



Synchopath

by RGBastler

Who are we?



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The Synchopath functions as a video mixer between two video input signals, adding various levels and layers of distortion and glitches. The effect is sensitive and requires careful handling and experimentation due to its dependency on the video sources and display. Additionally, it features an audio input for an extra layer of interaction.

Synchopath is based on:

Vidiffektor (Fluxmonkey): A glitchy, lo-fi distortion effect for analog video signals originally designed by James Schidlowsky and revived by Javier Plano (@Videonic). It splits a composite video signal, slices it up using an **LM393 dual comparator** which clocks a **4040 divider**, then adds a few of the divisions back to the original signal so that the original sync is more or less preserved.

<https://www.fluxmonkey.com/video/videffektor.htm>

Schele-Mixer (Gieskes): A simple 2-input analog video mixer based on the **LM1881 Sync separator**. It works by taking the sync of one of the two connected video signals and pushing it under the output video signal, considering that all video sources have slightly different sync speeds.

<https://gieskes.nl/visual-equipment/?file=schele-mixer>

Specifications:

Created for live A/V performance.

Types of Effects: Noisy, Patterns, Glitches, Saturation and B&W, Fades

Working on a single 9 / 12V power supply

Could be Implemented and moded.

The distorted signal output may not be valid on all displaying device, except on CRT TV.

Compatibility: NTSC & PAL

Intro to Composite Video Signal

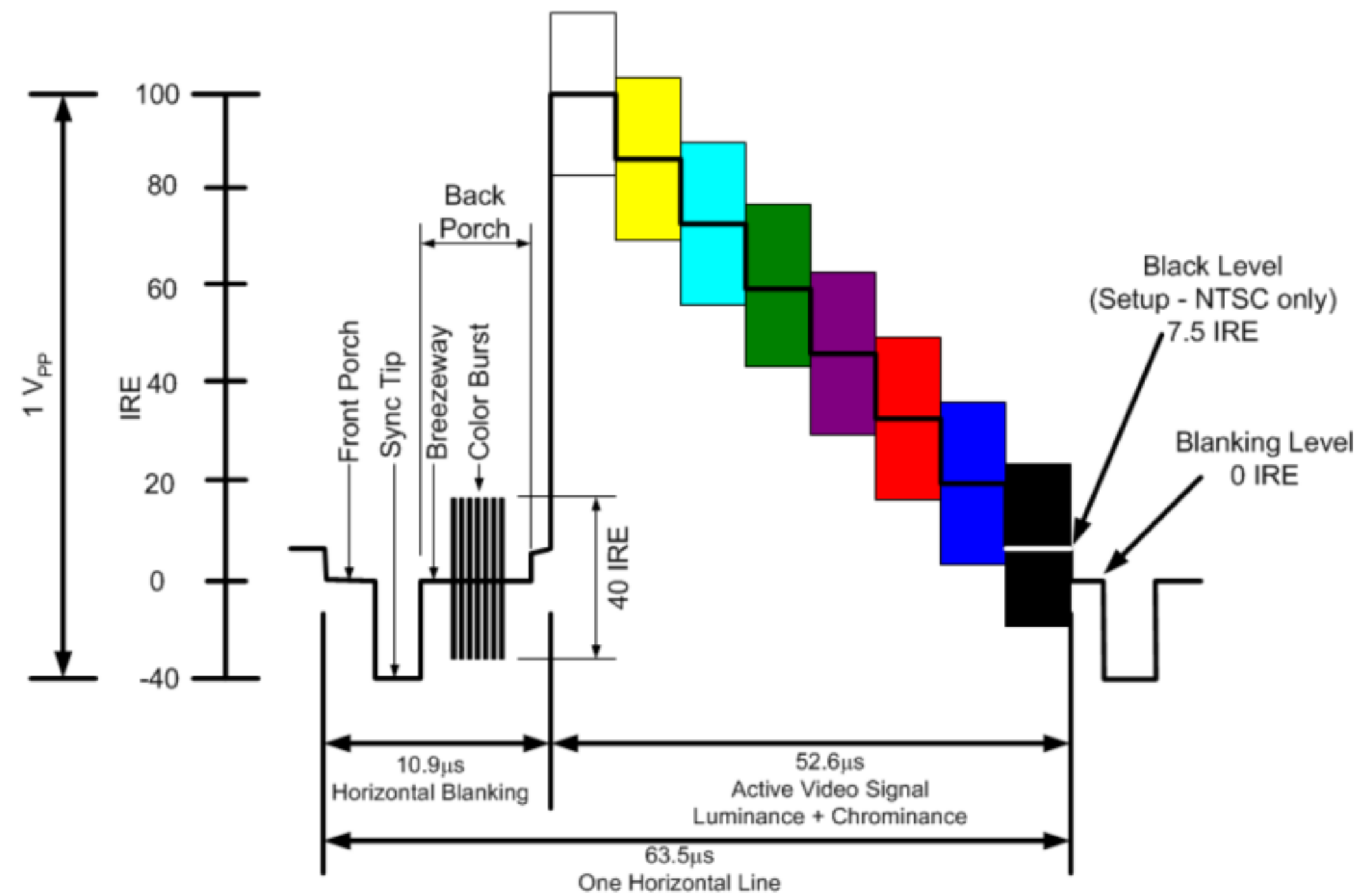


Figure 2. NTSC Composite Video Signal

CVBS (Color, Video, Blanking, and Sync) or SD Video

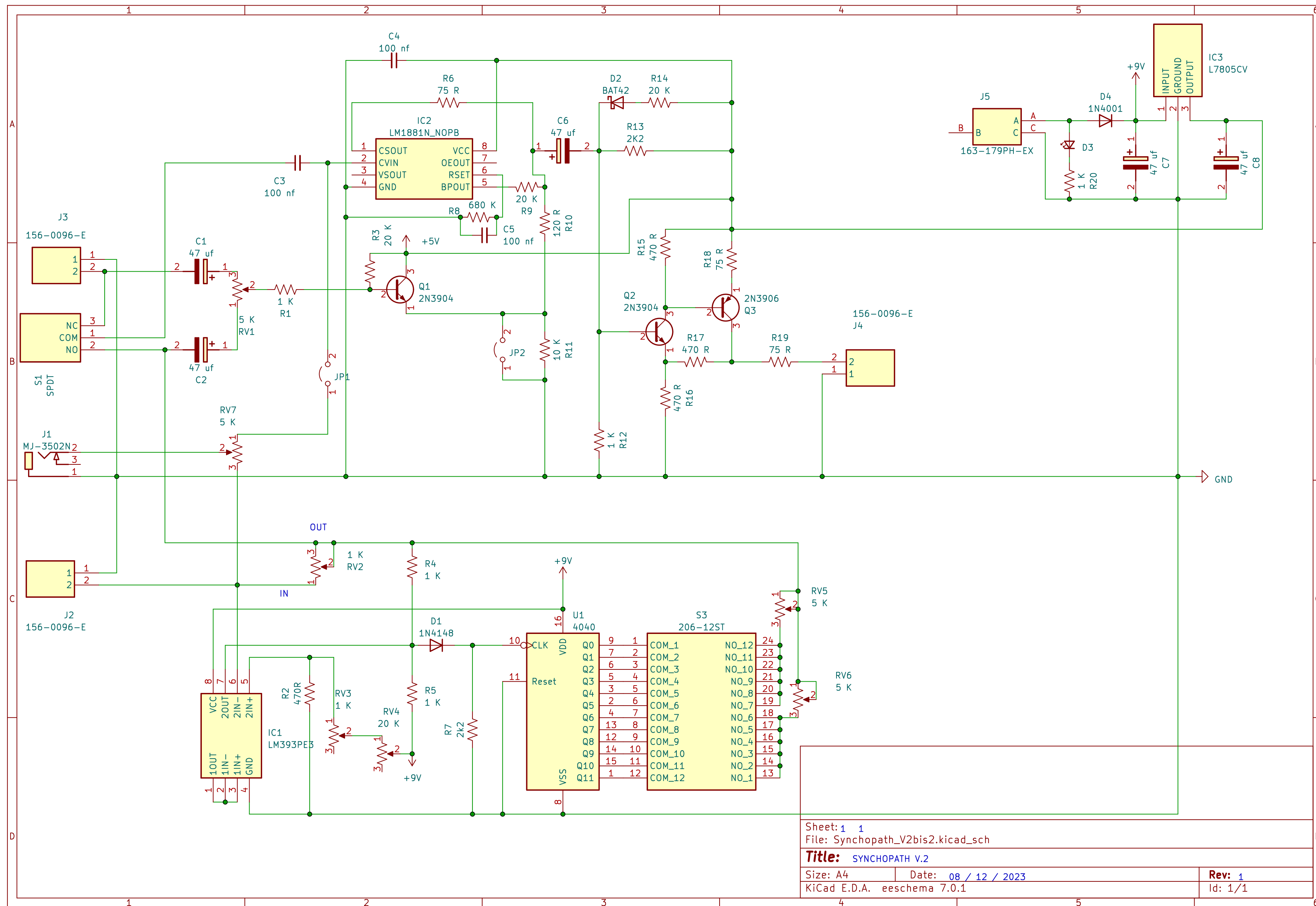
A composite video signal is carried over a single shielded conductor that was conceived to be compatible with B&W TV set.

The signal is broken up into frames and frames are broken up into lines (525 or 625).

The **chrominance** (C / color saturation and color hue) and **luminance** (Y) frequencies are interleaved on the same bandwidth (multiplexing).



SCHEMATIC

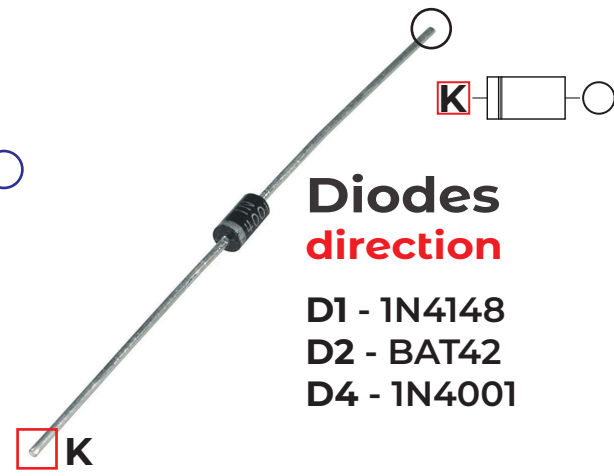


Components & Positions on Board



Resistors
no direction

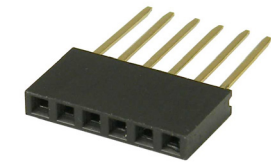
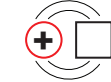
- R1, R4, R5, R12, R20 - 1K
- R3, R9, R14 - 20K
- R6, R18, R19 - 75R
- R7, R13 - 2.2K
- R8 - 680K
- R10 - 120R
- R11 - 10K
- R15, R16, R17, R2 - 470R



Diodes
direction

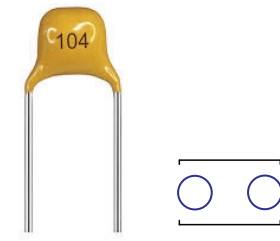
- D1 - 1N4148
- D2 - BAT42
- D4 - 1N4001

D3 - LED



Pin Headers
no direction

- JP1, JP2

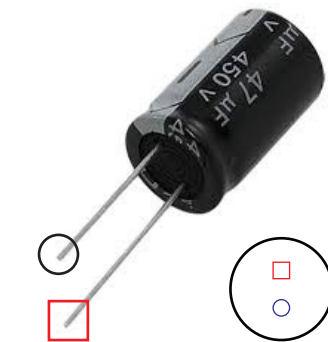
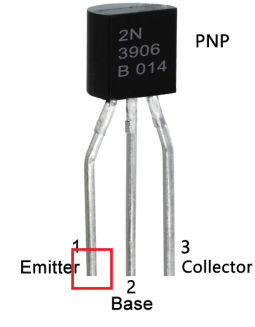


Ceramic Capacitor
no direction

- C3, C4, C5 - 100nF

Transistors
direction

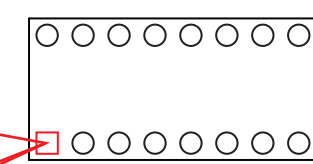
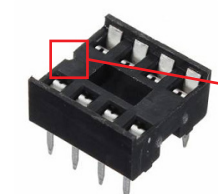
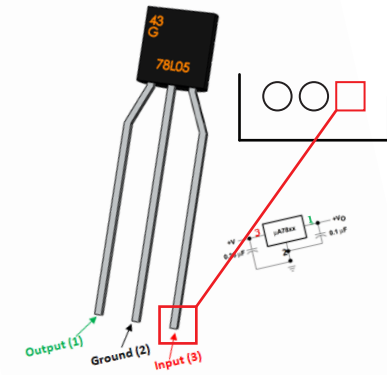
- Q1, Q2 - 2N3906
- Q3 - 2N3904



Electrolytic Capacitor
polarized, direction

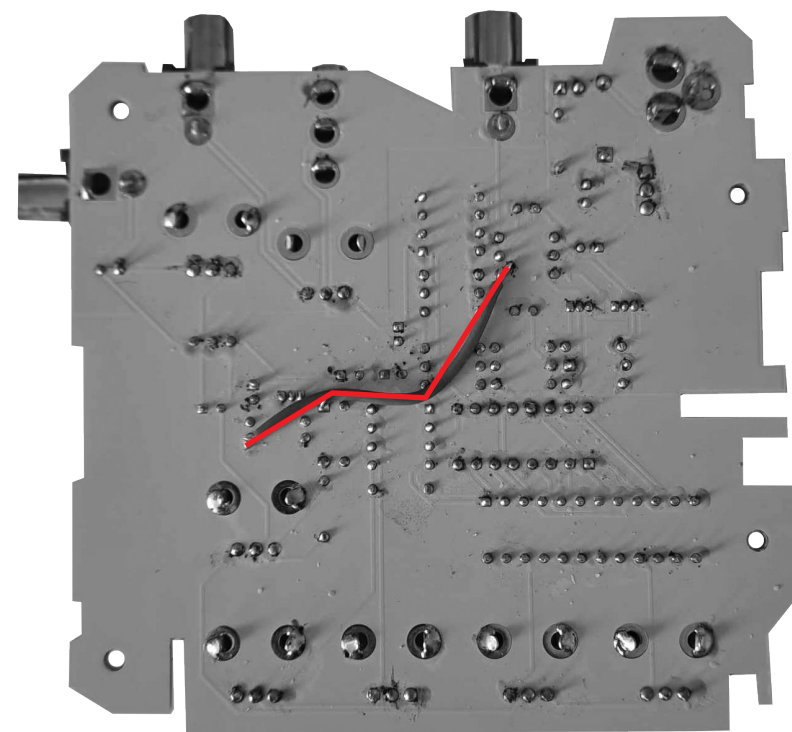
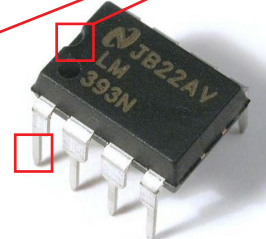
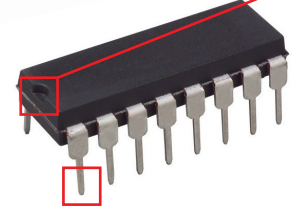
- C1, C2, C6, C7, C8 - 47 uF

IC3 - 78L05 (Voltage Regulator)



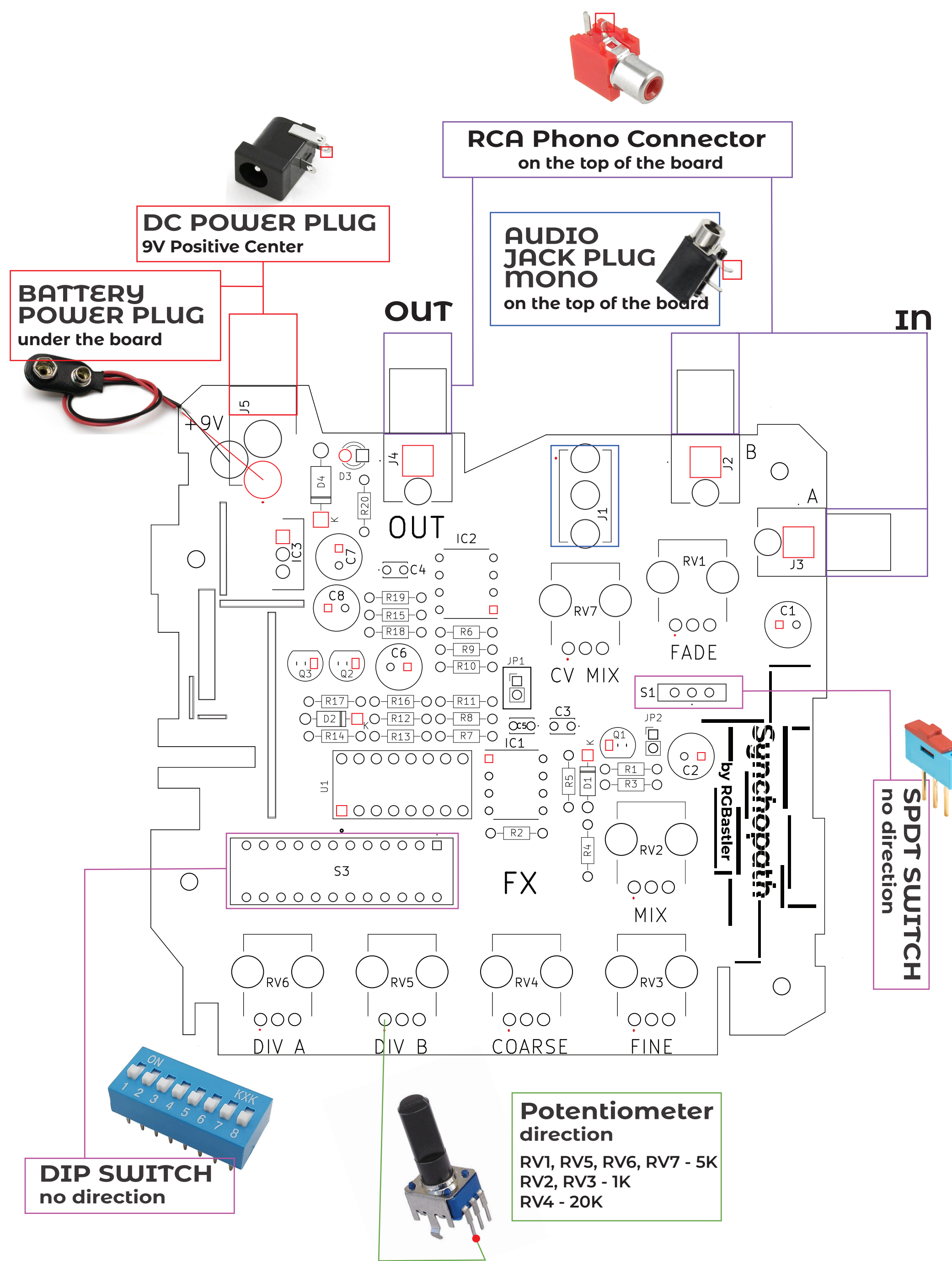
ICs and IC Socket
direction

- IC1 - LM393
- IC2 - LM1881
- U1 - CD4040



Wire Connector

Front Side:
R3 Right Leg to R18 Right



Soldering Steps on the Board

01. Resistors
02. Diodes
03. LED
04. Ceramic Caps
05. IC Sockets
06. Switches
07. Electrolytic Cap
08. Transistors
09. Phono Connectors
10. DC Power Plug
11. Audio Jack
12. Potentiometers
13. Wire on the back side
14. Verify all your soldering!

Please ask for the pin headers and the ICs at the end!

!!! PLUG AND PLAY !!!

BOM: SYNCHOPATH				
Unit	Reference(s)	Value	Type	Directions
5	C1, C2, C6, C7, C8	47 uf	Electrolytic Capacitor RAD 47/25 (Reichelt)	polarized / long leg on the square
3	C3, C4, C5	100 nf / 104	Capacitor ceramic X7R-5 100N (Reichelt)	no direction
1	D1	1N4148	Diode 200mA	orange / polarized / follow the schema
1	D2	BAT42 / B	Diode Schottky	Blue / polarized / follow the schema
1	D3	~	LED	LED / polarized / long leg on the round
1	D4	1N4001	Diode 1A	Diode / polarized / follow the schema
1	IC1	LM393	IC (DIP)	! first leg on square
1	IC2	LM1881	IC (DIP)	! first leg on square
1	IC3	78L05	Voltage regulator	! third leg on square - follow the schema
1	U1	CD4040BE	IC (DIP)	! first leg on square
2	IC1, IC2	IC Socket	IC Socket DIP-8	! first leg on square
1	U1	IC Socket	IC Socket DIP-16	! first leg on square
1	J1	~	Audio Jack plug mono MJ-3502N (Mouser)	follow the schema
3	J2, J3, J4	~	RCA Phono Connector 156-0096-E (Mouser)	follow the schema
1	J5	~	DC Power plug 163-179PH-EX (Mouser)	follow the schema
2	JP1	~	Pin Header	no direction - to add electrolytic value cap: 47uf, 100uf
1	JP2	~	Pin Header	to add capacitor - 102, 222, 103
2	Q1, Q2	2N3904	Transistor NPN	! first leg on square
1	Q3	2N3906	Transistor PNP	! first leg on square
5	R1, R4, R5, R12, R20	1K	Resistor	no direction
3	R3, R9, R14	20K	Resistor	no direction
3	R6, R18, R19	75R	Resistor	no direction
2	R7, R13	2k2	Resistor	no direction
1	R8	680K / A	Resistor (Mouser)	no direction
1	R10	120R / C	Resistor	no direction
1	R11	10K	Resistor	no direction
4	R15, R16, R17, R2	470R	Resistor	no direction
4	RV1, RV5, RV6, RV7	B502 / 5K	Potentiometer TV09A-4020FB502 (Mouser)	follow the schema
2	RV2, RV3	B102/ 1K	Potentiometer PTV09A-4020FB102 (Mouser)	follow the schema
1	RV4	B203/ 20K	Potentiometer 52-PTV09A-4020FB203 (Mouser)	follow the schema
1	S1	SPDT	Slide Switch ON/ON	Blue/ Red rectangle, no direction
1	S3	SPST	DIP Switch Piano	Blue rectangle, no direction

USER MANUAL

- FADE:** Fades the image between the two video inputs.
- SYNC** switch: Switches the synchronization between the two video inputs.
- CV MIX:** Adjusts the volume for J1 when an audio signal is received.
- MIX:** Adjust the level of effects
- FX:**
- Dip Switch:** Select effects. The first 6 (1-6) switches connect to DIV A, and the last 6 (7-12) connect to DIV B to adjust the effect.
- Coarse:** Adjusts the oscillator frequency.
- Fine:** Provides finer adjustment.

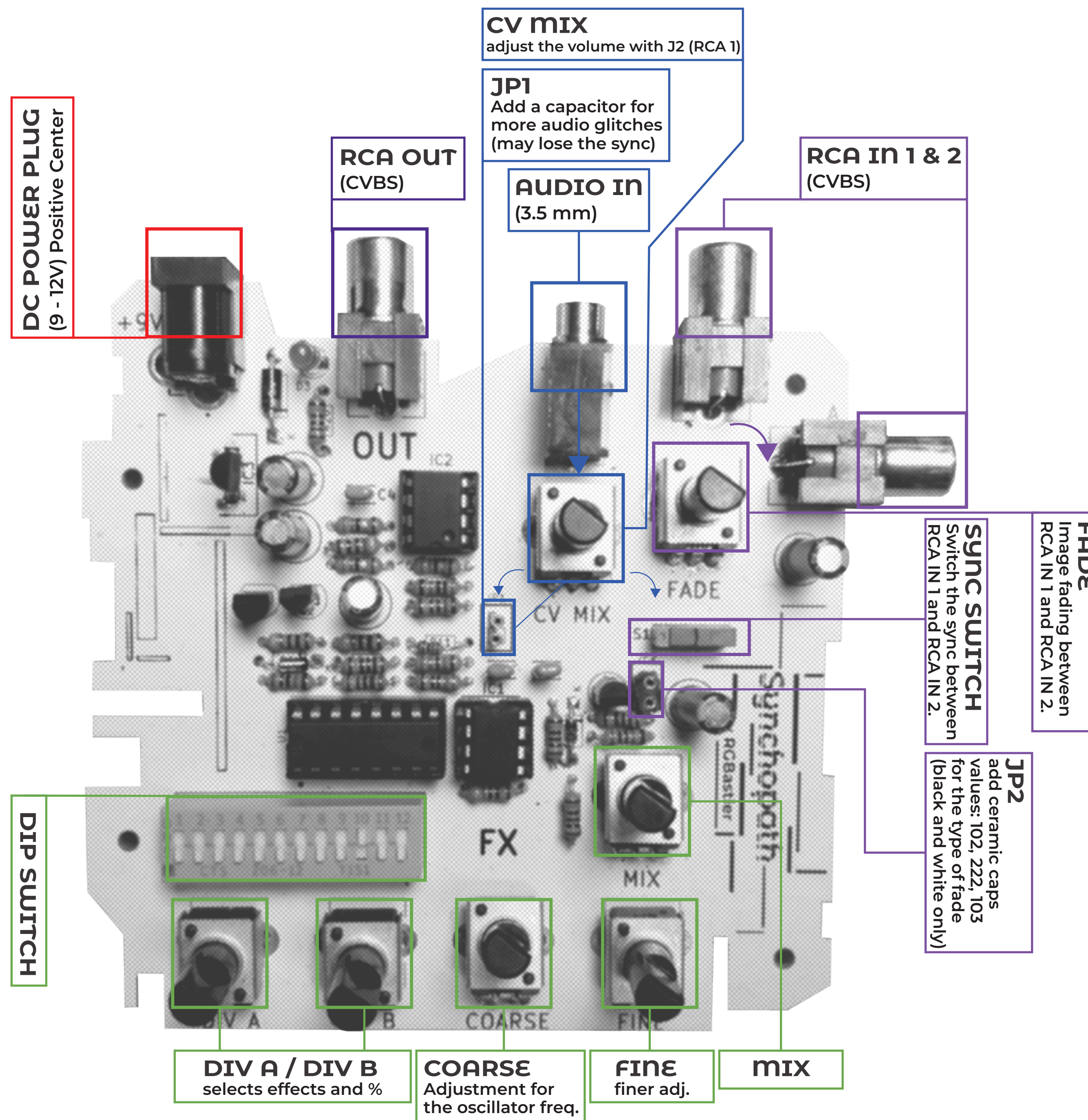
Additional Features:

- J1:** Adds glitches to the audio.
- Values for J1:** Electrolytic Cap (47 μ F, 100 μ F).
- J2:** Changes the fade type. Adding a Cap (102, 104) the colour of the video output will switch in b&w.
- Values for J2:** 103, 104, 222 - Ceramic / multilayer capacitors.

Please Note:

The video effects may change depending on the input devices. The distorted signal output may not be valid on all displaying devices, except on CRTV.

Compatibility: NTSC & PAL



CABLING

Video Output
CRTVs, TV Screens, Monitors.



Audio Input (mono)
any audio player



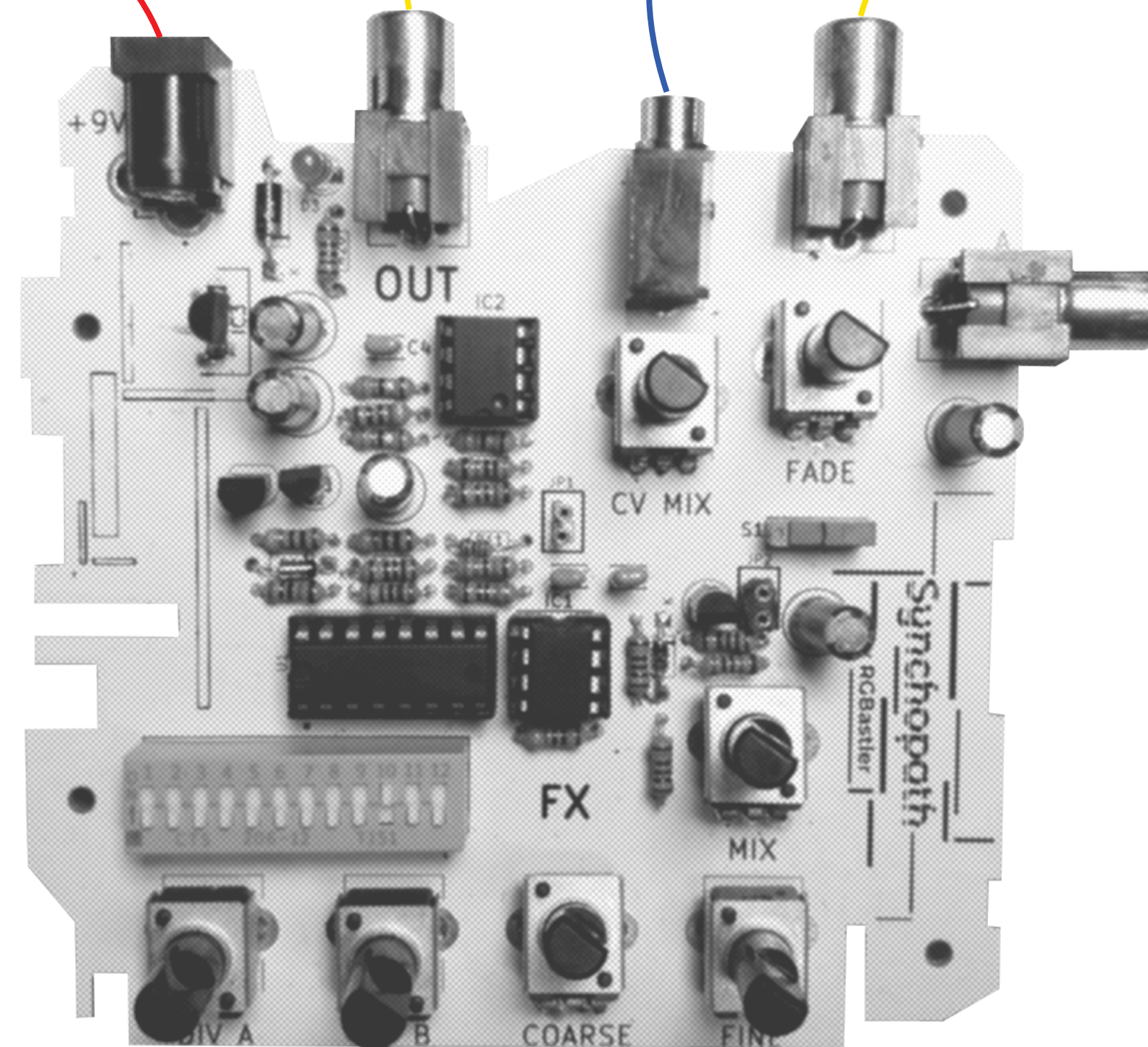
Video Input
ex. Camera, VHS Player, etc.



Video Input
ex. Camera, VHS Player, etc.



DC POWER PLUG
9 V Positive Center



—— **Thank you!** ——

For any questions, you can always contact us on:
website: <https://rgbastler.wordpress.com/contact>
Instagram: [@rgbastlercollective](#)