WERKSTATT-01
ASSEMBLY INSTRUCTIONS

PARTS LIST

A)   Werkstatt Ø1 Printed Circuit Board (PCB)................................. x 1
B)   Bottom Chassis (metal).. x 1
C)   Top Panel with silkscreened printing(metal)............................ x 1
D)   12 Volt DC power adapter... x 1
E)   Hardware Kit containing:
      a. Keyboard button caps................................. x 13
      b. 1/4" Sheet metal screws (Black)............................ x 4
      c. 1/4" Pan head machine screws (Silver)................ x 5
      d. Black nylon washer....................................... x 1
      e. Black nylon hex nut....................................... X 1
      f. Rubber feet.. x 4
      g. Patchable Header cables........................... x 5
F)   Serial Number label.. x 1

1. ATTACHING THE FEET

Attach the four rubber feet by pushing them into the holes of the Bottom Chassis and gently twisting.
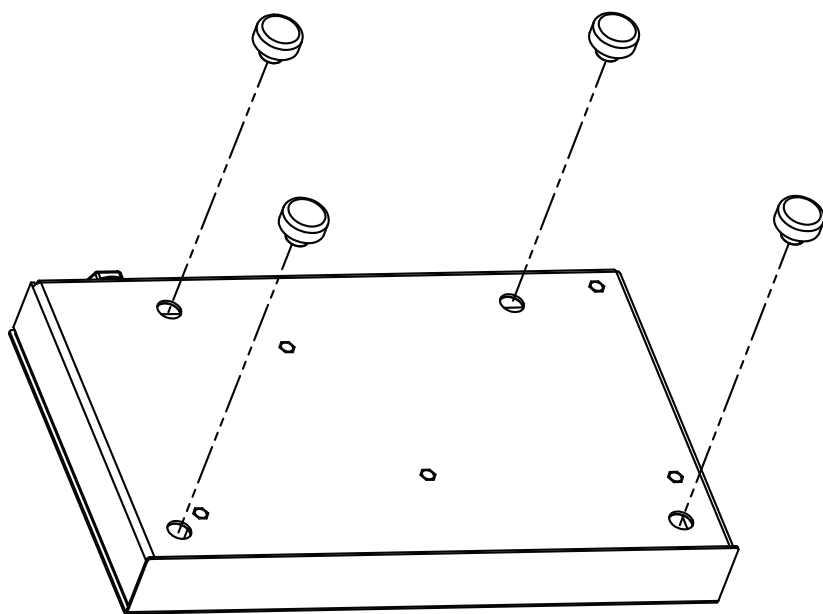

2. TRIMMING THE NYLON WASHER

The black nylon washer is used to isolate the audio jack from the inside of the Bottom Chassis. In order to slide the washer onto the audio jack, you will need to cut a 1/16" section from the washer.


3. INSTALLING THE ELECTRONICS

Carefully remove the Printed Circuit Board from the protective sleeve. Take the washer you prepared in the previous step and slide it onto the audio output jack, lining up the missing section with the metal tab on the jack.
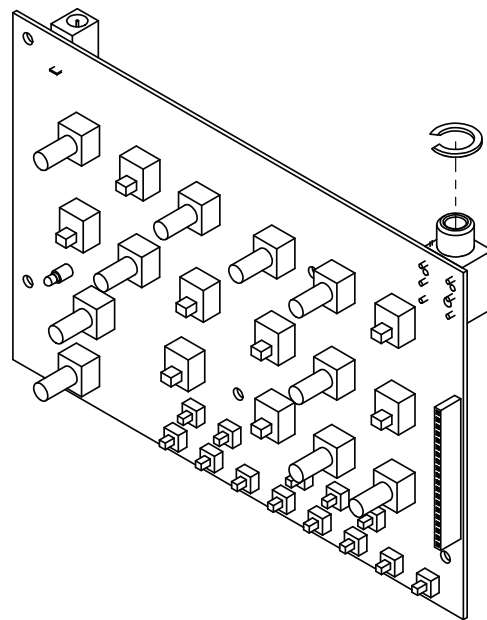
Next, place the Printed Circuit Board into the Bottom Chassis. Slide the audio jack through the jack hole, and be sure the five mounting holes in the Printed Circuit Board line up with the standoffs on the Bottom Chassis. Using the silver pan head machine screws (x5), loosely attach the Printed Circuit Board to the chassis. Take a moment to make sure everything is lined up neatly and correctly—including the power input jack—and then go ahead and tighten the screws.
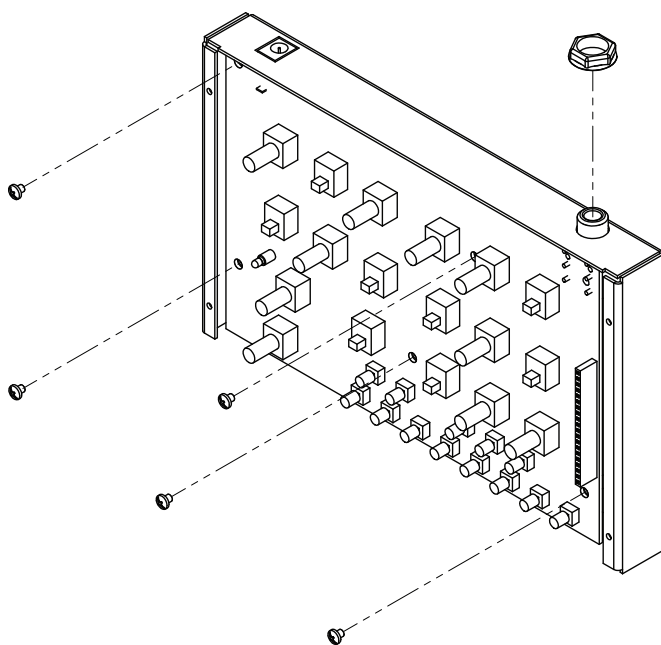

Finally, place the black nylon hex nut on the audio jack, and hand-tighten the nut to hold the jack securely to the Bottom Chassis.

4. POWER/LED TEST & KEYBOARD

Using only the included power supply, connect the barrel end to the power supply input of your Werkstatt-Ø1; connect the other end to an AC wall outlet (100-240 Volts AC / 50-60 Hz). At this point, the red LED on the front panel (LFO) should begin blinking. If it does, you're ready to move on.

Unplug the power supply from the Werkstatt before proceeding.

Place the 13 button caps on the keyboard buttons.
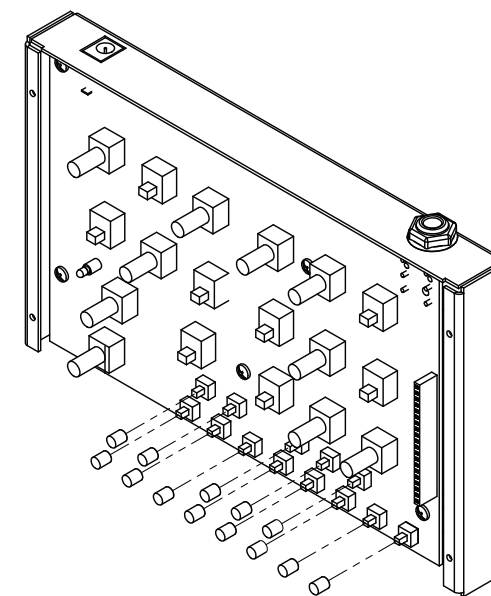
5. ADDING THE TOP PANEL

Next, place the Top Panel in position so that all of the knobs, switches, and keyboard buttons pass through the corresponding holes. Secure the Top Panel using the black sheet metal screws. The screw holes in the Top Panel should line up with the screw holes in the Bottom Chassis. *NOTE: Tightening these screws may require a little extra effort the first time.*
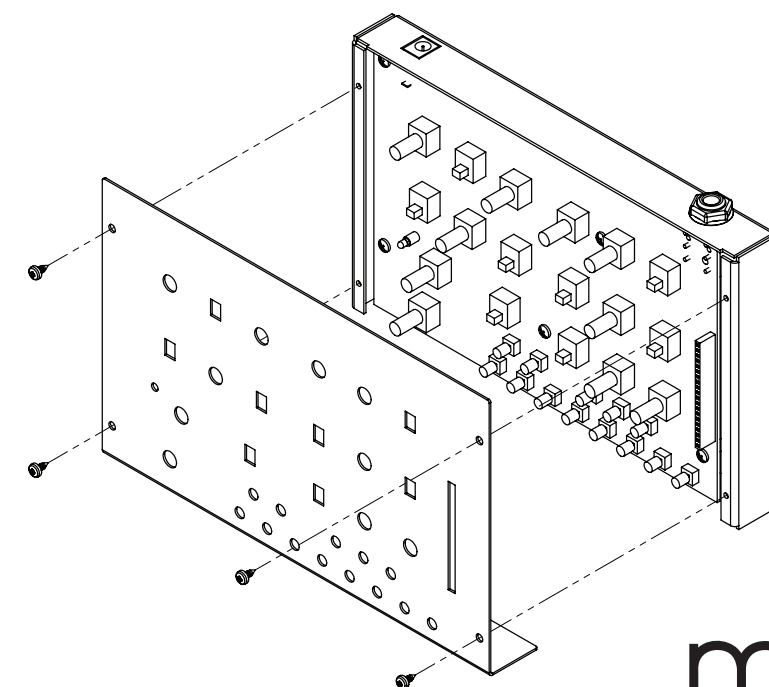
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WERKSTATT-01

QUICK START

To Learn More About Your Werkstatt Analog Synthesizer Download The Manual At: Moogmusic.com/werkstatt

VCO

A single Voltage Controlled Oscillator with two selectable waveforms is Werkstatt's primary source of sound.

FREQ - The Frequency knob sets the pitch of the VCO. Its range is 9+ octaves.

WAVE - Saw and Pulse waveforms are available on the Werkstatt. Each carries a distinct harmonic content, or timbre. When set to *SAW* the PWM knob is disabled.

PWM - The Pulse Width Modulation knob can be used to determine the width of the Pulse wave, thereby changing the timbre of the wave.

VCO MOD

Oscillator Modulation is a way of creating everything from subtle pitch vibrato, and chorus-like sounds to metallic and harsh effects.

SOURCE - The Source switch determines which Modulation Source will be applied to the Oscillator. *EG:* The Attack, Sustain, and Decay characteristics of the Envelope Generator will be used as the VCO modulation source. *LFO:* The Low Frequency Oscillator will be used as the VCO modulation source.

AMOUNT - The Amount knob is used to control the depth of the modulation.

DEST - The Destination switch determines which control will be affected by the chosen Modulation Source.With this switch set to PWM, the PWM knob is disabled. *PWM:* The Modulation source is used to continually vary the width of the Pulse wave. The VCO WAVE switch must be set to Pulse. *FREQ:* The Modulation source is used to continually vary the pitch of the Oscillator.

LFO

The Low Frequency Oscillator creates a cyclical modulation source that can be used to add a repeating change to any modulation destination.

RATE - Controls the speed, or frequency, of the LFO. The LED flashes once for every wave cycle, displaying the LFO speed.

WAVE - This switch allows you to select the Waveform of the LFO. *SQUARE:* The LFO will alternate directly between two distinct values representing the upper and lower limits of the wave. *TRIANGLE:* Creates a continuously changing value that sweeps between the upper and lower limits of the wave.

KBD - The keyboard features one-octave of round buttons as opposed to traditional keys, but the layout is the same. If more than one note is played at a time, the lowest note will be played.

GLIDE - Determines the time it takes to make a smooth pitch transition from one note to another note.
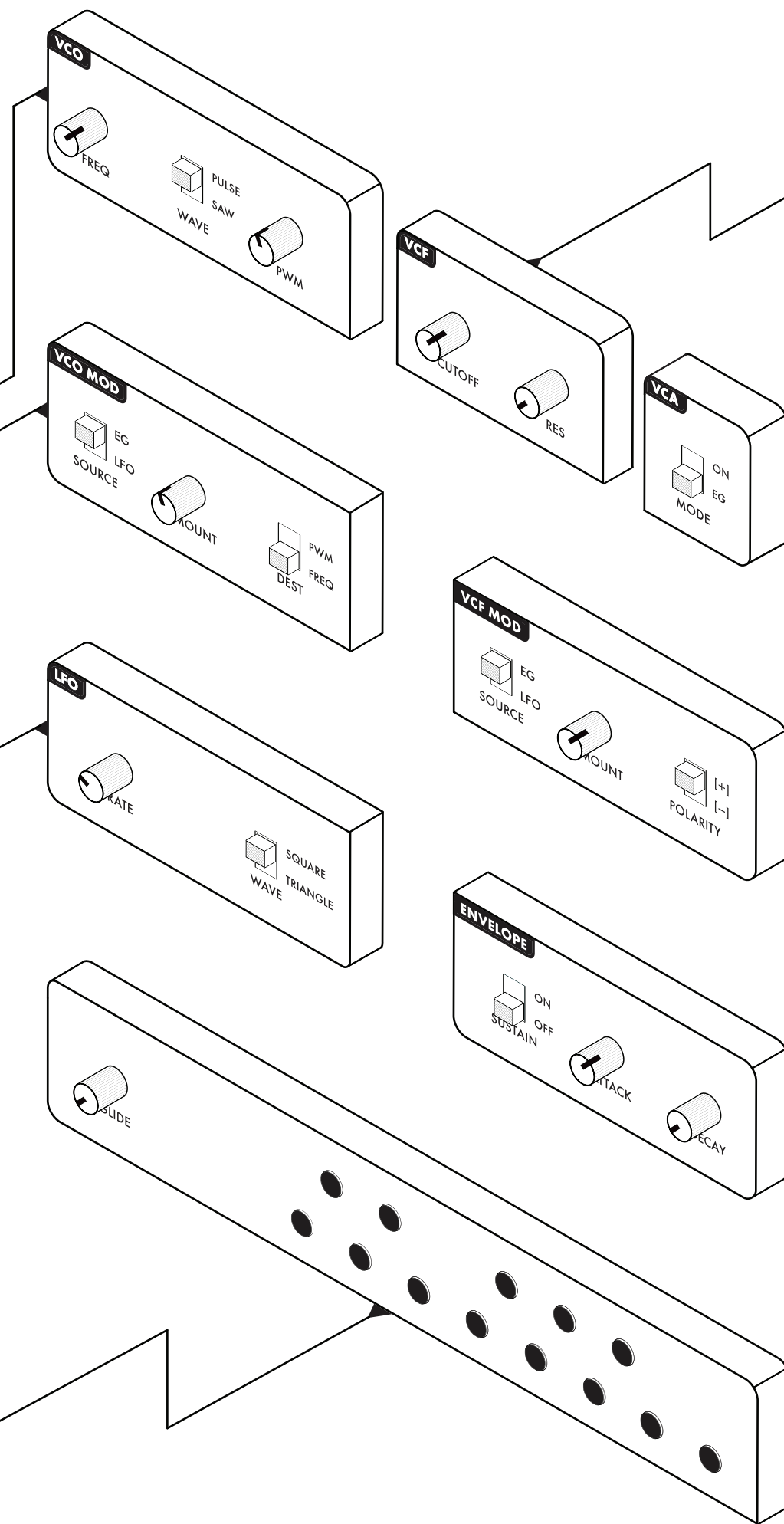
VCF

The Voltage Controlled Filter is a classic 24dB per octave Moog Ladder filter, which shapes sound by attenuating and/or emphasizing certain harmonic elements.

CUTOFF - The Cutoff knob specifies the frequency at which the Filter begins to attenuate sound.

RES - The Resonance knob determines the amount of harmonic emphasis applied to the filter cutoff frequency.

VCA

The Voltage Controlled Amplifier determines the output level of the Werkstatt. Its source is determined by the Mode switch.

MODE - The VCA can function in one of two ways, selected by the Mode switch. *ON* - The audio signal of the Werkstatt will output, or drone continuously. *EG* - The audio output level is controlled by the Attack, Sustain, and Decay characteristics of the Envelope Generator Module.

VCF MOD

Filter Modulation changes the value of the Filter's Cutoff Frequency.

SOURCE - The Source switch determines which Modulation Source will be applied to the filter cutoff. *EG:* The Attack, Sustain, and Decay characteristics of the Envelope Generator will be used as the VCF modulation source. *LFO:* The Low Frequency Oscillator will be used as the VCF modulation source.

AMOUNT - The Amount knob is used to control the depth of the modulation.

POLARITY- When EG is the modulation source, its Polarity can be reversed. This allows the envelope Attack to lower the Filter Cutoff Frequency Instead of boosting it. **[+]:** Normal Polarity **[-]:** Reverse Polarity.

ENVELOPE

Each time a key is pressed, the Envelope Generator produces control voltages that allow you to change the value of certain parameters over time.

SUSTAIN - Determines how the Sustain segment of the Envelope Generator will work when a note is held. *ON:* The Envelope will continue to sustain as long as the keyboard key being held. This results in an organ-like behavior. *OFF:* The Envelope will advance directly from the Attack stage to the Decay stage. This results in a plucked sound.

ATTACK - Determines the time it takes for the Envelope Generator to reach its maximum level after a key is pressed.

DECAY - Determines the time it takes for the Envelope Generator to reach its lowest level after the key is released, or after the attack segment is complete.

PATCHABLE HEADER - This allows control signals generated by the Werkstatt to be easily routed to the control inputs of the VCO, VCF, VCA, and LFO. The patch wires included with the Werkstatt are designed to make the most of these patch points.

VCO
FREQ
PULSE
SAW
WAVE
PWM

VCF
CUTOFF
RES

VCA
ON
EG
MODE

VCO MOD
EG
LFO
SOURCE
AMOUNT
PWM
FREQ
DEST

VCF MOD
EG
LFO
SOURCE
AMOUNT
[+]
[-]
POLARITY

LFO
RATE
SQUARE
TRIANGLE
WAVE

ENVELOPE
ON
OFF
SUSTAIN
ATTACK
DECAY

GLIDE

CV IN
VCA IN
VCF IN
VCO LIN IN
VCO EXP IN
LFO IN
VCF AUD IN
KB CV OUT
TRIG OUT
GATE OUT
EG OUT
LFO OUT
VCF OUT
VCO OUT
CV OUT