

Amp Matching Tutorial

The Axe-Fx II received a new effects block in Version 6.00 firmware called “Tone Matching”. This block is a powerful FFT difference analyzer and finds the spectral differences between a reference signal and a locally applied signal. While Tone Matching can be used to match your Axe-Fx II tone to a recorded source, it can also be used to match to a real-time source, i.e. an amplifier or another modeler or other signal processor. When used with a real-time source the accuracy of the Tone Matching block is enhanced by orders of magnitude since the same stimulus can be applied to both the source and the Axe-Fx II.

There are two basic techniques to amp matching. We will cover the more difficult, but more flexible method first and the easy method last.

What you will need:

Axe-Fx II

Guitar

Microphone and microphone preamp (if matching a guitar amp, not necessary if matching another modeler or using a DI signal).

A Y-cable(single mono to dual-mono cable) or A/B switch that allows connecting your guitar’s output to two devices. OR... an instrument cable to connect from Output 2 Left to the amplifier.

Momentary or Latching Footswitch OR MIDI Foot Controller with IA switch capability (CC message).

Method 1

This method involves acquiring the impulse response of the cabinet in use first and then performing a final clean up Tone Match. The advantage of this method is that you then have the IR to use with other amp models and the Tone Matching data is independent.

1. Acquire the IR of the speaker cabinet and microphone combination in use by following the instructions in the IR capture reference guide (<http://www.fractalaudio.com/downloads/manuals/axe-fx-2/Axe-Fx-II-ir-capture.pdf>). Note the User Cab that you have saved the IR to. Be sure to share the IR on Axe-Change so that others can take advantage of it.
2. Download and install the Amp Matching Template preset from Axe-Change (<http://axexchange.fractalaudio.com>). Make sure the Cab and TMA blocks are not bypassed.

In the TMA block be sure that the Reference Source is set to Input 2, Reference Channel is set to Left, and Mode is set to Live.

3. Make the following connections:
 - a. Connect amplifier to the speaker.
 - b. Connect microphone preamp output to Input 2 Left of the Axe-Fx II.
 - c. Connect the momentary footswitch to the Pedal jack on the Axe-Fx II or setup your MIDI controller with an IA switch for this task.
 - d. Do one of the following:
 - i. Using a Y-cable or A/B switch set to A&B connect the guitar to both the input of the Axe-Fx II and the amplifier.
 - ii. OR... connect a cable from Output 2 Left to the amplifier. Set the Output 2 Level knob on the front to maximum. If you encounter hum, use a Humbuster cable.
 - e. Connect the main outputs of the Axe-Fx II to your monitoring device, i.e. powered monitors, audio interface, etc.
4. Using either the front panel or Axe-Edit, edit the cabinet block so that the block is using the IR captured in Step 1. For example, if you saved the IR into User Cab 10, then set CAB to USER 10. Make sure that the MIC is set to NONE, and all other parameters are at default values.
5. In the Axe-Fx II I/O->AUDIO menu make sure that INPUT 2 MODE is set to LEFT ONLY.
6. In the I/O->CTRL menu set EXT CTRL 12 to PEDAL. In the I/O->PEDAL menu set the PEDAL TYPE to match the type of footswitch being used, i.e. LATCHING. If using a MIDI IA switch from a MIDI controller, set EXT CTRL 12 to the CC# of the IA switch. For either case the Auto-Learn function can be used to set the EXT CTRL value by simply pressing ENTER and then operating the switch.
7. Check levels. Turn the volume of your guitar up slowly and make sure that there is no clipping anywhere in the signal chain. This includes the microphone preamp and the Axe-Fx II inputs. Be sure that signal is being applied to both the Axe-Fx II and the amplifier.
8. You are now ready to do Tone Matching. The footswitch you set up in Step 6 toggles between the amplifier being matched and the Axe-Fx II amp model. For ease in determining which is active, the LCD will flash a message when the TMA block is soloing the reference source. Play your guitar and listen to the difference between the amplifier and Amp Block. It may be quite drastic but don't worry.
9. Set the Amp Block TYPE parameter to an amp model that is as similar to the amp being matched as possible. If the amp model is already present in the Axe-Fx II, then use that. If this is the case you should also set the tone controls to match the amplifier. For example, if you are trying to match a hot-rod Marshall style amplifier, use the Brit Super or Friedman HBE as a starting point.
10. Set the MSTR parameter according to the type of amplifier being matched. If the amp is a Master Volume (MV) amp set the MSTR to roughly the same value as that on the amp. If the amp is a non-MV amp set MSTR to 10.0 (non-MV amps will default to 10.0 when selected).
11. Do a preliminary Tone Match. Press the footswitch until the TMA block is not soloing the reference source. Select the Tone Match block using the front panel and press Edit. Press

the Up navigation button (Start Both) on the front panel. This starts acquisition of both channels. Turn your guitar to full volume and play some chords. We recommend playing complex chords over the length of the neck. For example an Edom13 barre chord played in a variety of positions from open to the highest comfortable fret is a good technique. Hold each chord briefly and minimize the silence between chords. Be sure to play for at least 10 seconds. Play one final open chord like an E7, hold that and press Enter to stop the acquisition and compute the matching data.

12. At this point you should have a pretty good match. Press the footswitch to toggle between the amplifier and the Tone Matched model. Now you want to make sure the levels are comparable since the Fletcher-Munson curves will alter your perception of the tone. Toggle between the amplifier and the model and adjust the LEVEL parameter in the Amp Block to match the volume levels.
13. The next step is to refine the gain. Turn the volume on the guitar down until the amplifier starts to clean up. Play lightly and switch between the amp and model using the footswitch. Adjust the DRIVE parameter in the Amp Block to match the gain. You can also use the BOOST and INPUT TRIM parameters to increase or decrease the gain if necessary.
14. Refine the input EQ. While switching between the amp and the model note the feel of the bass response as the amp distorts. The DEFINITION parameter can be used (along with the LOW CUT parameter) to tighten or loosen the bass if necessary. The more different the amp being matched is from the model the more these adjustments may be necessary. If you cannot achieve similar response then try a different amp model and go back to Step 11.
15. Repeat Step 11. Press 'X' and then 'Y' and play the chords. Press Enter to acquire the match.
16. You can then continue to refine the match as necessary by repeating Steps 11 through 14.
17. Improve the Tone Matching. Now that you have an accurate match, you can improve upon the tone using the various parameters in the Amp Block. Feel free to adjust the tone controls, DRIVE, MSTR, etc. to achieve a tone that is superior to the amp being matched.
18. Save your preset. Choose a location to save your preset and/or upload to your computer using Axe-Edit.

Method 2

This method does not use the IR of the cabinet. The Tone Matching block is used alone to acquire both the cabinet/microphone IR and the spectrum data of the amplifier being matched together. The drawback of this technique is that you cannot totally separate the cabinet data from the amp data so the Amp Block and Tone Matching block should be kept together in the preset. The Tone Matching data may be imported as cabinet data into another preset but the results will vary. The advantage of this technique is that you don't need to capture the speaker cabinet's IR so the procedure is easier and faster.

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2. Make the following connections:
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 - e. Connect the main outputs of the Axe-Fx II to your monitoring device, i.e. powered monitors, audio interface, etc.
3. In the Axe-Fx II I/O->AUDIO menu make sure that INPUT 2 MODE is set to LEFT ONLY.
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13. Repeat Step 9. Press 'X' and then 'Y' and play the chords. Press Enter to acquire the match.
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