

Solid Metal Pro

Based on:

Tight Metal Pro - Tight Metal Pro
Rock

Effect type:

Versatile High Gain Distortion

Build difficult:

Advanced

Amount of parts:

High, 166 components

Technology:

OpAmp Gate Stages

Power consumption:

9V

Enclosure type:

1590DD

Get your board at:

[Solid Metal Pro](#)

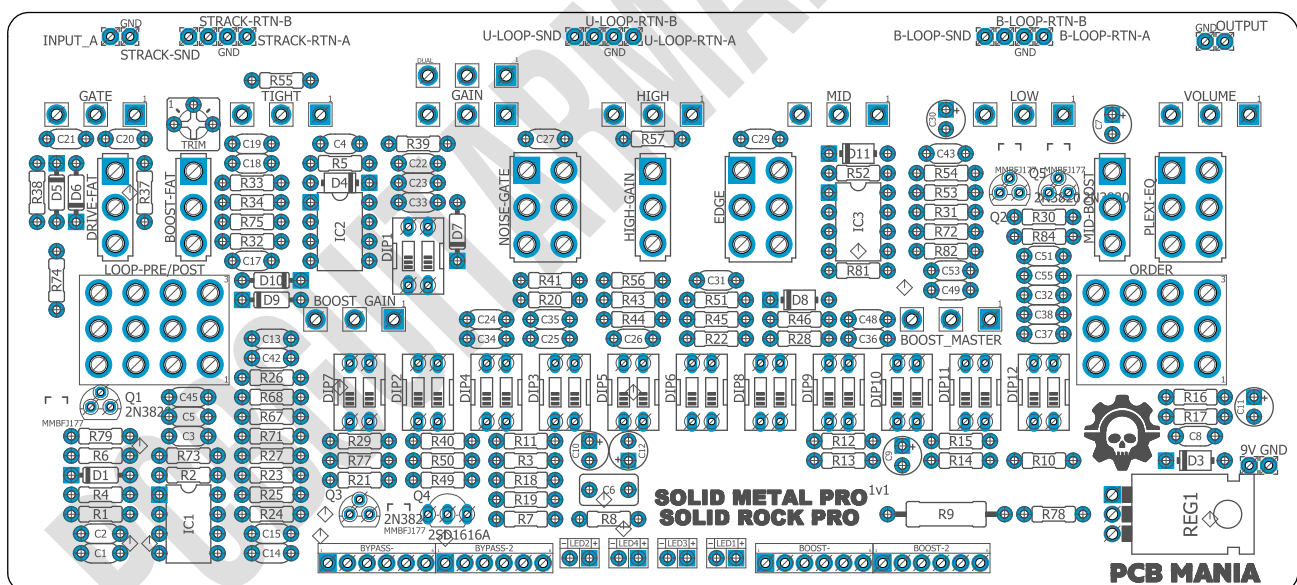
Get your kit at:

[Das Musikding \(Europe\)](#)

Project overview:

Our take on the Amptweaker Tight Metal Pro is a super adaptable build that includes dip switches to select between the Tight Metal and the Tight Rock version - or to make your own custom version.

This is by far one of the most versatile Drives we have ever made - If you liked the original [Solid Metal](#), you are gonna love the new Solid Metal Pro!



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Introduction

The latest high gain machine from Amptweaker-the Tight Metal Pro, redefines rock/metal tone and the very definition of total sonic brutality.

The design made by the iconic high-gain amp guru James Brown not only comes with a full assortment of high-gain tones and switching capabilities but includes Depth Finder and DeFizzerator processing built in for even more tone sculpting abilities.

We took the concept to the extreme by adding even more features to achieve the ultimate "Right in the face" moddable high gain distortion build. We kept this model under development for quite a while to ensure that it would include most of the features in the original unit + some extra ones. And boy, it paid off!

This final version incorporates the following:

- Noise gate
- 3 band active eq
- Boost
- Individual fat toggles for Drive and Boost
- Mid Boost
- Plexi Eq toggle
- Edge toggle for smooth mode
- High gain toggle
- Order switch for the drive and boost
- Sidetrack loop jacks
- Universal loop jacks
- Boost Loop jacks
- Universal loop pre/ post Toggle

The parts required for this build are quite common and easy to get - no fancy parts besides the four 4PDT Switches (Two toggles, two footswitches).

Are you ready to build this fantastic piece of gear?

Controls

Potentiometers

- Boost_Gain
- Boost_Master
- High
- Low
- Mid
- Tight
- Volume
- Gate
- Gain

Switches

- BOOST-
- BOOST-2
- BOOST-FAT
- BYPASS-
- BYPASS-2
- DRIVE-FAT
- EDGE
- HIGH-GAIN
- LOOP-PRE/POST
- MID-BOOST
- NOISE-GATE
- PLEXI-EQ
- DIP1 to DIP12

Bill of materials

Resistors	
Part	Value
R1	1M
R2	1M
R3	6k8
R4	100k
R5	47k
R6	1M
R7	330k
R8	10k
R9	47ohms, 2W
R10	6k8
R11	6k8
R12	6k8
R13	6k8
R14	6k8
R15	6k8
R16	6k8
R17	6k8
R18	6k8
R19	6k8
R20	1k5
R21	470k
R22	100k
R23	1k
R24	68k
R25	27k
R26	47k
R27	100k
R28	47k
R29	47k
R30	22k
R31	3k3
R32	47k
R33	100k
R34	470k
R37	100k
R38	470k

R39	47k
R40	15k
R41	3k3
R43	220k
R44	470k
R45	22k
R46	10k
R49	1M
R50	470k
R51	10k
R52	470k
R53	1k5
R54	4k7
R55	4k7
R56	47k
R57	1k5
R67	6k8
R68	100k
R71	8k2
R72	10k
R73	470k
R74	100k
R75	1M
R77	18k
R78	220R
R79	4k7
R81	3k3
R82	3k3
R84	6k8

Capacitors	
Part	Value
C1	47p
C2	33n
C3	100p
C4	4n7
C5	100n
C6	470n

C8	22n
C13	220n
C14	22n
C15	100n
C17	4n7
C18	100n
C19	47n
C20	1n
C21	47n
C22	100p
C23	22n
C24	33n
C25	47n
C26	47n
C27	220n
C29	100n
C31	560p
C32	47n
C33	33n
C34	47n
C35	100n
C36	47n
C37	22n
C38	100n
C42	22n
C43	100n
C45	33n
C48	10n
C49	47n
C51	47n
C53	10n
C55	220n

Electrolytic Capacitors	
Part	Value
C7	22u
C9	22u
C10	22u
C11	22u
C12	22u
C30	22u

Potentiometers	
Part	Value
BOOST_GAIN	B100k
BOOST_MASTER	B100k
HIGH	B10k
LOW	C100k
MID	A100k
TIGHT	C100k
VOLUME	B10k
GATE	B1M dual-gang
GAIN	A500k dual-gang

IC	
Part	Value
IC1	TL072
IC2	TL072
IC3	TL072

Transistors	
Part	Value
Q1	2N3820
Q2	2N3820
Q3	2N3820
Q4	2SD1616A
Q5	2N3820

Switches	
Part	Value
DRIVE-FAT	SPDT toggle on/on
BOOST-FAT	SPDT toggle on/on
LOOP-PRE/POST	4PDT toggle on/on
NOISE-GATE	DPDT toggle on/on
HIGH-GAIN	SPDT toggle on/on
EDGE	DPDT toggle on/on
MID-BOOST	SPDT toggle on/on
PLEXI-EQ	DPDT toggle on/on
ORDER	4PDT toggle on/on
DIP1	2 pole dip4 switch

DIP2	2 pole dip4 switch
DIP3	2 pole dip4 switch
DIP4	2 pole dip4 switch
DIP5	2 pole dip4 switch
DIP6	2 pole dip4 switch
DIP7	2 pole dip4 switch
DIP8	2 pole dip4 switch
DIP9	2 pole dip4 switch
DIP10	2 pole dip4 switch
DIP11	2 pole dip4 switch
DIP12	2 pole dip4 switch
BYPASS	4PDT footswitch
BOOST	4PDT footswitch

Voltage Regulator	
Part	Value
REG1	LM317

Diodes	
Part	Value
D1	1N4148
D2	1N4004
D3	1N5817
D4	1N4733
D5	1N4148
D6	1N4148
D7	1N4148
D8	1N4733
D9	1N4148
D10	1N4148
D11	1N4733
LED1	3mm red LED
LED2	3mm red LED
LED3	3mm red LED
LED4	3mm red LED

Shopping list

Resistors		
Qty	Value	Parts
5	1M	R1, R2, R6, R49, R75
13	6k8	R3, R10, R11, R12, R13, R14, R15, R16, R17, R18, R19, R67, R84
7	100k	R4, R22, R27, R33, R37, R68, R74
7	47k	R5, R26, R28, R29, R32, R39, R56
1	330k	R7
4	10k	R8, R46, R51, R72
1	47ohms, 2W	R9
3	1k5	R20, R53, R57
7	470k	R21, R34, R38, R44, R50, R52, R73
1	1k	R23
1	68k	R24
1	27k	R25
2	22k	R30, R45
4	3k3	R31, R41, R81, R82
1	220k	R43,
1	8k2	R71
1	18k	R77

Capacitors		
Qty	Value	Parts
1	47p	C1
4	33n	C2, C24, C33, C45
2	100p	C3, C22
2	4n7	C4, C17
7	100n	C5, C15, C18, C29, C35, C38, C43
2	4n7	C4, C17
9	47n	C19, C21, C25, C26, C32, C34, C36, C49, C51
1	470n	C6
5	22n	C8, C14, C23, C37, C42
3	220n	C13, C27, C55

1	1n	C20
3	33n	C2, C24, C33, C45
9	47n	C19, C21, C25, C26, C32, C34, C36, C49, C51
1	560p	C31

Electrolytic Capacitors		
Qty	Value	Parts
6	22u	C7, C9, C10, C11, C12, C30

Potentiometers		
Qty	Value	Parts
2	B100k	BOOST_GAIN, BOOST_MASTER
2	B10k	HIGH, VOLUME
2	C100k	LOW, TIGHT
1	A100k	MID
1	B1M dual-gang	GATE
1	A500k dual-gang	GAIN

IC		
Qty	Value	Parts
3	TL072	IC1, IC2, IC3

Transistors		
Qty	Value	Parts
3	2N3820	Q1, Q2, Q3
1	2SD1616A	Q4
1	2N3820	Q5

Switches		
Qty	Value	Parts
4	SPDT toggle on/on	DRIVE-FAT, BOOST-FAT, HIGH-GAIN, MID-BOOST
2	4PDT toggle on/on	LOOP-PRE/POST, ORDER

3	DPDT toggle on/on	NOISE-GATE, EDGE, PLEXI-EQ
12	2 pole dip4 switch	DIP1 to DIP12
2	4PDT footswitch	BYPASS, BOOST

Voltage Regulator		
Qty	Value	Parts
1	LM317	REG1

Diodes		
Qty	Value	Parts
6	1N4148	D1, D5, D6, D7, D9, D10
1	1N4004	D2
1	1N5817	D3
3	1N4733	D4, D8, D11
4	3mm red LED	LED1, LED2, LED3, LED4

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

DIP Switches description list

Dip 1 – IC2_B feedback capacitor. Sw.1 on – less low-mids amplified, sw.2 – more low-mids amplified. If both switches are on – capacitors are connected in parallel, resulting in 55nf capacitance, and you get even more low-mids.

Dip 2 and Dip 4 – are both low-cut filters. If the TIGHT pot is fully CCW – you get a low cut. Frequency depends on dip 2 and dials 4 switches: if in both dials sw.2 on – more lows cut. If in both dials sw.1 on – less lows cut. If in dip 4 both sw. on – you get two resistors in parallel the result will be around lowest (1k5), so it is the same as dip 4, only sw.2 on. If dip 2 both sw. on – you get two capacitors in parallel and resulting in 80nf capacitance. So, the highest low cut you get with dip 2 both sw. on and dip 4 sw. 2 on.

Dip 3 – coupling capacitor. If sw.1 on – less lows pass, if sw.2 on – more lows pass. If both sw. on – you get even more lows passing because two capacitors are connected in parallel with the resulting 147nf capacitance.

Dip 5 – a kind of parametric filter. If sw.2 on – more mids pass - lower value resistor R22, than R43 in series with 47nf capacitor. If sw.1 on – less mids pass – higher value resistor R44, than R43 in series with 47nf capacitor. If both sw. on – the same as sw.2 on, because of two resistors in parallel with resulting resistance about lower value (100k).

Dip 6 – IC3_A feedback resistor. If sw.1 on – you get a bit lower gain. If sw.2 on – you get a bit higher gain because of higher summing resistance in feedback. If both sw. on – same as sw.1 on, because of two resistors in parallel with resulting resistance about lower value (10k).

Dip 7 – shorting resistor in series with GATE_B trimmer and in parallel with D9, D10 diodes. If sw. 1 on – lower gate (compression), because of

lower resistance in series with trimmer that shortens diodes. If sw.2 on – higher gate (compression), because of higher resistance in series with trimmer, that shortens diodes. If both sw. on – same as sw.1 on, because of two resistors in parallel with resulting resistance about lower value (18k).

Dip 8 – resistor that shunts coupling capacitor C29. If sw.1 on – more lows pass, because of lower resistance. If sw.2 on – less lows pass, because of higher resistance. If both sw. on – same as sw.1 on, because of two resistors in parallel with resulting resistance about lower (1k5).

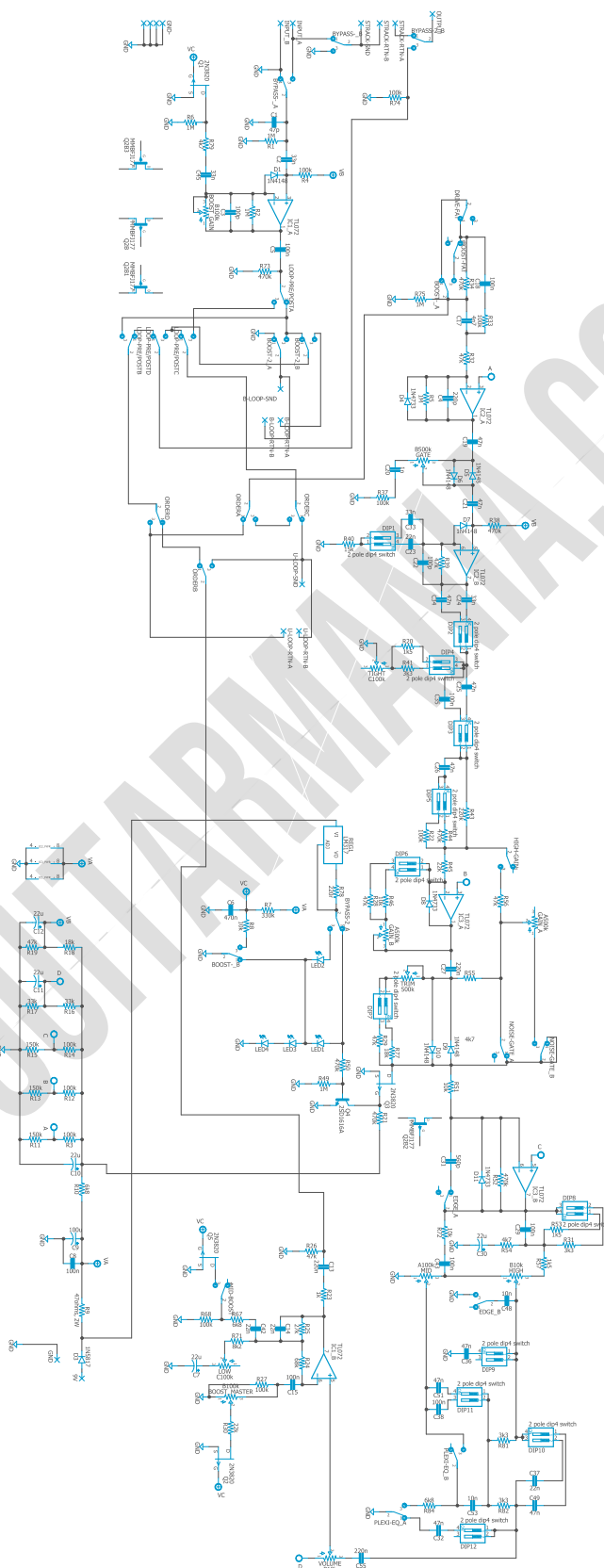
Dip 9 – this capacitor is not present on the original. If you turn sw.1 on – you add 47n (C36) capacitor in parallel to 10n (C48) capacitor resulting in 57nf capacitance, and it moves EDGE (high cut filter) more to mid frequencies range. Sw.2 has no use.

Dip 10 – coupling capacitor. If sw.1 on – more low-mids pass, because of higher capacitance. If sw.2 on – less low-mids pass, because of lower capacitance. If both sw. on – you get even more low-mids pass, because of two capacitors in parallel with resulting 69nf capacitance.

Dip 11 – filter capacitor for PLEXI_EQ. If sw.1 on – less mids pass, because of lower capacitance. If sw.2 on – more mids pass, because of higher capacitance. If both sw. on – you get even more mids passed because of two capacitors in parallel with resulting 147nf capacitance.

Dip 12 – this capacitor is not installed in the original. It gives you a high-mid cut if you turn sw.1 on when PLEXI_EQ is turned off. Sw. 2 has no use.

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 Wima'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 to take a look at our [Pedal Building Guide](#).

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

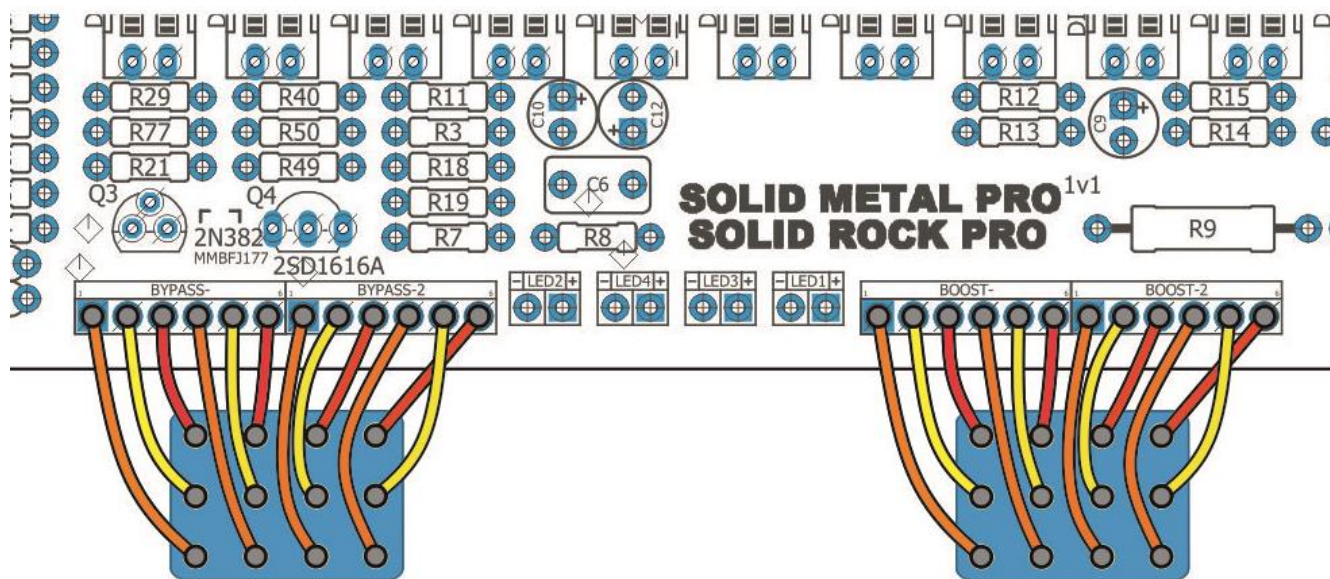
1. Resistors & diodes
2. Capacitors, starting with the smaller ones and the ceramic ones.
3. Electrolytic capacitors (always check the polarity)
4. Transistors
5. Wires
6. Potentiometers and switches
7. Off-board wiring

Drill Template

This Project has been planned to fit into a 1590DD 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.

Wiring Diagram



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, design 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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