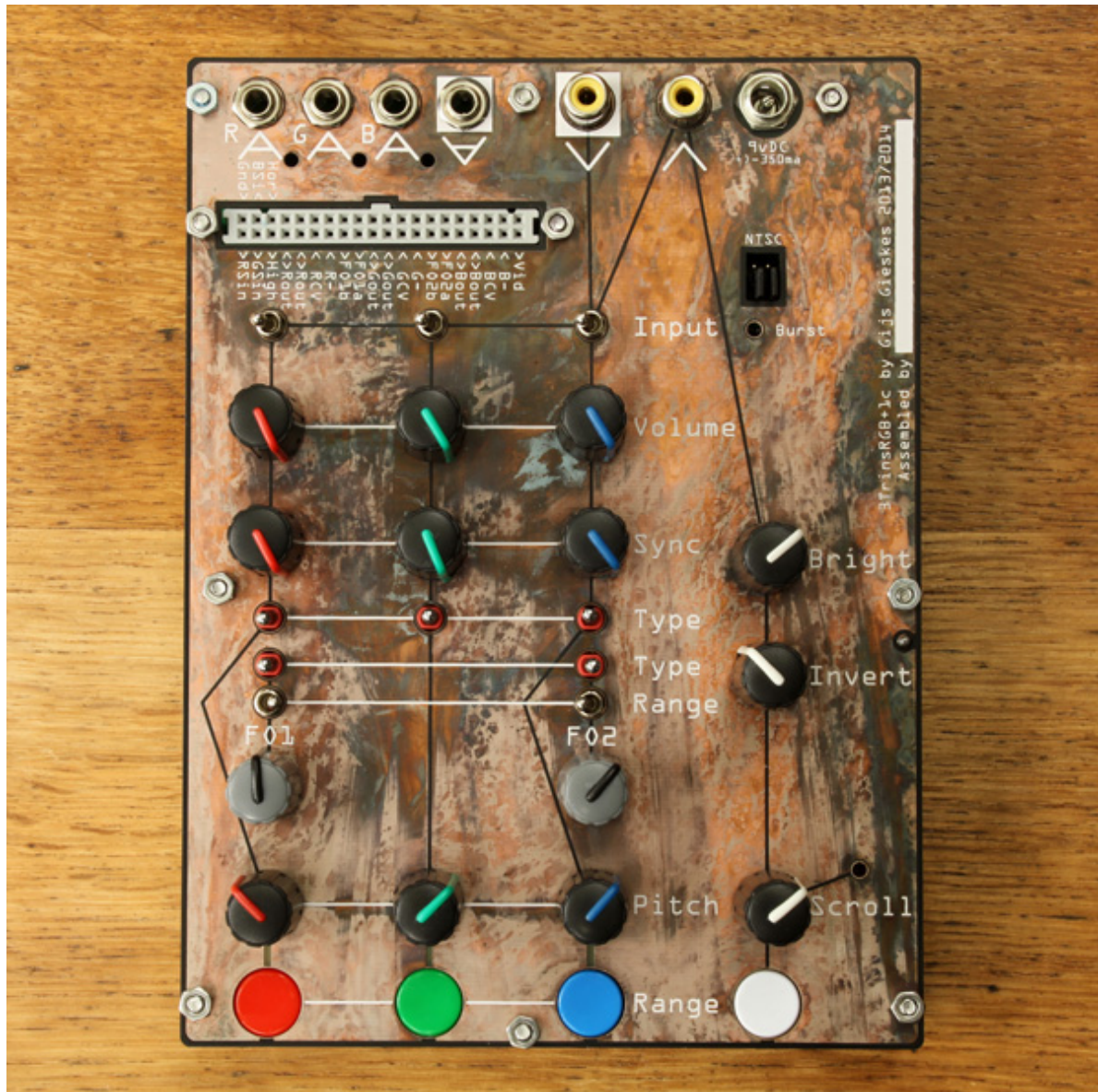


# 3TrinsRGB+1c Manual V1

2013/2014

3TrinsRGB+1c is a analog audio video synthesizer, with the HEF40106 ic as oscillator source. The reason for using this ic is that it is used a lot by people just starting to make electronics. When I started to make oscillators I was using it often, and am still using this ic quite allot, because it can do a lot with just a small amount of components.. In this case the amount of components used seems to have risen quite a lot because of all the features that are included in the device..



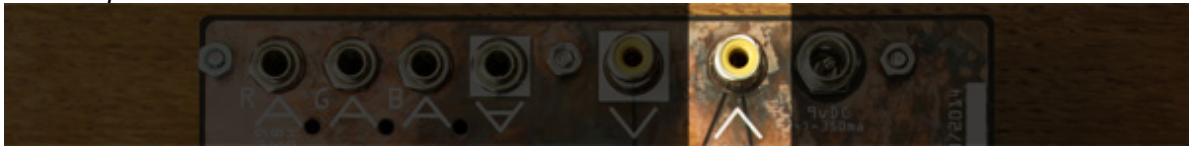
## Power:



It needs 7.5v to 12v DC power supply with + in the center and GND on the sleeve.  
The power it uses depends on the settings, it can be between 60ma and 250ma.

If the power usage goes above 340ma the resettable fuse is activated.

*Video input:*



PAL or NTSC composite signal.

*Video output:*



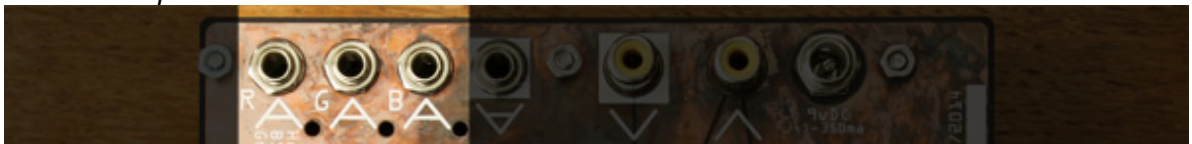
PAL or NTSC composite signal.

*Audio output:*



the audio volume is around 2.5v peak to peak.

*Audio/CV inputs:*



The RGB mono mini jack inputs can be used to do audio visualization or as CV inputs. All inputs are capacitor coupled with 22uf capacitors, the input impedance can be set using a 2M trimmer potentiometer resulting in slowly discharging capacitors, making it reasonably possible to use CV signals.

For weak signals, like a electric guitar, turn the trimmer pot (holes next the A's) all the way to the left.

For strong signals (10v peak to peak) turn the trimmer pot all the way to the right.

(Do not use the trimmer pots allot, they are not made for allot of use).

*Header about:*



The 2x20 pin gray header can be used to make patches using jumper cables.

Do not connect any external signals to this header, it is only for internal use. If you do want to connect external gear use the mono mini jack RGB inputs.

You can also power circuits from the header built on a breadboard or on a plugin prototype beard.

When you use jumper cables please make sure the tips are not bend and sharp, then they can damage the header.

All inputs have a 10k input impedance, all outputs are diode mixed using transistors with 1k impedance.

Arrow to the header means Input, and arrow away from the header means Output, if there arrows to and from the header it means you can use it as a Input and also as a Output.

#### *Header connections:*

Hor: This is a input that is going to the Scroll adjustment (see Scroll description below)

Gnd: This is ground (used for powering header plugins).

BSi: Sync signal for the Blue signal (can be used with header plugins).

RSi: Sync signal for the Red signal (can be used with header plugins).

GSi: Sync signal for the Green signal (can be used with header plugins).

High: This is a voltage source with 22ohm impedance, can be used to set a RGB channel to a solid color (also used for powering header plugin circuits).

Rout: Output for Red signal.

RCV: CV input for Red oscillator.

R-: Cuts of the Red signal.

FO1a: Low frequency oscillator 1, from buffer a.

FO1b: Low frequency oscillator 1, from buffer b.

Gout: Output for Green signal.

GCV: CV input for Green oscillator.

G-: Cuts of the Green signal.

FO2a: Low frequency oscillator 2, from buffer a.

FO2b: Low frequency oscillator 2, from buffer b.

Bout: Output for Blue signal.

BCV: CV input for Blue oscillator.

B-: Cuts of the Blue signal.

Vid: Video signal connected to the video input .

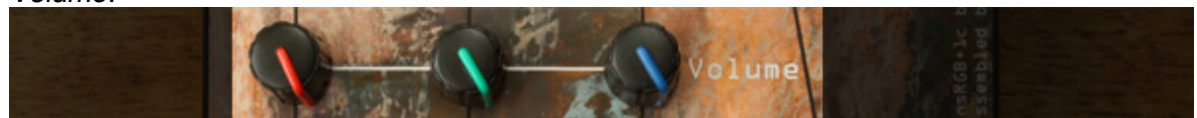
#### *Input:*



Selects signals connected to the video input (switch to right).

Selects RGB oscillators signals (switch to left).

#### *Volume:*



Pots can be used to set volume of RGB signals.

#### *Sync:*



Set the amount of synchronization that is used by the RGB signals.



*Type (RGB oscillators):*



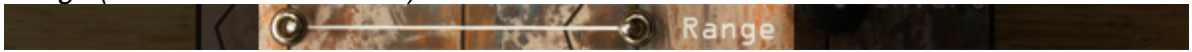
Select Saw left, Triangle, Saw right.

*Type (F01 and F02 oscillators):*



Select Saw left, Triangle, Saw right.

*Range (F01 and F02 oscillators):*



Set the specific oscillator to low frequency or high frequency.

*Pitch (F01 and F02 oscillators)*



Set pitch for RGB oscillators.

*Pitch (RGB oscillators)*



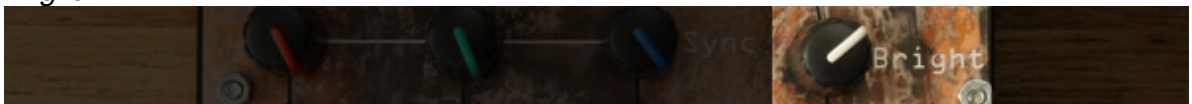
Set pitch for RGB oscillators.

*Range (RGB oscillators):*



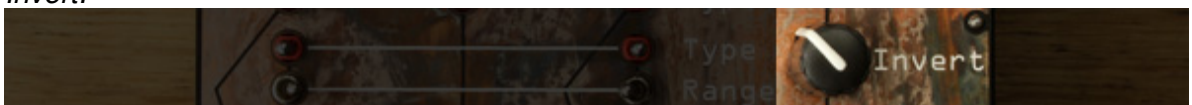
Set the specific oscillator to low frequency or high frequency, in this case creating horizontal or vertical lines.

*Bright:*



Set the brightness of the video signals that is connected to the video input.

*Invert:*



Make the video signal that is connected to the video input positive or negative.

### *Scroll:*



Adjusts the speed of the sync generator of the 3TrinsRGB+1c, use this to synchronize the video signal you connect to the video input to the 3TrinsRGB+1c.

You can scroll left and right, when you make the image scroll to the left in a slow pace it will snap to the video signal that is connect to the video input.

If the video signal is to far out of range use the variable capacitor to adjust it a bit more.

Some video sources might be to much out of range, bending the image to the right or left.

VHS video signals are to unstable to get a still standing image on the screen.

You can use the button to make the image scroll up. If the video signal connected has more or less lines then the selected video standard the image will scroll up or down, and can not be made to stand still.

### *Standard selection (top panel):*



There are two jumpers (on the top panel near where it says NTSC and burst), set them both to bottom for PAL and to top for NTSC.

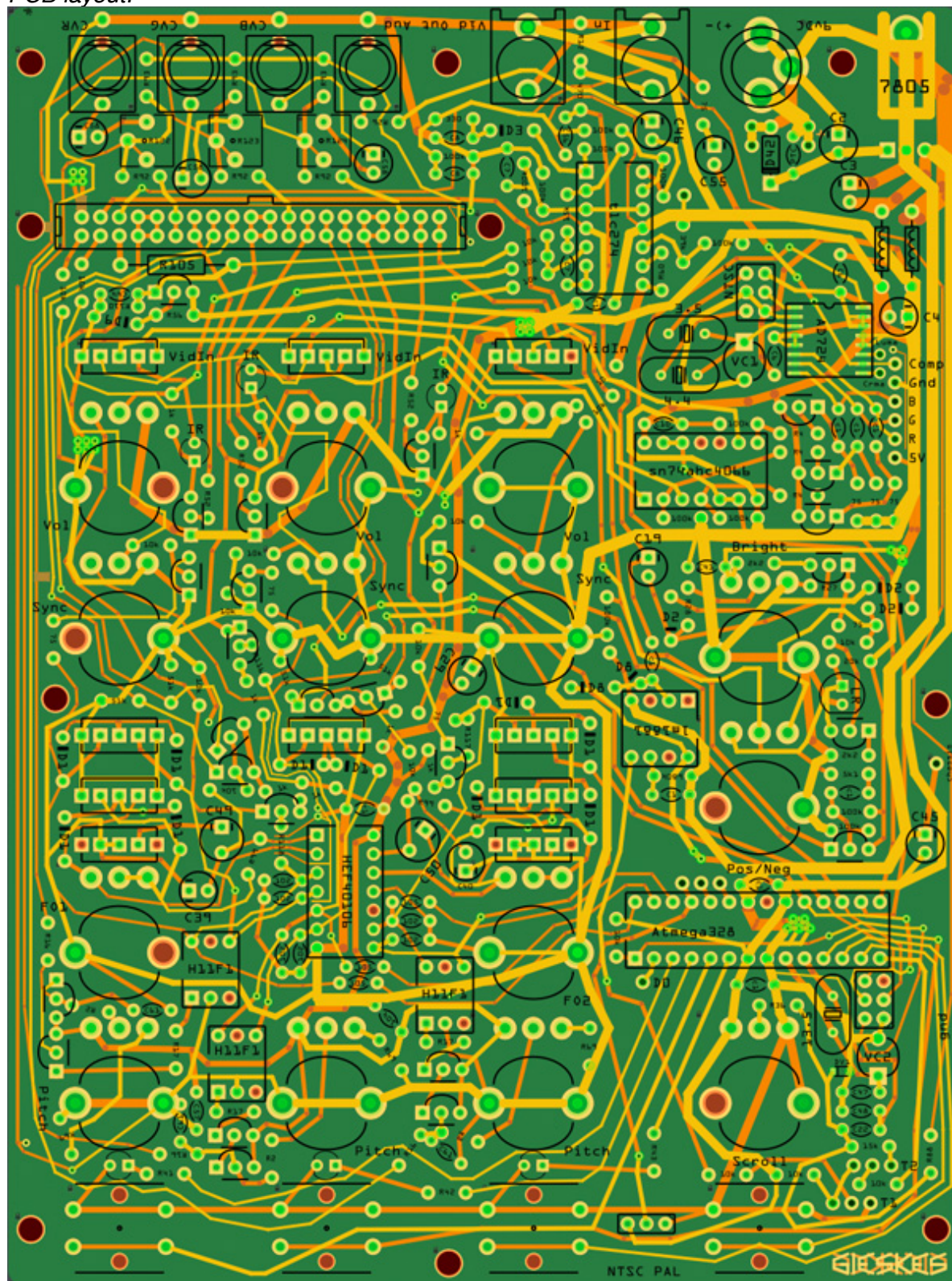
### *Standard selection (front view):*



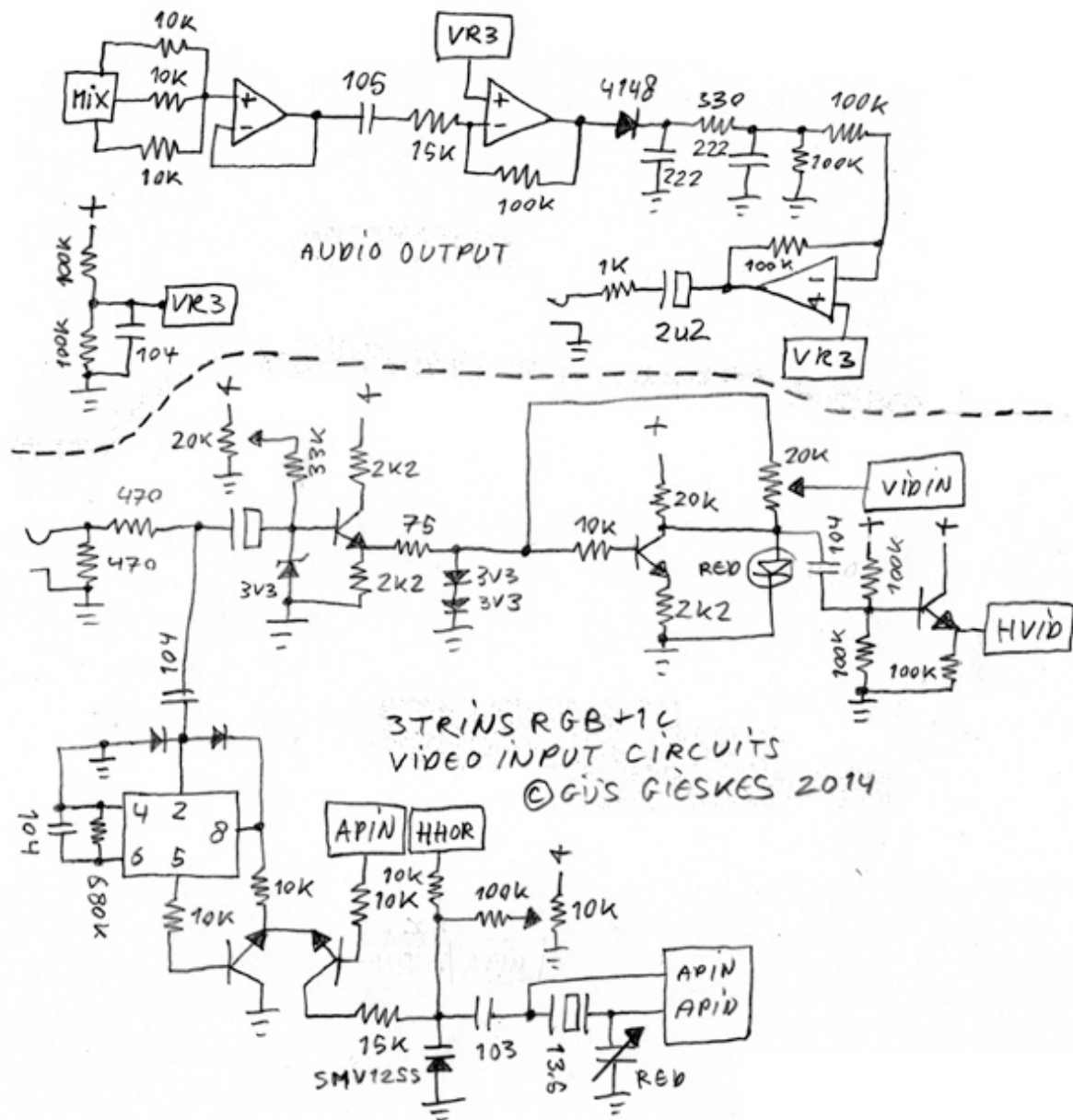
There is also a jumper on the bottom PCB between the blue and white button, set to the right for PAL and to the left for NTSC.



PCB layout:



# Schematic Audio output and Video Input:



Schematic RGB oscillators, LFO and Virtual grounds:

