El Rey de la Gloria Azul II

Build Document

Version: 0.1 Beta

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Introduction

The Marshall Blues Breaker was a pedal introduced in 1991 with the purpose of simulating a vintage Marshall combo amp used by Eric Clapton. The pedal itself doesn't produce much gain, but the way that it pushes the tubes brings out some amazing tones. JHS and Analogman used the Blues Breaker circuit as a basis for their own variants.

This board is one of my favorites. It allows for three stock circuits to be on a single board. However, the fun is the amount of control we each have in regards to the modifications. Do you want a stock Blues Breaker with a few clipping options? What about a King of Tone with an extra gain stage?

The Ultimate King of Tone (I'm calling it the Ultimate) is a King of Tone with all of the extra mods. You could easily make an "Ultimate" Blues Breaker or an "Ultimate" Morning Glory. Choose any combination of modifications to make it your own. You could also add a V-Boost board to switch from 9V to 18V!

The Analogman King of Tone is two of these boards in a single enclosure. If you're looking to clone that pedal, buy two of the boards!

Final notes.

1. JP1 should be set. However, my ear didn't hear much of a difference between jumping pins 1 & 2 and 2 & 3. Let **your** ear decide.
2. The same can be said for the volume pot's lug 1. Setting it to GND or VR made no audible change to me. Try either way if you want.
3. Have fun with the clipping options. Try different diodes and combinations of diodes. Try asymmetrical vs. symmetrical. "The world is your oyster."

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Bill of Materials

Resistors

P/N	Blues Breaker	Morning Glory	King of Tone	Ultimate King of Tone
RPD	1M to 2M2	1M to 2M2	1M to 2M2	1M to 2M2
R1	1M	1M	1M	1M
R2	3k3	3k3	33k	33k
R3	4k7	4k7	27k	27k
R4	10k	10k	10k	10k
R5	220k	220k	220k	220k
R6	6k8	6k8	6k8	6k8
R7	1k	1k	1k	1k
R8	6k8	6k8	6k8	6k8
R9	1M	1M	1M	1M
R10	47k	47k	47k	47k
R11	47k	47k	47k	47k
RX1	*Omit*	68k	*Omit*	68k
RX2	*Omit*	1M	*Omit*	1M
RX3	*Omit*	22k	*Omit*	22k
RX4	*Omit*	12k	*Omit*	12k
RX5	*Omit*	12k	*Omit*	12k
RX6	*Omit*	100k	*Omit*	100k

Note: Early versions of the Blues Breaker used 33k and 27k for R2 and R3 respectively.

Diodes

I obtained all of my diodes for the Blues Breaker and Morning Glory from Tayda. That's what the layout was setup for. However, I obtained the BA282s from smallbear.

P/N	Blues Breaker	Morning Glory	King of Tone	Ultimate King of Tone	Notes
D1	1N914	1N4148	MA856	MA856	You can sub a 1N4148 for a 1N914. Some people suggest a BA282 as a sub for the MA856.
D2	1N914	1N4148	MA856	MA856	You can sub a 1N4148 for a 1N914. Some people suggest a BA282 as a sub for the MA856.
D3	1N914	1N4148	MA856	MA856	You can sub a 1N4148 for a 1N914. Some people suggest a BA282 as a sub for the MA856.
D4	1N914	1N4148	MA856	MA856	You can sub a 1N4148 for a 1N914. Some people suggest a BA282 as a sub for the MA856.
D5	*Omit*	*Omit*	*Omit*	Pick one	See the section about modifications for more information.

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D6	*Omit*	*Omit*	*Omit*	Pick one	See the section about modifications for more information.
D7	*Omit*	*Omit*	*Omit*	Pick one	See the section about modifications for more information.
D8	*Omit*	*Omit*	*Omit*	Pick one	See the section about modifications for more information.
D9	*Omit*	*Omit*	1S1588	1S1588	Some people suggest a 1N400x as a sub for the 1S1588.
D10	*Omit*	*Omit*	1S1588	1S1588	Some people suggest a 1N400x as a sub for the 1S1588.
D11	1N400x	1N400x	1N400x	1N400x	Polarity protection.

Capacitors

P/N	Blues Breaker	Morning Glory	King of Tone	Ultimate King of Tone	Type	Notes
C1	10nF	47nF	10nF	10nF	Film Box	
C2	47pF	47pF	100pF	100pF	Ceramic	Early versions of the Blues Breaker used 10pF.
C3	10nF	10nF	10nF	10nF	Film Box	
C4	10nF	10nF	10nF	10nF	Ceramic	
C5	100nF	100nF	100nF	100nF	Film Box	
C6	10nF	10nF	10nF	10nF	Film Box	
C7	10nF	10nF	10nF	10nF	Film Box	
C8	100nF	Jumper	1uF	1uF	Film Box	Output cap for Blues Breaker, KoT, and UKoT.
C9	*Omit*	*Omit*	*Omit*	*Omit*	Film Box	Huh. I can get rid of this cap in my next rev.
C10	100uF	100uF	100uF	100uF	Aluminum Electrolytic	Power filter cap.
C11	100uF	100uF	100uF	100uF	Aluminum Electrolytic	
CX1	*Omit*	100pF	*Omit*	100pF	Ceramic	
CX2	*Omit*	470pF	*Omit*	470pF	Ceramic	
CX3	*Omit*	100n	*Omit*	100n	Film Box	
CX4	*Omit*	10u	*Omit*	10u	Aluminum Electrolytic	
CX5	*Omit*	*Omit*	1uF	1uF	Aluminum Electrolytic	Output cap for KoT and UKoT. Combined with C8 to make 2uF.
CX6	Jumper	2u2	Jumper	Jumper	Aluminum Electrolytic	Output cap for Morning Glory.

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Integrated Circuits

P/N	Blues Breaker	Morning Glory	King of Tone	Ultimate King of Tone	Notes
IC1	TL072	LM833N	JRC4580	JRC4580	Have fun; try other dual opamps.

Transistors

The 2N5457 and J201 are hard to get from Tayda. You can get the MPF102 easily from them.

P/N	Blues Breaker	Morning Glory	King of Tone	Ultimate King of Tone	Notes
Q1	*Omit*	2N5457	*Omit*	2N5457	You can try a J201, MPF102 or other JFET, including SMD options (MMBF5457, etc.).

Potentiometers

P/N	Value	Notes
GAIN	B100k	I recommend this one. Want more gain? Use a B250k.
PRES	B50k	Not required in Blues Breaker and Morning Glory, but doesn't hurt. You can always set it to 0 ohm. (If you exclude it, you can also omit C7.) Trimpot.
TONE	B25k	I recommend this one.
VOL	A100k	For the Morning Glory and Ultimate King of Tone, bend lug 1 and solder it to the octagonal pad labeled "VOL PAD GND." I recommend this one.

Switches

Look at the Modifications section for a little more information.

SW1 is an SMD pad on the backside. Use solder (or include solder and a small piece of wire/resistor lead) to jump the pads.

You must set JP1! When looking at the board in the same orientation as the front page of this document, pin 3 is the furthest in the bottom left. The pins are in reverse order from left-to-right: 3, 2, 1.

NOTE TO KYLE: Put a damn label/square pad on JP1 to indicate pin.

P/N	Blues Breaker	Morning Glory	King of Tone	Ultimate King of Tone
BRIGHT_CUT	*Omit*	SPDT on-off-on	*Omit*	SPDT on-off-on
HARD_CLIP	*Omit*	*Omit*	SPDT on-on	SPDT on-on
CLIP	Jump pins 1 & 2	Jump pins 1 & 2	Jump pins 1 & 2	SPDT on-off-on
SW1	Jumper	*Omit*	Jumper	*Omit*
JP1	Jump pins 1 & 2	Jump pins 1 & 2	Jump pins 2 & 3	Jump pins 2 & 3

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Other Parts

I obtained all of these from Tayda. That's what the layout was setup for.

Qty	Value	Notes
2	8-pin socket	Cut one in half to use for the transistor.

Modifications

I wanted this build to have more options than some of the others out there. So, instead of you picking and choosing which one or two mods to have, I've allowed all of them. This makes for a TRUE box of tone.

Bright Cut

The Morning Glory adds a 470pF to the feedback/clipping section. The pedal has a toggle switch to activate/bypass this capacitor. You have a couple options here:

1. Stay with the Morning Glory style to only use the 470pF and activate/bypass it. The Morning Glory uses a SPST for on-off.
2. Add a 100pF cap to switch between the 470pF and the 100pF. This 100pF is a "pulled out of the air" number based on the original Tube Screamer. Use any value that you prefer; high capacitance will cut the treble more than lower capacitance. You'll want to test different values to see what sounds better/different to you.
3. My preference: use a SPDT on-off-on to do a combination of numbers 1 and 2.

Hard Clipping

The original King of Tone had an internal DIP switch that allowed you to turn this on or off. Now, you can use a SPDT on-on to do it externally. Combine this with the Clip mod to allow for many different clipping options. Only use this mod in combination with D9 and D10.

While the King of Tone uses 1S1588 diodes here, feel free to socket and try others.

Clip

This switch allows for you to have a second set of clipping/voicing options. You can use a SPDT on-off-on if you want; the center position will just lift out the clipping. Feel free to use any diodes, LEDs, or MOSFETs of your liking, including LEDs.

Output Gain (SW1)

The Morning Glory adds a JFET as part of the output stage. This will increase the volume and change the output impedance. If you use this mod, be sure to connect lug 1 of the Volume pot to the GND pad located next to the original pad. (You'll need to bend the pin of the pot.)

Presence

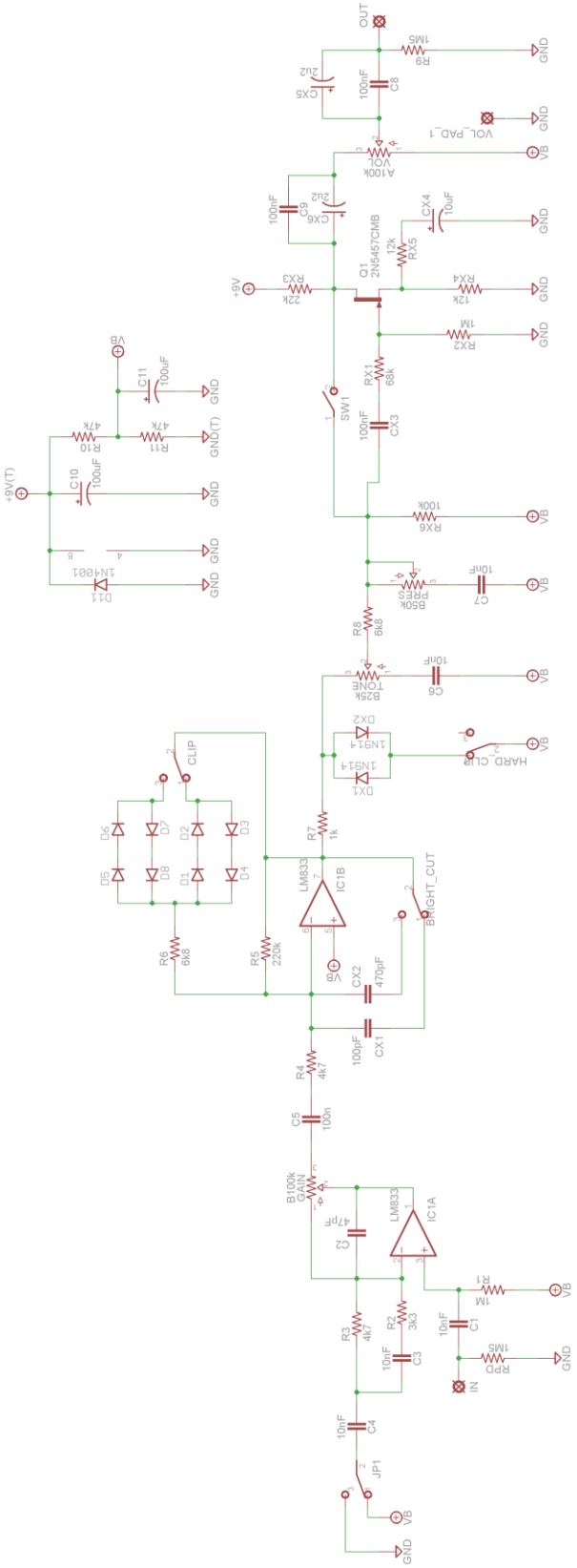
The King of Tone adds an internal trim pot to allow tweaking of the tone. There's really no reason to not include this trim pot. If you want, just set it to zero resistance to make it behave like a stock Blues Breaker or Morning Glory.

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Build Notes

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Schematic



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Images

Hopefully coming soon.

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