FRACTAL AUDIO SYSTEMS

AX8 AMP MODELER + FX PROCESSOR

FIRMWARE RELEASE NOTES

VERSION 10.00 — JULY 17, 2018

AX8 version 10.00 incorporates some of the “Ares” modeling from the Axe-Fx III.

Improved CPU usage in some presets.

Improved AX8-Edit communication stability.

VERSION 9.04 — JANUARY 24, 2018

AX8 v9.04 is based on Quantum 9.04 for the Axe-Fx II. The following features and fixes are included.

- Improved speaker compression modeling and interaction with power amp. This results in a more dynamic response.
- Changed default cathode follower hardness (CF Hardness) to 0.75 to align better with measured values.

VERSION 9.03 — DECEMBER 21, 2017

AX8 v9.03 is based on Quantum 9.03 for the Axe-Fx II. The following features and fixes are included.

- Improved power amp modeling.
- Disabled Amp block active Presence control if power amp modeling is bypassed.
- Fixed a bug in Multitap Delay “Rhythm Tap” type delay time entry.

VERSION 9.02 — NOVEMBER 09, 2017

AX8 V9.02 implements new Amp Modeling, and a new Drive Model introduced by the Axe-Fx Quantum 9.00 , 9.01, and 9.02.

Additions:

- Improved overall performance of most presets 2% - 3%, your mileage may vary.
- Improved Speaker Compression algorithm so that the change in the speaker impedance is accounted for.
- Removed the “Motor Drive” and “Transformer Grind” algorithms and associated parameters from the Amp block. These have been replaced by the new “Speaker Compression” algorithm. This algorithm models the interaction of the power amp with the power compression of the virtual speaker. The “Spkr Comp” parameter controls the amount of virtual speaker compression. This value defaults to 3.0 when the Amp block is reset. It does not get reset when changing the model. If using the AX8 with a tube power amp and conventional guitar cab you may want to reduce this value to 0.0. The gain reduction meter shows the amount of virtual power compression (select the Spkr Comp knob to monitor the gain reduction). Typical guitar speakers compress between 3 and 6 dB depending upon construction, age, volume, etc. The default value is conservative and yields about 3 dB of compression.
    - Note that the Master Volume control will interact considerably with the Speaker Compression algorithm as will the Presence and Depth controls. Higher values of Master Volume will cause more virtual speaker compression.
- Improved Delay block. Also reworked the Deluxe Mind Guy, Mono BBD and Stereo BBD delay models based on the improvements.
- Added “Blackglass 7K” Drive model based on a Darkglass B7K. The model was obtained with the Attack and Grunt switches in the middle positions. The Grunt switch changes the low-cut frequency therefore the Low Cut control can be used to replicate this switch. The Attack switch controls a shelving filter on the input and can be replicated using the Tone control.

Fixes:

- Corrected an issue that was causing a problem saving presets on a small number of AX8 units.
- Fixed Learn function in Pitch block not working if modifier attached to the Learn parameter and not in GUI for that block.
- Fixed several wrong default values in the “Class-A” models introduced in V9.01.

VERSION 8.02 JUNE 05, 2017

AX8 V8.02 implements the new Amp Modeling improvements and fixes introduced by the Axe-FX Quantum 8.00, Quantum 8.01, & Quantum 8.02, as well as 5 new cabinets.

Additions:

- Improved amp modeling. Improves clarity and sounds more “open” especially for non-MV amp models or when the MV is turned up.
- The bias excursion values for most amp models have been updated based on new measurement techniques. Existing presets will automatically be updated to the new values.
- Based on user feedback the Amp block Speaker Drive now defaults to zero.
- Increased gain of “Brit Brown” model by 12 dB.
- Added “5F1 Tweed EC” based on a Fender Eric Clapton Vibro-Champ.
- Added (at Kirk Hammett’s request) modifier capability to the output compression parameter (“COMP”) in the Amp block (previously named “OUTPUT COMP”).
- Added five new factory cabs. These custom mixes represent a small sample of the world-class IRs now available from Celestion. The full IR packages can be purchased at their new website: www.celestionplus.com
- All types in the Compressor block now support both Filter and Emph parameters. These parameters control the detector filtering. Filter is a low-cut filter and Emph is a high-frequency emphasis. These parameters can be used to tailor the response of the various compressor types to different material.

Fixes:

- Fixed “quantization” noise when Amp block Transformer Drive parameter is set to its minimum value and a lot of gain is applied after the block. This specifically addresses the “Tube Pre” model as the default Transformer Drive is at the minimum.
- Fixed Amp block Preamp Hardness parameter not “sticking”.
- Fixed bug where presets that use a User Cab(s) and were saved under earlier firmware versions might have the incorrect User Cab(s) assigned when recalled on later firmware.
- Fixed minor bug in Amp block output transformer modeling which caused slight attenuation of upper treble frequencies. This results in clearer, more chimey tones.
- Fixed mistake in “Citrus RV50” amp model.
- Removed the Dry Delay parameter from the Flanger as it has never been functional in the AX8.
- Fixed a bug in the Delay that caused audio problems when attaching a controller to the Diffusion parameter.

VERSION 7.02 PUBLIC BETA APRIL 3, 2017

AX8 V7.02 adds MOTOR DRIVE to the AMP block, as well as some effect block enhancements.

Additions:

- The improved Motor Drive simulation, developed for the AxeFX II Quantum V7.02, is available in the Amp block now. New algorithm more accurately models the compression of guitar loudspeakers by factoring in the reactive aspects of the compression. It is recommended to use the simulation in the Amp block when using an FRFR configuration as the Amp block simulation uses the speaker resonance information in the calculations. The simulation in the Amp block is independent of the block’s output Level control.
- Gain monitoring of the Motor Drive is available on the PWR DYN page of the Amp block. Monitoring is available when the Motor Drive parameter is selected. Note that typical guitar speakers have around 3-6 dB of compression when driven hard with American speakers being on the low end of that range and British speakers being on the high end. Some speakers can exhibit even more compression than this with compression amounts of 8 dB or more depending upon the magnetic materials used and the construction of the speaker motor.
- The thermal time constant of the virtual voice coil is adjustable using the “Motor Time Const” parameter. Typical guitar speakers are anywhere from 0.05 to 1.0 seconds depending upon the mass of the voice coil and the materials used.
- Improved Amp block output compressor. New algorithm is more musical and reacts faster to transients. If you are using this in your presets it is recommended to audition your presets and readjust as necessary. The Gain Reduction meter now shows the total gain including the makeup gain.

- Added Input Diffusion to Multitap block Band Delay, Quad Series, Plex Delay, Plex Detune and Plex Shift types.

Fixes:

- Fixed Optical and Pedal compressors output level dependent upon Ratio parameter of Studio type. If using these types in existing presets the presets should be auditioned to ensure the volume is correct.
- Fixed switching between Optical compressor types can cause brief level drop.

VERSION 7.01 MARCH 16, 2017

AX8 V7.01 fixes a couple of bugs from V7.00 and adds 2 new compressors to the COMPRESSOR block, and a new drive pedal to the DRIVE block.

Additions:

- Added two new "Optical" types to Compressor block. The Optical 1 type is based on classic optical tube compressors famed for their smooth sound. Use before the Amp block to smooth out your licks and increase sustain. Use after the Amp block for instant "Hit Record" sound. The Optical 2 type is similar to Optical 1 but uses a true RMS detector.
- Added Input Level switch to Pedal and Optical types in Compressor block. Use "Instrument" when compressor is placed before Amp block. Use "Line" when compressor is placed after.
- Added "Shimmer Drive" type to Drive block.

Fixes:

- Reduced output level of "Brit AFS100" amp models.
- Fixed bug where older presets may cause the Amp block to initialize with invalid parameter values potentially causing lockups.
- Fixed a bug that caused a drop in output gain on some amp models.
- Fixed the loading of User Cabs on presets created with firmware older than V7.00
- Improved runtime performance by 0.5% - 1.0% depending on the preset. **NOTE: Your mileage may vary depending on controller assignments and global settings.**

VERSION 7.00 MARCH 07, 2017

AX8 V7.00 implements enhancements and bug fixes from the Axe-FX Quantum V7.00.

Additions:

- Added "LEARN" to the "CUST. SHIFT" in the PITCH block.
- Improved phase inverter modeling in Amp block. This provides thicker power amp distortion. New algorithm also includes bias shifting which results in more harmonic spectrum variation with input amplitude. This improves feel, "knock" and creates sweeter single note soloing. The new "PI Bias Shift" parameter controls the amount of phase inverter bias shift. Note that some real amps are "spitty" in nature due to PI bias shifting, i.e. Trainwrecks, and the new algorithm is designed to replicate that behavior accurately. If you find the behavior undesirable reduce the PI Bias Shift value as desired although this will reduce authenticity.
- Improved output transformer modeling. This results in tighter, less boomy and smoother bass when the virtual power amp is driven hard. Note that this change may be significant and initially alarming with certain amp models. While the new algorithms are much more accurate they may be disconcerting to those who are accustomed to the old algorithms. In these cases the user may want to decrease the Transformer Drive and/or Low Res parameters in the amp block at the expense of accuracy. It is recommended instead, however, to readjust other parameters in the preset (i.e. Drive, BMT, etc.) which will achieve more authentic results.
- Improved Amp block cathode follower modeling (again). This results in tighter bass and "chunkier" tones. As a result nearly all amp models that use cathode followers have been reworked with updated parameters. It is recommended that the model be reloaded by deselecting and reselecting the desired model which will load the pertinent default values. Models that have benefited the most from this include:
    - Bogfish
    - Brit 800
    - CA3+

    - Cameron CCV
    - Corncob
    - Dizzy V4 Blue
    - Dizzy V4 Silver
    - Herbie
    - Recto1 and Recto2
    - Solo 88, 99 and 100
- Changed default value of Speaker Drive to 0.5. When selecting an amp model the Speaker Drive parameter will now default to a value of 0.5 which is commensurate with a small amount of speaker breakup. Adjust this value to taste, if desired. If using the Axe-Fx II with a power amp and conventional guitar speakers you may want to reduce this value as the guitar speakers will impart their own distortion.
- Added "Dirty Shirley 2" amp model based on an earlier version of this amp with some different component values. This model is a little more aggressive than the regular model.
- Changed "Bludojai Clean" amp model so that "Pre-Amp Bypass" is off (Pre-Amp Bypass actually bypasses the tone stack and increases the gain so it should be more correctly referred to as "Tone Stack Bypass").
- Added "Brit 800 #34" amp model based on the "Santiago #34" modifications.
- Changed taper of Overdrive control in "USA Lead" amp models so that control is not so abrupt.
- Replaced following OwnHammer factory cabs with new IRs (see Note 2):
    - Cab #57 with "4x12 MAR PR-H55 FULL"
    - Cab #142 with "1x12 DLX P12R Fat"
    - Cab #146 with "4x10 SUPER VERB CTS FAT"
    - Cab #148 with "4x12 MAR PR-M20B FULL"
    - Cab #149 with "4x12 TRAD V60 FULL"
- Added five new cabs comprised of our favorite mixes from several of our latest cab packs:
    - 1x12 Class-A 15W Mix
    - 1x15 Vibrato Verb Mix
    - 2x12 Class-A 30W Mix
    - 4x10 SuperVerb Mix
    - 4x12 Greenback Mix
- Added "3-Band Console" to the Graphic EQ block.

Fixes:

- Corrected a potential crash bug in the DRIVE block initialization.
- Fixed mistake in preamp compression algorithm.
- Fixed missing feedback network capacitor in all "Recto" models. This results in extended bass response.
- Fixed mistakes in "Euro" amp models.
- Fixed mistakes in "Cameron" amp models.
- Fixed several mistakes in "Shiver" amp models.
- Fixed mistakes in "Hot Kitty" amp model.
- Fixed wrong transformer match value in "Citrus Terrier" model.
- Fixed "Ruby Rocket" and "Ruby Rocket Brt" model names swapped. The amp's bright switch is logically backwards (bright on is switch down).
- Fixed input gain slightly too high in "Solo 88 Cln" model.
- Fixed wrong phase inverter tail resistor and snubber capacitor values in "Brit AFS100" models.
- Fixed wrong screen resistor value in all "PVH" models.
- Fixed the dynamic meter display on the Dynamics Page of the AMP block.
- Fixed bug that prevented the "CRUNCH" parameter from saving correctly with the preset in the Public Beta.
- Fixed the User Cabinet offset bug discovered in the Public Beta. All user cabinets will line correctly even if they were shifted by the user on V7.00 Public Beta.

NOTES:

1. This firmware has significant changes to the core algorithms. While every attempt has been made to ensure compatibility with existing presets it is recommended that the amp block be reset by deselecting and reselecting the desired amp model to load the new default values and the preset then auditioned and readjusted as necessary.

2. Fractal Audio Systems is pleased to announce that our online store will be carrying a new series of OwnHammer Cab Packs containing high-quality IRs for use with the Axe-Fx II, AX8, or Cab-Lab. In addition, OwnHammer has provided five new IRs to replace some of the factory cabs they provided previously, including one free sample from the new, "OwnHammer 412 Mar Green Vintage" available now at http://shop.fractalaudio.com. This pack contains some of the best IRs we've ever heard and is simply a "must have" for vintage 4x12 "Brit Green" tones.

VERSION 6.02 DECEMBER 19, 2016

AX8 V6.02 is a minor enhancement release incorporating the Axe-FX Quantum V6.02 changes.

Additions:

- Improved speaker overdrive modeling in Amp block. New algorithm captures the “throaty” sound of an overdriven speaker along with the gentle compression. The “Spkr Drv” (Speaker Drive) parameter has been moved to the Spkr tab on the Amp menu. NOTE: If you are using Speaker Drive in existing presets you should audition these presets and adjust the parameter as necessary as the sound and behavior of the algorithm is considerably different than before. **NOTE: Setting this parameter to higher values will simulate a blown speaker.**
- Improved Drive model frequency response accuracy for models based on op-amp architectures. Models now behave with near-perfect accuracy even when Drive control is set to extreme values.
- Updated “BB PRE” Drive model.
- Added “TIMMY” Drive model.
- Optimized DRIVE Block, gaining a performance increase of approximately 1%.

Fixes:

- Fixed “PI FUZZ” output level too low. The Drive and Level tapers have also been changed so any presets using this model should be auditioned and adjusted accordingly.
- Fixed wrong capacitor value in “Esoteric ACB” Drive model. Any presets using this model should be auditioned and the model deselected and reselected to reset the internal parameters.
- When “DISPLAY LARGE PRESET” is set to “ALWAYS”, the display now correctly updates when renaming the preset from both AX8-Edit and the STORE screen.

VERSION 6.01 DECEMBER 01, 2016

AX8 V6.01 implements minor fixes discovered in the Public Beta as well as a couple of modifications from the Axe-FX Quantum 6.01.

Please NOTE: The major feature additions are described in the release notes for V6.00 which was never officially released.

Fixes:

- Updated all models to use an appropriate Preamp Tube Type when selected. I.e. British models will now use the ECC83 when selected.
- Fixed wrong Preamp Bias default value for Wrecker Express model.
- Fixed wrong Power Amp Bias default value for several models.
- Relabeled "PA GRID BIAS " "PWR TUBE GRID BIAS" on the advanced tab of the AMP block

Additions:

- Added “EXIT” to the F-Switches. This allows the F-SWITCHES to act like the <EXIT> Button. This has primarily been added to allow the user to toggle the Persistent Large Preset Display when it is set to ALWAYS.

VERSION 6.00 NOVEMBER 17, 2016

AX8 V6.00 is a major enhancement release incorporating the Axe-FX Quantum V6.00 changes, and adds a couple of new features.

Please NOTE: This release was never officially released; however all of these features and fixes are incorporated into V6.01.

Additions:

- Greatly improved Wah block. Two new parameters have also been added: “Coil Bias” parameter allows the user to adjust the DC offset of the virtual inductor. “Low Cut Freq” sets the highpass filter due to the input coupling capacitor. It is recommended that existing presets be auditioned and, in most cases, deselecting and reselecting the desired model to reset dependent parameters.
- Improved Amp block output transformer to power tube interaction modeling. This results in less “smear” in the overtones when the virtual power tubes are driven into clipping.
- Improved Amp block plate clipping modeling. New algorithms more accurately replicate the gradual onset of clipping and never fully hard clip resulting in a more dynamic and “open” tone. Note that the increased dynamics may result in some amp models having higher peak volumes which can result in clipping with existing presets. To remedy this simply turn down the Level control in the Amp block.
- Recalculated Amp block preamp tube parameters. The “12AX7A SYL” (Sylvania 12AX7A) is now the default type as we think it sounds the best.
- Improved background calculation accuracy for cathode follower parameters.
- Added Solo 88 tone stack type (the Solo 88 Rhy and Lead models previously used the Solo 100 tone stack which has a different treble taper and load resistance). The Solo 88 Rhy and Lead models now default to that tone stack type.
- Increased maximum amount of virtual power amp sag in Amp block. The maximum amount of sag is now twice what was previously available. Existing presets will automatically be adjusted to compensate for the increased range of the Supply Sag control, i.e. if the Supply Sag was set to 8.00 it will be adjusted down to 4.00 so as to yield the same amount of sag. High values of Supply Sag can be used to make the feel “easier” and/or replicate the behavior of other products that intentionally exaggerate compression.
- Added Persistent Large Preset Display. Please see **NOTE 1**.
- Added “DEFAULT SCENE” to all presets; this allows the default to be configured for each preset. Please see **NOTE 2**.

Fixes:

- Fixed wrong snubber cap value in Recto 2 amp models. This changes the default High Cut value to 10 kHz.
- Fixed wrong phase inverter component value in all “Plexi 50W” amp models. Probably not audible though.
- Fixed volume of “Brit Silver” amp model.

NOTE 1: Persistent Large Display

The large display feature has been modified to allow for a persistent display. To access this feature to the GLOBAL MENU:

SETUP->GLOBAL->SETTINGS

Change the “DISPLAY LARGE PRESET” parameter to “ALWAYS”.

Once this feature is enabled, the large preset name will appear every time you switch presets. The display will remained unchanged until the <EXIT> button is pressed. Pressing the <EXIT> button will return the AX8 to its Main display page. To return to the Large Preset Display, simply press <EXIT> again from any one of the Main display pages.

PLEASE NOTE: this will override the “LAYOUT GRID EXIT” parameter setting.

NOTE 2: Default Scene per Preset

The Default Scene is defined as the scene that is loaded any time a new Preset is selected. Prior to V6.00, the Default Scene was strictly a global setting. Starting with this release, each preset can override the Global setting and select a different Default Scene. Take the following steps to access this new parameter.

From the Main screen, use the <PAGE> button and navigate to the “CFG” page.
Use the <NAV> knob to select the bottom parameter menu item “DEFAULT SCENE”. This parameter can be modified by any of the other knobs, “A” – “D”.

The choices for DEFAULT SCENE are:

- Scenes 1 – 8
- CURRENT – This leaves the current scene unchanged from what was currently selected prior to the Preset Change.
- GLOBAL – This uses the previously mentioned Global DEFAULT SCENE setting. *Note: This is the default for all presets created prior to V6.00.*

VERSION 5.01 NOVEMBER 03, 2016

AX8 V5.01 is a major enhancement release incorporating the Axe-Fx Quantum V5.01 changes.

Additions:

- Improved preamp tube modeling for tubes driving cathode followers. In models that use cathode followers this results in warmer distortion with smoother decay. The shape of the cathode follower distortion can be adjusted with the new “CF Hardness” parameter found on the Advanced tab in the Amp block.
- Added “Legato 100” amp model based on a certain famous Carvin Legacy 100.
- Added “Capt Hook” amp models based on a Hook Captain Classic 34. This amp uses a mu follower which yields a complex distortion with smooth decay. There are six models:
  1. Capt Hook 1A: Channel 1 w/ EQ and Boost switches off.
  2. Capt Hook 1B: Channel 1 w/ EQ and Boost switches on.
  3. Capt Hook 2A: Channel 2 with Edge switch off.
  4. Capt Hook 2B: Channel 2 with Edge switch on.
  5. Capt Hook 3A: Channel 3 with Edge switch off.
  6. Capt Hook 3B: Channel 3 with Edge switch on.
- Improved diode clipping algorithms in Drive block. As a result the following Drive models have been rematched:
  - Rat Dist
  - Super OD
  - T808 OD
  - T808 MOD
  - Plus Dist
  - Esoteric ACB
  - Esoteric RCB
  - Zen Master
  - Ruckus
- Optimized the DRIVE block to improve run-time performance 1% - 2% (your mileage may vary).
- Fixed tone stack error in Recto 2 amp models.
- Changed Presence knob taper in Recto1 Norm and Recto2 Vntg models to match actual amps.
- Changed behavior of Amp block’s Preamp Comp when set to “Ideal” so that compression amount is roughly the same as when set to “Authentic”. If you are using the Ideal setting on a preset you may need to increase the Preamp Comp parameter value.

Fixes:

- Clear INPUT 2 LED’s on startup when no actual input signal is present.

VERSION 4.01 OCTOBER 6, 2016

AX8 V4.01 is a maintenance release containing the following fixes:

Fixes:

- Corrected a bug that allowed spurious SYSEX commands to be broadcast on the MIDI OUT port. This conflicted with attached 3rd party devices.
- Changed the behavior of the Control Switches (CS1 and CS2) blocks so that a refresh of AX8-Edit is no longer triggered.

- Changed the behavior of the Sticky Preset Footswitch so that the unit always returns to the main screen. This prevents display issues in effect blocks. It is also consistent with the behavior of the Single Preset Footswitch.

VERSION 4.00 SEPTEMBER 16, 2016

AX8 V4.00 contains Quantum 4.0 and so much more!

Additions

- *Quantum 4.0:* Improved power tube plate current vs. grid voltage accuracy. New models more accurately reflect how the response is higher order at lower grid voltages and "relaxes" into a lower order response at higher grid voltages. This improves feel when the virtual power amp is overdriven and improves harmonic content accuracy.
- All operation of AX8-Edit is now separate from the operation of the front panel. NOTE: any changes made on the front panel of the AX8 while AX8-Edit is attached will still cause a refresh of the editor. This change dramatically reduces audio dropouts due to editor interaction.
- Removed the Footswitch grid restriction of allowing the same block on multiple footswitches. Now that footswitches have the ability to be latching or momentary, it can advantageous to attach both a latching (for both BYPASS and X/Y Toggle) to a block, while allowing the BYPASS to be assigned to a momentary switch at the same time.
- Removed PICK ATTACK parameter from the AMP Block. (The value was never processed on the AX8)
- Added TILTEQ, LOWSHELF2, HIGHSHELF2, and PEAKEQ2 to the Filter block.

Fixes

- Fixed a bug causing noise issues when attaching controller to some modifiers on the AMP block.
- CS1 and CS2 now correctly load the default state on a preset change.
- The Filter on Voice 2 of the Synth block works correctly now.
- Changing the BYPASS state of a block on the LAYOUT grid correctly lights the edit LED.
- Panning all the way right with Pan parameters other than the Balance no longer mutes the output on the following effect blocks:
    - Pitch
    - Multi-Tap
    - Enhancer
    - Delay

VERSION 3.52 JULY 12, 2016

AX8 V3.52 is a maintenance release.

Fixes:

- Corrected Noise issue induced by placing a controller on the AMP block BOOST parameter modifier.
- Fixed a bug where CS1 and CS2 returned default state when TAP TEMPO was executed.
- Fixed a display bug that prevented the MIDI Channel from displaying properly under the CONFIG: MIDI menu.
- Optimized the MIDI port send subsystem to accommodate devices (Diezel Amps) with short MIDI timeouts.
- Fixed Recall Effect so effects saved in older presets are recalled correctly.

VERSION 3.51 JUNE 16, 2016

AX8 V3.51 is a maintenance release that mainly addresses a bug that can affect the AX8's ability to store SYSTEM PARAMETERS. This release should be used in lieu of V3.50 which introduced the storage bug. As always, please back up your unit before upgrading. If you are upgrading from any older revision, other than V3.50, please read the V3.50 release notes, as they detail important feature additions.

Additions

- BANK LOWER LIMIT and BANK UPPER LIMIT can now be set to the same value, limiting the use of the AX8 to 1 preset bank.

Fixes

- Correct a bug that prevented the AX8 from correctly storing the SYSTEM PARAMETERS
- Corrected a scrolling bug that corrupted the display on the CFG screen

VERSION 3.50 JUNE 14, 2016

AX8 V3.50 introduces some cool new features as well as a couple of bug fixes.

Additions

- Added the new "USA IIC++" amp model from the AxeFx Quantum V3.03
- Added new "Control Switch Blocks" CS1 and CS2 – NOTE: see instructions below
- Added new GLOBAL and PER-PRESET momentary switches – NOTE: see instructions below
- Added the BANK LIMIT feature – NOTE: see instructions below
- Modified the global parameter "DEFAULT SCENE" with the addition of "CURRENT SCENE".
  This allows the user to keep the current active scene when changing presets.
- Pressing the <EXIT> button on the VU tab now returns the AX8 to the FS tab

Fixes

- Fixed unwanted distortion in 65 BASSGUY, DWEEZIL B-MAN, DIZZY V4 SLVR 2, & DIZZY V4 SLVR 4 amp models (since v3.04).
- Adjusting the top panel LED-Ring amp knobs now properly notifies AX8-Edit.
- The AX8 now properly handles MIDI "Running Status" messages, allowing control by 3rd party products (e.g. Roland FC-200).
- Fixed a bug that was affecting controllers attached to the RUN, HALF, and REVERSE parameters of the LOOPER.

ADDITIONAL NOTES:

GLOBAL and PER-PRESET Momentary Footswitches

Momentary switches do not "latch" when you step on them. They activate *while* your foot is down on the switch, and deactivate when you lift it up. Any of the numbered footswitches of the AX8 may now be designated as MOMENTARY.
This can be done either GLOBALLY, or PER-PRESET.

If a momentary footswitch is used to BYPASS/ENGAGE effects, the effect state will be *reversed* by the action of the switch.
A block that is saved as ENABLED will by momentarily bypassed. A block that is saved as BYPASSED will by momentarily enabled. The same is true for a momentary footswitch assigned to SCENE 1/2 Toggle: depending on whether Scene 1 or Scene 2 is selected, the switch will momentarily toggle to the other.

1. ***To Set Up a Global Momentary Switch***
   a. Navigate to the GLOBAL FOOTSWITCH ("GBL FS") page of the GLOBAL menu under SETUP.
   b. Set each switch as desired to one of the following options:
      i. PER-PRESET
      ii. GLOBAL LATCHING (This is equivalent to the "GLOBAL" setting from older firmware versions).
      iii. GLOBAL MOMENTARY

2. ***To Set Up a Per-Preset Momentary Switch***
   a. First, call up the preset you want to edit footswitches for.
   b. From the main FOOTSWITCH ("FS") page of the AX8, page right to the CONFIG page.
   c. Select the new FOOTSWITCH MODE ("FS MODE") option and press <ENTER>
   d. Set Each footswitch as desired:
      i. LATCHING
      ii. MOMENTARY
   e. Save the preset! (STORE -> ENTER -> ENTER

NOTE: The settings on the FS MODE page have no effect for a footswitch if it is set to one of the GLOBAL options on the GBL FS page!

Controller Footswitch Blocks CS1 and CS2

The AX8 now has the ability for footswitches 1-8 to operate as “Control Switches”.
Control Switch 1 and Control Switch 2 now appear in the list of SOURCES on every MODIFIER page.
Using this feature, for example, you can create a BOOST footswitch (Volume Modifier) a WHAMMY effect (Pitch Block: Control Modifier) or a single footswitch that toggles two or more effects on or off in unison (BYPASS MODE modifiers).

CONTROL SWITCH 1 and 2 are *footswitch blocks* that can be assigned Globally or Per-Preset like any other Footswitch Block from the main Footswitch (“FS”) page. Use NAV to select the desired location and turn “A” to step through the list of available footswitch assignments.

To Set Up a Control Switch Footswitch:

1. On the Footswitch (“FS”) page of the AX8, use **NAV** and **A** knobs to assign CS1 or CS2 to footswitch 1 – 8
2. Add a modifier to the desired parameter, setting “CTRL SW1” or "CTRL SW2” as the SOURCE.
3. Adjust the modifier to work as desired.

Now, when you step on the footswitch, the modifier will change the value of the assigned parameter.
NOTE: Coupled with the new “Momentary Footswitch” options, Control Switches are quite powerful!

The **initial value** of each Control Switch is saved per scene. The initial values are set on the new Control Switches (“CTRL SW”) page of the CONTROLLERS area of the CONFIG page.

To Set Initial Values for a Control Switch:

1. From the main FOOTSWITCH (“FS”) page of the AX8, page right to the CONFIG page.
2. Select the CONTROLLERS option and press <ENTER>
3. Page to the CONTROL SWITCH (“CTRL SW”) page.
4. Set the initial value of each switch for each scene to either “ON” or “OFF”.

Bank Limit

Bank Limit is a new feature designed to prevent “oops” when stepping up or down through banks during a live performance.
It limits the available banks you can access through the footswitches with an UPPER and LOWER limit. For example, you could limit your AX8 to footswitch access to banks 1 through 4 for one gig, and banks 12 and 13 for another. Bank Limit is enabled through the global menu, and adds three new parameters to the GLOBAL SETTINGS menu.

To set up Bank Limit:

1. Navigate to the SETTINGS page of the GLOBAL menu under SETUP.
2. Set BANK LIMIT as desired: “NO”, “WRAP”, & “NO WRAP”
    a. NO – Banks are NOT limited. Lower and Upper limit settings are IGNORED.
    b. WRAP – Banks ARE limited and will wrap around from the highest back to the lowest (or vice versa).
    c. NO WRAP – Banks ARE limited and will NOT wrap.
3. Set BANK LOWER LIMIT: 1 – 64 as desired. Cannot be higher than the UPPER limit.
4. Set BANK UPPER LIMIT: 1 – 64 as desired. Cannot be lower than the lower limit.

This feature has no effect on AX8 Edit.

VERSION 3.04 MAY 12, 2016

AX8 V3.04 addresses the issue of incorrect parameters appearing in AX8-Edit. As always, we recommend that you back up your system and presets using Fractal-Bot before proceeding with installation.

Additions

- None

Fixes

- In some rare cases, AX8-Edit mis-reported the CPU Load disabled state of effects. This has been corrected.
- Corrected an issue that caused sporadic effect parameter display issues in AX8-Edit.
- All Pan Right or Balance Parameters are no longer limited to 99.9% to prevent muting the output All Balance parameters now transition from -100 to 100.
- Increased CPU utilization introduced by V3.03 has been corrected back to normal.

VERSION 3.03 MAY 09, 2016

AX8 V3.03 has been created to fix a few issues discovered during the release of V3.02. As always, we recommend that you back up your system and presets using Fractal-Bot before proceeding with installation.

Fixes

- A small number of units have experienced sporadic boot failures at power up. This release fixes an initialization bug that was found to cause this issue.
- A bug fix in V3.02 intended to fix a crash bug related to incoming MIDI data over the standard MIDI port, was found to be corrupting data. This bug fix corrects the original crash bug, without the unintended data corruption.
- The Volume/Pan block was muting the outputs when panning 100% to the R. This has been corrected.
- In some cases, the AX8-Edit parameter buffer was not being populated correctly. This led to some rare cases of overwriting presets with incorrect data. This too has been remedied.

VERSION 3.02

AX8 Firmware 3.02 is based on the Quantum 2.04, 3.00, 3.01, and 3.02 firmware updates for the Axe-Fx II. This is a major release and may change the sound of existing presets (specifically, the AMP block) although RESET SYSTEM PARAMETERS should not be necessary. We always suggest that you backup your AX8 using Fractal-Bot before a firmware update.

Quantum Updates:

- Re-matched Friedman BE and HBE amp models using a newer reference amp, as the original reference amp is an early model and has questionable QC.
- Added Friedman BE/HBE V2 models based on a Friedman BE/HBE with the “Voice” switch toggled left. The original models (based on the switch toggled right) have been renamed Friedman BE/HBE V1.
- Reduced popping when changing Amp block Preamp Bias.
- Fixed Drive block “Plus Dist” type defaulting to wrong clipping type.
- Improved Amp block output transformer modeling. New model more accurately simulates dynamic core losses and leakage inductance. The “Xfrmr Grind” knob controls the intensity of the effect. Higher values result in more high frequency response and a more “open” sound. Very high values can yield a raspy, spitty tone common in vintage and/or low wattage amps. Modern “big iron” amps tend to have low values. Note that the audibility is dependent upon how hard the virtual power amp is driven and is more noticeable as the MV is increased. Also note that the effect in real amps is highly dependent on the speaker. Some speaker/transformer combinations exhibit significant high frequency dynamic boost while other combinations yield almost none. As always use your ears as the final determinant.

  Note: The Transformer Grind parameter will be set to a default value and the Dynamic Presence parameter will be reset to 0.0 for any presets created with previous firmware.

- Improved triode plate modeling for cases when plate load is complex.
- Improved Ruby Rocket models frequency response accuracy vs. Drive knob. Existing presets should be reset by both deselecting and reselecting the amp model or by turning the Low Cut Freq parameter to 10.0.
- Extended the range of the Amp block Hi Cut Freq parameter to 400 Hz to 40 kHz. As this changes the preset storage format, existing presets will be automatically updated to use default values.
- Added “Dweezil’s B-man” amp model based on a modified Fender Bassman as used by Dweezil Zappa.
- Fixed wrong default Tube Bias value in Recto1 and Recto2 amp models.

Additional Enhancements:

- Moved the “VU” page to the main menu, including a new CPU indicator. (To access this page quickly from the main footswitch screen, simply tap SHIFT followed by PAGE.)
- Greatly improved the performance/efficiency of modifiers.
- INPUT 1 PAD now defaults to “12dB” (when you perform RESET SYSTEM PARAMETERS).
- The AX8 now clears a CPU overload when you change scenes, so any disabled effects can be re-enabled if possible.
- Optimized MIDI input. (This change does not affect MIDI over USB.)
- Added Large Preset Display: The Global Parameter “DISPLAY LARGE PRESET” with the values “NO”, “1 SEC”, “2 SEC”, “3 SEC”, and “4 SEC” was added. When set to any value other than “NO” the Large Preset Name will display for the period of time specified every time the preset is changed by the user.
- Added the Preset Recall Display. Both SINGLE PRESET/BANK and STICKY PRESET/BANK now display a list of the 8 presets in the current selected bank. If the current selected bank contains the active preset, then the active preset is displayed in reverse video. When in STICKY PRESET/BANK mode, this screen is persistent.
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AX8 Specific Fixes

- Fixed EMPHASIS on the Pedal Compressors so it behaves like the same parameter in the Axe-FX.
- FX BYPASS support (SHIFT->EDIT) now works on the “LAYOUT” page of the main menu, and from *within* the edit menu of the LOOPER block.
- Previously un-configured MIDI PC SCENE no longer produces the wrong MIDI Channel Output.
- Fixed a bug preventing PROXIMITY from processing the RIGHT channel in a stereo CAB block.
- Removed the CAB block’s “MIC” parameter since it never worked (and microphones are now “baked in” to all pro-quality IRs anyway!)
- Added “PROXIMITY FX” (Enable/Disable) to the Advanced Menu in the CAB block to control whether the PROXIMITY parameter is active or not. When importing an Axe-Fx Cab block with “Mic” set to “NONE”, this parameter will be set to “disabled” and the PROXIMITY control will do nothing.
- Fixed a bug in INPUT DRIVE: Attaching a controller no longer causes crackling on some models (particularly the “JR BLUES” and “5153 50W BLUE”).
- Fixed a bug in INPUT DRIVE: Turning the INPUT DRIVE knob fully counterclockwise no longer causes oscillations in some models (particularly Angle Severe, Friedman BE/HBE models).
- CPU load no longer spikes 35% when placing a modifier on the REVERB TIME parameter.
- Fixed a crash bug, where a flood of incoming MIDI messages would crash the AX8
- Fixed a bug affecting the clipping algorithm of the “BRIT SILVER” amp model.
- Fixed a bug that allowed AMP models imported from the AxeFx to leave a controller attached to the OUTPUT LEVEL parameter modifier (not supported in the AX8). NOTE: the controller is now removed by the AMP block.
- Reduced audio dropouts when editing with AX8-Edit.

VERSION 2.02

This release is based on the modifications made to the AxeFX II Quantum V2.02, hence the jump in version numbers. This is a major release, and we strongly urge you to RESET YOUR SYSTEM PARAMETERS upon successful installation of this firmware.

- Improved tube modeling. New algorithms uses more accurate plate current formulas based on actual measurements rather than theoretical values. This results in smoother, thicker distortion and better dynamic response.
- Improved power supply modeling. New algorithms improve sag and feel. For convenience the virtual power supply voltage (B+) can now be monitored on the PWR DYN tab of the amp block. When the Supply Sag control is selected the gain reduction meter will display the supply voltage in dB relative to the idle voltage.
- Improved cathode bias algorithm for “Class-A” amp models (i.e. Class-A 30W, AC-20 Dlx, etc). In conjunction with this the Cathode Squish parameter has been repurposed as “Cathode Bias” and controls the value of a virtual cathode resistor. A value of 50% is “optimum” and biases the power tubes at true Class A operation (neglecting any bias shifting due to supply sag, screen droop, etc.). Values greater than 50% increase the resistance and therefore bias the power tubes “colder”. Values less than 50% bias the tubes beyond Class A. In a real amp this would probably destroy the tubes but that limitation does not exist in our virtual amp. Most real amps of this type actually operate far below Class A and the default values for the models will reflect this. Note that the Power Tube Bias value should be set to 1.00 for these amp types (since that parameter controls the grid voltage and the grid voltage is at a maximum in these types of amps). Existing presets will be automatically updated with new default Cathode Bias and Power Tube Bias values.
- Improved Phaser block CPU usage.
- Added “Filter Slope” parameter to Cabinet block. This can be used to select between first-order (6 dB/octave) or second-order (12 dB/octave) filters for the Low Cut and High Cut filters.
- Improved Plexi “Jump” models to account for interaction between Drive controls.
- Renamed Plexi 50W High amp model to “Plexi 50W Hi 1” (see below).
- Added “Plexi Hi 2” amp model which is similar to Plexi 50W Hi 1 except the second triode stage has a 0.68uF cathode bypass capacitor. The second bypass capacitor was added in the early 70’s and gives a slightly brighter tone.
- Added “Plexi 100W 1970” based on a 1970 Marshall 1959SLP 100. This particular amp has a darker, smoother sound than earlier Plexis.
- Added “Ruby Rocket” amp model based on a Paul Ruby Rocket with the Bright switch in the down position. The existing model has been renamed “Ruby Rocket Brt” to reflect the state of the Bright switch being in the up position.
- Added “AC-20 12AX7 B” amp model based on an AC-20 Deluxe with the rear switch set to 12AX7 and the Bass/Treble switch set to Bass. The existing models have been renamed AC-20 EF86 B, AC-20 EF86 T, and AC-20 12AX7 T.
- Added “Spawn Nitrous 1” amp model based on the OD-1 mode of a Splawn Nitro with KT-88 power tubes.
- Fixed Spawn Nitrous model broken by earlier firmware update. If you are using this model in your presets you should reset the model by deselecting and reselecting the amp type. This model has been renamed “Spawn Nitrous 2” to indicate that it is the OD-2 mode (see above).
- Fixed wrong default Negative Feedback value in all “Dizzy” models. Note that the Presence control in these models has more range than the actual amp as the amps have a limiting resistor that the models do not have. Turning the Presence all the way up on the real amps is equivalent to around 7-8 on the models.
- Fixed wrong Bass taper in Recto2 amp models. Previous taper was Log30A. Taper is now Log10A. Existing presets should be auditioned as the amount of bass will be less.
- Improved power tube saturation modeling. This yields warmer, “tubier” distortion. The PA Hardness parameter is automatically set for each power tube type but may be overridden if desired.
- Improved virtual output transformer saturation modeling.
- Change “Thru” bypass mode so that effect input is muted. This prevents, for example, delays from creating echoes when engaged.
- Added “Invert” mic type to Cabinet block. This inverts the signal allowing for interesting effects in conjunction with the delay parameter.
- Fixed Reverse Delay being modulated slightly for long delay times.
- Fixed Mr Z MZ-8 amp model sounding “off”.
- Added Bright Knob Control to all amp models.
- Fixed a bug where the hardware TREBLE knob did not correctly control the Treble on some amp models.
- GATE/EXP block now correctly stores and loads the Y parameters.
- Added access to the Balance Knob in the GATE/EXP block.
- Fixed a bug where attaching a controller to Volume Increment or Decrement could potentially corrupt a preset.
- Fixed Bypass Toggling when using Y on the Multi-Delay block.
- Fixed a bug on the Layout grid; placing a block no longer automatically connects to a previous empty block.
- Fixed a user reported bug: Dialing the AMP Block Drive parameter to zero quickly using the dedicated "DRIVE" knob would cause a loud oscillation on the Angle Severe amp models.
- Modified Scene Revert so selecting the current scene will revert to saved settings.
- Fixed a bug where the Looper Control did not like to be initially triggered by the F-switches

- The user is no longer restricted from inserting blocks that create CPU overload. Unit now continues disabling the highest load effects.
- Fixed a bug that produced unpredictable behavior when pressing <ENTER> on an empty block on the layout grid.
- Fixed Crash bug using AX8-Edit: placing shunt in upper left corner, and then editing Input Gate.

NOTE: This firmware represents a significant update in the amp modeling and the amp models themselves. Many models have been redone. Although care was taken to ensure as much compatibility with existing presets as possible, your presets may be altered.

V1.01

V1.01 is a maintenance release, and contains the following BUG fixes:

- Added FAS Boost to the DRIVE Block.
- Fixed Modifiers on the PAGE3 of the WAH Block.
- FXLOOP Block correctly restores it state on Preset and Scene change.
- Metronome in the TEMPO now works.
- Controllers no longer cause an audible pop or click.
- Scene Changes made on the LAYOUT GRID, such as Effect BYPASS, are now correctly saved to the preset.
- Replacing a CPU intensive block with a less intensive block (such as a SHUNT) is no longer blocked by the unit.
- Global Controllers Volume Increment and Decrement now work
- *Fixed a bug where setting Tap Tempo to the "SCENE" function switch disabled the "LOOPER" and "TEMPO" LEDs.*
- *Fixed a bug where setting Tap Tempo to the "LOOPER" function switch disabled the "TEMPO" LED.*
- Single TAP TEMPO will now timeout correctly and return you the main screen
- Compressor Side Chain now works correctly.
- Both channels of the stereo CABINET block now output the same level.
- Attaching a controller to the DRIVE parameter of the AMP block no longer causes a +25% increase in CPU utilization.
- PHASER LFO phase now works correctly

NOTE: Version 1.01 was the first update. 1.0 was the initial release, so there is nothing prior to the notes above.