



CAPTURING SPEAKER CAB IRs WITH THE AXE-FX II

Whether built in to a “combo” or housed in its own cabinet, the **speaker** is a major part of the sound of any guitar or bass amp. When you hear great tone on a recording or at a live show, someone has also done a great job of selecting and placing **mics**.

The Axe-Fx II uses Impulse Responses (“IRs”) to faithfully reproduce the sound of a **mic’d speaker**, with over 100 **Factory Cabs** provided, and extra memory slots for **User Cabs**. Fractal sells professionally produced **Cab Packs** of IRs, but you can also create your own using a **capture utility** built-in to the Axe-Fx II. It’s easy and requires only some common pro-audio gear.

DECIDE ON A CAPTURE METHOD

There are two different methods of IR capture. Both methods require microphone(s) and preamp(s). Both methods produce excellent results.

Method 1 requires a flat, neutral, full-range power amp. This will typically be a solid state amp designed for pro-audio applications (e.g. *not* a guitar amp, which would add tonal coloration).

Method 2 uses a **speaker-level DI box** to “factor out” the power amp, so you can use *any amp*—even a regular guitar amp.

MONITOR YOUR AXE-FX

When creating IRs, you’ll probably want to test-drive the results right away. Connect your guitar to your Axe-Fx and set up whatever you’d normally use for direct, **full-range monitoring** (headphones, studio monitors, powered FRFR speakers, etc.). The capture process utilizes OUTPUT 2, so please ensure that the current Axe-Fx II Preset does not include the FX LOOP block, and that OUTPUT2 ECHO is set to “NONE” on the I/O page of the audio menu.

MIC THE SPEAKER

- Before you can mic a speaker, you’ll need to play some guitar through it. You can plug right in to the actual guitar amp itself as one normally would, or you can use an Axe-Fx preset with the Cab block bypassed, into a neutral power amp, into the speaker. One advantage of the latter method is that once you capture the IR, using it in that same preset should produce results remarkably close to the original source tone.
- Once you’ve got a good guitar tone coming through the speaker, it is time to set up the mics. Recording studios have control rooms isolated from a sound-insulated booth or live room, making it easy to hear what the microphone is picking up without interference from the loud amp. Having an assistant to adjust the mic is convenient. If this option isn’t available to you, try using headphones to let you focus on the mic’d tone—loudness helps, but don’t damage your hearing! You can also record the amp and listen back to make sure you are satisfied with the tone.
- The tone you get from a mic’d speaker depends on the type and position of the microphone(s). Select a mic that is well-suited for guitar cab recording and position it according to your preference. Good information is widely available about mic placement, distance, angle, etc., but don’t be afraid to experiment.
- Each mic needs to be connected to a **preamp** to bring the signal up to line level for processing. The preamp also contributes to the tone, and a high-quality preamp (like an API) is generally preferred, but even the preamp of an inexpensive mixer can produce excellent results.
- With an optional mixer, multiple microphones can be combined to produce and capture a tone that blends their characteristics. Do not apply dynamics processing (e.g. compression) as this will misrepresent the response.
- If the cab is loaded with multiple speakers, you should listen to each one to determine your favorite(s), and capture any that sound good to you.

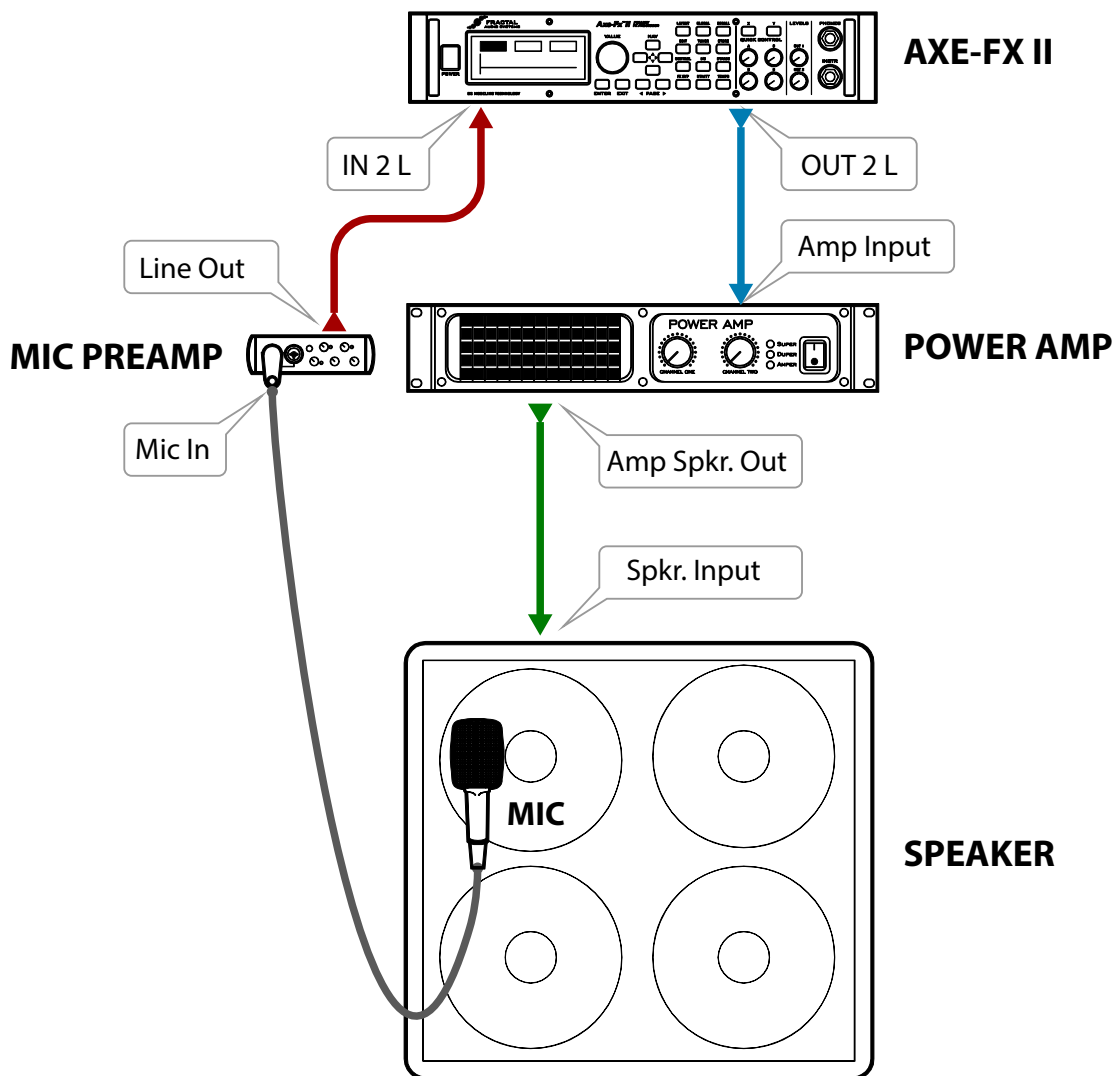
METHOD 1 SETUP: NEUTRAL POWER AMP & "MIC ONLY"

Method one requires a microphone, a preamp, and a flat, neutral power amp.

- Set up a preset with your preferred AMP block, and set its CAB block to "SCRATCHPAD 1" for instant auditioning of results.
- Connect the mic to the input of the preamp.
- Connect the output of the preamp to **INPUT 2 LEFT (FX RETURN)** of the Axe-Fx II.

Note: The diagram shows a single mic, but you can easily combine mics using a mixer to capture an entire blend at once.

- Connect **OUTPUT 2 LEFT (FX SEND)** of the Axe-Fx II to the input of your power amp.
- Connect the power amp's speaker out to your speaker cabinet.
 - If your speaker has a male plug, a female-to-female 1/4" adapter makes it easy to connect to the cable from your power amp.
 - If your speaker is not connected to a plug or jack, you may need to make up a special cable with alligator clips to attach the power amp to its terminals. Disconnect at least one of the terminals from the original amplifier.
- On the **GLOBAL: CONFIG** page of the Axe-Fx, set **IR CAPTURE METHOD** to "MIC ONLY".
- **NOTE:** IRs created using this method will include any tonal coloration imparted by the power amp. Cab-Lab can remove this effect using a separate "Reference IR" of just the power amp created using a speaker-level to line-level DI, but if you have this DI-box at the time of capture you might as well use "Method 2" (see page 3).
- Follow the capture instructions on page 4.



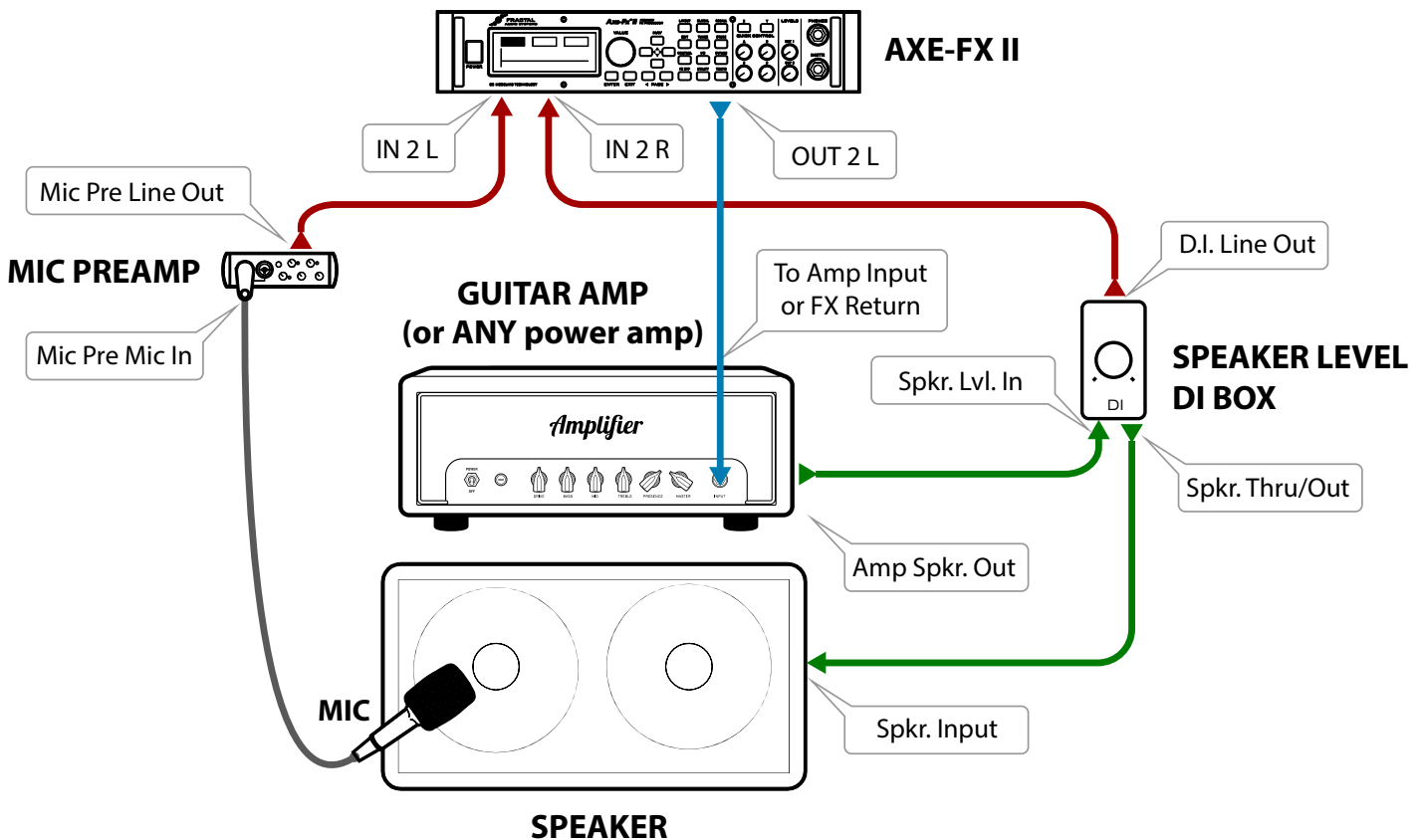
METHOD 2 SETUP: ANY POWER AMP & “MIC + DI”

Method two requires a microphone, a preamp, and a DI Box with the special capability to convert speaker level to line level. This method completely “factors out” the tonal influence of the power amp, allowing almost any amp to be used. A neutral power amp is still probably preferred, but even a guitar amp will produce excellent results! If you do use a guitar amp, you should connect to its **FX Return** if possible, but even the front input can also be used, as the Axe-Fx is able to remove distortion, completely separate the speaker response, and produce a pure and accurate IR.

- Connect the mic to the input of the preamp.
- Connect the output of the preamp to the **INPUT 2 LEFT (FX RETURN)** of the Axe-Fx II.

Note: The diagram shows a single mic, but you can easily combine mics using a mixer to capture an entire blend at once.

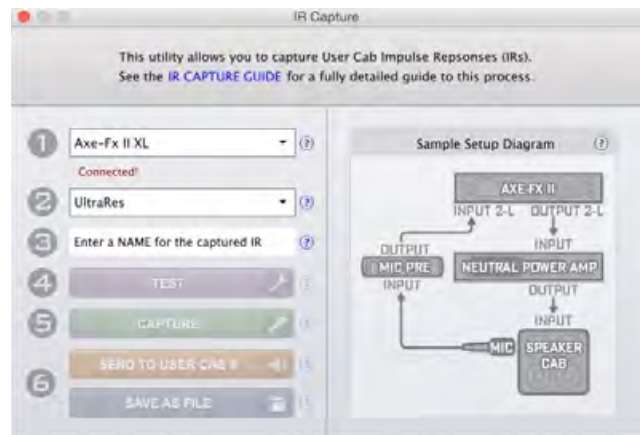
- Connect **OUTPUT 2 LEFT (FX SEND)** of the Axe-Fx II to the FX Return of your guitar amp. If your amp doesn't have an FX return, you can use the guitar input. Setting the amp to a clean setting is recommended but not critical.
- Connect the amplifier's speaker output to the speaker level input of the DI box. Be sure to use a DI box that is specifically designed to work with speaker level signals and one that does NOT have any on-board cabinet emulation. You can also use the DI output of your amp if it has one, as long as it is not a speaker emulated output.
- Connect the **Speaker Out or Thru jack** of the DI box to the **input** of your speaker.
- Connect the **Line Level Output** of the DI box to **INPUT 2 RIGHT** on the Axe-Fx.
- On the GLOBAL: CONFIG page of the Axe-Fx, set **IR CAPTURE METHOD** to “MIC + DI”.
- On the I/O: AUDIO page of the Axe-Fx, set **INPUT 2 MODE** to “STEREO”.
- Follow the capture instructions on page 4.



CAPTURING USING CAB-LAB

Cab-Lab, available from <http://shop.fractalaudio.com> provides the best and easiest way to capture IRs.

- Make the connections for your chosen setup as detailed on page 2 or page 3 of this guide.
- Connect your Axe-Fx II to the computer via USB, making sure that our [USB driver](#) is installed.
- In the Axe-Fx, set up a preset with the Amp block set to an appropriate model and the Cab block set to “SCRATCHPAD 1”. (IRs are automatically sent to this special location upon capture for instant auditioning.)
- Launch Cab-Lab. Start the IR Capture Utility from the Tools menu.
- Work through the steps of the Capture Utility in order. The question mark icons provide “Help,” explaining the details of setting levels, saving results, etc.
- Test your new IRs in the Axe-Fx before breaking down the capture setup.



CAPTURING FROM THE AXE-FX II FRONT PANEL

This section covers capturing from the Axe-Fx front panel, but we recommend using Cab-Lab instead if possible.

- Make the connections for your chosen setup as detailed on page 2 or page 3 of this guide.
- In the Axe-Fx, set up a preset with the Amp block set to an appropriate model and the Cab block set to “SCRATCHPAD 1”. (IRs are automatically sent to this special location upon capture for instant auditioning.)
- Press **GLOBAL** on the Axe-Fx II and change to the “CONFIG” page. Ensure that IR CAPTURE MODE is set to Ultra-Res (unless for some odd reason you wish to capture in the older STANDARD resolution format). IR CAPTURE METHOD should be set to MIC ONLY or MIC+DI depending on which method you set up for.
- Press **UTILITY** on the Axe-Fx II and change to the “IR CAP” page.
- Navigate to the on-screen [TEST] button and press **ENTER** to generate a test sweep for setting levels.
 - The **OUTPUT LEVEL 2** knob on the front of the Axe-Fx sets the level of the sweep signals sent to the power amp. Turn it and your power amp up until you hear the test through the speaker. It should sound loud—loud enough to “push” the speaker and eliminate background noise interference, but not loud enough to be uncomfortable or cause distortion.
 - The front panel **INPUT 2 LED** meters of the Axe-Fx II will indicate the signal level coming back to the Axe-Fx through the mic and preamp. The signal should “tickle” the red LED. Adjust the preamp OUTPUT level accordingly, and use INPUT 2 level on the INPUT page of the I/O menu of the Axe-Fx for fine-tuning.
- When levels are set correctly, it is time to capture! Navigate to the on-screen [CAPTURE] button and press **ENTER**. Wait quietly for the capture to complete (two sweeps, ~20 seconds)
- Save your capture! Use **NAV** and **VALUE** to select a location (“SAVE TO #”) and enter a “NAME”. Shortcuts on the A,B,C and D knobs make naming easier. Navigate to the on-screen [SAVE] button and press **ENTER** twice to store.
- Save your IRs to the computer. Two files created for each capture. The first — a SysEx (.syx) file — can be dumped from the [DUMP] button in the capture utility to any 3rd party SysEx recorder like Sysex Librarian (Mac) or MIDI-OX (Windows). The second — an .IR file — contains the raw capture data and should be saved separately in the same way. Files must be dumped one-by-one as IRs are captured. Once you perform a new capture, the previous .IR data is overwritten.
- Test your new IRs in the Axe-Fx before breaking down the capture setup.