Arcade Commander

Based on:
Earthquaker Devices Bit Commander

Effect type:
Monophonic analog guitar synthesizer with four octaves of vintage square wave synth tones.

Build difficult:
Intermediate

Number of parts:
Average, total 43 components

Technology:
Xicon Audio Transformer

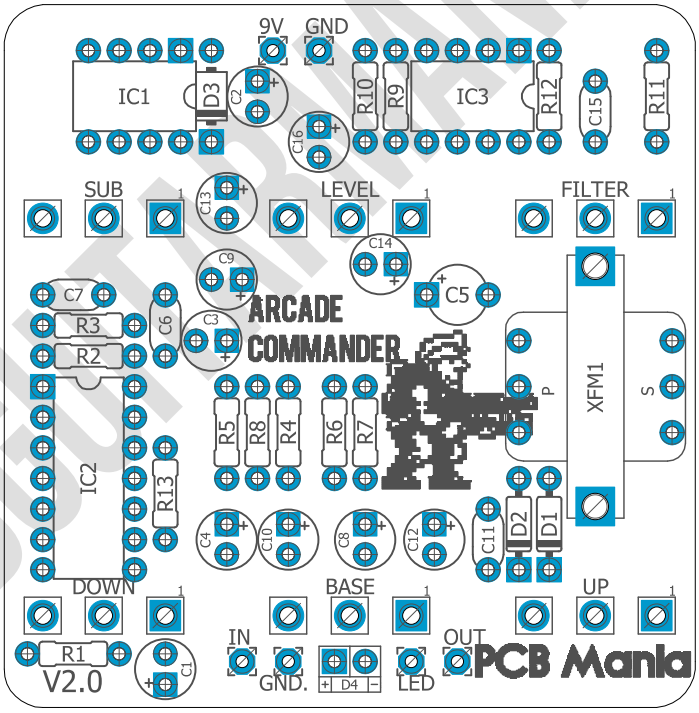
Power consumption:
9V

Enclosure type:
125b

Get your board at:
Arcade Commander

Get your kit at:
Das Musikding (Europe)

Project overview:
The Arcade Commander is a monophonic analog guitar synthesizer with four octaves of vintage square wave synth tones. User-friendly controls, two octaves down, one up, square signal control, everything fully analog.



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Introduction

With the Arcade Commander, you can relive the glory days of primitive mono synths and nostalgic chiptune-y leads! This pedal allows you to blend your guitar or bass signal with sub-octave rumble and octave-up shriek for some pronounced effects.

Play above the seventh fret to get fast and predictable results, or adventure below that where the tracking gets a bit volatile, resulting in all kinds of unpredictable fun.

Add or subtract octaves to pump, pulse, shape, and swell your sound. Whatever you choose to do, the Arcade Commander will deliver it in the form of a powerfully and uncompromised tone!

Controls

Potentiometers

- Base
- Sub
- Up
- Level
- Down
- Filter

Bill of materials

Resistors	
Part	**Value**
R1	1m
R2	22k
R3	100k
R4	100k
R5	220k
R6	47k
R7	220k
R8	220k
R9	10k
R10	10k
R11	10k
R12	10k
R13	2k7-4k7

Capacitors	
Part	**Value**
C6	10n
C7	22n
C11	1n
C15	**22n***

Electrolytic Capacitors	
Part	**Value**
C1	1uf
C2	10uf
C3	1uf
C4	1uf
C5	100uf
C8	1uf
C9	1uf
C10	1uf
C12	1uf
C13	100uf
C14	10uf
C16	1uf

Potentiometers	
Part	**Value**
BASE	100k B
SUB	100K B
UP	2k B
LEVEL	100k A
DOWN	100k B
FILTER	5k B

IC	
Part	**Value**
IC1	LM386
IC2	CD4024BE
IC3	TL072

Transformers	
Part	**Value**
XFM1	42TM011-RC

Diodes	
Part	**Value**
D1	1n4148
D2	1n4148
D3	1n4001
D4	3mm red LED

Shopping list

Resistors		
Qty	**Value**	**Parts**
2	100k	R3, R4
4	10k	R9, R10, R11, R12
1	47k	R6
3	220k	R5, R7, R8
1	22k	R2
1	1m	R1
1	2K7-4K7	R13

Capacitors		
Qty	**Value**	**Parts**
2	22n	C7, C15
1	1n	C11
1	10n	C6

Electrolytic Capacitors		
Qty	**Value**	**Parts**
8	1uf	C1, C3, C4, C8, C9, C10, C12, C16
2	10uf	C2, C14
2	100uf	C13, C5

Potentiometers		
Qty	**Value**	**Parts**
1	100k A	LEVEL
3	100k B	BASE, DOWN, SUB
1	5k B	FILTER
1	2k B	UP

IC		
Qty	**Value**	**Parts**
1	LM386	IC1
1	TL072	IC3
1	CD4024BE	IC2

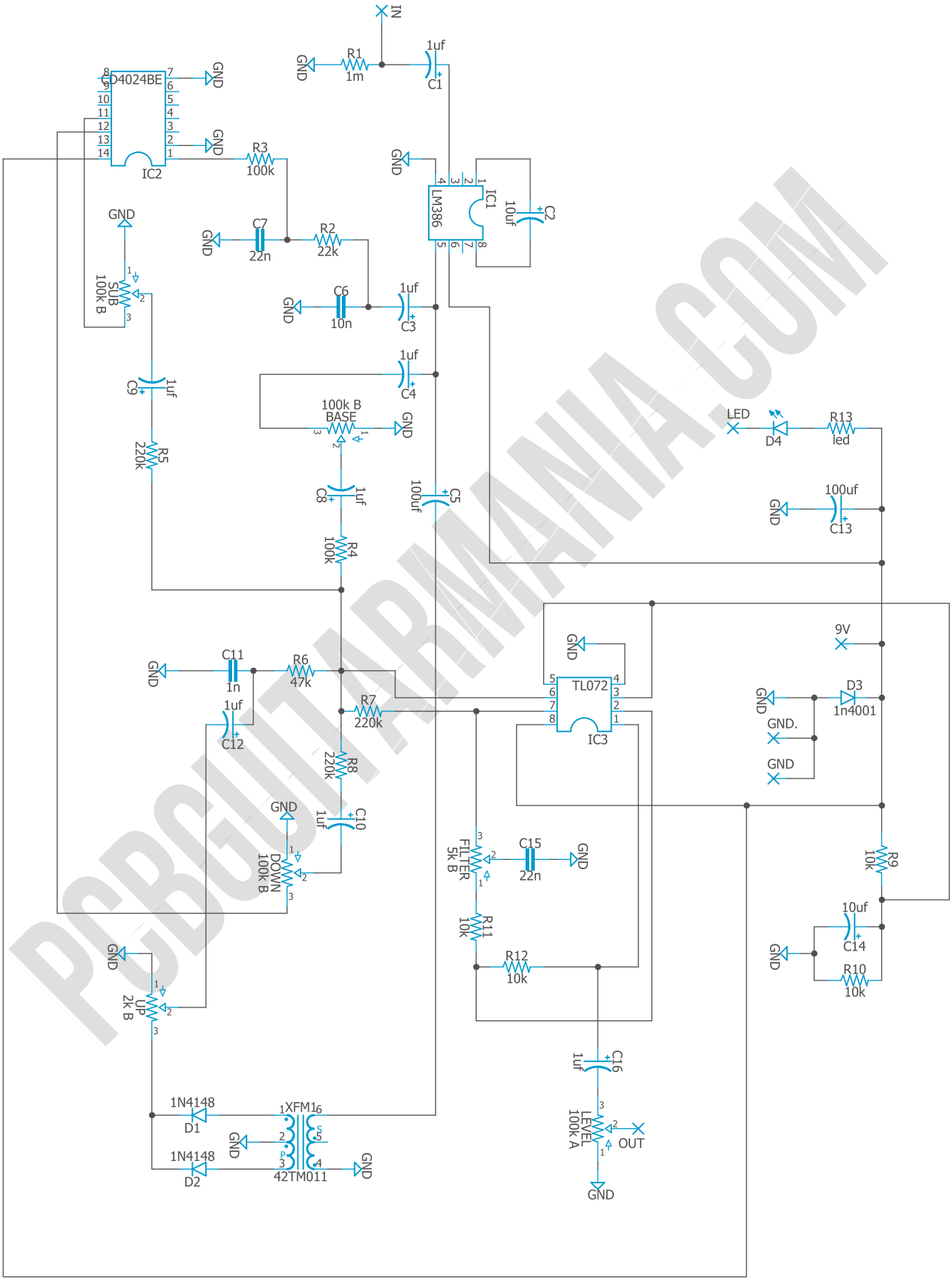
Transformers		
Qty	**Value**	**Parts**
1	42TM011-RC	XFM1

Switches		
Qty	**Value**	**Parts**
1	3PDT Stomp foot	-

Diodes		
Qty	**Value**	**Parts**
2	1N4148	D1, D2
1	3mm red LED	D4
1	1n4001	D3

Jacks		
Qty	**Value**	**Parts**
1	DC JACK	-
2	AUDIO JACK	-

Schematic



Components Recommendations

As many people like to experiment with some pedals with higher voltage, always ensure your **electrolytic capacitors'** max tolerance is over 25v.

This board has been tested using Film box capacitors for most of the values over 1nf and ceramics discs for those under 1nf. However, high-quality components such as Wilma's Capacitors and Panasonic's electrolytics can deliver a better performance.

All the resistors used for testing this project are 1/4W Metal Film.

The BOM and Shopping list are exclusive regarding this project. It doesn't include all the hardware like the 3PDT bypass switch, audio/dc jacks, enclosure, etc.

Build Notes

If this is one of your first projects, I recommend you take a look at our Pedal Building Guide.

For a successful and tidy build, it's recommended the following order:

1. Resistors & diodes
2. Capacitors, starting with the smaller ones and the ceramic ones.
3. Electrolytic capacitors (always check the polarity)
4. Transistors
5. Wires
6. Potentiometers and switches
7. Off-board wiring

C15*

This cap is in charge of the tone pot response. 22Nf is the value on the original unit, but I found that's pretty useless this way. It's recommendable to experiment with higher values, such as 220nf.

Wiring Diagram

All our projects include a free 3PDT Board to make the wiring easier and tidier. Also, all of our PCBs feature the status LED on board.

The pad named "Ctrl" or "LED" is the one that controls the status of the led; wire it to the "LED" pad on the 3PDT board or in the control slug of your 3PDT.

This board has been designed to match our EZ 3PDT PCB; check it here to access our Pedal Wiring Guide.

Drill Template

This Project has been planned to fit into a 125b enclosure type.

Check the Attached “Drilling templates” to drill the box properly. The files are on Scale 1:1, ready to print on an A4 page.

Licensing and Usage

We really appreciate your trust and support in buying this PCB, as well as your will to dive into the DIY electronics world. For us, that's why you can make this project work properly and enjoy not only the building process but also experiment and play with it on your rig.

We try to reply to every question we receive on our email or our social media. Still, we try to encourage all our customers to join our PCB Guitar Mania – Builders Group on Facebook to post all your doubts, issues, suggestions, or requests, share your builds, and have some feedback from other fellow builders and us!

We tested all our projects following this same guide on their standard configurations. Although, not all of the variations and mods have necessarily been checked. These are suggestions based on the schematic analysis and the experiences and opinions of others. Feel free to share with us your views and recommendations regarding the mods your personal experimentation.

These boards may be used for commercial endeavors in any quantity unless expressly noted. No attribution is necessary, though accreditation or a link back is always much appreciated.

If you are a builder planning to make your own run of pedals, we also offer the service of custom-made boards with your brand and logo, designed according to your specifications.

The only usage restrictions are that, first, you cannot resell the PCB as part of a kit without prior arrangement with us, and second, you cannot scratch off the silkscreen or other way of trying to hide our logos and the source of the PCBs. Like it's written above, if you want to have your designs with your brand and logo, we could undoubtedly reach an agreement.

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