

# LEIPZIG-3

## USER MANUAL



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# WELCOME!

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Leipzig-v3 is a 100% analogue synth using circuits that date back to the 1970s and 1980s – these give Leipzig a really old sound that is rich and full of character.

The circuits are not stabilised and sanitised by CPUs and the controls are not read by CPUs and quantised.

Leipzig has a huge sound, especially when used for bass (something it excels at!), a fact often commented to us by our customers with great excitement! The mixer / filter can be really overdriven if required giving the synth a really hard sound. This can be toned down of course and nice soft synth sounds are possible too - and everything in between.

Though a master at big bass sounds, Leipzig is exceptionally good at making electronic percussion. Not just the sounds, but also percussive loops by using the on board step sequencer. Patterns can quickly be produced, then either easily sync'ed to your DAW, or sampled in.

As well as bass and percussion, Leipzig will produce leads, effects, modular style and other sounds equally well.

Leipzig is extremely powerful. Don't be worried by the 'complex' looking front panel. The synth has been designed to be easy to use, ideal for beginners, but still have the depth and versatility to enable many years of superb sounds.

There are many modulation choices on the rotary select switches. All signal choices have been carefully chosen.

Leipzig was designed by a musician of electronic music, and a popular choice by known music professionals. We like to think we know what makes a good synth and that is reflected in the design of Leipzig.

The on board analogue sequencer is not just for making simple melodies or percussive loops. Think of it also as a modulation source. Each step can be used to drastically change the sounds. This makes it also serve as a simple way of making 'presets'. Just step to get the next sound. The sequencer can control the pitch of either VCO, and also the filter cut-off.

Leipzig also has a 16 note digital sequencer too, for playing back melodies, that can then be manually transposed using your keyboard or DAW.

Sync'ing the sequencer to a MIDI sequencer or DAW couldn't be easier. Sync is easy by sending it MIDI Note 000. That way you can clock the sequencer at any tempo, divide the tempo down (relative to your DAW's tempo), stop it, start it, mute, etc, all from your DAW – something that you cannot do with MIDI Sync.

So Leipzig is ideal for both beginners, and more advanced synthesists and musicians. Use anywhere you want big analogue sounds that have a true vintage sounds. Ideal also if you have the budget for just one analogue synth since this synth covers so many bases (and basses!).



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## MAIN FEATURES

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- Pure analogue voice and modulation circuitry.
- Fat analogue Moog style transistor ladder filter – 24db/Octave 4 pole.
- Two analogue VCOs with individual Glide (portamento).
- Sub-VCO for extra depth and power.
- Osc Sync & Cross-Mod.
- Option to overdrive the mixer and filter.
- Plenty of modulation routing possibilities.
- Versatile analogue CV step sequencer – with plenty of clocking options.
- 16 step note sequencer, with transpose feature.
- Use the analogue sequencer as a modulation source.
- Versatile CV patch bay.
- Rugged steel/aluminium construction.
- MIDI In for DAW/software sequencing.
- Headphone output.
- All the sound character of the renowned previous version Leipzig-S.

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# WHAT'S DIFFERENT SINCE LEIPZIG-S?

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The new version has been entirely redesigned to improve reliability, quality and other manufacturing considerations.

The format is now the more popular desktop type. This version is not rack mountable.

Sound wise it is the same - it retains that wonderful angry pure analogue sounds the previous version had. We kept the sound the same - it's what people love - we just added some useful new features....

## **WE ADDED SOME USEFUL NEW FEATURES:**

Headphone output.

Patch input and outputs.

Extended the capabilities of the sequencer.

The sequencer can turn off VCO2 square wave on selected beats.

Other subtle tweaks, including adding an illuminated power switch.

## MANUAL OVERVIEW

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Though Leipzig-v3 has some very special features, the general architecture, signal flow, control naming etc is fairly standard, so using this synth should be fairly straightforward.

If you have experience with other analogue synths you should be able to get this going without reading the manual! However, we advise you read the safety information and further read the rest to discover how to use some of the unique features.

This manual does not aim to teach you the principles of analogue synthesis and assumes you have prior knowledge of analogue synths and their use. What this manual does is list the functions and their use.

A quick web search will bring up plenty of general analogue synth tutorials and forums are always a good place to ask question about general synth use.

## POWER

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Leipzig-v3 comes with a power supply.

Voltage: 18V DC. Current: over 500mA.

Plug the power lead into the rear of Leipzig-v3.

## MIDI

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### LEIPZIG-V3 HAS

MIDI In        to play the synth from a MIDI keyboard, sequencer or DAW.

MIDI Thru     outputs a copy of what comes into the MIDI In socket.

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## USING THIS UNIT SAFELY

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Before using this unit read this instruction manual.

Do not open or modify this unit or its power supply.

Do not attempt to repair the unit or replace parts within it. Refer servicing to a qualified service engineer.

Never use or store the unit in places that are;

- subject to extremes of temperature (such as in direct sunlight, in an enclosed vehicle, on a heater or near a heating duct, etc).
- that are damp or wet (e.g. bathrooms),
- humid,
- exposed to rain,
- dusty,
- high levels of vibration.

Make sure the unit is placed on a stable and level surface.

Use only the specified AC adaptor. Make sure the mains voltage matches that of the adaptor. Ensure the correct polarity adaptor is used. Other adaptors could be of the wrong type of voltage or polarity and could result in damage, malfunction, or electric shock.

Do not excessively bend or twist the adaptor cable. Doing so may damage the cable. Damaged cables could cause a malfunction, a shock, or fire hazard.

Do not allow any small parts (like pins, coins), liquids, flammable material to enter the unit.

Immediately disconnect the mains supply and adaptor, and contact a qualified service engineer;

- when the AC adaptor or power supply cord has been damaged,
- when objects have fallen into, or a liquid has been spilled into the unit,
- when the unit has been exposed to rain or other liquids,
- when the unit does not appear to function correctly.

When small children are present adult supervision must be provided.

Protect the unit from strong impact, including being dropped.

If the unit is sharing a power outlet with several other devices when using extension cords/ multi-sockets, ensure the current rating of the cords/sockets are not exceeded.

Before using the unit in a different country, check the mains supply is correct for the AC adaptor.

When disconnecting the AC adaptor plug, always grasp it by the plug body, not the wire.

When the unit is to remain unused for a length of time, disconnect the adaptor from the mains.

Cables can be a risk to small children. Always place them out of reach.

Never place objects on top of the unit.

Never handle the unit, the AC adaptor, or any cables with wet or moist hands.

Before cleaning the unit, disconnect from the mains.

Whenever you suspect lightning in the area, disconnect the AC adaptor.

Did you read all this? Good now you will be safe, but please still use what common sense health and safety assumes we all don't have!



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# IMPORTANT NOTES

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## PLACEMENT

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Do not expose the unit to direct sunlight or place it near devices that radiate heat, or leave inside an enclosed vehicle, or otherwise subject it to extremes of heat. Excessive heat may also discolour the unit.

Do not use the unit in a wet area, or expose it to rain or moisture.

## MAINTENANCE

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For everyday cleaning, wipe it down with a dry soft cloth, or one that has been slightly dampened with water. To remove stubborn dirt, use a cloth impregnated with a mild non-abrasive detergent. Afterwards be sure to wipe the unit dry thoroughly with a dry cloth.

Be sure to disconnect the AC adaptor before any cleaning.

Never use benzene, thinners, alcohol or other such chemicals and solvents to clean the unit.

## ADDITIONAL PRECAUTIONS

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Use a reasonable amount of care when using the buttons and knobs. Unreasonable use or rough handling may cause damage or malfunctions.

Never strike or apply strong pressure to the unit.

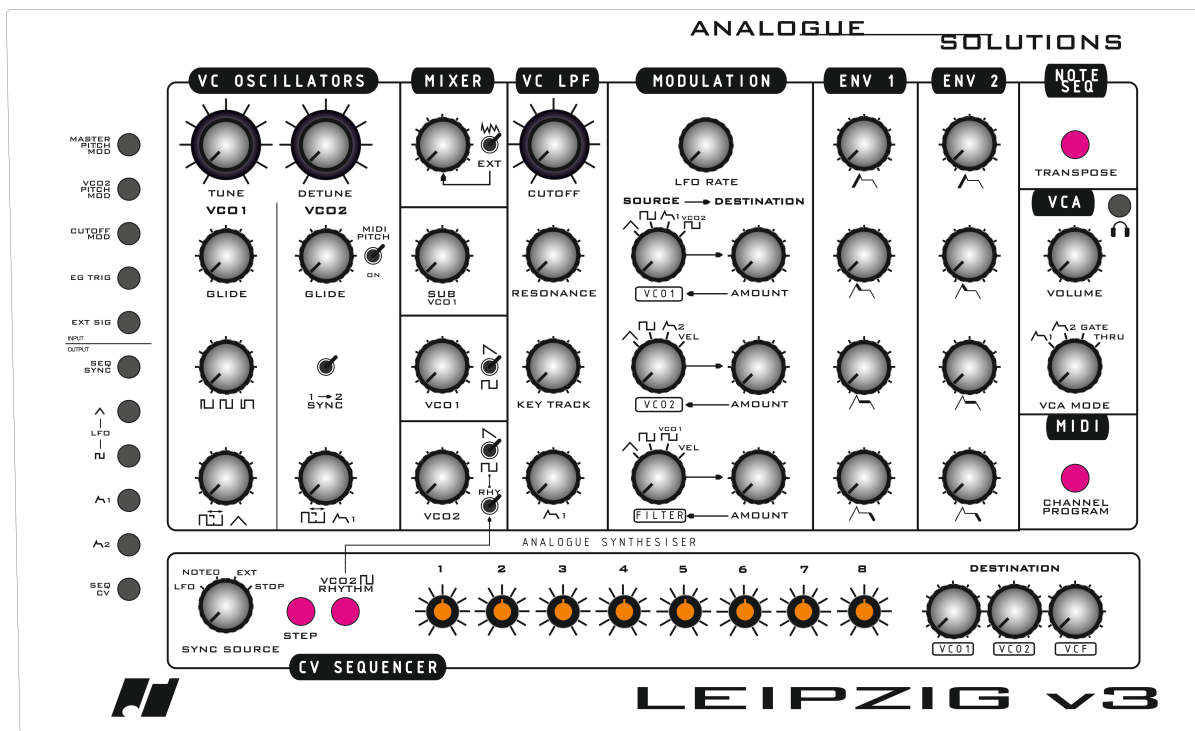
When disconnecting or connecting any cable, hold the cable plug not the cable. Insert or remove straight and perpendicular to the case.

To avoid disturbing your neighbours always keep your volume levels at a reasonable level.

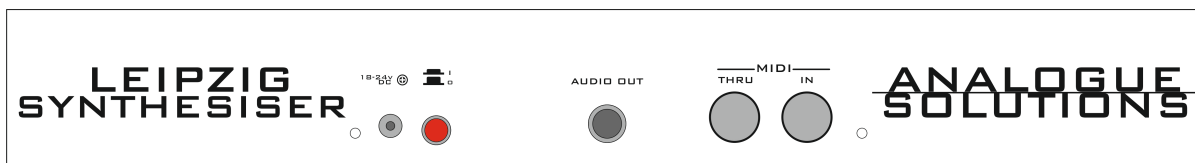
When transporting the unit use the original packaging.

# MAKING CONNECTIONS

## FRONT PANEL



## REAR PANEL



Turn the input level down on your mixer.

Connect AUDIO OUT to your mixer using a standard ¼" (6.35mm) mono unbalanced jack cable.

Connect the mains adaptor to the rear.

Rotate the SYNC SOURCE rotary switch in the lower left corner to LFO to start the sequencer.

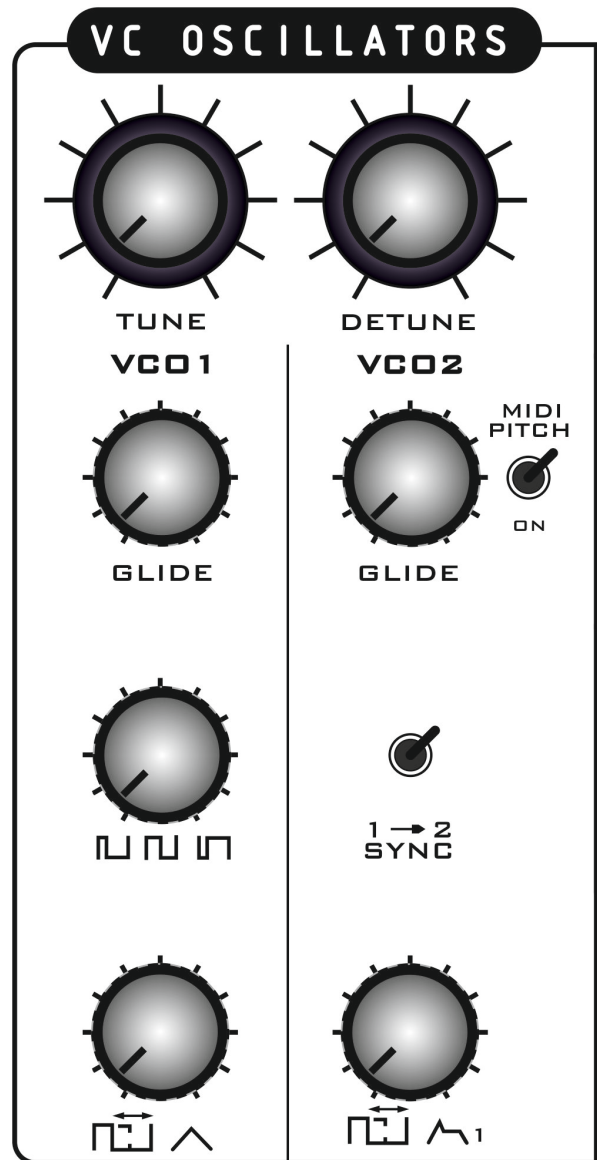
Slowly increase the level on your mixer to a suitable level.

Note; you will have to adjust other controls on Leipzig to get a sound, like VOLUME, VCO Levels, Filter CUTOFF. Many settings will produce no sound!

If you wish to play the synth with a MIDI sequencer or MIDI keyboard connect the controller's MIDI OUT to Leipzig's MIDI IN and ensure MIDI channels match. Leipzig typically ships set to channel 1.

# TOUR OF THE CONTROLS

## VCO - VOLTAGE CONTROL OSCILLATORS



The two VCOs are almost identical, but VCO1 has a manual Pulse Width control, and VCO2 has a Sync feature.

## MASTER TUNE

This tune control affects both VCOs.

Note; there are lots of ways this synth can play out of tune. Obviously Master Tune and Detune must be set correctly. But also the MODULATION AMOUNT controls will affect tuning and also the positions of the sequencer's VCO1/2 DESTINATION amount controls.

## DETUNE

This tune control only affects VCO2.

## GLIDE

This is a portamento function. Each note will glide to the next new note, slowly rising or falling in pitch to the new note. The Glide knob changes the rate (time) it takes to reach the new note.

## MANUAL PULSE WIDTH (VCO1 ONLY)

This changes the pulse width (duty cycle) of the square wave. Basically turn it and hear the effect it has on the sound of the square wave!

## PULSE WIDTH MODULATON

This allows modulation of the square wave's Pulse Width. On VCO1 it can be modulated by the LFO Triangle wave. On VCO2 by Envelope 1.

## SYNC (VCO 2)

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Oscillator sync is where the VCO's waveform can be reset by another signal. Don't worry about the technicalities. Just use the feature and enjoy the sound!

VCO2 can be sync'ed to VCO1 Square wave, or it can be



turned off.

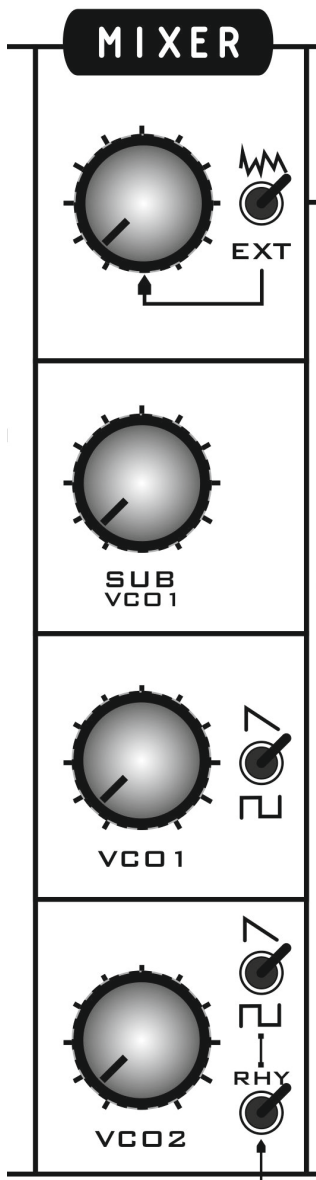
You will need to play around with the relative pitches of VCO1 and VCO2 to find a setting that works best.

### **MIDI PITCH (VCO 2)**

This switch disconnects the Pitch control of VCO2 from MIDI, so it will no longer respond to MIDI note commands.

It becomes a 'free running oscillator' and will not respond to MIDI. Ideal for modulation.

## MIXER



Audio is mixed with the mixer before being fed to the input of the filter.

The levels can be set way beyond clean allowing the signals to overdrive and distort giving the synth a wonderful hard or angry sound. This is great when filtered and/or used for bass lines.

There are points where you can set it all to almost distort - be just on the borderline. It may be here that you get some subtle crackling. If this does occur, simply tweak the levels a little lower to get a clean signal, or a little high to overdrive more.

### NOISE / EXTERNAL TOGGLE SWITCH

The switch selects either white noise or the signal (if any) patched into the EXT socket.

### SUB VCO1

This is the sub-oscillator taken from VCO1. It's one octave down and typically used to beef up sounds, particularly bass!

### VCO 1 / 2 WAVEFORM TOGGLE SWITCH

The switch selects either Sawtooth or Square wave.

### VCO 2 WAVEFORM TOGGLE SWITCH

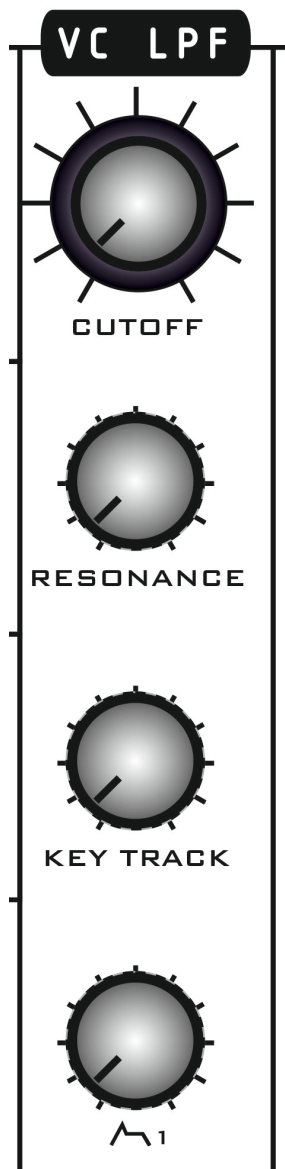
The switch selects either Sawtooth or Square wave. VCO2's square wave can play a rhythm, as programmed on the step sequencer with the PROG button and when using the switch below.

### RHY TOGGLE SWITCH

To do this set the waveform switch of VCO2 to Square, and the RHY (rhythm) switch down (on). More details on this and its uses are in the sequencer section.

## VC LPF – VOLTAGE CONTROLLED LOW PASS FILTER

Leipzig has a 24db/octave transistor ladder filter with a sound similar to the old Moog synths.



### CUTOFF

This changes the cutoff frequency and changes how bright the sound can be.

### RESONANCE

Sometimes called Q or Emphasis on other synths. This changes the Q, or feedback at the cutoff frequency. In simple terms, the squigyness of the sound!

### KEY TRACK

This control routes pitch CV to the filter cutoff. When it is turned up, as you play higher up the keyboard, the filter will open up. This makes the sound get brighter as you play up the keyboard.

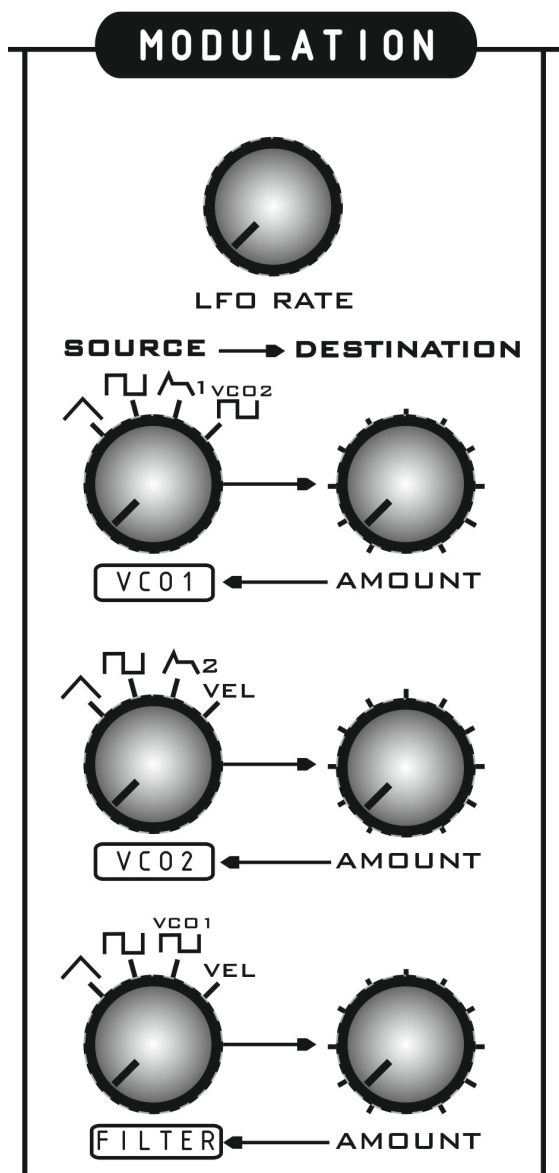
### EG MODULATION

This control sets the amount of cut-off modulation from Envelope 1.



# LFO – LOW FREQUENCY MODULATION

The LFO produces both triangle and square waveform outputs. The LFO modulation signal is typically used to create 'wah-wah' or vibrato type of effects.



## LFO RATE

This control sets the speed of the LFO.

## MODULATION

This section selects and routes various modulation signals to the VCO and VCF circuits.

The three rotary switches select the modulation source, for example VCO1 or 2 audio, LFO, MIDI Velocity (VEL) or EG1/2.

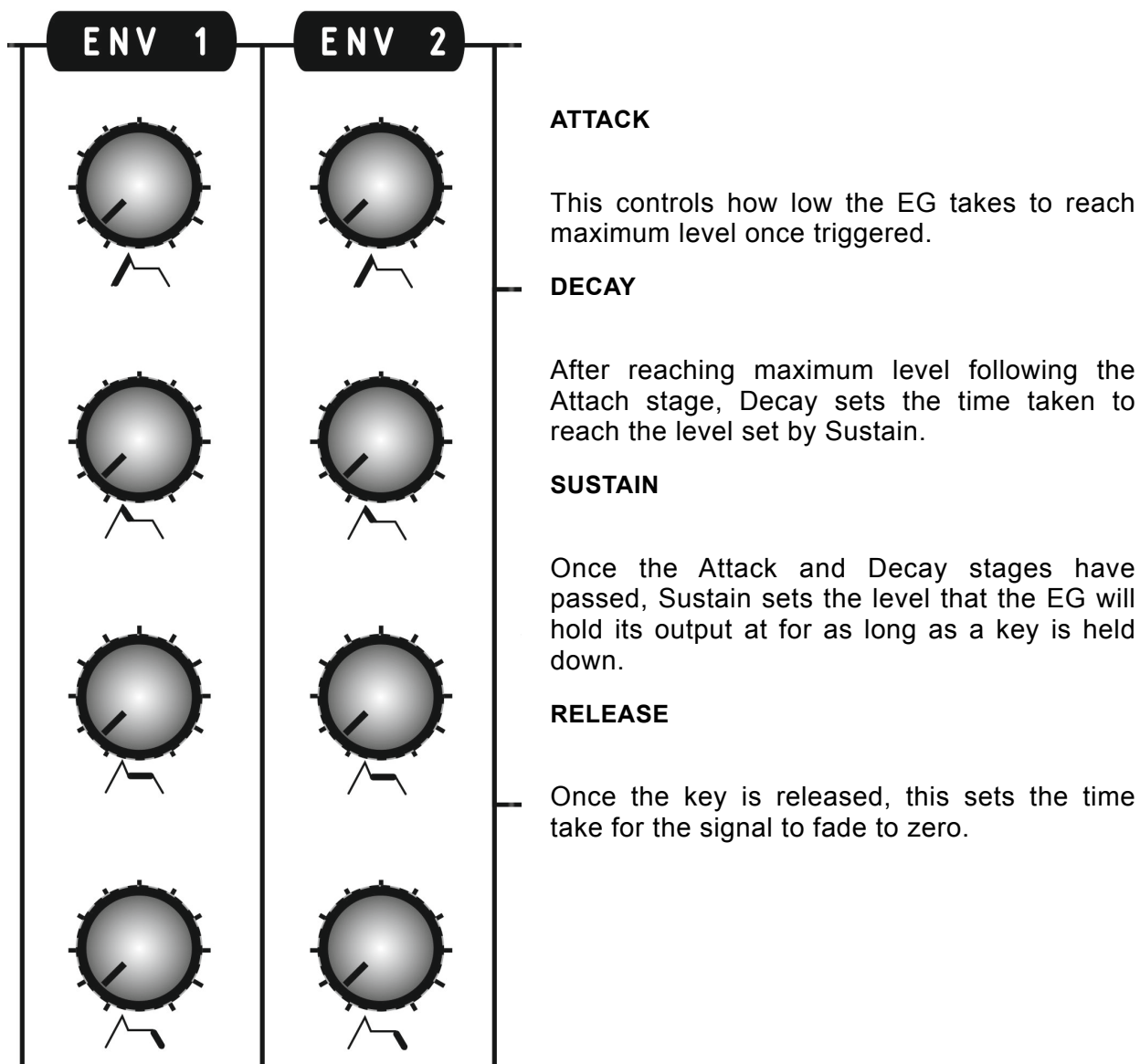
The Level control sets the modulation level.

Each circuit (VCO1, VCO2, VCF) has its own choice of modulations sources.

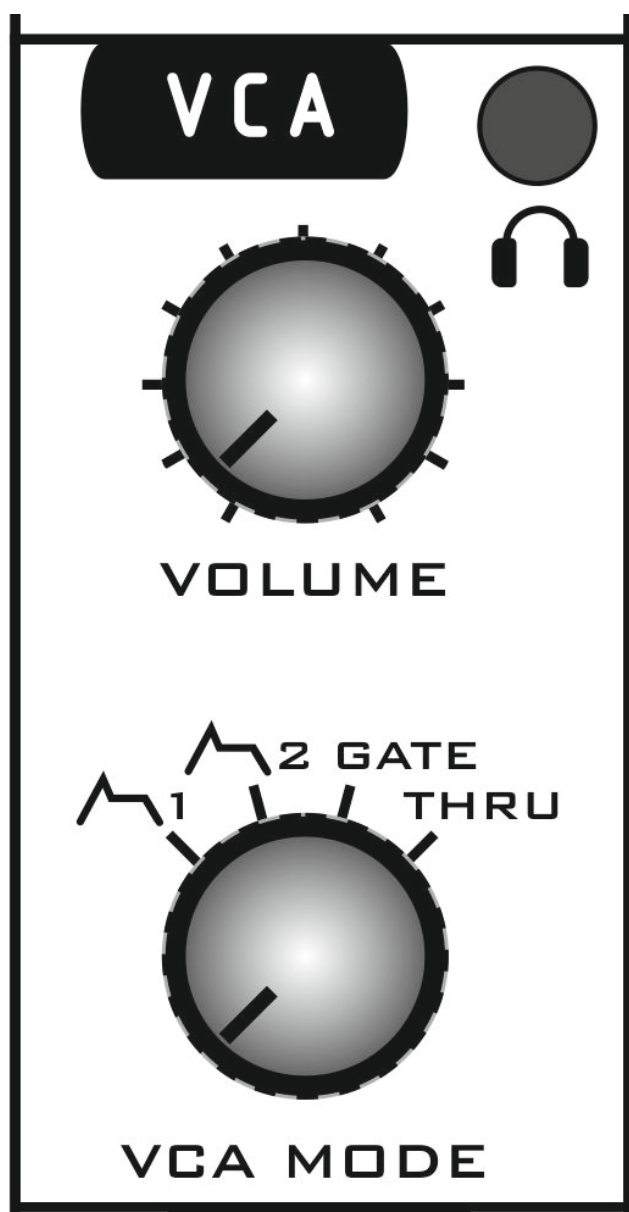
## EG1 & EG2 - ENVELOPE GENERATORS

Envelopes are modulation signals that you trigger and then they evolve over time. Typically used to change the volume or filter cutoff, though they can also be used to modulate the VCO pulse widths or pitch.

Both envelopes are identical, so only one will be described!



## VCA – VOLTAGE CONTROLLED AMPLIFIER



The VCA is an amplifier whose gain can be changed with a modulation signal, typically an envelope.

There are four choices available on the rotary switch.

### MODE

#### **EG1 /EG2**

Normally used to contour the volume.

#### **GATE**

The VCA opens and closes with no gradual attack or decay, much like an organ.

#### **THRU**

This holds the VCA open at full volume. This is typically used when feeding external audio into the synth. It can then be used like an effects processor.

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# HEADPHONES

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The volume control affects both the rear panel out and the headphone socket.

The volume range is quite wide to accommodate a wider range of headphones, with differing impedances. So with some headphones, full level would be really too loud. So start with the volume set at minimum.

Then plug in your headphones and slowly increase to a comfortable level.

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## MIDI

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MIDI control has been kept intentionally minimal. This is a ‘traditional’ true analogue synth. We don’t want you to get carried away micro-editing controller values with your clever computer!

There are three main elements you can control;

Pitch CV (MIDI Note) – used to control the pitch of the VCOs.

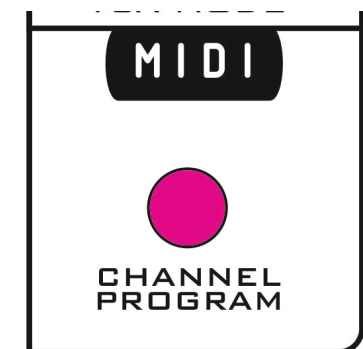
Gate (MIDI Note on/off) – used to trigger the envelopes or clock the sequencer.

Velocity CV – this is a modulation CV. It is controlled by MIDI velocity and used to modulate the filter cut-off.

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## PROGRAM

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This button is used to set the MIDI channel.

Works best if you plug a MIDI keyboard direct to program rather than via a DAW.

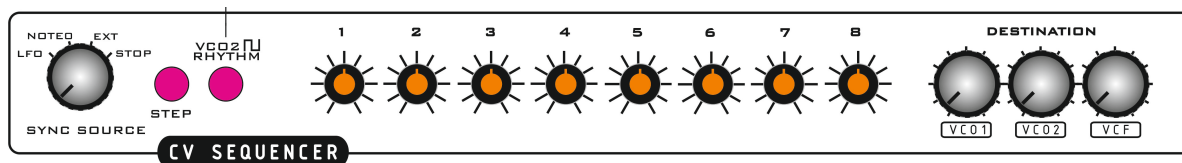
*To change the MIDI channel;*

Play some MIDI notes whilst pressing the Program button.

The receive channel will be set to the same as the received MIDI messages’ channel and stored.

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## ANALOGUE CV SEQUENCER



This is the fun bit ☺

Leipzig-v3 has a built in analogue step sequencer. It can be clocked from various sources and produces an analogue CV that can be used to modulate the VCOs or filter cut-off.

It is fantastic as a modulation source.

It can also be used to create simple melodies that can be transposed with your MIDI keyboard.

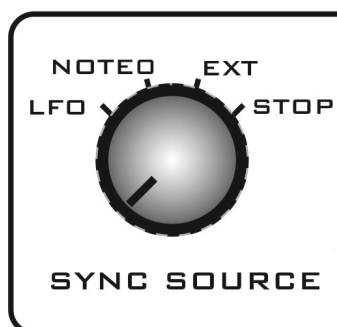
It can also be used as a simple waveform generator and then used as a new audio source that can be played and filtered.

Note; it does not produce a MIDI output! This is an analogue synth, after all! Think of this sequencer more as a modulation source, though of course you can create simple melodies.

## SYNC SOURCE

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### ***-and syncing to MIDI***



The sequencer can be clocked from three different sources;

#### **LFO**

Internal LFO becomes the clock source.

#### **NOTE0 (MIDI CLOCK SYNC)**

##### *NOTE0*

When this is selected on the SYNC SOURCE switch, Leipzig's sequencer will sync to MIDI clock and/or MIDI Note 0, if either are received.

MIDI Note 000 can be used to step / clock the sequencer. Each time that note is received the sequencer will clock one step.

This is the best way to sync with your DAW, since you can program a string of notes however you wish:

16ths

8ths

Some rhythmic pattern.

It also allows you to stop (mute) the sequencer mid-Song, and restart at will. Also to change the clock pattern, like half the speed, for example - all things you cannot do with MIDI Sync.

If you wish to use NOTE0 as your 'sync' signal, you must ensure the transmitting device (for example, your DAW) is not transmitting MIDI clock.

*MIDI Clock*

When you select NOTE0 on the rotary switch, this position also enables the sequencer to sync to MIDI clock.

Use this setting to sync using MIDI clock OR NOTE0. Don't use both as they will conflict! (But you could).

**EXT**

If a clock signal or LFO is fed into the EXT socket on the rear panel then that becomes the source.

**STOP**

Stops the sequencer!



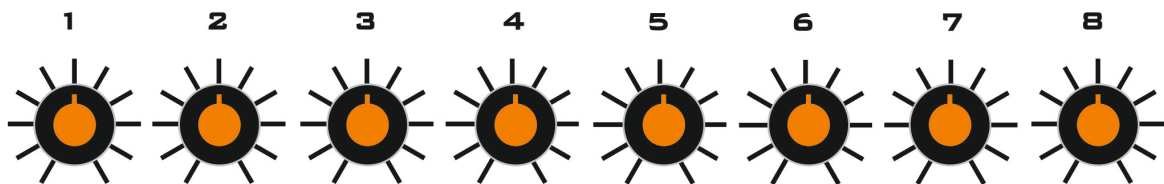
## STEP

- The step button allows you to manually step the sequencer.



**STEP**

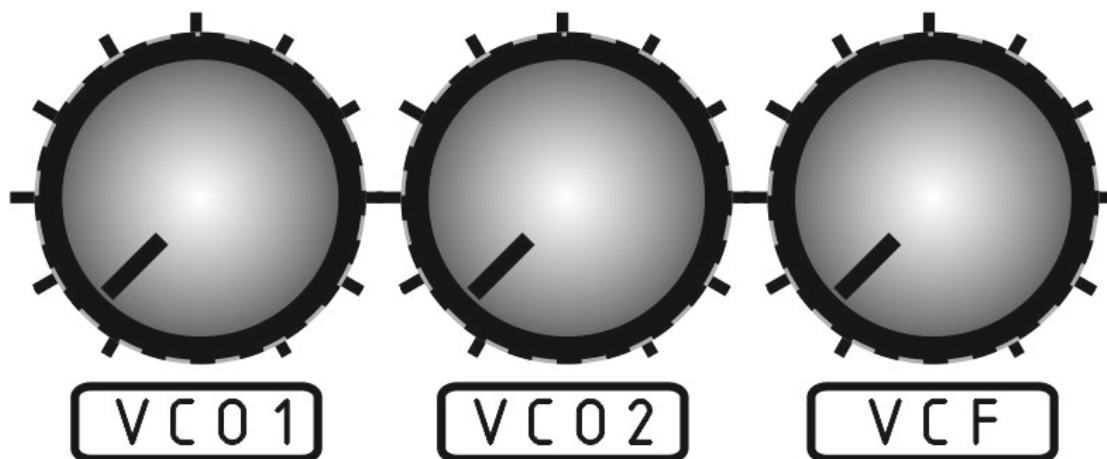
## STEP CV KNOBS 1-8



These adjust the CV level for each step.

## DESTINATION

### DESTINATION



The output CV of the sequencer can be routed to VCO1 pitch, VCO2 pitch and VCF cutoff. The level can be changed using the appropriate control.

You must tune the VCO1 and VCO2 mod level pots by ear so that both VCOs are playing in unison. However, by adjusting them differently, you can make them seem to play separate melodies, or in combination with other settings, create new and interesting sounds.

Set lowish filter CUTOFF and VCF EG MOD settings, and full VCF Sequencer mod settings and create great filter dynamics!

## RHYTHM (FOR VCO2 SQUARE)

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It's possible to program an eight step rhythm that plays in step with the eight CV controls of the sequencer.

The rhythm works in conjunction with VCO2's square wave (only) when the appropriate switches are set:

VCO2 wave set to Square.

RHYthm switch set on (down).

VCO2 will only sound when the Rhythm LED is lit.

This, in conjunction with VCO1 - which will always play on every sequencer step - will give the wonderful illusion that more than one synth is playing.

To turn on and off whether VCO2 will play on a step, manually step through the sequencer using the Step push button, then toggle on/off VCO2 using the Rhythm push button.

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## NOTE SEQUENCER

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As well as the eight step analogue CV sequencer, there is a 'hidden' 16 step note sequencer.

Leipzig constantly remembers the last 16 MIDI notes it receives, and stores them in volatile memory in a 16 note loop.

Each time a clock is received (as set by the Sync Source rotary switch) the next note in the 16 step loop is played.

It is always locked in sync with the analogue sequencer.

New notes can be entered into the 16 note loop even whilst the sequencers are running.

The only time new notes are not logged is when the Transpose button is lit.

When pressed, you can use your MIDI keyboard to transpose the note sequence.

You can't clear the pattern - there's no point to that, and patterns cannot be stored. It's a dynamic sequencer and the intention is you change the notes in the pattern as it plays.

It's a dynamic sequencer that constantly stores every note you play in via MIDI, even when the sequencer is running. This way you can update the pattern whilst it is running.

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# PATCH POINTS

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Leipzig has a healthy number of CV patch points. These are all 3.5mm mono sockets. Most of them are pretty self explanatory. The synth can be cross patched within itself. Cross patching to other modular synths is possible of course.

## CV IN

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MASTER  
PITCH  
MOD



### MASTER PITCH MOD

CV into here will modulate the pitch of both VCOs. It is a modulation input, so it isn't precisely calibrated to 1V/Octave (since it's not necessary), however, it is pretty close, should for some odd reason you want to use a MIDI converter! (Remember, it has one built in!).

VCO2  
PITCH  
MOD



### VCO2 PITCH MOD

Same as above, but just modulates VCO 2.

CUTOFF  
MOD



### CUFF OFF MOD

CV into here will modulated the filter cut-off.

EG TRIG



### EG TRIG

A trigger or gate signal into here will trigger both Envelopes.

EXT SIG



### EXT SIG

This is an external signal input. Via other switches and controls, the external signal could be audio and routed through the mixer, or a clock signal and used to clock the Sequencers from an external device.

INPUT

## CV OUT


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OUTPUT

SEQ  
SYNC 

**SEQ SYNC**

This is like a clock through. It is a copy of the clock signal selected to clock the sequencer. It can be 'Thru'ed' onto another device so all sync together.

  
|  
LFO 

**LFO TRIANGLE AND SQUARE**

LFO signal outputs.

|  
 

**EG 1 / 2**

EG 1 and 2 signal outputs.

**SEQ CV**

This is the voltage output from the eight step analogue sequencer.

SEQ  
CV 

# LEIPZIG V3 PATCH SHEET

Patch Name: \_\_\_\_\_

Notes: \_\_\_\_\_

ANALOGUE SOLUTIONS

## LEIPZIG v3

**VC OSCILLATORS**

TUNE VCO1

GLIDE

DETUNE VCO2

GLIDE

MIDI PITCH ON

1 → 2 SYNC

**MIXER**

EXT

SUB VCO1

VCO1

VCO2

**VC LPF**

CUTOFF

RESONANCE

KEY TRACK

**MODULATION**

LFO RATE

SOURCE → DESTINATION

VCO1 → VEL

VCO2 → VEL

FILTER → AMOUNT

**ENV 1**

**ENV 2**

**NOTE SEQ**

TRANSPOSE

VCA

VOLUME

A1 → 2 GATE THRU

VCA MODE

**MIDI**

CHANNEL PROGRAM

**ANALOGUE SYNTHESIZER**

1 2 3 4 5 6 7 8

DESTINATION

VCO1 VCO2 VCF

**CV SEQUENCER**

NOTED EXT STOP

LFO RHYTHM

SYNC SOURCE STEP

MASTER P.MOD

VCO2 P.MOD

CUTOFF M.MOD

LEG TRIG

EXT SIG

EXT CURR

SEQ SYNC

LFO

A1

A2

SEQ CV

CV SEQUENCER

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# SPECIFICATION

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## ***Leipzig-v3***

### *Power*

*18V regulated DC, 500mA or higher.*

### *Power plug*

2.1mm. Centre positive.

### *Weight (mass)*

Approx. 3Kg.

### *Size*

*432 x 262 x 63 mm (WxDxH).*



Specification subject to change without notice.

### **Warranty**

Leipzig comes with a 1 year (from purchase date) back to base warranty, (i.e. customer must arrange and pay for carriage to and from Analogue Solutions or the dealer from which purchased). Any import/export or tax charges are the customer's liability.

This warranty shall not apply where the product has been subject to alteration, misuse, accident, neglect (such as extremes of temperature and/or moisture) or to wear resulting from normal use.

At the sole discretion of Analogue Solutions, the warranty is deemed to be void should the unit be or considered to have been opened or any other modifications or tampering be carried out by unauthorised parties.

### **CE Compliance**

This unit complies with EU Directives 73/23/EEC and 89/336/EEC. Standards: EN55103-1, EN55103-2, EN60065

*LEIPZIG-v3 'user manual'*  
Analogue Solutions  
web: [www.analoguesolutions.com](http://www.analoguesolutions.com)  
email: [info@analoguesolutions.com](mailto:info@analoguesolutions.com)