The Fort Processor by Isn'tses
build guide and instructions

Further info on this circuit and its development can be found at http://isntses.co.uk/blog

Building Instructions
(These instructions and components are only for the black version of the Fort Processor circuit board: if you have a different colour PCB see our site for another build document.)

At each step double-check the components are in the right place before you solder them, or better still get someone else to do so.

Step 1: Resistors & pots
Before soldering check each resistor colour code is the correct value. Larger resistors may have to stand on end to fit.

Label on PCB:	Value:	Qty	Notes:
/4, R2, R3, R14, R15	10k	5	
FUZZ, /2, R1	1k	3	
R4,R5	3m3	2	
R10,R11	47k	2	
R7	10M	1	
R8	20M LDR	1	Light dependent resistor
R9,R6, *C8*	100k	3	**NOTE: C8 is now a resistor, not a capacitor as marked.**
R12	470k	1	
(R13)	wire jumper		**NOTE: bypassed with wire - use a cut-off resistor leg**
RV1	100k trimmer pot	1	
POT1,POT2, POT3,	100k potentiometer	3	

Step 2: Capacitors
The electrolytic caps are polarised: the negative side (shorter leg, stripe on the side of the component) in marked with a white semicircle on the PCB. Ceramic caps aren't polarised.

Label on PCB:	Value	Qty	Notes
C1, C2, C3, C5, C9, C10, C11, C12, C14, C15, C18, C19, C20	100nF (AKA 0.1uF)	13	Ceramic capacitors, marked '104'
C4	10uF	1	Electrolytic cap. (controls chopper speed range.)
C6, C7, C16	1uF	3	Electrolytic caps. (C6 controls LDR range)
C22	100uF	1	Electrolytic capacitor.
(C8)	-	0	*(changed to a 100k resistor, as listed above.)*
C13	10nF (AKA 0.01uF)	1	Ceramic capacitor, marked '103'
C17	220nF (AKA 0.22uF)	1	Ceramic capacitor, marked '224'

Step 3: Sockets
Solder the IC sockets (check the number of legs) and the audio and power jacks.

Label on PCB:	Value	Qty	Notes
INPUTJACK, OUTPUTJACK		2	3.5mm switched stereo jacks
DC POWER JACK	DC Power Socket 3.5mm Centre-Negative	1	(or a 9v battery clip: red wire to +9v, black wire to GND)
4066, 4093	DIP-14 sockets - 14 legs	2	Make sure notches on sockets match those drawn on PCB
4049, 4040	DIP-16 sockets - 16 legs	2	"

Step 4: CMOS chips

Carefully insert the ICs in the sockets, making sure they are the right way round with the notches at the same end as is drawn on the PCB, and that all the legs are straight and in the correct holes.

Label on PCB:	Value	Qty	Notes
U1 - 4040	CD4040BE 12-stage Binary Counter	1	Octave divider
U2 - 4093	CD4093 CMOS Quad 2-Input NAND Schmitt Triggers	1	Oscillators
U3 - 4066	CD4066BE, Analogue Switch Quad SPST	1	Chopper/signal switcher
U4 - 4049	CD4049UBE, Hex, CMOS Inverter	1	Amplification/distortion

Step 5: check the circuit is working

The Fort Processor is powered by a standard Boss-style guitar pedal power supply, ie 3.5mm centre negative 9v DC. Take great care **never** to use any other kind of power supply! **There is no protection against reverse polarity**, so if you accidentally plug in a centre-positive or an AC/AC power supply you will damage the circuit and will have to replace the chips!

Before plugging in for the first time, connect the audio output to an amp or mixer - set to a cautiously low volume - so you can immediately tell if it's working and quickly the unplug the power if there is any problem.

The audio input is mono. If your cable is stereo then only the left (tip) signal will be used. The output signal is mono but split to left and right via resistors, so either TRS/stereo or mono minijack cables should work. We usually use a stereo minijack to dual-mono 1/4" cable for the output.

We recommend sticking small rubber feet on the underside of the board, or bolting it to a wood/cardboard/plastic base/shallow box using the provided screw holes, or simply placing it on a soft and non-conductive surface (eg fabric, rubber or wood) when you play. Do not place on a metal surface.

See our blog for modifications ideas and alternative power options: http://isntses.co.uk/blog