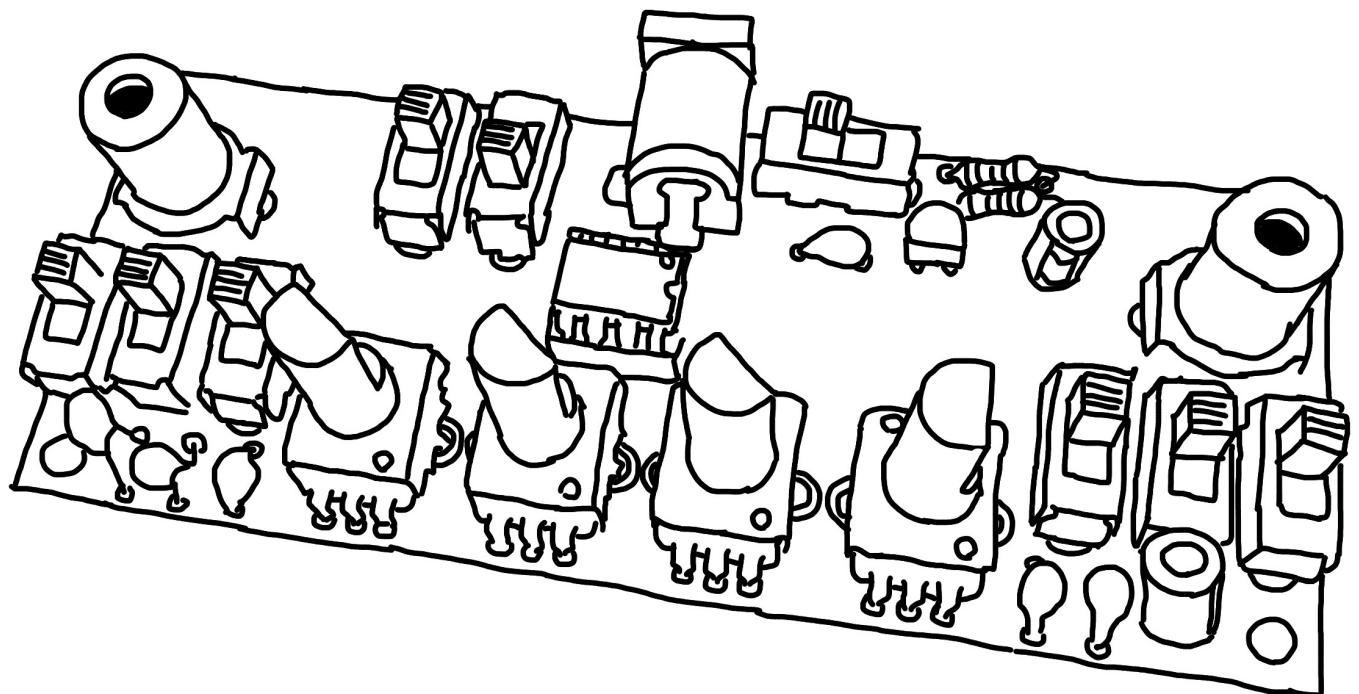


cyberboy666 & underscores.shop present
a circuit adapted from karl klomp design

rupture

simple analog video glitch

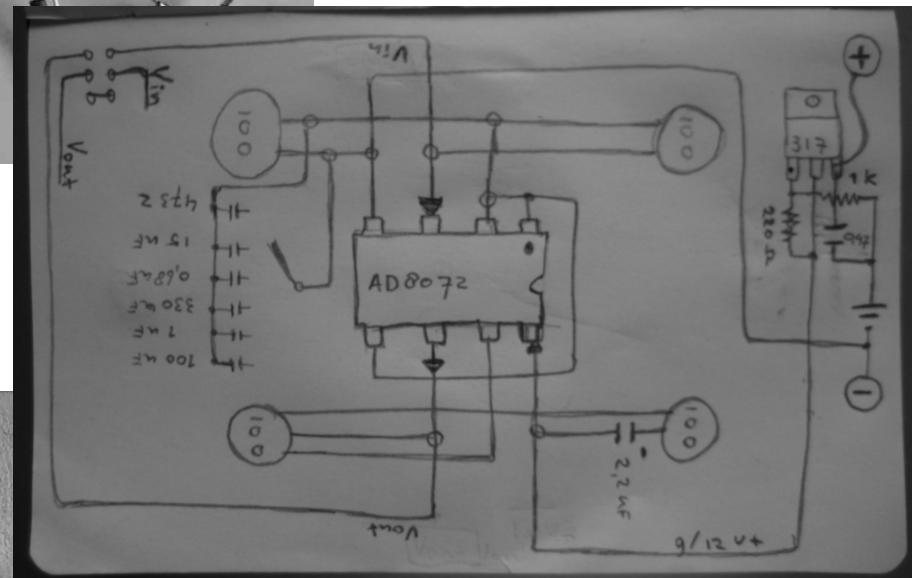
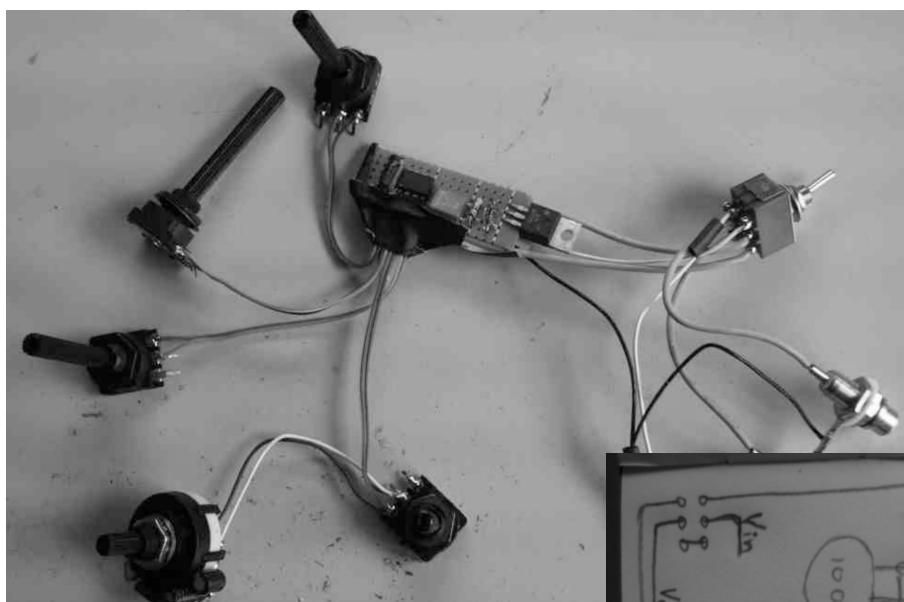


instruction manual and build guide
v0_2

View this project online at underscores.shop/_rupture_

BACKGROUND

this project is an adaption of a video glitch processing circuit created originally by Karl Klomp known as the rupter. this and many other interesting historic video hardware glitch machines can be seen on web-archive of their site. Pictures and schematic of the original circuit are below:



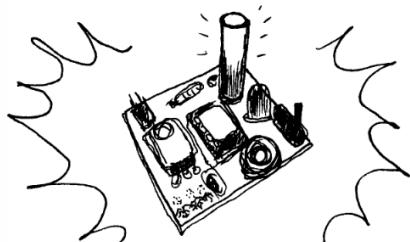
The current version of this circuit started as an exercise in my *Intro to Kicad* workshop that ran for VIDICON_2020

BUILD INSTRUCTIONS

It is highly recommended to use the interactive BOM to help with placement on this build - type kutt.it/qdZRSV into a browser or find the links from the github page

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HERE'S HOW TO DO IT



BY: MITCH ALTMAN
(SOLDERING WISDOM)
ANDIE NORDGREN
(COMICS ADAPTATION)
JEFF KEYZER
(LAYOUT AND EDITING)



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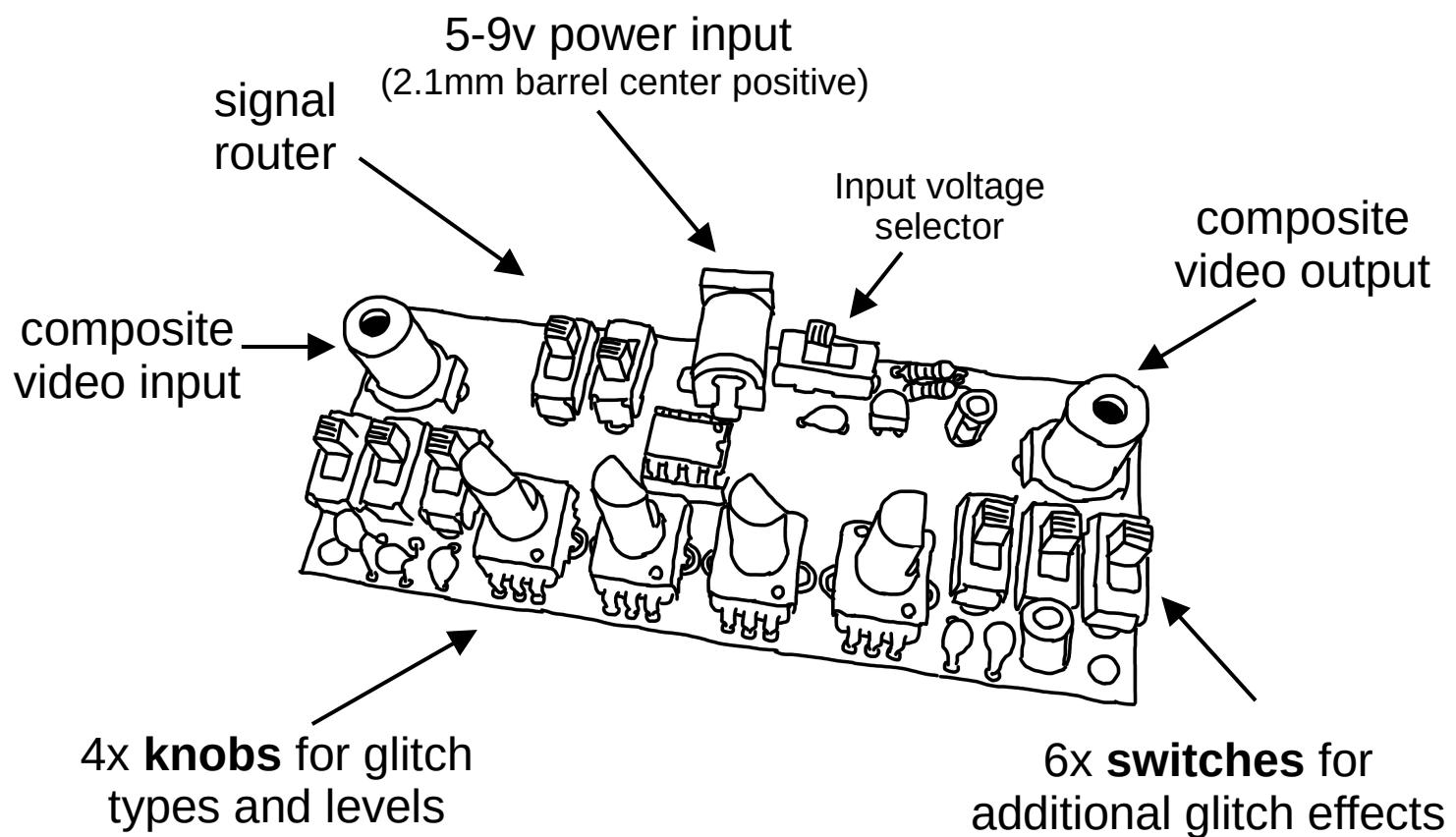
note on soldering: remember to heat pad first (2-3 seconds), then add solder, then continue to heat (1-2 seconds)

Checkout the web-comic *soldering is easy* for more soldering advice

- start with the resistors and capacitors, taking care to place the correct value in the correct footprint – for most direction does not matter – only electrolytic capacitors have direction as indicated on the silk screen. Place in as many as you are comfortable with at once and then solder and trim legs and repeat – can also do the regulator – where direction is also important
- now place in the switches - make sure enough solder is on the outer pins for structural stability – you may need to hold the switch in place with one hand while the other hand touches just enough solder to the pad to hold it in place for the other pins
- now lets do the ic/socket -> make sure the direction is correct! place in and fold two corner pins to hold in place, then solder all pins. you can place the ic in now too.
- finally lets place the control parts, starting with the power jack (can use something under the board to balance it while you solder), next place the rca jacks and pots. be generous with the solder here -> this is to strengthen the mechanical connections as well as making electrical ones

See operating instructions page for setup and testing

OPERATING INSTRUCTIONS



setup

start by connecting a composite video source to the IN rca jack and a composite video display to the OUT rca jack (use a crt tv for best results) - now without the power plugged in you should be able to see your clean video source on the display by changing the ROUTER switches to both UP or both DOWN

OPERATING INSTRUCTIONS CONT.

router

the video input and video output signals can be connected to the effect circuit in 4 different ways - this is because the left router switch will connect the IN signal to the TOP/BOTTOM of the effect circuit, and the right router switch will connect the OUT signal to the TOP/BOTTOM - without power TOP-TOP and BOTTOM-BOTTOM acts as straight signal pass-through. with power these will give different effects.

regulator

the REGULATOR switch next to the power jack selects whether the power line is passed through a ~7v voltage regulator -> if you are powering your circuit with 9-12v then you must have this switched on (RIGHT) to avoid damaging your ic. if you are powering with 5v then it can be bypassed by switching to the left, although it wont hurt to still have it on - just changes the effects slightly in some places.

glitch controls

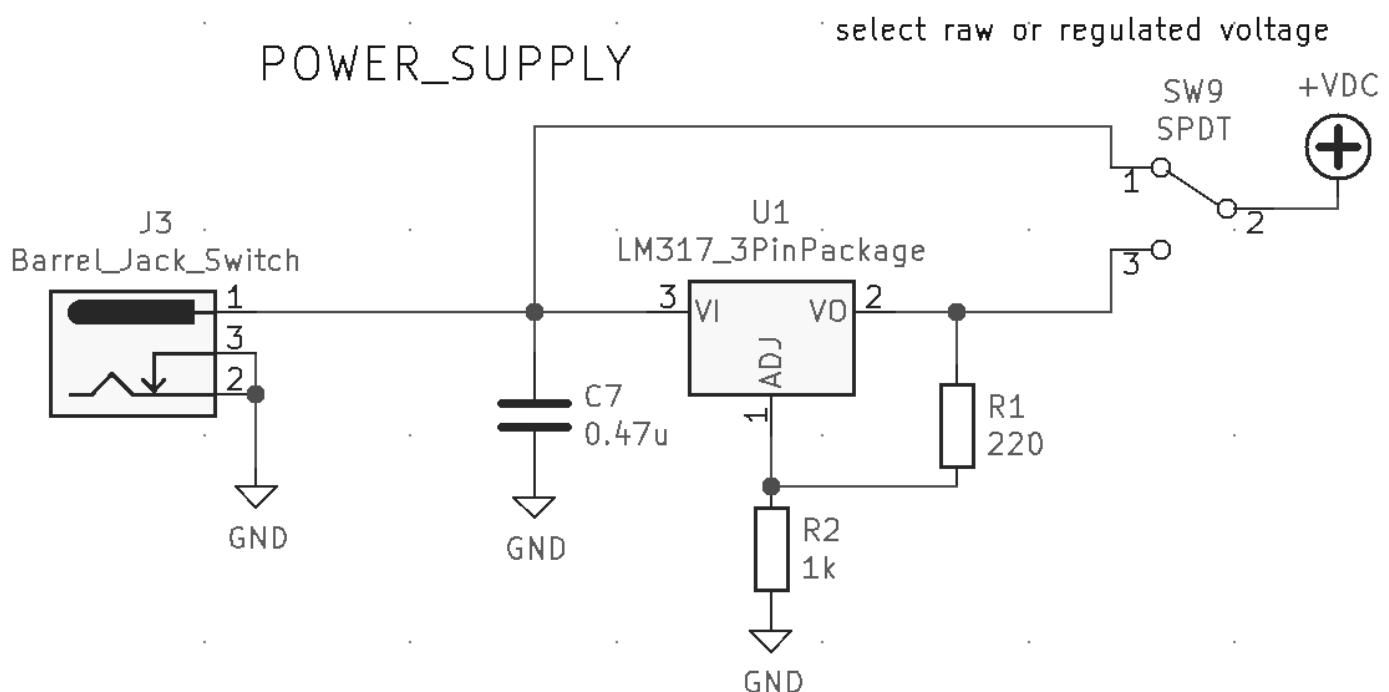
the 4 knobs and 6 switches will control the glitch effects when the power is connected. the default position is all knobs rotated anti-clockwise and all glitch switches set to UP. in general i would start by moving the left most knob first and working towards the right most - same with the glitch switches.

ROUTER positions UP-UP, DOWN-DOWN and DOWN-UP all produce quite interesting and different glitches on a crt screen. UP-DOWN for the most part does little more than a few abstract lines.

HOW THE CIRCUIT WORKS

This circuit is a 'glitch effect' that works in a similar way to *circuit bent* video devices – it is not always obvious how these circuit works as the destructive effects are usually found through trial-and-error and as a result of misusing the video hardware.

However we can make sense of some parts at least of the _rupture_ schematic:



~~LM317 is a popular adjustable current regulator chip~~
means the amount of voltage on the output is set by the values of two resistors connected to it:

- where $V_{ref} = 1.25$

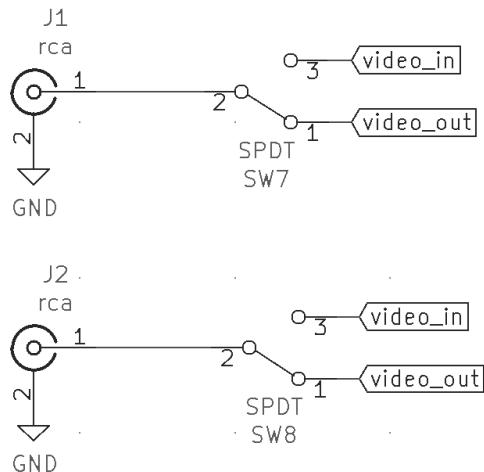
$$V_{out} = V_{ref} \left(1 + \frac{R_L}{R_H} \right)$$

So in our case the V_{out} would be $1.25 * (1 + 1000/220) = \sim 7v$

Then we can see that the switch **SW9** can bypass this regulator sending directly the voltage on input to the ic

HOW THE CIRCUIT WORKS CONT.

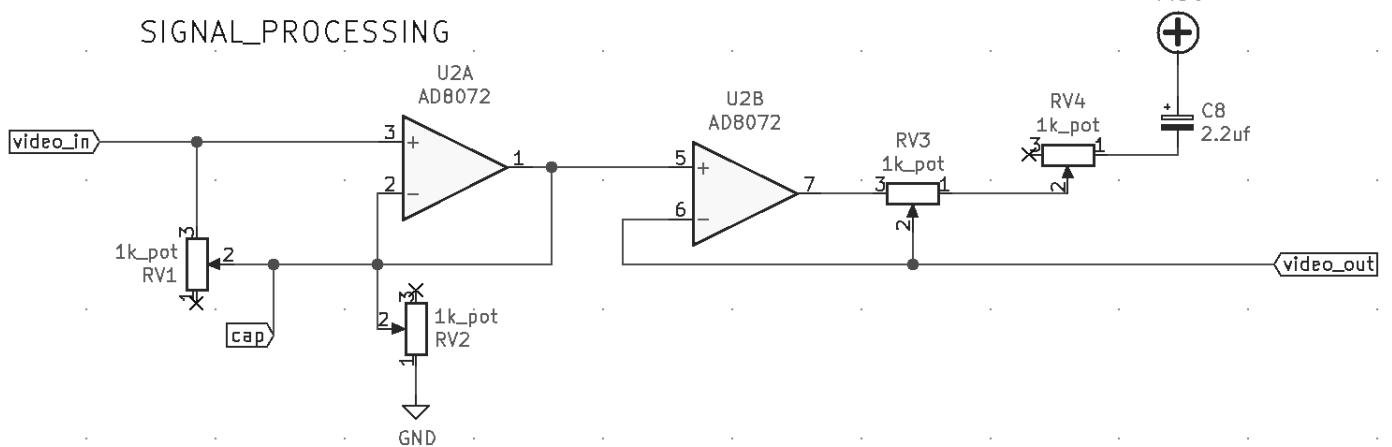
SIGNAL_ROUTER



The signal router uses two switches to send the video input and output signals to the front (DOWN) and back (UP) of the processing circuit – I originally just wanted to put a effect-bypass switch here but found that connecting the circuit backwards/ both sides to the start and both to the back also produced interesting glitch results – this configuration still allows straight bypass but also access to some more effects

The heart of the circuit is the AD8072 ic – a dual high speed video opamp – the configuration below with glitch controls doesn't really make sense to me compared to how you would usually wire an opamp but regardless the results are interesting. Experimenting some more with this ic in slightly different configurations may even produce different results ! Let me know what you find :)

SIGNAL_PROCESSING



CREDITS AND MORE INFO

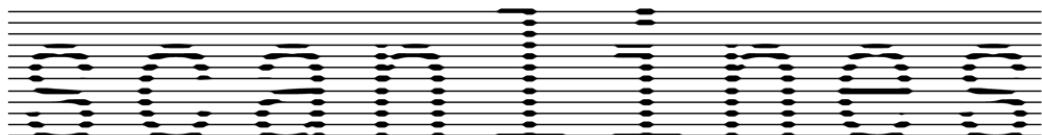
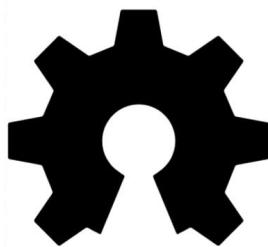
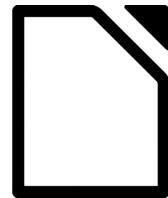
This circuit is distributed through UNDERSCORES – open video hardware label – visit underscores.shop for more info

The pcb was designed using KICAD , this booklet was created in LibreOffice Draw

Everything from gerbers, cad files, panels and documentation is freely available online and distributed under CC-BY-SA / open-source licenses – help us contribute to the commons !

Ask any questions or start discussions related to this project on the scanlines.xyz forum – an online community space dedicated to diy av / electronic media art

You can contact me directly at *tim (at) cyberboy666 (dot) com*
Please get in touch if you are interested in hosting a workshop !



Thanks to Karl Klomp for sharing your designs and knowledge. to Bastien Lavaud for circuit advice, always. To Guergana Tzatchkova for booklet design inspiration. To Ben Caldwell for project advice. To everyone who has or will contribute ❤️❤️