

Noise Toy

Noise Toy is a kit specifically designed for circuit bending. It emulates a child's toy and includes samples of sounds typically found in such devices as well as nursery rhyme tunes. These sounds can be distorted and glitched in complex ways.

In keeping with the methodology of circuit bending it's a bit of a puzzle working out how to get interesting sounds out of it. If you get stuck this document describes in detail how the kit works:

www.madlab.org/documents/HowNoiseToyWorks.pdf

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Construction

First fit and solder the resistors (R1 to R29, excepting R7) to the circuit board and trim their legs. Identify the resistors by the coloured stripes on the body. Note that R7 is replaced by a ferrite bead.

Next fit the chip sockets (IC1 and IC2) matching the notch in the socket against the notch in the symbol on the board. Care should be taken when soldering these components to avoid solder bridges between the pins. It is not recommended that the chips are soldered directly to the board.

Solder the ferrite (R7) either way around.

Fit and solder the capacitors, paying attention to the polarity of the electrolytics (C1, C2, C3 and C4) (negative is marked by a stripe on the side of the body). The tantalum capacitor (C7) should be fitted such that the shorter leg is by the minus sign. The ceramic capacitors (C5, C6 and C8) and the polyester capacitor (C9) can be fitted either way around.

Bend the legs of the regulator (REG) at right angles and solder it such that the metal heatsink is flat on the board and the side with the writing is facing upwards. Solder the LEDs (LED1 to LED4) matching the shorter leg (also flat on the rim) to the hole with the line.

Solder the transistor (TR1) matching the shape to the symbol on the board.

Solder the jack socket (AUDIO).

Solder the power socket (POWER). Optionally also fit the PP3 battery snap (BATTERY). Support holes are drilled on the board for the battery snap leads. Feed the leads up through the support holes from the track side of the board and then down the solder holes. Red is positive and black is negative.

Don't fit the chips into their sockets until you have thoroughly checked your construction. Check that all the components have been inserted correctly and that there are no dry joints and no solder bridges between pins. Then match the small notch in each chip to the notch in its socket.

Attach rubber feet to the underside of the board at the corners.

Connect headphones or powered speakers (with a 3.5mm jack plug) to the audio output socket.

Either connect a mains power supply (5-9V regulated DC, 300mA, centre +) to the power socket, or 4 AA cells to the battery snap.

The software includes a power-on self-test. The LEDs should flash twice and it should beep if the board is functioning correctly.

Noise Toy can output an audio signal on its jack socket which has a maximum peak-to-peak of about 2 volts. This is more than capable of producing a loud sound in a pair of 32-ohm impedance headphones.

Component list

Resistors

R1, R2	100R (brown, black, brown, gold)
R3, R4, R8, R10 - R13	10k (brown, black, orange, gold)
R5	470R (yellow, purple, brown, gold)
R6, R9	150R (brown, green, brown, gold)
R14 - R27	1k (brown, black, red, gold)
R28, R29	330R (orange, orange, brown, gold)

Capacitors

C1, C4	220uF electrolytic (blue or black)
C2	10uF electrolytic (blue or black)
C3	100uF electrolytic (blue or black)
C5, C6, C8	100nF ceramic (brown, marked '104')
C7	10uF tantalum (yellow/brown, beaded)
C9	100nF polyester (yellow or blue, square)

Semiconductors

TR1	ZTX689B transistor (black)
REG	LD1117V33 LDO 3.3V 0.8A regulator (black/silver)
LED1, LED2	5mm blue
LED3, LED4	5mm red
IC1	MCP4921 12-bit DAC + 8-pin socket
IC2	dsPIC33EP128MC202 microcontroller + 28-pin socket

Miscellaneous

R7	ferrite
AUDIO	3.5mm jack socket
BATTERY	PP3 moulded battery snap + 4 x AA battery box
POWER	2.1mm dc power socket

PCB

Self-adhesive rubber feet x 4