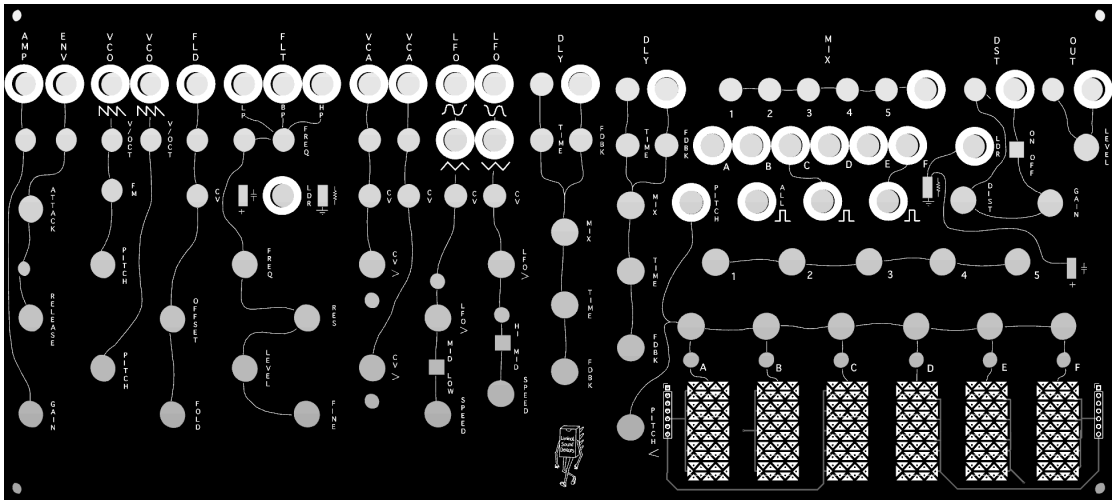
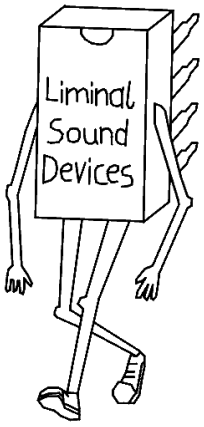
BURG



Burg analog modular system functioning as standalone synth voice, complex analog multi FX processor, CV controller or all at once. It can work for many different musical approaches or creative processes and it bridges between the analog modular world and external gear. Burg is easily integrated in any standard eurorack format cases (min. 46HP) or ships as standalone version with backplate and standoffs. The collection of 18 simple but characterful modules allows you to explore beautiful and weird interactions all over the device. Dynamic melodies, harmonic drones, weird noises, outer space sound effects or even drum sounds can be easily patched. If you plug-in an instrument, a microphone or your favorite tunes, it is easy to modulate any audio signal with a crispy filter(wasp-style), a wavefolder, some heavy distortion and a double delay to glitch your mind away. With 60 patching points in total, possible combinations are almost endless.

The intuitive touchpad interface gives easy control over multiple CV and gate signals at the same time and is the main modulation source of the Burg system. Two light dependent controller guarantee a unique behavior and can be modified easily according to your needs. Also other modules can be modified by exchanging components on the back plate, so customizing the frequency range of the oscillators/LFOs or shaping your individual clipping distortion with different types of diodes is possible. Start exploring analog music circuits and shape them to your needs.

Specifications:



18	individual modules
26	patchable Inputs
29	patchable Outputs (labeled with white circle)
36	Control-Knobs

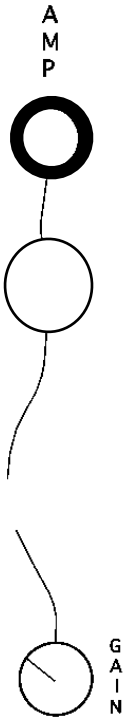
Features:

1x	High Gain Input Amplifier
1x	Envelope Generator/Follower
2x	Saw Tooth Oscilllator (1V/Oct)
1x	Wavefolding Low Pass Gate
2x	Low Frequency Oscillator (Sine/Triangle)
1x	Wasp Filter
2x	Voltage Controlled Amplifier
2x	PT2399 Delay
1x	Five Channel Mixer
2x	Light Dependent Controller
1x	Touch Pad Controller

Burg is the german word for castle and is the name our friend Gary gave the place, where we designed and assembled this synth, to emphasize the last bastion of free and impregnable soul in the heart of Munich and reflects on the closed but yet powerful synthesizer system. The circuits contained in Burg are fairly simple and are based on classic schematics. The synth captures a moment of our individual explorations with analog circuitry, trying to leave the opportunity behind, that some further improvements could be done forever. While building the Burg there has been several moments where it could have been a finished version, starting from a small battery based DIY project in March 2023. One year later it is in a state to greatly enhance the potentials of our own individual musical setups and we wanted to share the results with our dears and all other people who are interested.

INPUT & OUTPUT LABELING

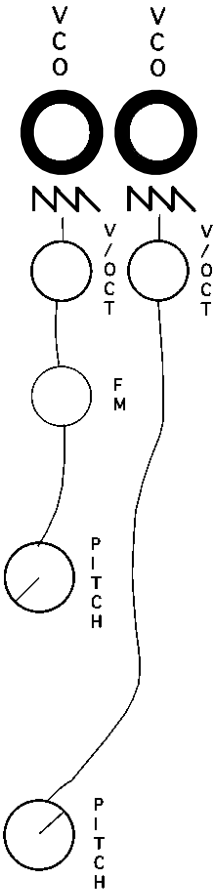
CV INPUT **AUDIO INPUT** **AUDIO OUTPUT**



AMP

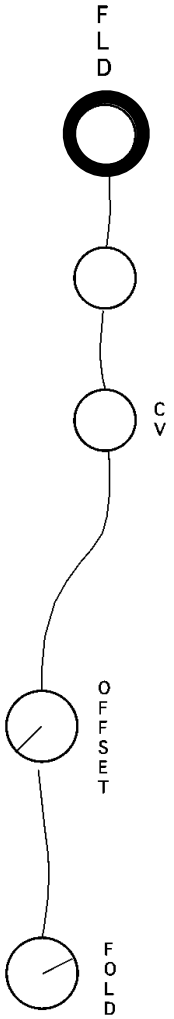
The AMP module consists of an amplifier with a gain of approximately 100 times , so it can easily push low level inputs like an electric guitar, a piezo or headphone outs to eurorack level.

VCO



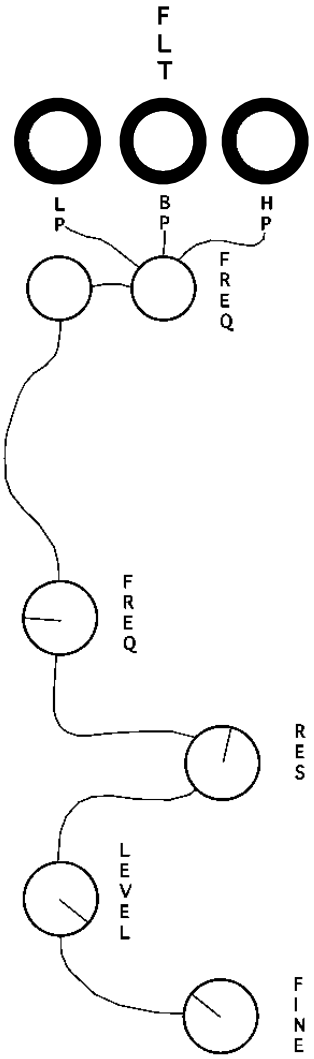
The two VCO modules are quite simple. Both output a saw tooth wave, while the first one also got a dedicated frequency modulation input in addition to the V/OCT input. The speed range of both oscillators depend on the capacitor placed onto the labeled pin sockets on the backside of the PCB (OSC1 & OSC2). With high capacitor values you will get lower pitches, vice versa small capacitor values will result in high pitches. With some of the values (220nf) it will be possible to calibrate the oscillators pitch with the small trim-potentiometer so it will react to v/oct.

FLD

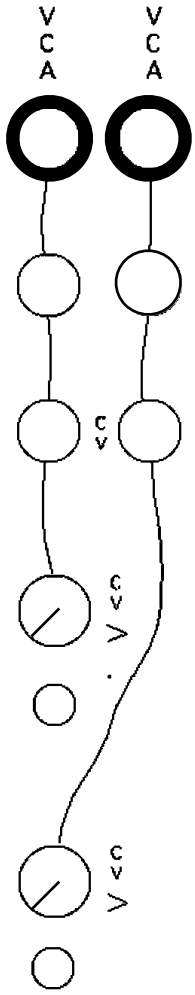


The FLD module is a combination of a Wavefolder and a vactrol based VCA. The CV input controls the amplitude of the VCA which can also be controlled via the OFFSET knob. The FOLD knob sets the amount of wavefolding, set to minimum the signal will stay unaffected. With OFFSET set to maximum, the signal will pass the VCA unchanged in amplitude. Depending on the settings of the LEVEL and FOLD knobs the effects can be used separate or simultaneously. It works aswell as attenuator.

FLT



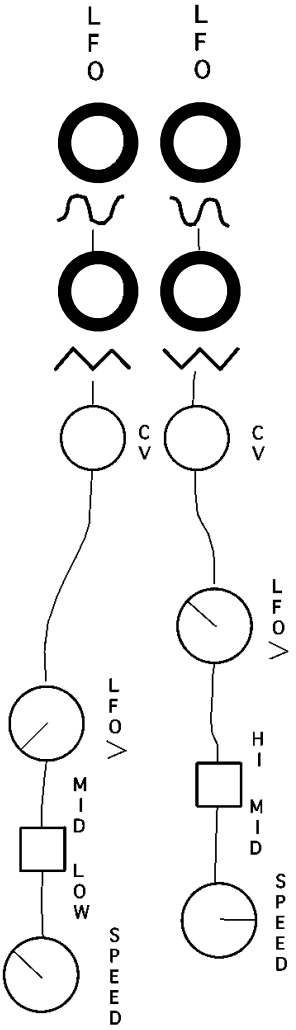
The filter section contains a wonky but characterful version of a wasp filter. The Low Pass out (LP) closes down to 150 Hz. In high LEVEL settings the filter will also add distortion to the signal. It can scream in high resonance settings, but also self resonates with smooth sine waves. The FINE knob kind of controls the bandwidth and the amplitude of the resonance at the same time. In combination with the RES knob it unfolds the potential of this filter.



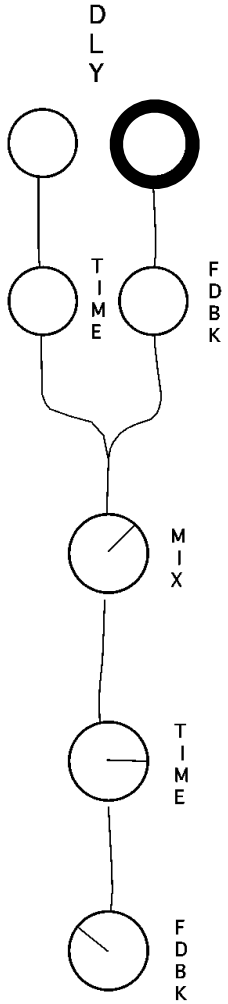
VCA

The two identical VCA modules are based on a fairly old circuit. The control voltage input response is more exponential than linear and it adds a slight distortion. You can attenuate the CV input signals with the LEVEL-knob. On the back panel you can change the regular NPN transistors (2N3906) to a PNP transistor (2N3904) to invert the function of the VCA, so it is always open and closes with a CV input signal.

LFO



The two LFOs offer a wide frequency spectrum and can therefore be used as a modulation or audio source. Both have a triangular and sine wave out. While the first LFO concentrates on fairly slow modulation sources, the second LFO focuses on faster settings, it can be used in audio rate, especially good as a subby sine wave generator. The CV input can be used to link the LFO with any external clock for weird behaviors.

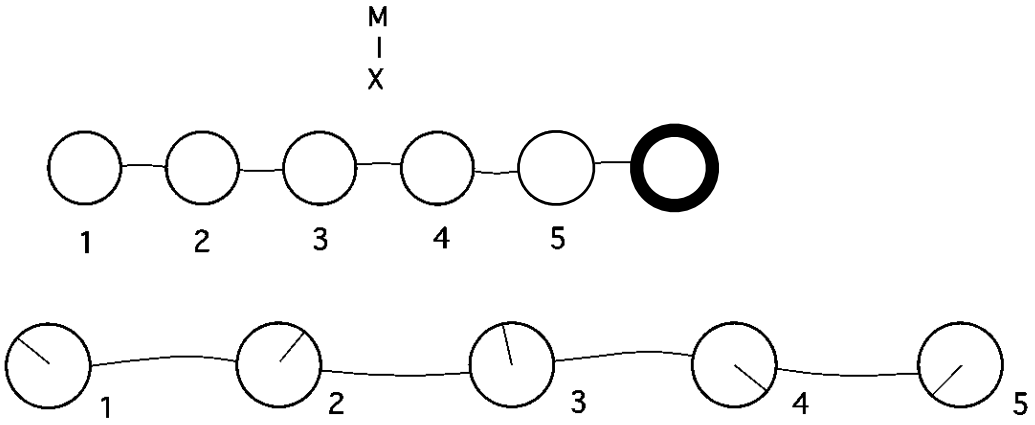


DLY

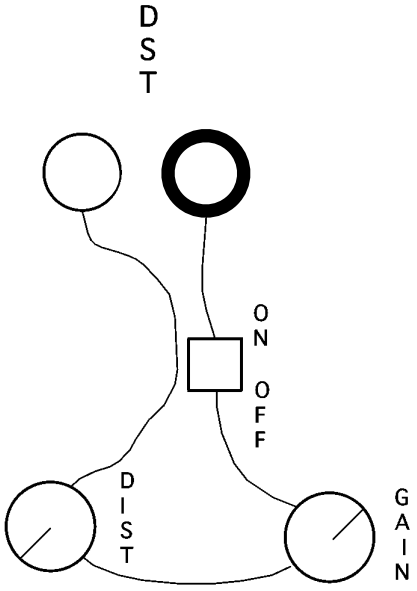
The two delay units are based on the PT2399 delay chip, which is well known for creating a characterful LoFi analog style delay. The first unit focuses on longer delay times and glitches. With diodes in a hard clipping configuration in the feedback path it is possible to create endless crunchy delay feedbacks. The second delay unit focuses on karplus strong effects and short delay time settings. If you turn this feedback knob all the way up it may harm your ears.

MIX

The MIX module contains an active five channel mixer, with dedicated volume knobs for each channel and sums all signals on the white encircled jack.



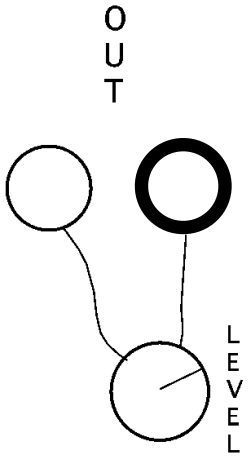
DST



The DST module offers a high gain amplifier and all combinations of diode clipping distortion. In fact the DST module got a higher gain than the AMP module, so it can be seen as a second input pre amp as well. Two diodes are placed in a hard-clipping configuration and one in a soft clipping configuration. Feel free to place different types of diodes inside the pin sockets at the backside of the PCB or even leave some away.

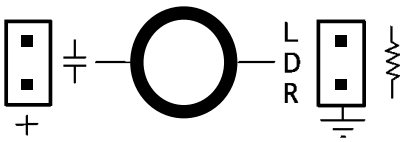
OUT

The Output Module amplifies the signal 1.5 times. In the integrated hard patch it functions as the main volume control, but if you patch in an audio signal it can also be used as an attenuator.



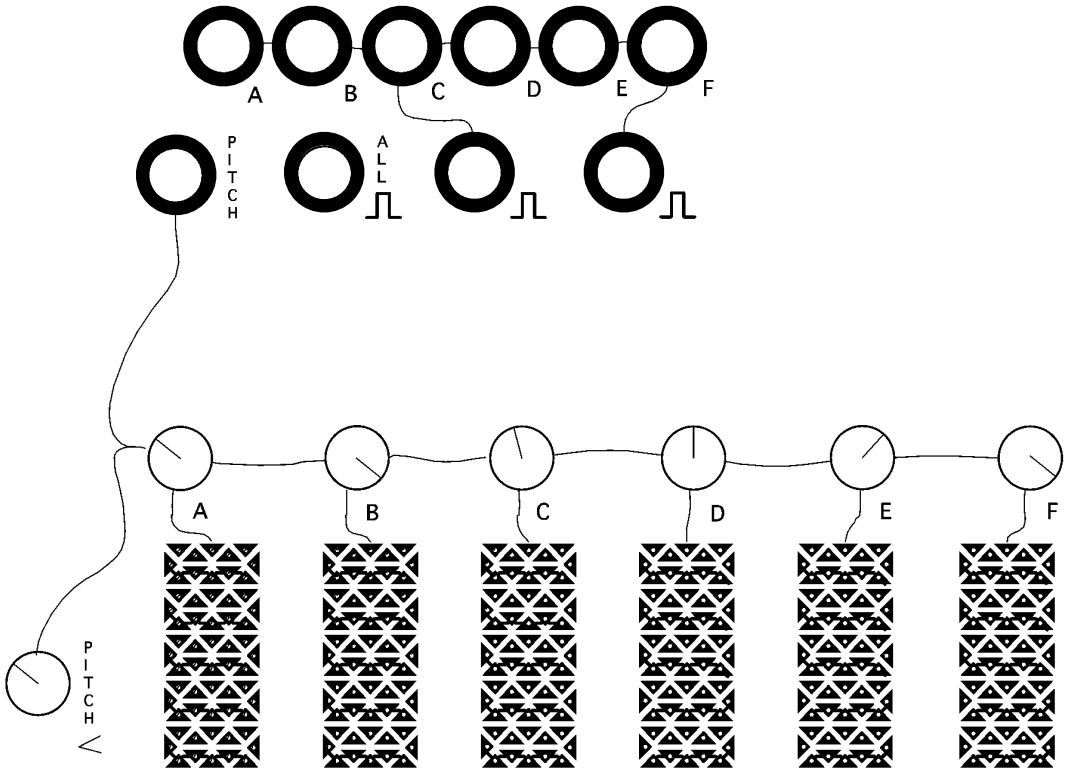
LDR

There are two LDR modules on the board. One close to the filter and one woven into the distortion unit. If you place two LDRs inside the pin sockets on the front panel you will get CV signals on the outputs depending on the surrounding light intensity with one LDR lowering the signal and the other rising the signal. Replace one of the LDR with a capacitor it slews the decay of the CV signal for smoother controls. And if you instead replace the other LDR with a resistor the signal goes only higher with a brigther light intensity. Also two resistors can be placed into the pin sockets to set a fixed voltage.



TOUCH PADS

Every of the six touch pads (A B C D E F) has its individual CV output with a range of 0-9 Volts. All six pads (A B C D E F) can be tuned to an individual note with the knob on top of the pads and be outputted at the pitch out. When pressed simultaneously the pitches of the pads will be summed together. This results in 63 different combinations of pressing the pads together make it possible to play complex melodies. Also the gate signals are summed on a dedicated ALL output and two individual gate outs for pad three and pad six.

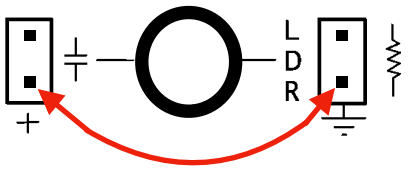


Warnings and Safety Instructions

DAMAGED GEAR

Warning! Several modules of this device can be modified by changing some components on the back or front panel. If you make these changes according to the instructions above, everything should be fine. Experimenting with the circuit bending points without any knowledge in electronics might result in damaging your unit.

DON´T CONNECT THESE TWO PIN SOCKETS! TOGETHER!



SHORT CIRCUIT

ELECTRIC SHOCK

CAUTION! Under some circumstances this device can lead to fire or electric shocks. Several small voltages lay on the front panel of the unit, make sure that your surroundings are dry and clean. Exposing this appliance to rain, moisture or splashing liquids has to be strictly avoided! Take care of your children!