LOAD + PLAY

LP-60

Six voices, one chorus, a whole decade.



A polysynth inspired by the Juno-60, tuned by ear and by measurement against a real Roland JU-06A, chorus hiss included.

USER MANUAL VERSION 1.0.0 FREE AND OPEN SOURCE

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1 Introduction

A free, open-source 6-voice polysynth inspired by the Roland Juno-60. Its DCO, filter, envelopes, LFO and chorus were tuned by measurement against a real Roland Boutique JU-06A.

The LP-60 follows the Juno-60 architecture: one oscillator per voice (sawtooth, variable-width pulse, sub-oscillator, noise), a high-pass filter, a resonant 24 dB filter, a VCA, an ADSR envelope, an LFO and the famous stereo chorus.

Every section was compared with a JU-06A recorded setting by setting: 58 tests, each replayed identically in the LP-60 and measured the same way (pitch, harmonics, filter cutoff, envelope curves, LFO and chorus rate and depth, hiss level). Three measurements out of four are within tolerance; the remaining differences are small.

What makes its sound

- **DCO**: sawtooth and pulse can be stacked, in phase like the original; 49 % width at rest, 4 % at maximum, constant level whatever the PWM.
- **Filter**: 24 dB/octave, four saturating stages, resonance up to self-oscillation (tuned to the note), measured bass loss.
- **Envelopes**: almost linear attack, exponential decay and release, non-linear sustain, up to 10 octaves of filter sweep.
- **LFO**: triangle from 0.04 to 67 Hz (fast enough to grit up the tone), delay then gradual fade-in.
- **Chorus**: modes I, II and I+II, all stereo, with the dark hiss of the BBD delay lines, adjustable.
- **Playing**: 6 rotating voices, UP / U&D / DOWN arpeggiator over 1 to 3 octaves, HOLD, 12 factory sounds, MIDI file player (drop a .mid onto the window).

2 Installation

- **macOS**: copy `LP-60.component`, `.vst3`, `.clap`, `.lv2` into `~/Library/Audio/Plug-Ins/` (Components, VST3, CLAP, LV2 folders) and drag `LP-60.app` to Applications. The software is not signed with Apple: on first launch, right-click → Open.
- **Windows**: copy `LP-60.vst3` to `C:\Program Files\Common Files\VST3` and `LP-60.clap` to `C:\Program Files\Common Files\CLAP`. If SmartScreen shows up: More info → Run anyway.
- **Linux**: copy the plugins to `~/.vst3`, `~/.clap` and `~/.lv2`.

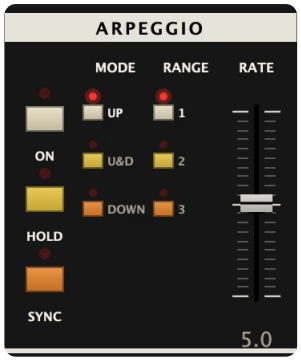
Then restart your music software: the LP-60 shows up under "Load & Play".

3 The interface



The whole Juno-60 front panel, left to right: arpeggiator, LFO, oscillator, filters, VCA, envelope and chorus. Twelve factory sounds are picked at the top centre.

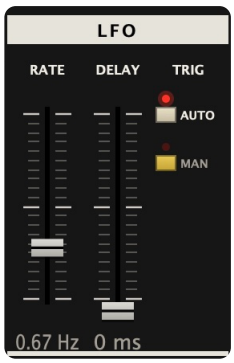
1 Arpeggiator



UP, U&D or DOWN over 1, 2 or 3 octaves, from 1.5 to 50 steps per second. HOLD keeps the chord when you let go, SYNC locks the arpeggio to your host's tempo.

CONTROL (AUTOMATION)	RANGE	DEFAULT
Arpeggio On	Off / On	Off
Arpeggio Mode	UP / U&D / DOWN	UP
Arpeggio Range	1 / 2 / 3	1
Arpeggio Rate	0.0 … 10.0	5.0
Arpeggio Tempo Sync	Off / On	Off
Hold	Off / On	Off

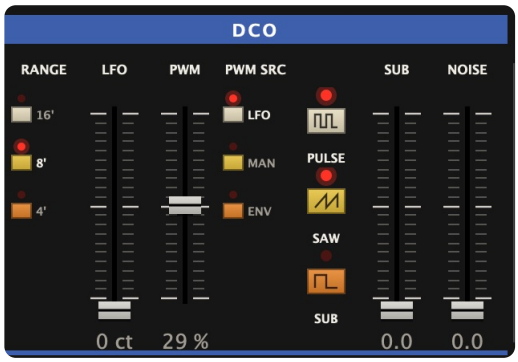
2 LFO



A triangle from 0.04 to 67 Hz, fast enough to grit up the tone. DELAY holds it back, then fades it in after each note, just like the original.

CONTROL (AUTOMATION)	RANGE	DEFAULT
LFO Rate	0.04 Hz … 67.0 Hz	4.23 Hz
LFO Delay Time	0 ms … 1.75 s	0 ms
LFO Trigger Mode	AUTO / MAN	AUTO

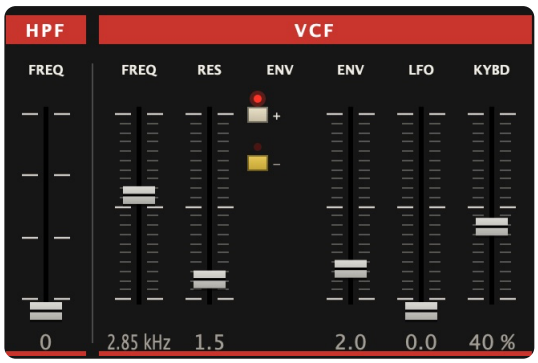
3 DCO



Sawtooth, pulse and sub-oscillator can be stacked, at 16', 8' or 4', plus noise. Pulse width follows the LFO, the envelope or your hand: from 49 % down to 4 %, at constant level.

CONTROL (AUTOMATION)	RANGE	DEFAULT
DCO Range	16' / 8' / 4'	8'
DCO LFO	0 ct … 380 ct	0 ct
DCO PWM	49 % … 4 %	49 %
DCO PWM Mode	LFO / MAN / ENV	MAN
DCO Pulse	Off / On	Off
DCO Saw	Off / On	On
DCO Sub On	Off / On	Off
DCO Sub Osc	0.0 … 10.0	0.0
DCO Noise	0.0 … 10.0	0.0

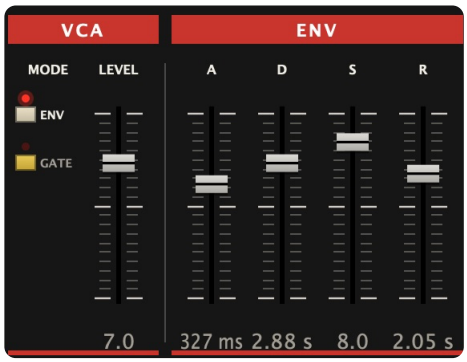
4 Filters



A four-position high-pass, then the resonant 24 dB filter with four saturating stages, up to self-oscillation tuned to the note. Normal or inverted envelope, LFO and keyboard tracking.

CONTROL (AUTOMATION)	RANGE	DEFAULT
HPF Frequency	0 / 1 / 2 / 3	0
VCF Frequency	8 Hz … 80.68 kHz	23.33 kHz
VCF Resonance	0.0 … 10.0	0.0
VCF Envelope Polarity	+ / -	+
VCF Envelope	0.0 … 10.0	0.0
VCF LFO	0.0 … 10.0	0.0
VCF Keyboard Follow	0 % … 100 %	0 %

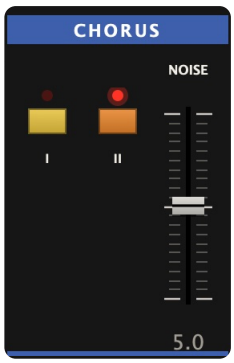
5 VCA and envelope



The VCA follows the envelope or simply opens while the note is held (GATE). ADSR measured on the JU-06A: almost linear attack, exponential decay and release.

CONTROL (AUTOMATION)	RANGE	DEFAULT
VCA Mode	ENV / GATE	ENV
VCA Level	0.0 … 10.0	7.0
ENV Attack	1 ms … 3.00 s	1 ms
ENV Decay	5 ms … 13.34 s	749 ms
ENV Sustain	0.0 … 10.0	10.0
ENV Release	5 ms … 13.34 s	62 ms

6 Chorus



I, II or both together, always in stereo, with the dark hiss of the BBD delay lines. NOISE sets that hiss: at zero, the chorus is perfectly clean.

CONTROL (AUTOMATION)	RANGE	DEFAULT
Chorus I	Off / On	Off
Chorus II	Off / On	Off
Chorus Noise	0.0 … 10.0	5.0

7 Playing



Master tune, pitch-bend range to the oscillator and to the filter, mod-wheel depth on the LFO. Six rotating voices; drop a .mid file onto the window to hear it.

CONTROL (AUTOMATION)	RANGE	DEFAULT
Master Tune	-50 ct … 50 ct	0 ct
Bender DCO Range	0 st … 12 st	2 st
Bender VCF	0.0 … 10.0	0.0
Mod Wheel Vibrato	0.0 … 10.0	5.0
Tempo (without host)	40 BPM … 240 BPM	120 BPM

4 Factory sounds

Pick them from the menu at the top of the window, or from your host's preset menu.

1. Init
2. Warm Pad
3. Strings
4. Brass
5. Bass
6. Sub Bass
7. Organ
8. Pluck Arp
9. Wide Lead
10. Sweep Pad
1. Bells
12. Noise FX

5 Specifications

Version	1.0.0
Price	Free
License	GNU AGPL v3 (open source)
Type	Virtual analog polysynth, 6 voices
Formats	AU, VST3, CLAP, LV2, standalone application
macOS	10.13 or later, Apple Silicon and Intel
Windows	10 / 11, 64-bit (VST3, CLAP, LV2, standalone)
Linux	x86-64 and ARM64, including Raspberry Pi 4/5 (VST3, CLAP, LV2, standalone)
Processing	2x oversampling, any sample rate
Latency	3 samples
CPU load	≈ 2.4 % of one core with 6 voices (Apple M1, 48 kHz)
Sons d'usine / Presets	12
Automatable parameters	39
MIDI	Notes, pitch bend, mod wheel, sustain pedal, host tempo sync (arpeggiator)

6 License and notices

LP-60 is free software, distributed at no cost under the GNU AGPL v3 license: you can use it in your tracks, commercial ones included, without owing anything. The full source code is published on GitHub; if you modify and redistribute it, your changes must stay under the same license. The software is provided as is, without warranty.

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Website: https://alexlexlexlexlexlex.github.io/load-and-play/
Source code: https://github.com/alexlexlexlexlexlex/load-and-play