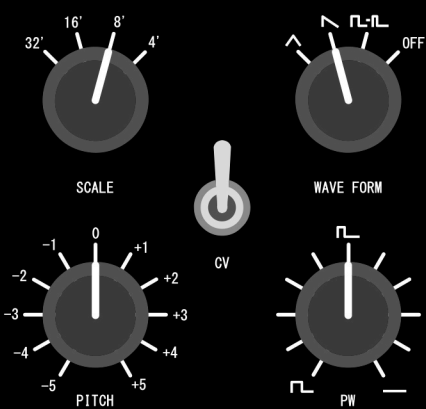


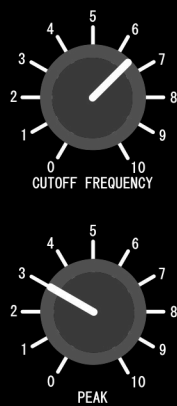
KORG MS-X

AN EXTREME MONOTRON MOD

VOLTAGE CONTROLLED OSCILLATOR



VOLTAGE CONTROLLED LOWPASS FILTER



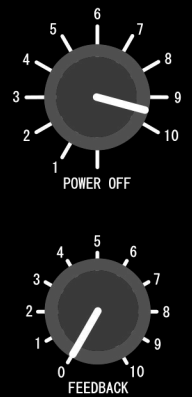
VOLTAGE CONTROLLED AMPLIFIER



ENVLOPE GENERATOR



VOLUME



PORTAMENTO



SUB OSCILLATOR



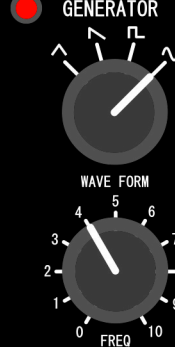
FREQUENCY MODULATION



CUTOFF FREQUENCY MODULATION



MODULATION GENERATOR



KORG
SYNTHESIZER

FAR BEYOND PERCEPTION INSTRUMENTS

BY
SOUL MACHINE

Updates

V1.2

(12 / 3 / 2018)

VCO:

CR filter before CD4040 Removed

Details on CD4040 connection

ADSR:

Filter Env and Pitch Env pots added

V1.3

(10/12/2019)

VCO:

PWM resistor scale corrected

DISCLAIMERS

It must be clear, that by opening your **MONOTRON** you loose all the warranty and it is your own responsibility that is engaged.

The mod described in this document requires direct modifications of the PCB and is
NOT RECOMMENDED
if you don't have a very good experience in electronic.

The author disclaims any liability for damages or injuries caused while working on this project, or project based on this design.

Hi,
First of all, I would like to personally thank you for your
interest in this project and I hope you'll enjoy it!

Soldering:

Be sure to use a good professional soldering iron every time you'll have to work directly on the Monotron. The PCB is made of **lead free** solder (Sn/Ag/Cu), this means a general purpose iron won't be able to melt anything unless it can reach the temperature of **350°C (662°F)**. Seriously, **DO NOT EVEN TRY** if you don't have the proper soldering device, the SMD components don't like to be heated for a long time and you risk to murder this tiny adorable Synth!
For the rest of the project, no problem, any iron will do the job as long as you work carefully.

Measuring:

Like any other electronic project, you'll need a good multimeter but also an oscilloscope because some parts of the conception need direct visualization for calibration and adjustments. Please read carefully the instructions I wrote on the schematics.

About mistakes:

You think I made a mistake? **You must be right!**
I drew these schematics almost one year after I built the MSX so it would be quite a performance if no mistake made its way to the party!
Do not hesitate to breadboard before soldering and contact me if you find something, I'll update the schematics!

Crediting:

I **REALLY** want to see your projects!
Feel free to send pics and videos of your MSX to djsoulmachine@gmail.com, I'll be glad to post them on my website!
Oh, and because I spent time to open this project to everyone, if you could credit me whenever you can, that would be **GREAT!**

Thanks a lot in advance and Good Luck ;)
Jeremie // Soul Machine // Far Beyond Perception

Components Buyer's Guide

Amplifiers:

TLo82 (Dual Op-Amp) or TLo84 (Quad Op-Amp)
for dual rail (-9V/9V) purposes.

LM321 (Dual Op-Amp) or LM324 (Quad Op-Amp)
for single rail (0V/5V) purposes.

Resistors:

Use only 1% resistors,
except for push up and pull down circuit where you can use 5% resistors.
The resistors in the scale circuit need to be **PERFECTLY** matched!

Capacitors:

Use only **Metal Film Capacitors**,
except in the powering and portamento circuits where
you will have to use Electrolytic Capacitors.

Potentiometers:

All linears.

As for the volume pot, I used one with a switch inside to use it
as a power ON just like the MS10 & MS20.

Exotic Components:

IC7660s: charge pump, the little "s" is very important!

Electric Druid VCADSR 7B: Voltage Controlled Envelope Generator.

20MHz Xtal: Crystal Oscillator.

The BOM (for atns...):
A big THANKS to GOT from France who made this BOM!

IC	E-Druid VCADSR 7B	1	
IC	ICL7660s	1	
IC	CD4040BE	1	
IC	LM324	5	or 19 x LM321
IC	TL084	2	or 4 x TL082
REGULATOR	7805	1	
ROTARY SWITCH	3P4T	2	
ROTARY SWITCH	4P3T	1	
SWITCH	SPDT	2	
SWITCH	DPDT	1	
POTENTIOMETER	B10k	12	
POTENTIOMETER	B10K + DPDT	12	(VOLUME + ON/OFF)
POTENTIOMETER	B20K	2	(PITCHMOD - FILTERMOD)
POTENTIOMETER	B100K	1	(PWM)
POTENTIOMETER	B220K	1	(PORTAMENTO)
TRIMMER	10k	5	
TRIMMER	100k	3	
CRYSTAL	20MhZ	1	
TRANSISTOR	2SC945	1	
DIODE	LED	2	
DIODE	1N4148	4	
CAPACITOR	100µF	4	
CAPACITOR	47µF	2	
CAPACITOR	10µF	9	
CAPACITOR	1µF	5	
CAPACITOR	470nf	1	
CAPACITOR	100nF	2	
CAPACITOR	47nF	1	
CAPACITOR	4,7nF	1	
CAPACITOR	1nF	4	
CAPACITOR	500pF	1	
CAPACITOR	470pF	1	
CAPACITOR	100pF	1	
CAPACITOR	22pF	3	
RESISTOR	1M	4	
RESISTOR	680k	1	
RESISTOR	470k	1	
RESISTOR	330k	1	
RESISTOR	220k	2	
RESISTOR	150k	1	
RESISTOR	100k	39	
RESISTOR	68k	1	
RESISTOR	47k	2	
RESISTOR	39k	1	
RESISTOR	33k	1	
RESISTOR	27k	1	
RESISTOR	22k	1	
RESISTOR	10k	9	
RESISTOR	5,6k	2	
RESISTOR	4,7k	1	
RESISTOR	2,2k	4	
RESISTOR	1k	11	
RESISTOR	390r	1	
RESISTOR	180r	2	
RESISTOR	56r	1	
RESISTOR	50r	1	
RESISTOR	12r	1	

S 101

VR1

VOLUME

VR2

KLM-3035

Lead-Free

94V-0
MS-1E198407

SW1

VCO

PITCH

VR3

LFO

RATE

(LED1

UNDER)

VR4

LFO

INTENSITY

VR5

FILTER

CUTOFF

VR6

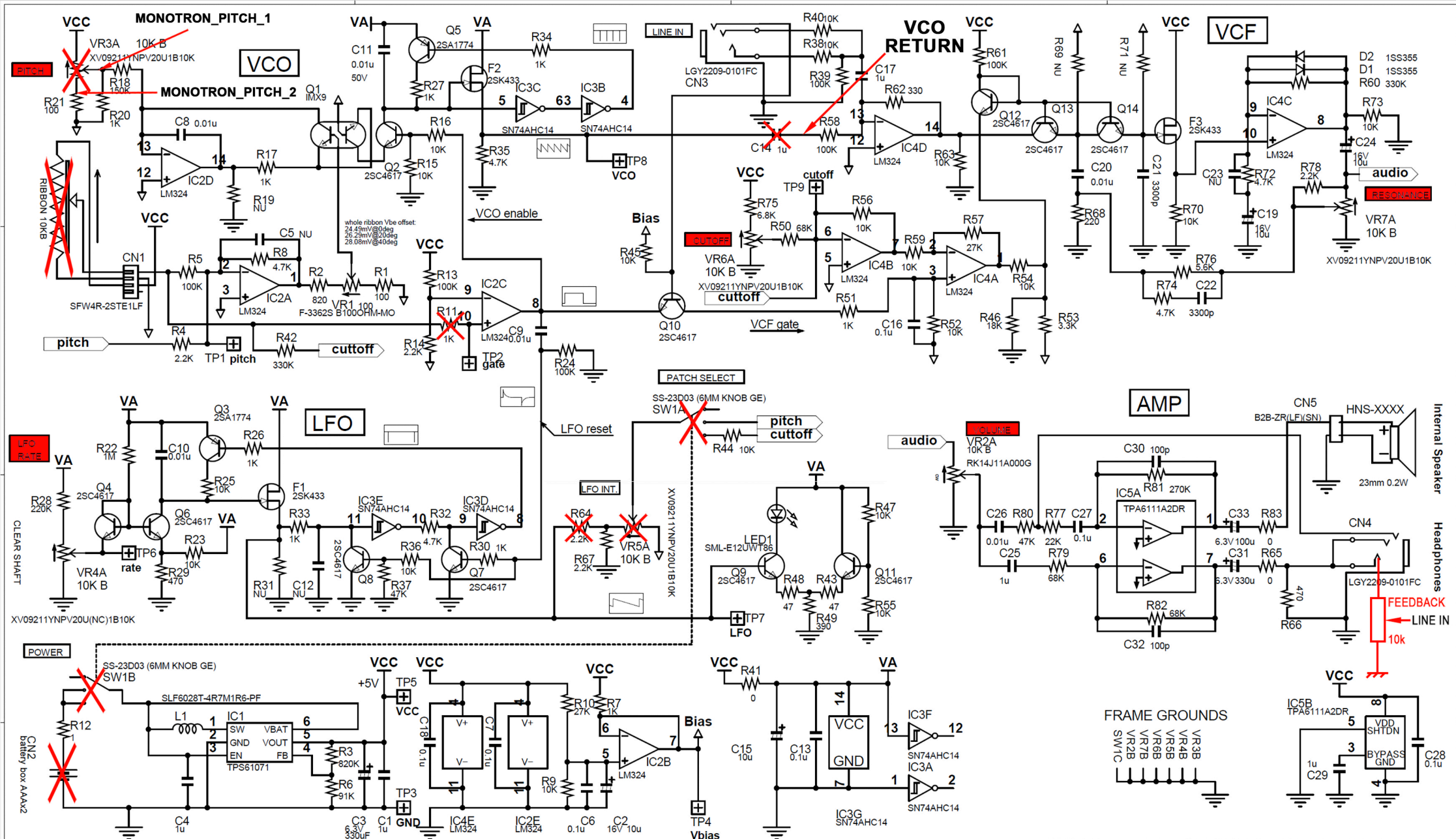
FILTER

PEAK/

RESONANCE

VR7

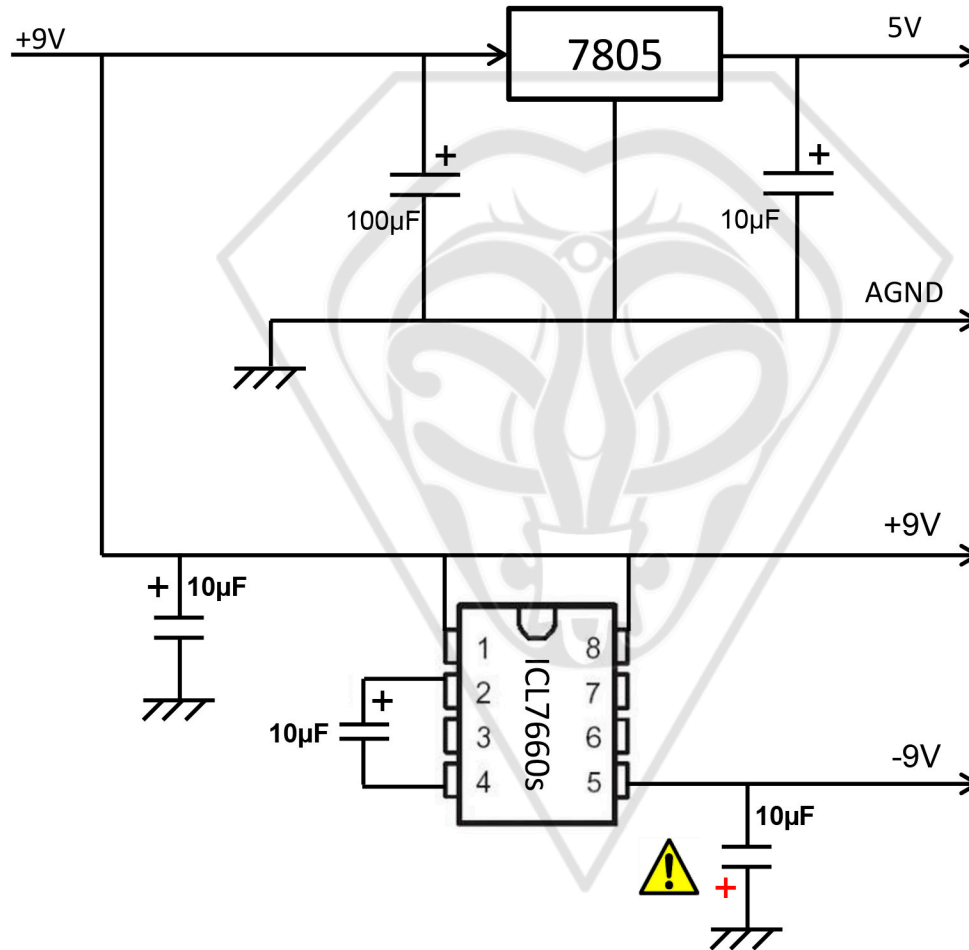
KLM-3035-A



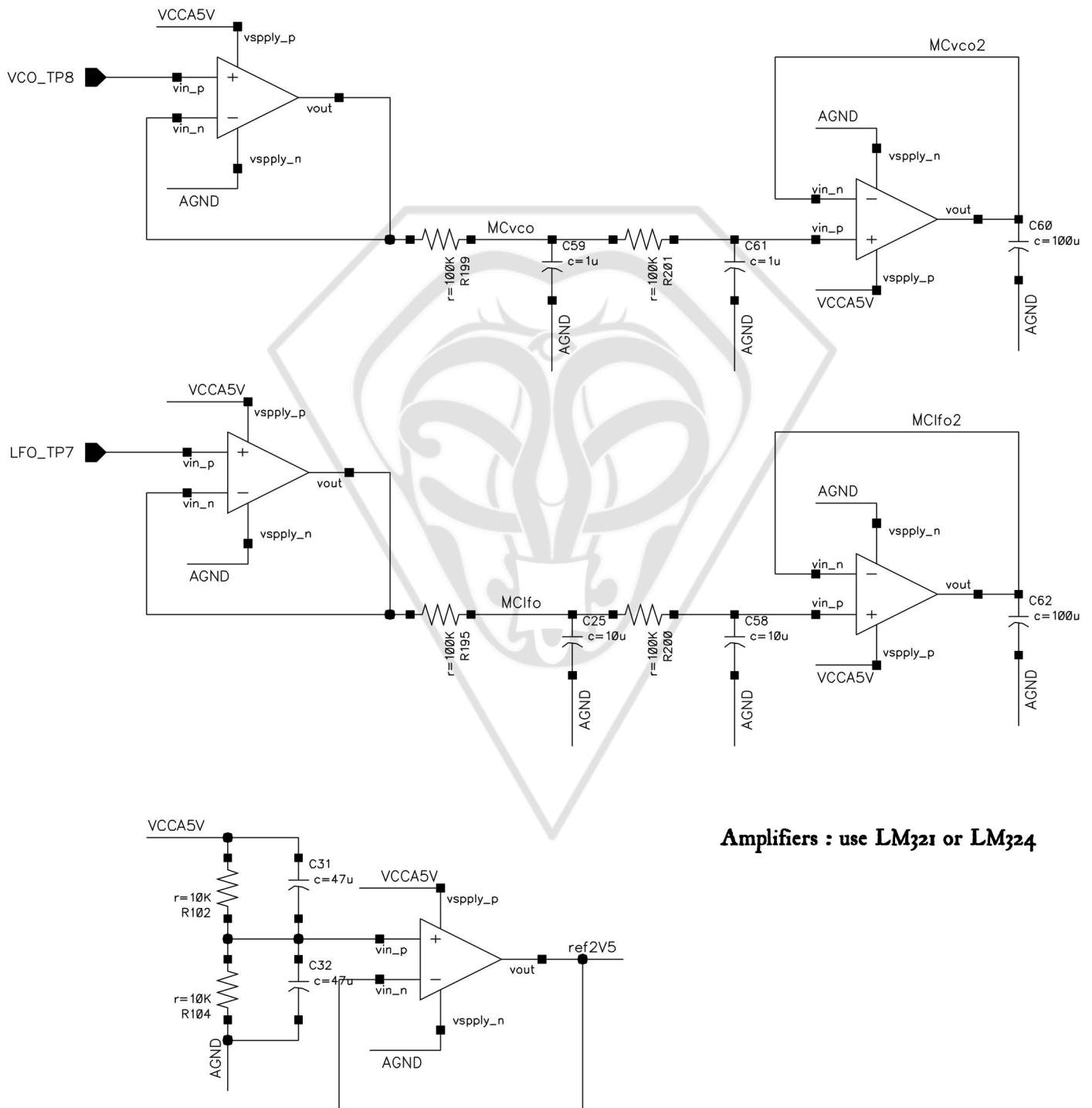
Details of this schematic are subject to change without notice.
 Any modification to any monotron will immediately void its warranty.
 Korg or any of its affiliates will not accept responsibility for any damages, personal loss or injury that may result from any modification to the device.

MODEL	TITLE	
monotron	MS-X Mod - MS10 40th Anniversary -	
KORG	DATE	DESIGNED BY
	2018	FAR BEYOND PERCEPTION

POWERING

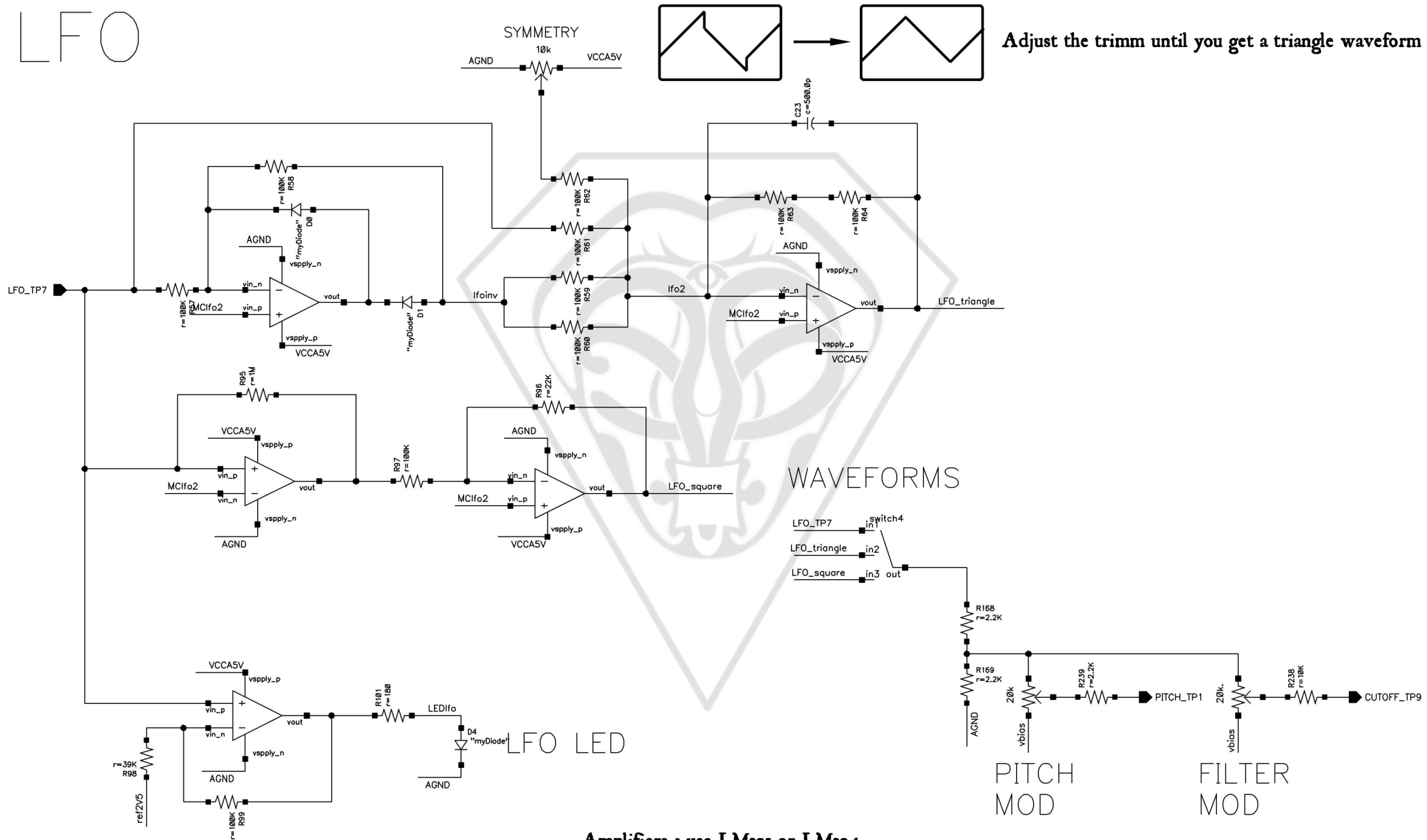


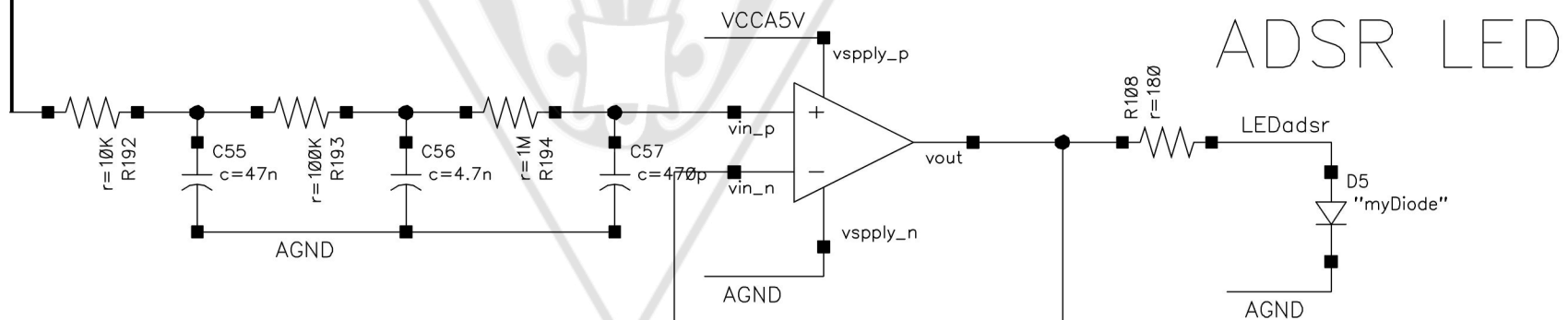
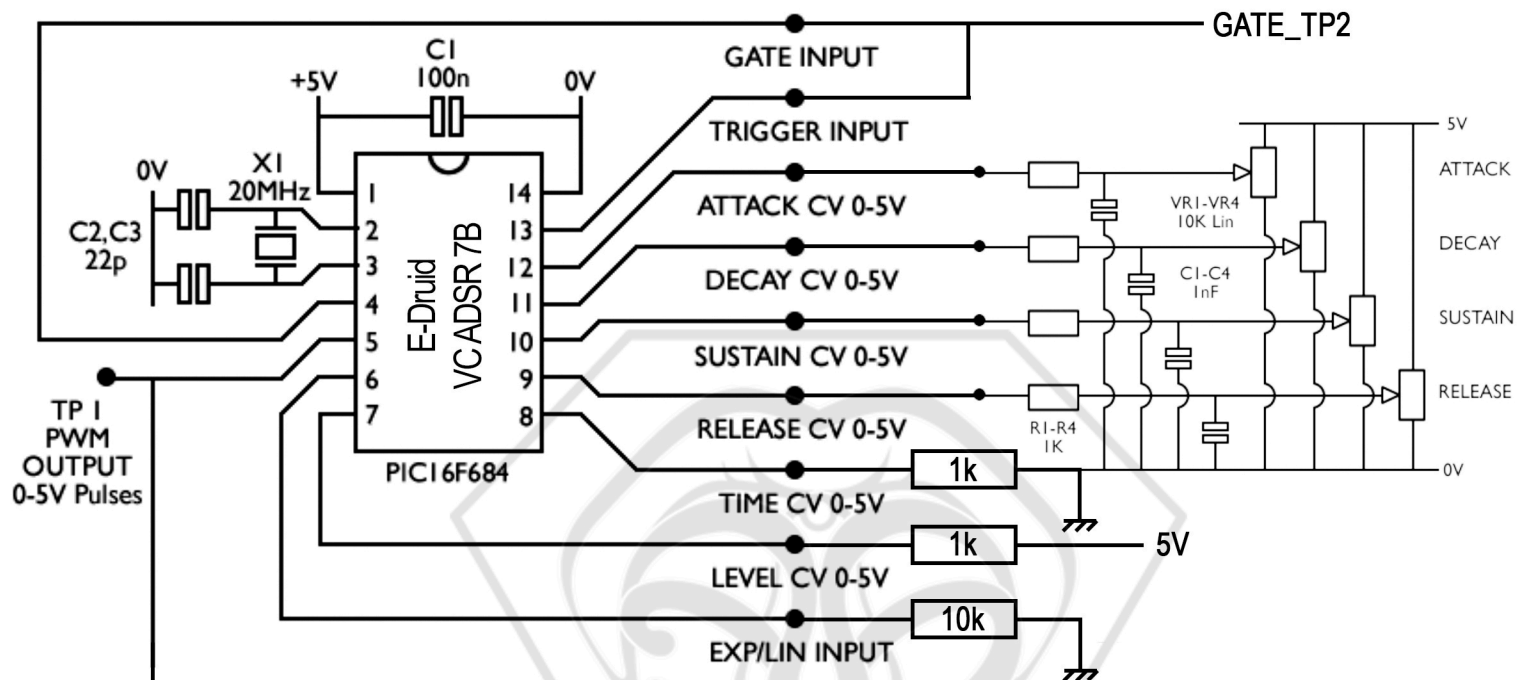
VOLTAGE REFERENCES



Amplifiers : use LM321 or LM324

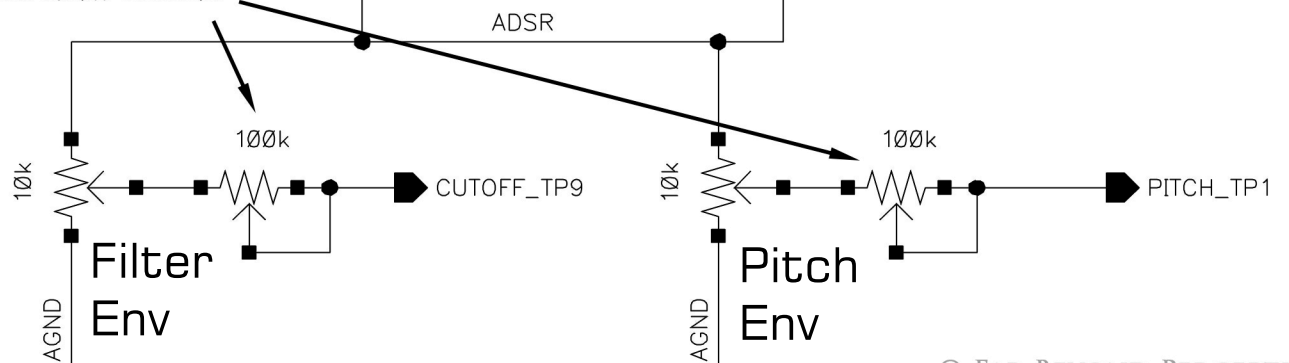
LFO





Adjust trimms until you get the right amount of pitch and cutoff variation

ADNR

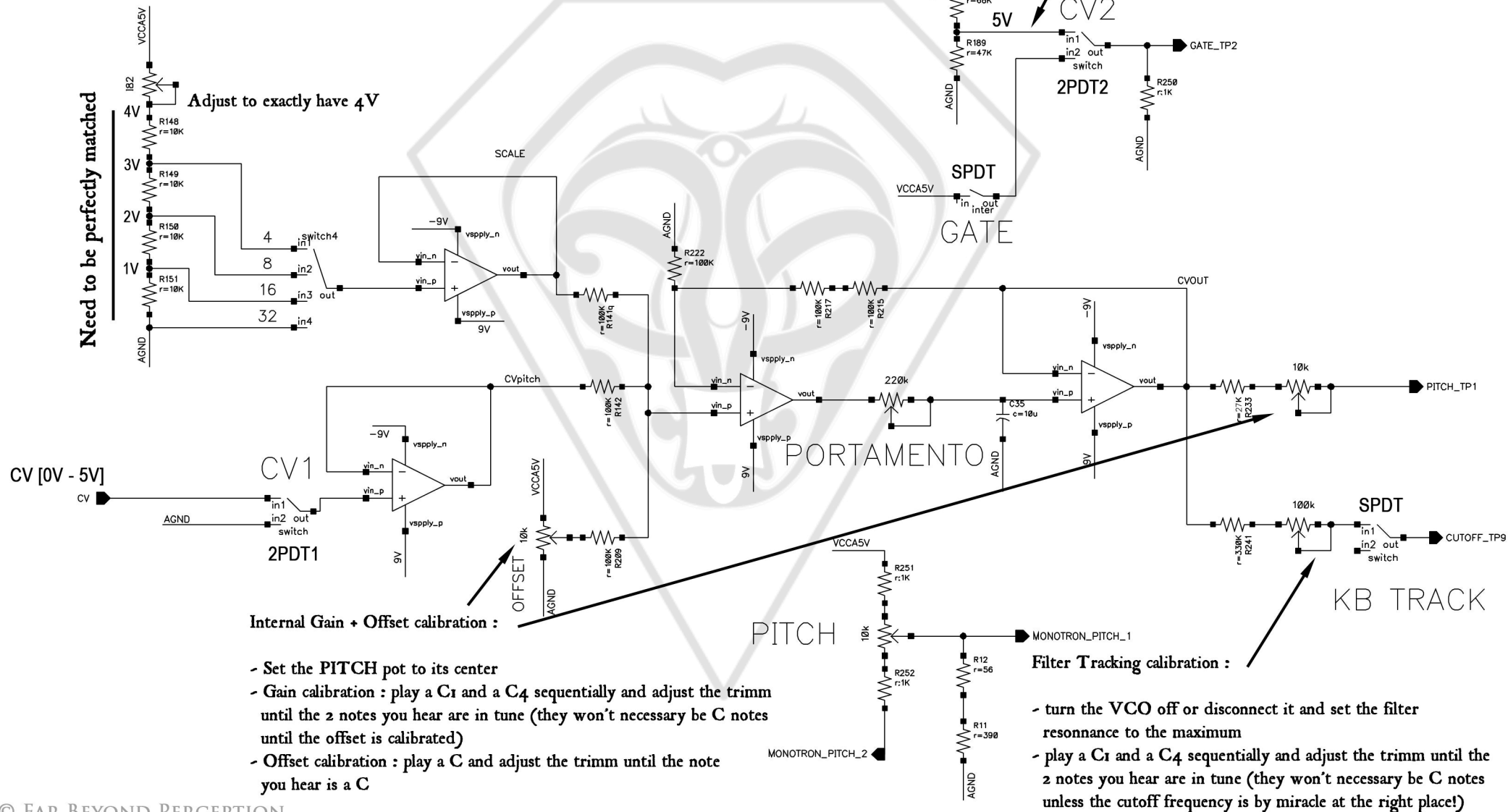


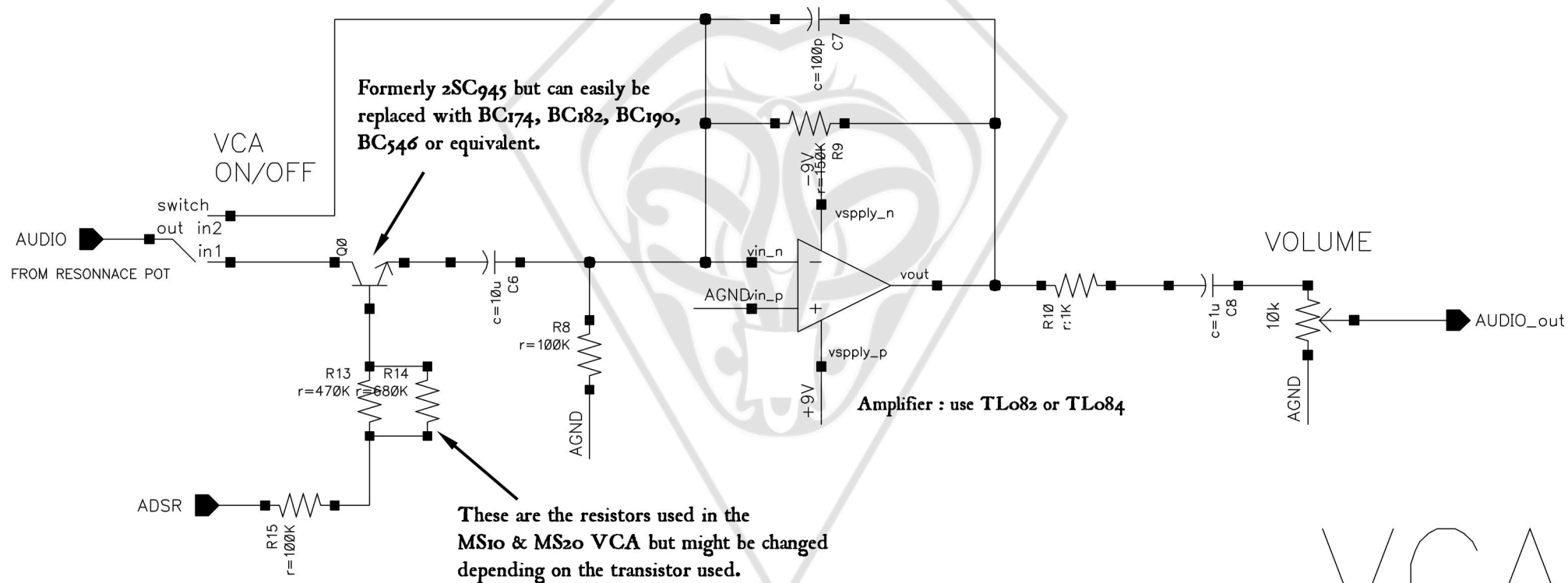
For 12V GATES
(ARTURIA devices)

GATE_12V

R188

Connect here if you already have a 5V Gate





VCA

© FAR BEYOND PERCEPTION



FAR BEYOND PERCEPTION INSTRUMENTS

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