

# **CERIATONE**

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## **A M P L I F I C A T I O N**

# **Plexi51**

**“All Access”**

**50W Amplifier**

User's Manual

Thank you for the purchase of your Ceriatone Plexi 51 All Access guitar amplifier!

Here, we hope to explain how best to use your new amp.

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### **1) About the Plexi 51 All Access**

Ceriatone offers the classic Plexi 50 model in several different variations, to reflect the historical differences of the circuit, namely from '67, 68, 69, 70, and later '70s, as well as the 50W Bass version as well.

Other than the above, we also offer the JTM50, which is the early Plexi circuit, but with tube rectification.

Over the years, we have received many requests for mods, to incorporate a feature from a specific year, onto another. So we thought that it might perhaps be a great idea to come up with an amplifier that can have as many Plexi features inside of one amp.

Thus, the Plexi 51 All Access is born – an amplifier that allow the user to have it ALL, Plexi wise!

With this amp, you don't have to buy all 5 variations of the Plexi from us. Just get this one, and be amazed at the various differences and combinations you can get!

If that ain't value for money, I don't know what is!

Rock on!

- Nik S Azam

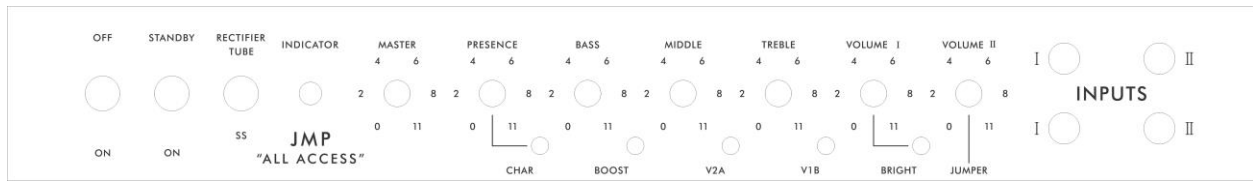
## 2) QUICK SETUP *(for instant gratification)*



- 1) Plug your guitar using a 1/4" instrument cable into the upper I input on the right of the front panel
- 2) Plug a suitable power cable from the rear panel MAINS cable inlet to your wall power receptacle
- 3) Plug the Plexi into your speaker cabinet using 1/4" speaker cable
- 4) Set the IMPEDANCE SELECTOR to the match the impedance of your speaker cabinet
- 5) Set all rotary tone and gain controls on the front panel to 12:00 (clock face)
- 6) Set VOLUME controls at just above minimum, with PPIMV set to full

- 7) Set front panel POWER switch in the ON position (down position, with adjacent STANDBY switch in the “STANDBY” mode) for 60 seconds to allow tube filaments to warm up. Select the Rectifier to be in SS (Solid State) mode first.
- 8) Set front panel STANDBY switch to “ON” mode (down position)
- 9) *ROCK!!!!!!*

### 3) FRONT PANEL CONTROLS



From left to right:

- 1) **POWER** 2-way toggle switch
- 2) **STANDBY** 2-way toggle switch
- 3) **RECTIFIER** 2-way toggle switch
- 4) **INDICATOR** LED
- 5) **POST PHASE INVERTER MASTER VOLUME (PPIMV)** control
- 6) **PRESENCE** control
- 7) **CHARACTER** 2-way toggle switch
- 8) **BASS** control
- 9) **BOOST** 3-way toggle switch
- 10) **MIDDLE** control
- 11) **V2A** 2-way toggle switch
- 12) **TREBLE** control
- 13) **V1B** 2-way toggle switch
- 14) **VOLUME I** control
- 15) **BRIGHT** 3-way toggle switch
- 16) **VOLUME II** control
  - a. With Push Pull **JUMPER** switch
- 17) **INPUT I and II** input ¼” instrument jack

**POWER** two-way toggle switch powers the amp on and off. With the toggle switch in the DOWN (“ON”) position, the amp is on. In the UP position, the amp is OFF.

**STANDBY** applies high voltage to the vacuum tube anodes (and screen grids) during use of the amp. To ensure long tube life, first power the unit on with the STANDBY toggle switch in UP position for approximately 60 seconds. You can then switch to DOWN ("ON") to use the amp. With the toggle switch in the UP position, the amp is in STANDBY mode. In the DOWN position, the amp is in OPERATE mode

**RECTIFIER** allows you to select Solid State or Tube rectification, for the amp. The tube rectifier used is a GZ34/5AR4. Using Tube Rectification will allow you to get the JTM50 circuit.

Please put the amp to STANDBY first, before toggling this switch!

**POST PHASE INVERTER MASTER VOLUME (PPIMV)** is a master volume control that acts after the phase inverter. This allows you to still have preamp and phase inverter distortion, but at lower volumes. When this control is maxed, the PPIMV is bypassed, thus it will be like a stock Plexi circuit.

**INDICATOR** will illuminate when the Plexi is powered by turning the front panel POWER toggle switch to the ON position. If INDICATOR does not turn on, check your power cable connections, and then the fuse on the rear of the unit.

**PRESENCE** adjusts the high frequency response of the power amplifier using negative feedback. Use this control to add sparkle and clarity to your tone.

**CHAR (Character)** allows you to select between 2 Presence capacitor values, ie 0.1uf (Left) and 0.68uf (Right). Most Plexi amps come with 0.1uf capacitor, but there were samples with 0.68uf as well, which alter how the high-mids are boosted.

**BASS** adjusts low frequencies

**BOOST** is a switch that adds a preamp signal boost by defeating the tonestack, which is lossy. This switch is a 3 way switch so you have stock (Left), boosted (Middle), and semi-boosted (Right).

**MIDDLE** adjusts the mid frequency response

**V2A** is a 3 way switch which selects the value of the cathode bypass capacitor on the V2A stage (Cathode Follower). Some Plexi do not have this capacitor, some have 0.68uf, while others have values like 330uF. Usually, this difference also comes with difference at other sections, for example, amps with 0.0022uF V1B coupling capacitor do not have a cathode

bypass capacitor, while those with 0.022uF have a bypass capacitor.. We invite you to try different combinations! 0.68uF (Left), None (Middle), 330uF (Right).

**TREBLE** adjusts the high frequency response

**V1B** is a 2 way switch which selects the value of the V1B coupling capacitor. Some Plexis come with 0.022uF, while some with 0.0022uF. Usually, this difference also comes with difference at other sections, for example, the V2A bypass capacitor, or the lack of it. We invite you to try different combinations! 0.022uF (Left), 0.0022uF (Right).

**VOLUME I** sets the overall volume and gain of the “BRIGHT” channel of the amp.

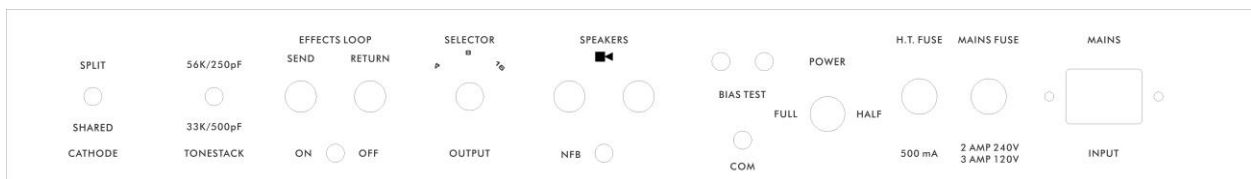
**BRIGHT** is a 3 way selector which selects the bright capacitor value for the Bright channel. You can select none (Middle), 100pF (Right), or 1000pF (Left).

**VOLUME II** adjusts the overall volume and gain of the “NORMAL” channel of the amp.

**JUMPER** is a push pull switch on the VOLUME II control above. When this is pulled, it will “jumper” the channels, thus blending them together. Both Volume I and Volume II are used, to determine the amount from each channel, when jumpering.

**INPUT I and II** are ¼” jacks for instrument cables. Plug your guitar in here. Use the I input for the BRIGHT channel. The BRIGHT channel has more gain, more treble, and a more prototypical Plexi tone. The UPPER I input is higher gain, whereas the LOWER I input is lower gain. Use the II input for the NORMAL channel. The NORMAL channel is much darker, lower gain, and has an abundance of lower frequencies. The UPPER II input is higher gain, whereas the LOWER II input is lower gain.

#### 4) REAR PANEL CONTROLS



From left to right:

- 1) **SPLIT/SHARED CATHODE** switch
- 2) **TONESTACK** switch
- 3) **SEND** ¼" instrument jack
- 4) **LOOP ON OFF** switch
- 5) **RETURN** ¼" instrument jack
- 6) **IMPEDANCE SELECTOR** three-way rotary selector
- 7) **SPEAKERS** ¼" speaker jacks (x2)\
- 8) **NEGATIVE FEEDBACK (NFB)**
- 9) **BIAS TEST** probe jacks (x4)
- 10) **COM** probe jack
- 11) **FULL / HALF** 2-way toggle switch
- 12) **HT FUSE**
- 13) **MAINS FUSE**
- 14) **MAINS** IEC cable inlet

**SPLIT/SHARED CATHODE** switch is to select between the earlier shared cathode (330uF/820 ohms) configuration for V1, to the later split cathode (330uF/820 for V1A, and 0.68uF/2K7ohms for V1B).

**TONESTACK** switch is to select between the earlier 56K slope resistor + 250pF treble capacitor, to the later 33K slope resistor + 500pF treble capacitor configs.

**SEND** is the Send jack of the effects loop, which is a SOLID STATE BUFFERED type, in this amp. A ¼" instrument cable is used, to the Input of your effects.

**LOOP ON OFF** switch is to turn the Buffered Loop on or off.

**RETURN** is the RETURN jack, accepting the Output from your effects, using ¼" instrument cable.

**IMPEDANCE SELECTOR** three-way rotary selector. Set to the position that matches the impedance of your speaker cabinet.

**NOTE** – *if you are using two speaker cabinets in parallel (ex – two 16 Ohm cabinets), set the impedance selector to half that of a single cabinet (in this case, 8 Ohms).*

**SPEAKERS** ¼" speaker cable jacks. Use a ¼" speaker cable to connect your speaker cabinet to the amplifier using these jacks. If you use one speaker cabinet, either jack is acceptable.

**NOTE** – *never turn your amplifier to OPERATE mode ("1" / DOWN position on STANDBY) without connecting the amplifier to a speaker cabinet or suitable dummy load! Failing to do so may damage your amplifier!*

**NEGATIVE FEEDBACK (NFB)** is a 3 way switch to select different NFB resistor values: 27K (LEFT), 49K (RIGHT), and No NFB(MIDDLE).  
No NFB will give the amp a louder, more gainy characteristics. Wild!

**FULL / HALF** switches the power output of the power amp. HALF mode configures the power tubes to run in triode operation, and this negates any need to reconfigure the IMPEDANCE SELECTOR.  
Please turn the amplifier to STANDBY before toggling this switch

**BIAS TEST** and **COM** multimeter probe jacks – use this for external bias current measurements (see Section 5, Page 8)

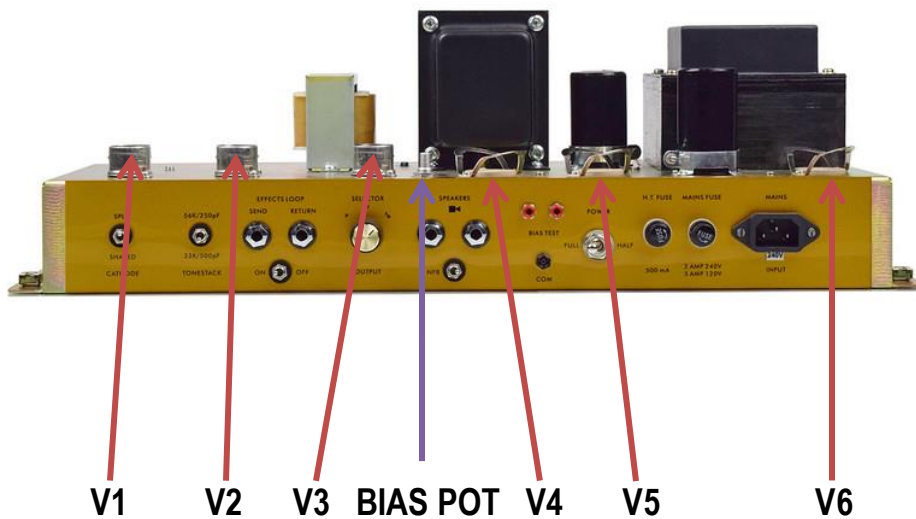
**HT FUSE** 0.5A SLO BLO fuse – used to protect your amplifier from voltage spikes or excessive current draw. Replace only when necessary.

**MAINS FUSE** SLO BLO fuse – used to protect your amplifier from voltage spikes or excessive current draw. Replace only when necessary. 3A is used for amplifiers used with a 120VAC country supply, and 2A is used with 240VAC.

**MAINS** IEC cable inlet – plug a suitable IEC power cable into this inlet to power your amplifier



## 5) TUBE COMPLEMENT AND BIAS ADJUSTMENT



From left to right:

- V1: 12AX7/ECC83 (Input stage Bright and Normal channels)
- V2: 12AX7/ECC83 (stage 2 and tonestack cathode follower)
- V3L: 12AX7/ECC83 (phase inverter for power amplifier)
- V4-V5: EL34 (power tubes)
- V6: GZ34 (tube rectifier)

**BIAS ADJUSTMENT CONTROL IS INDICATED BY THE RED ARROW**

To measure your power tube bias, carefully follow these steps **with the amplifier in OPERATE, MASTER at minimum, and connected to a speaker load (not doing so may damage your amplifier!)**:

- 1) Turn on a digital multimeter (DMM), and set it to read millivolts (mV) in the 100mV range (this will vary from DMM to DMM)
- 2) Plug a black probe into the color-coded jack on your DMM, and do the same for a red probe
- 3) Insert the black probe tip into the black probe jack (red arrow). This is GROUND in the amplifier.
- 4) Insert the red probe tip into the V4 red probe jack (green arrow) on the left. This measures bias for V4. Write down your measurement

- 5) Repeat step 4 for V5 through V7, moving to each responding red probe jack for each power tube. Write down your measurement for each

To calculate bias, there are two pieces of information you need to know: your amplifier's power tube plate voltage, and the published value for maximum plate dissipation for the power tubes used in your amplifier. To save you some time and energy, here are those two values:

- Approximate V4-7 plate voltage for Plexi 51 amplifier  
= 430VDC with Solid State Rectifier chosen
- Maximum plate dissipation for EL34s  
= 25W

...and now some math. The formula for calculating bias is as follows:

$$\frac{\text{maximum plate dissipation}}{\text{amplifier plate voltage}} \times \text{percent of maximum dissipation} \times 1000 \\ = \text{bias current (mA)}$$

In most cases, amplifiers are biased between 50% and 75% dissipation. We bias the the amp to approximately 35mV on a DMM, which is 65% dissipation.

An example is as follows:

$$\frac{25W}{430VDC} \times 65\% \times 1000 = \text{about } 35mA$$

You might wonder why your DMM is set to millivolts and not milliamps – simply, we have a 1 Ohm resistor placed between your probe jacks and ground to convert a current reading to a voltage reading. That way, a bias current of 35mA measures as 35mV on your DMM.

**NOTE** – Only set your DMM to mV for measuring bias on the amplifier. Not doing so may damage your DMM.

Now that you know how to calculate bias, all you need to do is:

- 1) Follow steps 1-5 on page 9

- 2) Calculate what bias voltage reading you will set your tubes to (in this case, we will use 35mV)
- 3) Place your red probe in the LEFT **BIAS** jack, and the black probe in the **COM** jack.
- 4) Turn the bias potentiometer shaft SLOWLY until your DMM reads 35mV
- 5) Wait 1 minute
- 6) Recheck all power tube bias measurements
- 7) Readjust bias potentiometer shaft if necessary

Note that, the bias above is when SOLID STATE (SS) rectification is selected. When Tube Rectification is selected, the plate voltages inside the amp will be lower, due to the drop introduced by the tube rectifier.

However, this has already been compensated, for bias, by a resistor inside the amp that changes values when you toggle the Rectifier switch. Hence, you do not have to rebias for Tube Rectifier operation.

### *A FEW COMMENTS ON BIASING*

Due to the nature of vacuum tube amplification, there are inherent risks when biasing your amplifier. Extremely high-voltages are present, and vacuum tubes reach high temperatures during use.

The risk of electrical shock and/or skin burns should ALWAYS be kept in mind. Therefore, bias at your own risk, and only while paying attention and taking all precautionary measures.

Biasing should only be done on a clean workbench with no distractions. Do not wear loose clothing or any jewelry. Take your time, and think carefully before each step.

Again, bias at your own risk. Ceriatone Amplification is not responsible for any damages or injuries resulting from user biasing.

## 6) FREQUENTLY ASKED QUESTIONS

*How do I hook up this thing?*

- See Section 2, beginning on page 3.

*Is the FX loop series or parallel? Active or passive?*

- The FX loop is series, and is a buffered solid state type

*Can I substitute different tube types?*

- Although you can try 12AT7s, 12AU7s, 5751s without any harm, the design is optimized for 12AX7s, and are therefore the only recommended tube in the preamp positions.
- Please use only GZ34/5AR4 for the tube rectifier
- Please use only EL34s for power tubes. While other tubes might work, knowledge, and mods might need be required. Please consult a qualified technician for any mods.

*Do I need to use a matched and balanced phase inverter?*

- It is not necessary. Feel free to experiment with different tubes (of the same type) in your amp, though!

*I've read that the components used in this type of amplifier are really important. What is inside my amplifier?*

- We use a combination of parts custom-made for us to our specifications (power transformer, output transformer, choke, high-temperature / low-ESR electrolytic capacitors) and those used in our British series (1/2W carbon composition resistors, 1W carbon film resistors, TAD Mustard capacitors, high-voltage silver mica capacitors, Belton tube sockets, and Alpha potentiometers, Cliff jacks). Finally, we occasionally use NOS components from our vast surplus parts collection in locations they work well and complement the voicing or enhance the performance of the amplifier.

## 7) How to achieve the classic circuits?

Let us take the '67 50W Plexi amp, which has the following circuitry:

- a) V1 Cathode: Shared
- b) V1B Coupler: 0.022uF
- c) V2A Cathode Bypass: None
- d) Tonestack: 56K/250pF
- e) Bright Cap: 100pF
- f) NFB: 27K
- g) Presence Cap: 0.1uF
- h) Rectifier: Solid State

To get Plexi 50 Bass:

- a) Bright: None

To get JTM50:

- a) Rectifier: Tube

To get '68 Plexi 50:

- a) V1 Cathode: Split
- b) V1B Coupler: 0.022uF
- c) V2A Cathode Bypass: 0.68uF
- d) Tonestack: 33K/500pF
- e) Bright Cap: 100pF
- f) NFB: 47K
- g) Presence Cap: 0.1uF (some 0.68uF)
- h) Rectifier: Solid State

I invite you to study the circuits of other years, so you can try them! You can view the layouts of the other circuits for the Plexi 50 on the Ceriatone website.

You can also mix and match these settings, to create your own sounds! Enjoy!

## 8) Settings templates

Please resize, and print the templates below, to make your settings templates

