meter	(SOURCES page) An analogue signal-strength meter for the receiver, S1 to S9 and up to +40.
LEVEL	Output level, -18 to +6 dB.
DRIFT	0 to 100 %, 50 % by default (see above).
OUT	The output meter.
KEYS	(SOURCES page) Eight lamps for the voices you play and an amber one for the RUN drone.

LCR DELAY

Three delay lines: LEFT, CENTRE (heard in both sides) and RIGHT. The round lamp beside the title switches the delay in or out; switched out, the sends close and the repeats already sounding die away.

SYNC	Lit (green LED): the times are note values at REAPER's tempo. Off: milliseconds.
SEND	0 to 100 %: how much goes into that line.
TIME	With SYNC: 1/32, 1/16 T, 1/16, 1/8 T, 1/16 D, 1/8, 1/4 T, 1/8 D, 1/4, 1/2 T, 1/4 D, 1/2 or 1 bar (T = triplet, D = dotted). Without: 20 to 2000 ms. The box under the knob shows the time. Changes glide.

REPEATS	0 to 95 %: the line's feedback.
TONE	The filter in all three loops: dark and narrow to the left, bright and open to the right.

FLANGER

The round lamp beside the title switches it in or out (crossfaded); it greys out when out. Left and right sweep a quarter-turn apart.

RATE	0.02 to 5 Hz.
DEPTH	0 to 100 %: how wide the sweep is.
FEEDBACK	-95 to +95 %, "0" marked at the centre. Positive is a ringing, metallic flange; negative is hollower.
MIX	0 to 100 %.

BLEEPS

DENSITY	How often a phrase of one to five bleeps (soft square tones) or boops (sines) plays, from none up to about six a second.
PITCH	200 Hz to 4 kHz: the centre of the five-note scale the bleeps are drawn from.
LEVEL	0 to 100 %. The bleeps go hard into the LCR delay.
BLEEP	A lamp that flashes with each bleep.

Presets

The presets are level-matched; choosing one never starts or stops RUN.

Default	14 MHz with a modest bandwidth, carriers a fifth apart counter-rotating slowly, light hum and crackle, the LCR delay on.
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Deep Space Carrier Wave	Carriers an octave apart, loud and slowly fading in and out, a quiet receiver at 21.6 MHz, no hum, a slow flanger, longer repeats and a few bleeps.
Shortwave Static Sweep	The receiver up front in the 31 m band with a wide bandwidth and lots of DRIFT (90 %): stations fading, static crashing, more crackle; the carriers in the background.
Electromagnetic Hum	Loud 60 Hz hum with plenty of buzz, slowly fading, carriers half a semitone apart beating, crackle that comes and goes, and a hollow negative-feedback flanger.
Deep Drone Void	Carriers an octave apart, low 42 Hz hum, no crackle, long dark delays (1/2, 1 bar, 1/2 triplet) with high repeats and a deep, slow flanger.
Pulsar Transmission	Carriers two octaves apart pulsing fully in and out at 1.5 Hz with the crackle pulsing in time, the receiver at 1.6 MHz, short delays and bleeps.
Stellar Static	The receiver at 27.5 MHz fully open and loud, a busy crackle that comes and goes, bright repeats and a gentle flanger.
Machine Breathing	Carriers, receiver and a buzzing hum each fading on their own slow cycles, like something breathing, through a flanger.
Cosmic Background	A wide-open receiver at 3.2 MHz, slowly swept carriers, long repeats, a slow flanger and high bleeps.
Atmospheric Anomaly	Fast, deep carrier sweeps, every source fading on its own, free-running delays at 333, 555 and 777 ms, a deep negative-feedback flanger and bleeps.
Radio Astronomy	Tuned to 1.42 (the hydrogen line's 1420 MHz, scaled), carriers an octave apart, a little 60 Hz hum, the receiver slowly fading, and bleeps.
Quiet Signal	A narrow, close receiver, soft carriers fading slowly, little hum, a few crackles and low, gentle bleeps through dark repeats.

Tips

- Light RUN and record a few minutes while you slowly turn SW TUNE or drag the dial: an evolving bed you can edit later.
- Automate SW TUNE in REAPER for a sweep across the band; small moves find the whistles, big jumps change the station mix.
- Use the FADE knobs on two or three sources at different rates: the soundscape then never repeats itself exactly.
- A SINE SPREAD of a few tenths of a semitone gives slow beating; 7 or 12 gives open, consonant drones.
- For a cleaner bed, set POP DENSITY and BUZZ to 0 and narrow the BANDWIDTH.
- Keep an eye on OVERLOAD when you raise several levels at once; the clipper catches overs at -0.3 dBFS, but LEVEL is the cleaner fix.

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