

CHERNOBYLIZER by Isnt'ses
Build guide and BOM

The Chernobylizer is straightforward to build but you must take care to get everything in the right place. ALWAYS DOUBLE CHECK COMPONENTS BEFORE SOLDERING AS DE-SOLDERING IS TROUBLESOME. SAVE YOURSELF TROUBLE :) BE SURE BEFORE SOLDERING.
Further info on this circuit and its development can be found at www.isntses.co.uk/blog

Step 1. Resistors:

Insert the resistors first, bend the legs close to the blob to ensure they fit nicely. Before soldering, check that each resistor is in the right place. (You can look up the colour codes to double check. <https://www.hobby-hour.com/electronics/resistorcalculator.php> is a good online resistor calculator.)

R2, R3, R7, R8, R9, R10, R11, R12, R19, R22, R23, R24, R25, R26, R27, R28	x 16	100k
R1	x 1	22r
R14, R20, R21	x 3	1k
R15	x 1	5k1
R13	x 1	15k
R16	x 1	22k
R18	x 1	174k
R17	x 1	220k
R5, R6	x 2	2m2
R4	x 1	5m6

Step 2. IC Sockets

When inserting the chip sockets ensure they are correct with the notch at one end matching the notch on the PCB. Ensure the number of pins match the number of holes and are fully inserted so the socket is flat against the PCB. Hold or tape them firmly in place before soldering and solder two corner pins first followed by the rest of the pins. Ensure there are no solder blobs joining any of the pins together.

U1, U3	x 2	14-pin DIP socket
U2, U4	x 2	8-pin DIP socket
U5	x 1	16-pin DIP socket

Step 3. Capacitors: ceramic disc & film capacitors - non-polarised

Ensure you check the values on the capacitors.

C4, C5, C19	x 3	4.7nF (aka 4700pf) - Code: 4n7 or 472
C1, C2, C3	x 3	10nF (aka 10000pf) - Code: 103
C22	x 1	47nF (aka 47000pF) - Code: 47n or 473
C13, C20, C21, C23, C24, C25, C29	x 7	100nf (aka 0.1uF) - Code: 104

Step 4. Electrolytic capacitors - polarised

These are cylindrical, the negative side is indicated by a white stripe and a shorter leg. Match the stripe with the white half-circles on the PCB. Important: If inserted the wrong way, the circuit will not function correctly. DOUBLE CHECK POLARITY AS UNSOLDERING THESE IS COMPLICATED.

C18	x 1	1uF
C14, C27	x 2	10uF
C15, C28	x 2	47uF
C6, C11, C12, C26	x 3	100uF - LEAVE OUT C11 , it is no longer required
C16	x 1	220uF
C7, C8, C9, C10	x 4	1000uF

Step 5. Diodes

D3: Match the stripe on the diode to the stripe on the PCB (and the square solder pad.)
LEDs: Match the shorter leg with the square solder pads on the PCB. If you are uncertain, search "LED polarity diagram" online.

D1, D2	x 2	3mm LED
D3	x 1	Diode 1N5817 (DO-204AL)

Step 6. Jacks and switch

The jack sockets should fit in easily with the silver side on the outside. The switch can go either way around. Check all legs are in properly before soldering.

J2	x 1	DC barrel jack socket - 2.1mm pin
J3, J4	x 2	PJ301BM 3.5mm mono jacks
SW1	x 1	SPST miniature toggle switch

Step 7. Potentiometers

The pots should clip firmly into place. The pots are DIFFERENT VALUES, ensure these are in the correct place according to the value. Ensure legs are correctly inserted and straight before soldering.

RV1	x 1	"Liquidator" - 1k 9mm potentiometer, linear taper
RV2	x 1	"Bio-robot" - 10k 9mm potentiometer, linear taper
RV3, RV4	x 2	"Metallik" & "Mystikal" - 100k 9mm potentiometer, linear taper
RV5	x 1	"Berserk" - 500k 9mm potentiometer, linear taper

Step 8. ICs

Insert the IC's into the sockets. Ensure they are inserted the right way up, matching the notch on the socket. Ensure all legs are all straight and none are bent over or outside their holes. (Take care to insert U2 and U4 in the correct position as they look similar)

U1, U3	x 2	CD40106BE - DIP-14
U2	x 1	LM386 audio amplifier - DIP-8
U4	x 1	LM358 op amp - DIP-8
U5	x 1	CD4046BE phase locked loop - DIP-16

Step 9. Test the circuit

CHECK ALL SOLDER JOINTS, ENSURE CHIPS ARE IN CORRECTLY. Make sure the switch is in the up position. Turn all 5 knobs fully clockwise.
Connect the left-hand output socket to a mono input of a mixer or amplifier. Turn the volume to a fairly low setting and connect the 9v power to the Chernobylizer.

If you don't see the LEDs light up, or don't hear anything, immediately unplug the circuit and check your solder joints and that the components are all inserted properly.

If the circuit is working properly you should hear a continuous drone/noise which rises in pitch then slowly falls. Play with the other controls and touch the touchpads. The right LED eye should be on continuously and the left eye should flicker in relation to the sound output.

You should have a fully functioning synth, this is incredible and you are a noise master.

If it is not working common problems may include: missed solder joint, dry solder joint, chips not inserted correctly, wrong power supply, polarity of capacitors not correct.

Chernobylizer

By Isn'tses

The Chernobylizer is a psychogeographic and esoteric synthesiser designed by Isn'tses (Lisa McKendrick & Tim Drage). This synth contains a world of unique aggressive sounds, including throbbing multi-oscillator pulsewaves, crunchy glitches, bass rumble, harsh noise, 8-bit-esque bleeps, geiger-counter clicks, birdlike tweets and a unique motor-like power-draining effect. Detailed PCB art covers both sides of the board.

The synth is controlled by five knobs and 9 touch-pads. Multiple oscillators interact in deep and mysterious ways, and can be manipulated by an unorthodox resonant pseudo filter and a versatile power-starving section.

The Chernobylizer attempts to add to the conversation surrounding the Chernobyl disaster and is an experiment in horror noise. This comes from our own personal interest in Chernobyl and research into the radiation disaster. The silver outline on the front of the PCB represents the decontamination zone and the white outline on the back is the exclusion zone. The four large capacitors represent the four reactors of the Chernobyl plant. The touch pads are mutated forms, mutations caused by radiation. The three 'phantom touchpads' on the right only have an effect when also touching some of the other pads on the left hand side of the switch.

The power-starve switch represents the draining of power to reactor 4. If the switch is turned downwards, power will slowly drain from the four large capacitors causing the synth to create a sound similar to the reactor losing power followed by a Geiger counter crackle, then to little or no sound as it is fully drained. Note: this is not an on/off switch but if the synth is making no sound it may have fully drained; turning the switch back up will restore power to the circuit in a full-on explosion of sound. This is a rough reenactment of how Reactor 4 exploded. The middle knob controls the wet and dry signal of the filter. All the 5 knobs can be experimented with to create various explosive, loud, crackling noises and drones.

OUTPUTS

The synth has two outputs:

1. The output on the left is an audio output and includes all sounds coming from the synth.
2. The output on the right does not include sounds coming from the filter but includes all other sounds from the oscillators. It is an unfiltered, DC-coupled output which could also act as a weird gate/trigger/LFO signal when connected to other synths or modules. In this way it is compatible with various Eurorack modules and other synths which have CV, gate or clock input.

The Chernobylizer does not have an input.

LEDs

The LED on the right lights up when the synth is on, and the one on the left flickers with the oscillators! We call them the bat eyes.

POWER SUPPLY FOR THE SYNTH - IMPORTANT

The Chernobylizer is powered by any standard BOSS-style 9v **centre-negative** power supply. Or it can become portable with a centre-negative DC-jack-to-9v-battery-clip adaptor (not included). Using any other power supply may cause the synth to short circuit so please be careful.

IMPORTANT

As this is an open circuitboard synth, take care to avoid placing on a metal/conductive surface while playing or you will short something out! It's best to use our laser-cut acrylic base kit (available separately from isntses.etsy.com) or make your own plastic or wooden base for the synth, or to stick some small rubber feet on the bottom.

Dimensions: 15cm (W) 10.5cm (L) 3cm (H)

The Chernobylizer plays well through the input of Isn'tses other synth, the Fort Processor

For more information on the development of the Chernobylizer, as well as demo videos, please visit the Isn'tses blog: <http://www.isntses.co.uk/blog>
isntses.etsy.com

CHERNOBYLIZER

by Isn'tses (Lisa McKendrick & Tim Drage)

www.isntses.co.uk

MAIN AUDIO OUTPUT
3.5mm mono jack socket
(AC coupled)

SECONDARY OUTPUT
DC-coupled pulsewave output.
Just the starved oscillators, not the pseudo-filter sound.
Use as a gate/CV/clock signal for other synths or modules, or as audio. Hot signal which can output sub-audio frequencies or DC offsets!

KNOBBS:

RV1 - LIQUIDATOR
Pseudo-filter frequency control

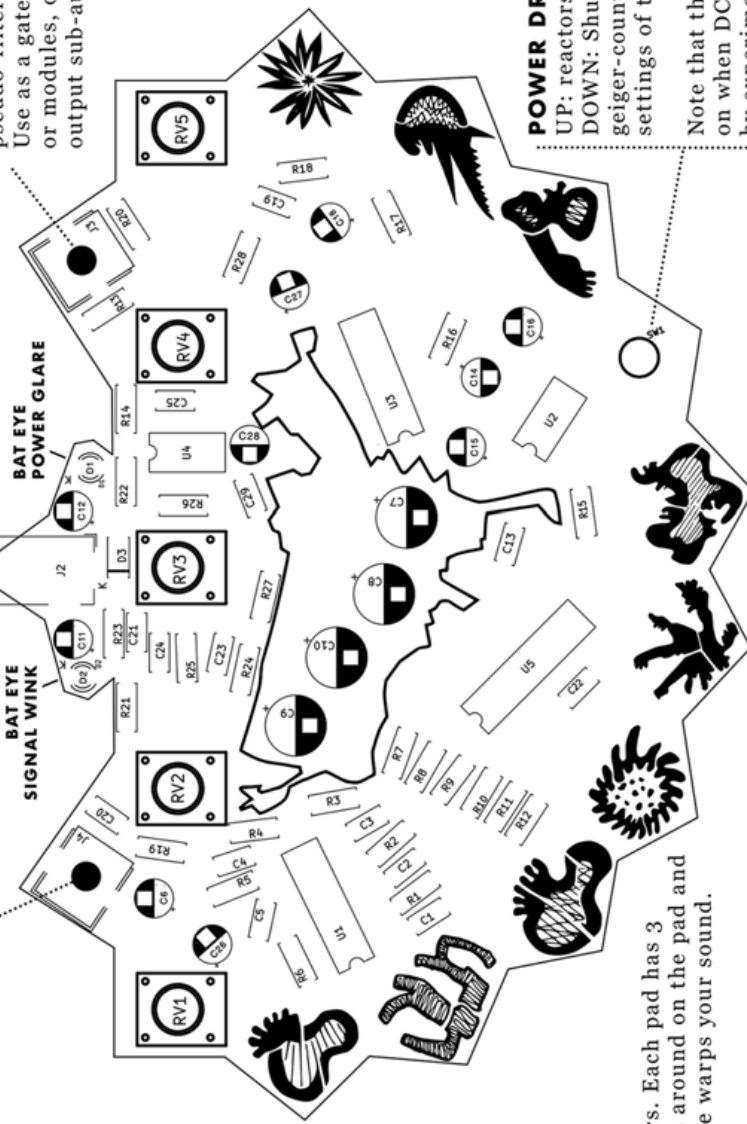
RV2 - BIO-ROBOT
Pseudo-filter resonance control

RV3 - METALLIK
Wet/dry crossfader
between pseudo-filtered
and plain oscillators

RV4 - MYSTIKAL
Power bend

RV5 - BERSERK
Power starve: anticlockwise
= less volts to the oscillators,
more noise and chaos

REACTOR TOUCHPADS
Six power-starvable oscillators. Each pad has 3 contacts; moving your fingers around on the pad and touching multiple pads at once warps your sound.



PHANTOM TOUCHPADS
Three fixed oscillators which are not normally connected to the audio path. Experiment with touching these alongside the other pads to bleed and modulate for sweet chaos.

POWER DRAIN SWITCH
UP: reactors have power.
DOWN: Shut down the reactor. Sound drains away to geiger-counter clicks or different sounds depending on the settings of the MYSTIKAL and BERSERK knobs.

Note that this does not switch the synth off! The circuit is on when DC power is connected, and you can still get sound by experimenting with the filter and touchpads. Turn the switch back on to blast into noise oblivion once more!