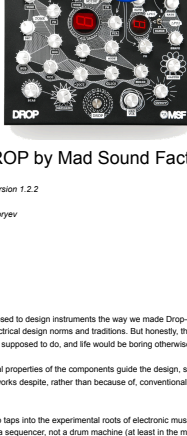


MAGIC ANALOG DEVICES



MADSOUNDFACTORY.COM



DROP by Mad Sound Factory

User manual, version 1.2.2

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You're not supposed to design instruments the way we made Drop—with a complete disregard for electrical design norms and traditions. But honestly, there are a lot of things you're not supposed to do, and life would be boring otherwise.

We let the natural properties of the components guide the design, shaping Drop into something that works despite, rather than because of, conventional engineering logic.

In doing so, Drop taps into the experimental roots of electronic music—raw, organic, and live. It's not a sequencer, not a drum machine (at least in the modern sense), but a proper musical instrument: easy to grasp, hard to master.

Trying to pin Drop down with a single definition doesn't quite work. Is it a semi-modular groovebox? A drum module? A noise machine? A deranged electric orchestra trapped in a box? Yes. And also, no. It can go from pounding techno to lush ambient, shifting with every user's vision.

So—what will it become in your hands?

MSF DROP synthesizer – 1 pc.

Patch cable set (25 cm) – 10 pcs.

Patch cable (60 cm) – 1 pc.

USB Type-A to USB Type-C power cable – 1 pc.

Mounting screws pack – 1 pc.

MSF DROP Poster & patch map – 1 pc.

Sticker – 1 pc.

1. Box contents

Check the following:

- Packaging integrity
- Completeness of the kit
- Synthesizer functionality

We recommend reading this manual before using the MSF DROP—you'll learn how the instrument works and get familiar with its interface.

2. First steps

Check the following:

- Packaging integrity
- Completeness of the kit
- Synthesizer functionality

We recommend reading this manual before using the MSF DROP—you'll learn how the instrument works and get familiar with its interface.

3. Connection

1. POWER ON – Power switch

2. POWER USB-C – 5V 1A power input

3. HEADPHONES – 1/4" (3.5mm) headphone output

4. LINE OUT – 1/4" (6.35mm) line output

5. COMMON GROUND – Ground connection for use with modular systems

Important: MSF DROP features a headphone amplifier built with germanium transistors. To prevent overheating or damage, **do not** connect anything other than TRS-equipped headphones to the HEADPHONES output.

Drop can be powered from any USB source:

- A 5V 1A USB power adapter (e.g., a phone charger)
- A computer or laptop USB port
- A power bank

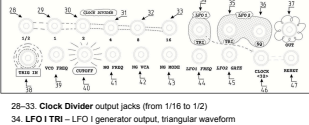
Make sure the power source provides sufficient current for stable operation.

4. Architecture

DROP consists of several modules:

- VCO – Tone generator
- NG – Noise generator
- CLOCK DIVIDER
- LFO I – Clock generator
- LFO II
- LPF – Low-pass filter
- SATURATOR – Ordinary Magic unit
- OUTPUT – Output stage
- DROP – VCO & NG trigger sensor

All modules have banana jack inputs and outputs. The top row contains outputs, while the bottom row contains inputs.



VCO (Voltage-Controlled Oscillator)

- TUNE – Main oscillator frequency
- FM – Depth of frequency modulation from the control signal applied to the VCO FREQ input (39)
- DECAY – Controls signal decay/duration (amplitude envelope)
- ENV FM – Envelope-controlled frequency modulation depth
- SUB – Sub signal level, two octaves below the main tone
- VCO – Main oscillator signal level
- 1 OCT – Signal level one octave below the main tone
- CLICK – Level of short percussive click

ORDINARY MAGIC BEE JELLY TECHNOLOGY SATURATION BY ZVUKOFOR Sound Lab

- BIAS – Alters the character of signal distortion:
 - Full left – Amplitude clipping applies to the lower half-wave
 - Full right – Amplitude clipping applies to the upper half-wave
 - Center – Symmetrical distortion of both wave halves
- SATURATE – Controls the intensity of this distortion.

NG MODE STATUS

11. TUNE – Main oscillator frequency of the noise generator

12. FM – Depth of frequency modulation of the generator from the control signal applied to the NG FREQ input (41)

13. Display – Displays the mode of operation and the frequency of the LFO generators

14. VCA – Controls the signal level sent from NG to the main sound path. The output signal level from NG can also be controlled by an external signal connected to the NG VCA input (42)

15. DECAY – Controls signal decay/duration (amplitude envelope)

16. MODE – Switches between the 6 operating modes of the noise generator

17. NOISE – Volume of the noise generator signal

18. MAD VCA – Adjusts the depth of distortion in the noise generator

LFO I (TEMPO CLOCK GENERATOR)

- CLOCK – Frequency of the main LFO I generator
- Display – Shows the status of the LFO I generator (see the MSF DROP block diagram)
- FM – Depth of frequency modulation from the control signal applied to the LFO I FREQ input (44)

LFO II

- RATE – Frequency of the LFO II generator
- RANGE – Toggle switch for selecting the frequency range of the LFO II generator, with three positions (fig. on the left)

24. SHAPE – Alters the waveform of the output signal. On the SQUARE output (36), it changes the pulse width. On the TRIANGLE output (35), it adjusts the slope of the triangular waveform.

MASTER SECTION

- MASTER – Overall volume of the synthesizer's output signal

VCF (VOLTAGE CONTROL FILTER)

- CUTOFF – Controls the filter's cutoff frequency. When a control signal is applied to the CUTOFF input (40), the knob determines the modulation depth of the filter by the input signal.

OTHER

- DROP – Touch sensor that triggers the envelope generators of the VCO and NG modules. Holding it down stops the trigger signal sent to the TRIG IN input (38).

28–33. Clock Divider output jacks (from 1/16 to 1/2)

34. LFO I TRI – LFO I generator output, triangular waveform

35. LFO II TRI – LFO II generator output, triangular waveform

36. LFO II SQ – LFO II generator output, square waveform

37. OUT – Line output, duplicates the LINE OUT jack (4) on the back panel

38. TRIG IN – Input for triggering VCO and NG

39. VCO FREQ – Input for external control of the VCO frequency

40. CUTOFF – Input for controlling the VCF cutoff frequency. To activate external control, fully insert a banana plug into the jack (internal switch, see block diagram).

41. NG FREQ – Input for external control of the noise generator frequency

42. NG VCA – Input for external control of the noise generator volume (VCA opening). Full insertion of a banana plug activates external control (internal switch, see block diagram).

43. NG MODE – Input for external switching of the noise generator mode. Switching behavior is adjusted using the MODE knob (16).

44. LFO I FREQ – Input for external control of LFO I frequency

45. LFO II GATE – Synchronization/locking input for LFO II. Applying a signal stops LFO II.

46. CLOCK – Combined jack serving as both the output of LFO I and the input of the CLOCK DIVIDER module. To connect an external sync signal, fully insert a banana plug (internal switch, see block diagram). To use the output signal from LFO I on other modules, insert the banana plug partially (see block diagram).

47. RESET – Reset input for the CLOCK DIVIDER module. A short pulse resets all outputs to 0 and restarts the count. A sustained signal blocks the CLOCK DIVIDER operation.

5. Details

The VCO and NG are triggered simultaneously in two ways: either by sending a signal to the TRIG IN jack (38) or by touching the DROP sensor (27). The presence of a trigger signal—whether from the sensor or TRIG IN—is indicated by the sensor's LED backlight.

The trigger signal is sent to identical envelope generators for VCO and NG, both of which are controlled by DECAY (3 and 15). The DECAY knob determines the duration of the signal decay.

Additionally, DECAY (3) for the VCO also affects the pitch of the oscillator. The depth of this effect is controlled by the ENV FM knob (4).

Keep in mind that you can use finger patching aside from using cables; your body is also a conductor of electricity.

VCO

The TUNE knob (1) sets the base frequency of the oscillator.

The VCO's frequency can also be controlled by sending a CV signal to the VCO FREQ input (39). The FM knob (2) adjusts the depth of frequency modulation from an external source.

The VCO produces four signals, each with independent level control:

- VCO – the main oscillator tone
- 1 OCT – one octave below the main tone
- SUB – two octaves below the main tone
- CLICK – a short percussive click at the moment of triggering.

NG

The TUNE knob (11) sets the main frequency spectrum of the noise generator.

The NG's frequency can also be controlled by sending a CV signal to the NG FREQ input (41). The FM knob (12) adjusts the depth of frequency modulation from an external source.

Unlike the VCO, the NG features additional output signal control. The VCA knob (14) controls the level of the noise generator's signal sent to the overall audio path. The output level can also be modulated by an external source connected to the NG VCA input (42). When an external source is connected, the VCA knob sets the desired modulation depth for the NG's output level. The signal sent to the NG VCA input is independent of the noise generator's envelope section.

The MODE knob (16) switches between six noise generator modes, displayed on the screen (see block diagram).

- Modes 1/3/5 produce different spectral compositions of noise.
- Modes 2/6 behave unpredictably depending on the generator's spectrum and the MAD VCA (18) knob setting.
- Mode 4 produces a tonal signal.

The NG has a single signal output, with its level controlled by the NOISE knob (17). After all signals are summed in the mixer section (SUB, VCO, -1 OCT, CLICK, NOISE), the combined output is sent to the VCF.

VCF, ZVUKOFOR ORDINARY MAGIC, GE HEADPHONE AMP

The VCF is a low-pass filter (LPF) with a soft resonance peak. It is controlled by the CUTOFF knob (26). When a CV signal is sent to the CUTOFF input (40), the knob determines the modulation depth of the filter by the incoming CV signal.

After filtering, the signal passes into the ORDINARY MAGIC BY ZVUKOFOR SOUND LABS module.

ORDINARY MAGIC BY ZVUKOFOR SOUND LABS

This module has only two controls:

- BIAS (9) – Alters the signal waveform distortion. In the far-left position, amplitude clipping is applied to the lower half-wave; in the far-right position, it affects the upper half-wave. In the center, distortion is symmetrical for both waveforms. Adjusting BIAS also affects transient response, allowing a smooth transition from soft to sharp attack.
- SATURATE (10) – Controls the intensity of signal distortion.

After passing through ORDINARY MAGIC, the signal reaches the Master Section, where it is distributed to LINE OUT (rear panel), BANANA OUT (37), and GE HEADPHONES AMP.

The MASTER knob (25) controls the final output level.

GE HEADPHONES AMP

A dedicated amplifier for low-impedance (32Ω) headphones, built with NOS germanium transistors in a Class AB push-pull circuit.

⚠ To prevent overheating and transistor failure, only connect TRS-equipped headphones to the HEADPHONES output!

LFO I & II

LFO I (CLOCK GENERATOR)

LFO I is designed by the developers as a "tempo-setting" clock generator, working in conjunction with the CLOCK DIVIDER. The signal from LFO I is fed directly into the CLOCK DIVIDER input. The insertion point is the CLOCK 32 (46) connector.

If you need to retrieve a square wave signal from the LFO I generator, insert the banana plug into the CLOCK 32 (46) socket but not all the way (see the block diagram). A triangle wave signal can be obtained from the LFO I TRI (34) connector.

LFO I has a CV input LFO I FREQ (44) for controlling the oscillator speed from an external source. The depth of modulation on the oscillator speed is adjusted with the FM (21) knob.

The CLOCK (19) knob sets the operating frequency of the generator.

LFO II

Designed by the developers as an additional module for modulating various parameters. Through mode switching, it has a frequency range from 0.1 Hz to 1 kHz.

The RATE (22) knob sets the operating frequency of the generator.

The RANGE switch (23) determines the speed range of the generator.

The LFO II GATE input (45) is used for synchronizing/locking the operation of LFO II. When a signal is applied to the connector, it stops the operation of LFO II. This allows for partial tempo synchronization from other clock sources.

LFO II has two outputs with different waveform shapes: triangle (TRI (35)) and square (SQ (36)).

The SHAPE knob (24) alters the shape of the output signal. At the SQ output (36), the duty cycle of the pulses is modified. At the TRI output (35), the slope of the "shelf" of the triangle wave is adjusted.

CLOCK DIVIDER

Designed for "dividing" the incoming clock signal to create more complex rhythmic structures.

It has two inputs: CLOCK <32> and RESET. By default, the CLOCK <32> input receives a clock signal from LFO I. If synchronization with an external signal source is required, insert a banana cable fully into the CLOCK <32> jack (see block diagram). This disconnects LFO I from the DIVIDER input, allowing it to read pulses from the CLOCK <32> jack instead.

When a signal is applied to the RESET input (47), the DIVIDER stops counting and resets to zero. It will not restart until the RESET input no longer receives a high-level signal.

The operation of the CLOCK DIVIDER is visually indicated on the display (13) (see block diagram above).

The signal at the 1/2 jack has the lowest pulse frequency. The signal at the CLOCK <32> jack (DIVIDER input) has the highest pulse frequency.

6. Technical

Dimensions: 230×230×71mm (+/-1mm)

Weight: 2kg

Power Supply: 5V 1A, USB Type-C connection

Power Consumption: up to 5W

MSF DROP is not intended for use in humid environments or at ambient temperatures below +5°C or above +45°C.

Avoid applying excessive force when connecting cables or using the controls.

Do not drop the device or expose it to water or other liquids.

Clock divider

Number of Outputs: 6

Number of Inputs: 2

Output Signal Type: Square wave, 50% duty cycle, 11V amplitude

Impedance of Each DIVIDER Output: 350Ω (+/-5%)

RESET Signal Threshold: Minimum 4.5V

External CLOCK Synchronization Signal: Minimum 2.3V (recommended level: 2.5V or higher)

LFO I & II

LFO I CLOCK:

Minimum frequency: 5.8 Hz (+/-5%)

Maximum frequency: 240 Hz (+/-5%)

Number of output signals: 2

LFO I TRI output: Triangle wave, Amplitude 6V, Output impedance 350 Ω (+/-5%)

LFO I SQ output: Square wave, Amplitude 10V, Output impedance 220 Ω (+/-5%)

Minimum trigger signal for LFO I GATE: 2.5V

Pulse width/slope adjustment range: 5 – 95% (+/-15%, depending on frequency).

Audio output

Audio Output (6.3mm Jack): Mono, unbalanced

- Maximum undistorted output level: 3.4V RMS (12.8 dBu)
- Output impedance: 330 Ω (+/-5%)

Audio Output ("BANANA"): Mono, unbalanced

- Maximum undistorted output level: 3.4V RMS (12.8 dBu)
- Output impedance: 330 Ω (+/-5%)

Headphone Output:

- Dual mono
- Minimum headphone impedance: 32 Ω
- Output level: >3 dBu per channel

Input signal range

Jack	Input signal range	Note
TRIG IN	2.5 – 11 V	-
VCO FREQ	2.5 – 11 V	The amount of modulation is adjusted using the FM knob
CUTOFF	2.5 – 11 V	The modulation range is adjusted using the CUTOFF knob
NG FREQ	2.5 – 11 V	The modulation depth is adjusted using the FM knob
NG VCA	2.5 – 11 V	The modulation depth is adjusted using the VCA knob
NG MODE	2.5 – 11 V	The modulation range is adjusted using the MODE knob
LFO I FREQ	2.5 – 11 V	The modulation depth is adjusted using the FM knob
LFO II GATE	2.5 – 11 V	-
CLOCK <32>	2.3 – 11 V	To disable the internal CLOCK generator, insert the "banana" connector fully.
RESET	4.5 – 11 V	-