Axe-Fx III Firmware Release Notes

11.01

Updated Speaker Impedance Curves for 2x12 Jazz 120, 4x10 Brit JM45 and 4x12 Hipower. Also added the following new curves:

2x12 Bassbuster (based on a Fender Bass Breaker)

1x12 Tweed Alnico Blue (based on a Fender Deluxe with Celestion Blue)

4x12 PVH 6160 (based on a Peavey 5150 w/ Sheffields)

4x12 Euro (based on a Bogner standard)

2x12 Recto (based on a Mesa Rectifier)

Added "Matchbox D-30 EF86" amp model. While the real amp has a six-position Tone switch, the model has a continuously variable tone control. Note that the Tone control is mapped to the Bass control in Ideal mode as the Tone switch is essentially a bass cut control.

11.00

Amp block now uses new high-order speaker impedance modeling. 52 speaker impedance models (and two LB-2 models) are included and can be selected using the Speaker Impedance Curve parameter (on the Advanced page). Selecting an amp model will load an appropriate default Speaker Impedance Curve for that amp model. The Cabinet Resonance parameter can be used to adjust the amount of cabinet resonance in the impedance curve. NOTE: The 2x12 Bassguy, 2x12 Jazz 120, 4x10 Brit JM45 and 4x12 Hipower data is incomplete and will be updated in a future release.

Setting Global "Update Pre-11.x Presets Spkr Imp Upon Load" parameter to YES will automatically update the Speaker Impedance Curve for the Amp blocks upon preset recall to use an appropriate Speaker Impedance Curve for that amp model. Setting the parameter to NO will leave existing presets unaffected. NOTE: Setting this to YES will also cause the EDITED LED to light indicating the preset has been modified.

Fixed Recto1/2 models default Negative Feedback and Power Tube Bias values slightly too low.

Fixed loss of precision in Drive block Tone control for some models (Rat, Timothy, et. al.) causing low frequency build-up over time.

10.02

Fixed popping noise can occur when switching between certain amp models. This also results in faster, smoother preset, scene and channel changes.

Fixed wrong Basic tab of Drive block when Ruckus LED/Si type selected.

Added Wrecker Liverpool Bright amp model. This models the amp with the three-position Bright switch in the brightest position.

10.01

Fixed divide-by-zero can happen in Drive block when using certain combinations of different diode types and a very strong input signal or when switching between different types.

Fixed can't access Drive block Advanced GUI page for Ruckus LED/Si type.

Changed Drive block Slew Limit to Slew Rate and updated default value of the models. Existing presets will be updated to the new default value upon recall. Note that the parameter now controls the slew rate and lower values equal less high frequency response at high amplitudes and vice-versa (the action is reversed from the previous firmware versions).

Added Wrecker Express Bright amp model. This models the amp with the three-position Bright switch in the brightest position.

10.00

Added Downtune control to Tuner. The Downtune control allows for simplified tuning when tuning down one to four semitones. The Tuner display will read the "natural" name of the note, i.e. if tuning down one semitone an Eb will read E. In addition any blocks that utilize pitch information will also be transposed accordingly.

Added Display Mode control to Tuner. This control allows selecting between all flats, all sharps or a mixture of sharps/flats for the displayed note name.

New power amp modeling algorithm. This algorithm improves the plate impedance accuracy substantially. This yields tighter bass, crunchier midrange and "chimier" highs.

Due to the changes in the power amp modeling algorithm the Power Tube Hardness parameter now behaves differently. Selecting a Power Tube Type loads the "knee voltage" for the power tubes and this voltage can be adjusted up or down using Power Tube Hardness. Higher values yield a lower knee voltage and more abrupt clipping and vice-versa. Existing presets will have Power Tube Hardness reset to 5.0 upon recall.

The range of the Transformer Match control has been reduced to 0.5 to 2.0. Existing presets will have this value reset to 1.0.

The Ideal Tetrode and Ideal Pentode power tube models are no longer applicable and have been replaced with 5881 and 6L6GB models, respectively.

The PI Bias Excursion values have been updated for some amp models. Existing presets will automatically be updated to the new default values. If you typically alter this parameter you should audition your presets.

The Amp block Dynamic Impedance parameter is no longer applicable and has been removed.

Added KT77 power tube type.

Improved Drive block. New diode modeling algorithm improves clipping accuracy especially for diodes with higher saturation currents, i.e. 1N270 and other germanium types.

Added D9E and D18 diode models to Drive block. These are Soviet germanium diodes valued for their smooth distortion characteristics.

Added "Ruckus LED/Si" type to Drive block. This model is based on a Suhr Riot with the toggle switch set to select the hybrid LED/Silicon Diode position.

Added "5 Band Mark" type to Graphic EQ block.

Fixed exported Tone Matches may, in rare cases, not sound the same as the Tone Match.

Fixed long delay times (over 1.5 seconds) in Plex Shift can cause artifacts.

9.01

Fixed Amp block input drive network instability in rare cases when switching between certain presets.

Fixed some amp models can become unstable for certain combinations of Negative Feedback and high values of Speaker Impedance and/or Transformer Match.

Added "Gain Enhancer" mode to Amp block Output Compressor. This mode can be used to simulate the acoustic reinforcement of a loud amp coupling into the guitar and enhancing the output signal.

9.00

New power amp modeling algorithm. This new algorithm now also separates the transformer matching from the speaker impedance. A new parameter, Speaker Impedance, allows adjusting the relative impedance of the virtual speaker. For example, to simulate connecting a 16-ohm speaker to an 8-ohm

output set Speaker Impedance to 2.0. Transformer Matching, on the other hand, changes the impedance ratio of the virtual output transformer.

To support the new power amp algorithm the internal transformer matching values and negative feedback values have been updated. The new negative feedback values will load when selecting an existing preset. If you typically adjust Negative Feedback when creating a preset be sure to audition your presets as the parameter value will be reset to the default value upon preset load.

Fixed Amp block Output EQ wrong frequencies if EQ Location set to "Input".

Fixed Amp block "Hi-Cut" calculation for amps without negative feedback. This affects the following models:
All AC-20 models
All Class-A 15W and 30W models
Citrus Terrier
Boutique 1 and 2
FAS Class A
Hot Kitty
Matchbox D-30
Mr. Z MZ-8 and MZ-38
Ruby Rocket and Ruby Rocket Bright
Supremo Trem
Wrecker Rocket

Fixed incorrect default P.A. Cathode Resistance value for Citrus Terrier model (correct value is 96%) and Class-A 15W model (correct value is 83%).

8.00

Improved amp modeling.

Added Swap Scene function to Layout->Tools.

Fixed Plex block Shimmer Verb causing NaN if Reverb Size set to 0%.

Fixed Tone Match block erroneous results on preset recall due to uninitialized data.

Fixed sluggish Axe-Edit behavior after boot on high CPU presets.

Fixed Rotary block Input Select not working correctly.

Fixed Compressor block sidechain filter not working if gain set to 0.0 dB.

7.01

Firmware image now uses compressed initialization. This results in a smaller file size and faster firmware updates.

Added Input Select to Megatap Delay, Multitap Delay, Plex Delay, Reverb and Rotary blocks.

Fixed Input Impedance not set correctly if an active effect is in a different row and prior column than the effect that should be controlling the impedance.

FC: Fixed stand-in switches not activating the down half of their assigned function.

7.00

Improved power amp modeling. New algorithm accounts for variation in load voltage as a function of transformer turns ratio. I.e. reducing the Transformer Matching will reduce the output level and vice-versa.

Fixed low output level for Shred Distortion Drive model.

FC: Fixed tap function executing on hold when "Hold Execute" is set to "Switch Up".

FC: Fixed switch executing from wrong layout after a stand-in switch is used.

FC: Fixed MLM functionality when cloning mixed units (FC-12's and FC-6's).

FC: Added FC-6/FC-12 compatibility mode. When enabled, FC-6(s) will use buttons 1, 2, 3 for the bottom row and buttons 7, 8, 9 for the top row. Accessible from HOME->SETUP->FC Controllers->Config Page, FC-6/FC-12 Compatibility Mode. It is disabled by default.

FC: When "Reveal Holds" is active the hold function states will be displayed (with default ring colors only) and button presses will execute the hold functions.

FC: Fixed hold functions firing on the MLM hold switch (switch 3 on FC-6 and switch 6 on FC-12) preventing MLM mode from executing.

6.04

Reduced background task priority on high CPU presets to improve client (i.e. Axe-Edit) performance.

Added "CC Boost" type to Amp block.

Improved CPU usage.

Optimized LCD graphics for better response.

Changed FC tuner note names to match main tuner (i.e. Eb instead of D#).

Added Solo feature to Parametric EQ block. When a band is sooled the frequency range for that band is isolated allowing the user to fine-tune the band.

Fixed output level of PI Fuzz model too low.

Fixed Modifier auto-engage not working when Auto-Engage is set to SLOW POSITION and the Update Rate is set to FAST.

Fixed Supremo Trem model missing Tone control in Authentic mode. Note: the Tone control is mapped to High Cut in Ideal mode.

Fixed FC and Axe-Edit not displaying tempo correctly if preset using global tempo.

FC: Fixed Layout Link not executing if no function is assigned to the switch.

FC: Added Mode parameter to Utility/Reveal Hold for Momentary/Toggle.

FC: Added Hold Function Execute Mode: TIMEOUT or SWITCH UP. "TIMEOUT" is same as the previous behavior. When set to "SWITCH UP", the hold function executes when you release the held footswitch, allowing precise musical timing.

FC: Fixed Per-Preset/Placeholder #24 not working.

6.03

Fixed long preset load time if preset using Filter block with Frequency parameter connected to modifier.

6.02

Added LFO to Filter block. When enabled, the LFO will modulate the frequency of the filter between the Frequency and the Mod. Frequency. The local LFO simplifies modulated filtering and frees up the global LFOs for other tasks.

Added adjustable filter to Plex block wet signal. Filter can be any of the standard types (all types except comb filter types). Frequency, Q and Gain are modifiable.

Added Shimmer Verb type to Plex block.

The Mode parameter in the IR Player block has been replaced by a Length parameter.

Changed Home page behavior so that menu stays on selected tab when returning. Pressing HOME while on the Home page resets to first tab.

FC: Improved communication reliability when using very long cables (requires FC firmware version 1.08).

FC: Fix preset tempo being used when global is selected .

FC: Add Layout Inc/Dec function.

6.01

Fixed memory allocation error causing boot irregularities.

6.00

Firmware 6.00 introduces the PERFORM tabs found on the HOME screen of the Axe-Fx III. There are two PERFORM tabs: Per-Preset and Global. The PERFORM tabs can be configured with up to 10 user-selected controls from any of the blocks found in the current preset (including CONTROLLERS and GLOBAL). Configuration of the PERFORM tabs is done via Axe-Edit III. Allowable controls include rotary knobs, push-buttons, drop-downs, and toggle controls (e.g., on/off controls).

The "Perform-PP" controls are stored per-preset. Adding or removing a control from "Perform-PP" will change the EDIT state of the preset.

The "Perform-Gbl" controls are stored in the Global Settings. Adding or removing a control from "Perform-Gbl" is automatically saved to the Global Settings.

Performance controls are added via the editor from a block's parameter view. The editor's selected parameter control is assigned to the desired Performance tab through a popup menu or a hot-key combination. [Please note the "Edit Modifier..." popup menu item for modifiable parameters. Modifiable parameters can quickly jump to the "Edit Modifier" dialog by pressing the hotkey 'M'.]

Hotkey assignments for Perform controls:
   * Per-Preset Add: SHIFT + '1' through '0', where '0' is the tenth control on the tab.
   * Per-Preset Remove: SHIFT + ALT + '1' through '0', where '0' is the tenth control on the tab.
   * Global Add:
     * Mac: COMMAND + F1 through F10.
     * Windows: CTRL + F1 through F10.
   * Global Remove:
     * Mac: COMMAND + SHFIT + F1 through F10.
     * Windows: CTRL + SHIFT + F1 through F10.

The editor's Perform view is accessed via the "Perform" button or the Tools / Performance menu. From this view, Per-Preset Performance controls can be imported and/or exported using the "Block Library" control. Additionally, the view's "Per-Preset" and "Global" tabs allow label editing for controls already assigned to the "Perfrom-PP" and "Perform-Gbl" tabs.

Changed Cabinet, IR Player and Tone Match block IR windowing so that window length is proportional to IR length (rather than a constant window length).

Doubled length of IR Capture Utility sweep. This improves SNR in challenging environments, i.e. a large, noisy room when capturing "far-field" IRs. The time between sweeps has also been increased to allow the room reverberation to decay sufficiently before starting the next sweep.

Improved Amp block power amp modeling.

Added five "Manual" controllers to Controllers menu. These can be used as modifiers for real-time manipulation of parameters from the front panel.

Combined LFO 1 and LFO 2 menus into a single menu.

Fixed Ring Mod block left/right slightly unbalanced.

Fixed Looper allows playback even if no loop exists causing noise.

FC: Further fixes for startup timing issues.

FC: Fixed Inc/Dec functions' upper limits defaulting to zero.

FC: Fixed learning of FC external pedals and switches in MIDI/Remote.

FC: Fixed external switch polarity not showing correctly on the FC Controllers Remote page.

5.08

Added Low Cut and High Cut to individual IRs in Cabinet block. Filter slopes are also selectable from 6 to 24 dB/oct.

Added IR Length parameter to individual IRs in Cabinet block. Shorter lengths can be used to remove room reflections and/or decrease CPU usage.

Changed Pitch block so that pitch detection is performed even when block is bypassed. This allows using the Learn function while the block is in bypass.

Fixed sometimes unit will hang at boot if an FC-12 running firmware version 1.06 or later is connected.

Fixed pop when switching from Hipower amp models to certain other amp models.

FC: Fix Layout Link not working when in MLM mode.

FC: Fix EZ Page changing values of Switch 1 even if no switch has been selected .

FC: Fix inc/dec wrap operation.

5.07

Improved Preset/Scene/Channel switching time.

Fixed wrong default Cathode Follower Compression values for Brit JVM and JS410 amp models.

Fixed AES/SPDIF input shifted by one bit causing clipping at -6 dBFS.

FC: Added support for stand-in switches (assign external switches to perform a function assigned to an FC switch).

FC: Support for FC firmware 1.06 (switch behavior and polarity)

FC: Added shortcut keys to/from Per-Preset and Global

FC: Added warning on switch page if the switch is overridden in the current preset

FC: Fix per-preset overrides not working on MLM page 2 for the FC-6

FC: Fix layout link and MLM interaction (switch 3 for the FC-6 and switch 6 for the FC-12)

FC: Fix layout link for per-preset switches

5.06

Added USA JP IIC+ Green amp model (channel 1).

Fixed wrong internal transformer matching value for Friedman Small Box model.

Fixed popping when switching between channels/scenes/patches with very different block levels.

Fixed incorrect error message when updating USB firmware via Fractal-Bot.

Fixed Upper Limit on functions in the Bank category reverting to '51' on restart (regardless of bank size).

Fixed FC layout names getting clobbered if knob A is used to Nav while editing.

Fixed loading defaults squashing the version (and other dummy params) on the devices page.

Display Effect name for Effect functions on the Overrides page of Per-Preset FC Settings.

Configurable timeout for the notifications on the FC main LCD.

Updated FC function Effect->Channel Select to turn off the LED ring if the effect is bypased and Smart Bypass is enabled.

Added TEST ON and TEST OFF to CS MIDI for the FC.

5.05

Fixed missing menu for USA JP IIC+ Yellow amp model when using authentic controls.

5.04

Added USA JP IIC+ Yellow amp model (channel 2). . NOTE: To emulate the "Shred" mode turn the High Treble control to approximately 3-4 dB (or adjust to taste, you are not limited by a single switch).

Fixed corruption in FC Remote menu.

5.03

Added USA JP IIC+ Red amp model (channel 3). NOTE: To emulate the "Shred" mode turn the High Treble control to approximately 3-4 dB (or adjust to taste, you are not limited by a single switch).

Fixed hold functions on page two of the Master Layout Menu for the FC-6.

Fixed FC Bank -> Inc/Dec function's upper limit from resetting to the maximum bank number on reboot or bank size change.

Fixed copy/paste of FC Layouts not setting Layout Link.

Fixed FC Layout Link for hold functions not surviving a reboot.

Fixed wet data muting during channel change in Multitap block.

5.02

Fixed presets created with firmware prior to 3.00 defaulting Amp block EQ Off/On parameter to Off instead of On.

5.01

Fixed presets created with firmware prior to 3.00 not loading various parameters correctly. These parameters are primarily the Spread parameters in the Chorus, Flanger, Rotary and Reverb blocks, among others.

5.00

Completely new Amp block cathode follower algorithm yielding more accurate results. The "Ideal" cathode follower type is no longer supported as it is incompatible and has been removed from the GUI. The Cathode Follower Time and Ratio parameters have also been removed as they are no longer applicable. A "Grid Clipping" parameter has been added which allows the user to adjust the grid clipping in the cathode follower. Lower values reflect the softer response of classic British and American tubes like Mullard, Sylvania and RCA. Higher values simulate the response of modern Chinese and Russian tubes with more abrupt clipping.

Updated various Amp block parameters related to new cathode follower algorithm. Existing presets are automatically updated to the new values.

Added AES/SPDIF Input Level control. This is located in the I/O->USB/AES menu. NOTE: this parameter will default to -40 dB after installation of the firmware. Be sure to adjust to the desired level if using the AES or SPDIF inputs.

Added Treble Booster and Mid Booster boost types to Amp block.

Improved Scene/Channel change logic. Only the wet data is muted when changing scenes and channels now leaving the dry data intact which results in smoother transitions.

Changed Control block Envelope Follower behavior so that when the signal exceeds the threshold the control value starts at zero rather than jumping to the threshold value.

Fixed wrong bass pot taper in Friedman Small Box model.

Fix FC per-preset corruption with some presets.

NOTE: Due to the new algorithms several amp block parameters are reset to default values when loading old presets. Included in these parameters is Preamp Bias Excursion. If you had altered this parameter in a preset note that it will be reset and you may want to readjust it.

4.03

Fixed Div/13 CJ 11 amp model muted when two Amp blocks used.

4.02

Fixed issue with certain amp models, i.e. Legato 100, exhibiting excessive blocking distortion.

Fixed loss of communications with FC-X foot controllers after being left on for very long periods of time, i.e. overnight.

Various fixes and improvement for FC-X controllers.

4.01

Fixed triode modeling algorithm for amp models with "cold clipping" stages, i.e. Recto, SLO, etc.

4.00

Improved Amp block preamp tube modeling.

Improved Amp block cathode follower grid modeling.

Improved power amp modeling for "Class-A" type amp models.

Added modifier capability to Decay Time, Level 1-8 and Pan 1-8 controls in Plex Delay block.

Added Presence Shift control to Amp block Tone page for the appropriate models when using Authentic controls.

Added SV Bass 1 amp model. This is the original SV Bass model prior to the change in 2.05. The new SV Bass model added at 2.05 has been renamed SV Bass 2.

Added FAS Skull Crusher amp model. The nastiest, most brutal amp model to ever escape from the seventh circle.

Reworked PI Fuzz model based on older "Triangle" version reference. A soft-reset of the model is required to load the new parameter values. Note that duplicating the behavior of a fuzz pedal requires that the pedal be the first non-bypassed block following the Input 1 block and the input block impedance must be set to Auto since fuzz pedals load down the guitar's pickups.

Added "Unlink All Blocks From Global" function to Layout->Tools menu. This unlinks all blocks from any global blocks to which they may be linked.

Expanded the names of the "USA" models to more clearly indicate the switch settings.

Fixed Tone page for Plexi 100W 1970 not showing Normal Drive control.

Fixed incorrect capacitor value and wrong default Low Cut value in BB Pre Drive model.

Fixed wrong default Low Cut value in Eternal Love and Esoteric ACB Drive models.

Fixed Output EQ in Amp block not being redrawn when changing channels and number of bands is different.

Fixed wrong triode plate frequency in Herbie CH3 model.

Fixed wrong mid and treble tapers in all Herbie models. Existing presets should be auditioned.

3.02

Improved Drive block. WARNING!!! The sound of some of the drive models may have changed significantly.

- Drive models based on op-amp and diode clipping topologies have been completely overhauled.
- For many types there is now a "Dry Gain" control. This parameter controls the amount of "dry" signal mixed with the "wet" (distorted) signal. For a Tube Screamer-based model this will default to 100% due to the topology. For other types this will default to 0. Values up to 200% are allowed. Note that the dry data is added before any tone controls and therefore is not exactly equivalent to a mix but rather replicates the behavior of analog circuits.
- Drive types based on op-amp and diode clipping circuits now allow control over the type and quantity of diodes in the positive and negative polarity. For example, the user can select (2) 1N34A diodes for positive signal polarity and (1) red LED for negative. Experiment with the various diode types and quantities to obtain new and unique sounds.
- The Basic GUI page now reflects only the controls found on the actual pedal. In cases where the actual pedal does not have any tone controls a simple Tone control is included for convenience.
- Added several new types.

Added "All" to Tuner Input Source selection. This sums all inputs.

Added Global "Tone Control Display" parameter. When set to Authentic (default) only those controls present on the actual amp are displayed. When set to Ideal all tone controls are displayed. Also, when set to Authentic the Bass, Mid and Treble controls are reset to default values when changing models to ensure accuracy for models that may not have these controls.

Fixed Tone Match block not updating correctly between preset changes if different Mode used.

Fixed loss of low frequency resolution for Tone Match block when set to Off-Line mode.

3.01

Fixed Graphic EQ pages not responding to navigation buttons.

Fixed FC load defaults correctly sets bank size before configuring switches.

Fixed FC use "Scene X" on main LCD if scene name is blank.

Fixed load FC-12 defaults won't switch first FC to layout 7.

Fixed FC scene name not updating if character(s) removed from end.

3.00

Improved amp modeling.

Improved speaker compliance algorithm.

Improved algorithms for modulation effects.

Improved Tone Match block graphs.

Improved Reverb block.

Added "EQ Off / On" control to Amp block. This modifiable parameter turns the graphic EQ on and off.

Added Plex Verb type to Plex block. While the Reverb block is designed for authentic, natural-sounding reverbs, the Plex Verb type is designed for large, ethereal reverb sounds. This type is also simple to use with no time, tempo, level or pan parameters required. For best results turn the Diffusion Mix up when using this type.

Added Spread and Pre-Delay controls to Plex block.

Increased the range of the Low Freq Time and High Freq Time in the Reverb block. This allows for creative reverb sounds. Several new reverb types have been added to illustrate these effects.

The Chorus, Flanger, Plex, Reverb and Rotary blocks now supports Spread values from -200% to 200%. Values beyond +/-100% increase the apparent image beyond the stereo field. The action of the spread control has also been improved so that the apparent volume remains constant vs. spread value.

Fixed IR Capture utility sometimes not working in Cab+DI mode.

Fixed slow response in IR Capture configuration menu when changing bank/slot.

Fixed Cabinet block graphs not showing traces for non-UltraRes IRs.

Fixed Input Source for Pitch Follower not exposed.

Fixed FC-X custom Mini-Display Label for Effect, Chan Select.

2.05

Added Threshold parameter for all types in Compressor block.

Change Drive block behavior so that when changing the Drive Type the graphic EQ is reset.

Reworked SV Bass amp model. Model is now based on a 1970 Ampeg SVT with 6550 power tubes and the midrange switch in position 3.

Cabinet block now automatically corrects the polarity of IRs that are inverted, i.e. captured from the back of a cabinet.

Added floor reflection modeling to Cabinet block. The intensity of the floor reflections can be adjusted with the new "Floor Reflections" parameter. Floor reflections play a large role in "amp in the room" sound. If the amp is on a carpet the floor reflections are minimal. If the amp is on a wood or other hard surface the floor reflections are significant. Existing presets will initialize this value to 0% so as to not change the sound. The default value is 50%. Note that negative values, while not realistic, are supported which inverts the reflection.

Added Diffusion to the Cabinet block room modeling.

Improved IR Capture Utility. User can now select between conventional deconvolution and reverse filter processing. In a high-noise environment the reverse filter technique can provide better results. In low-noise environments the conventional technique can provide slightly better bandwidth and magnitude accuracy. Note that the prior firmware used the reverse filter technique.

Added Processing parameter to IR Capture Utility. This selects between "Minimum-Phase" which transforms the IR into a minimum-phase version, "Auto-Trim" which removes the leading silence, and "None" which applies no processing at all. Note: prior firmware always used minimum-phase processing.

Added Delay Compensation to IR Capture Utility. This allows compensating for time-of-flight delay when capturing IRs. For example when capturing far-field IRs there may be significant time delay due to the distance of the mic from the speaker. This can reduce the precision of the measurement if the delay is excessive. To use the compensation configure the graph to the Time display. Do a test sweep and note the waveform delay. Dial in the desired amount of compensation delay and repeat as necessary. Note that the speed of sound is roughly 1 ft/ms so a mic that is 10 ft from the speaker would incur roughly 10 ms of delay. Note that IR Capture Utility will automatically compensate for delays up to approximately 20 ms (1K samples). Correction is only required for delays greater than 20 ms.

Added alignment graph to Cabinet block showing a zoomed time series of the IRs allowing visual adjustment of the mic distance. When using IRs that have not been minimum-phase processed this facilitates aligning the IRs.

Added Volume Increment/Decrement CCs for Output 2.

Added "Analog Compressor" to Compressor block. This compressor has a natural soft-knee response and captures the vibe of the classic compressors of the 70's and 80's.

Added Mix control to Multiband Compressor block.

Added Knee Type control to Multiband Compressor block.

Corrected the VU meters in the Output block to compensate for the "unity gain" nature of Outputs 3 and 4. Note that the Output block meters are BEFORE the Level controls (pre-fader) on the front panel and are therefore unaffected by the Level controls. The meters indicate the internal signal level relative to full-scale (dBFS).

Renamed Dumble-style amp models with PAB on accordingly.

Changed Volume Inc/Dec behavior so that muting is not performed.

Various changes and fixes for FC-6/12 foot controllers. Note: this firmware, or a later version, should be installed for proper operation of the foot controllers.

Fixed clicking noise in Pitch block at certain values of shift and tracking.

Fixed Cabinet block LF Damping and HF Damping parameters sometimes not working.

Fixed output gain of Compressor block when using either of the Pedal types dependent upon the Ratio control of the Studio type.

Fixed crash when adjusting Amp block Screen Q rapidly.

2.04

Added "Tube Compressor" type to Compressor block. This type is based on classic tube compressors like the Altec Lansing 436C. Since this type uses "variable mu" processing it may add subtle, and possibly desirable, distortion to the audio.

Added "FF Comb" and "FB Comb" types to Filter block. FF Comb is a feed-forward comb filter and FB Comb is a feedback comb filter. Delay Time controls the order of the comb filters, higher values result in more closely spaced notches and vice-versa. Depth controls the intensity of the filter, higher values result in deeper notches/peaks and vice-versa.

Added Comb Filter Type parameter to Multidelay block. The names of the parameters in the block have been changed from "Resonator" to "Comb Filter".

Added clock sync checking in I/O menu. If the user selects one of the digital input sources (SPDIF or AES) as the clock source and there is no valid input the menu will indicate no clock source.

Changed Cabinet block Room Size display to meters for clarity.

Fixed Cabinet block does not update if a newly captured IR is saved to an IR location in use.

Fixed Cabinet block "AIR" mixing is done before level normalization.

Fixed USB 5/6 Input Level affects SPDIF/AES input level.

Fixed setting size very low on room types in Reverb block can cause crash.

2.03

Changed Looper behavior so that Play indicator only lights during recording when overdubbing.

Added Looper Crossfade parameter. When set to ON the loop fades out/in at the end/start of the loop.

Improved Cabinet block room emulation. New algorithm provides denser and more immersive reflections.

Added Room Shape parameter to Cabinet block which selects between and hall and room shape.

Added "Bias Trem" type to Tremolo block. This uses a tube emulation algorithm to replicate the bias tremolo used in vintage tube amps.

Added "Harmonic Trem" type to Tremolo block. This recreates the famous sound of the tremolo circuit in the old "Brownface" amplifiers. This effect splits the spectrum and applies modulation to the two frequency bands. The Crossover Slope parameter selects the filter order for the crossover. The original circuit used a 6 dB/octave crossover. Higher slopes can give a more intense effect. The crossover frequency can be changed with the Crossover Frequency parameter. Note: unlike most implementations the Axe-Fx III version is full stereo and can be used before or after the Amp block without losing stereo separation. Additionally the effect supports LFO phase for the left/right which can be used to achieve unique sounds. Furthermore the effect supports LFO types other than Sine for even more unique sounds.

Note: both the Bias Trem and Harmonic Trem use nonlinear processing techniques and, as such, may add distortion to the audio signal just as their tube-based counterparts would.

Added "Grinder" boost type based on a Fortin Grind to the Amp block.

Added USB Input Level controls. These are located in Setup->I/O->USB. **Note that these values will default to -40 dB after the firmware upgrade.**

Changed background tasks to run dynamically based on available processing time. This prevents sluggish behavior of Axe-Edit and MIDI controllers immediately after startup.

Fixed IR capture export not working consistently causing issues with Cab-Lab 3.

Fixed incompatibility with Live mode in Cab-Lab 3 when using Axe-Fx III as the audio interface.

Fixed Reverb block NaN if setting size extremely low and turning modulation depth way up.

2.02

Fixed issue in phase inverter modeling causing excessive bias excursion in some amp models.

Fixed Reverb block causing crash if setting size to less than 6.0 for certain types.

Fixed FC GUI corruption when changing presets via foot controller.

Various other fixes and enhancements for FC-X controllers.

2.01

Added "Filter Type" to Compressor Side-chain.

Added "Auto-Swell" type to Volume block. This simulates "pinky swells" using the guitar volume knob. Threshold sets the input power to start the volume swell. When the input power drops below the threshold the swell circuit is reset and the volume drops to zero. Attack sets the rate at which the volume increases.

Increased size of VU meters and added gain readout in Layout GUI.

Added ability to select the source of USB Outputs 7,8 (to computer). Inputs 2-4 can be assigned to USB 7,8.

Improved Amp block phase inverter modeling.

Fixed minor error in Amp block voltage to speaker displacement transfer function causing more parameter shift than expected for a given Speaker Compliance setting.

2.00

Improved Amp block speaker dynamic parameter modeling. The new Speaker Compliance parameter controls the nonlinear behavior of the virtual speaker. Existing presets will load with this parameter at 0.0 and will be unchanged tonally from the previous firmware (IOW your presets will not be altered). Selecting a new amp model or resetting the block will set the value to 50% which is a typical value for guitar speakers.

Improved Amp block cathode follower modeling.

Improved Looper cross-fade at start/end of loop.

Improved stability and latency of Pitch block.

Improved anti-aliasing performance of Pitch block.

Added Temperament parameter to Pitch block. When set to "Just", pitch shifting uses just temperament with ratios defined by the harmonic overtone series. When set to the default value of "Equal", equal temperament tuning is used. Just temperament can be used to give a "sweeter" harmony, especially when followed by distortion.

Added "Virtual Capo" type to Pitch block. This is a simple one-voice pitch shift that is intended for drop-tuning and virtual capo use and is easy to configure and use.

Changed Pitch block behavior so that when selecting Whammy or Virtual Capo types the Mix is automatically set to 100%, otherwise 50%.

Improved algorithms in Multitap block.

Added two options to the Filter Order in the Cabinet block. "L: 6, H: 12" sets the filter slope to 6 dB/octave for the low cut and 12 dB/octave for the high cut. "L: 12, H: 6" sets the filter slope to 12 dB/octave for the low cut and 6 dB/octave for the high cut.

Changed Looper meter, CPU meter and Layout VU meter colors to cyan so that thresholds are visible to those with red-green colorblindness.

Fixed Looper not playing when pressing Once if Trim Start is nonzero.

Fixed MIDI running status ignored if active sense messages received between status messages.

Fixed Master Resonator Time not working in Multitap Delay.

Fixed diffusion not working on delay lines 2-4 in certain types in Multitap Delay.

Various changes and fixes for FC-X controllers.

Minor tweaks and improvements to the GUI.

1.18

Fixed meters on Home->Meters sometimes getting stuck.

Fixed MIDI-Over-USB hanging when receiving certain SysEx messages intended for other products. This occurs with some DAW software (i.e. Logic) at startup causing subsequent SysEx commands to be ignored rendering Axe-Edit non-responsive.

Fixed certain 3rd-party MIDI SysEx messages not processed properly when SysEx messages are also being received via USB (i.e. changing a block bypass state or channel via a MIDI foot controller while also using Axe-Edit).

Fixed adjustments to global Noisegate Offset do not take effect until editing Input block.

Fixed booting to preset with two amp blocks does not correctly initialize.

Fixed block channel change so that muting does not occur if block is bypassed.

Fixed IR Player block allows linking to Global Blocks.

Changed range of Attack and Release parameters in Input block gate to more suitable values.

1.17

Fixed NaN when selecting "USA" amp types.

1.16

Improved Multiband Compressor block so that mid-band gain is automatically compensated for crossover response.

Added Frequency Range parameters to Multiband Compressor block. This selects between Low and High frequency ranges yielding more flexible crossover frequencies.

Added Crossover Slope parameter to Multiband Compressor block. Choices are 12 and 24 dB/octave.

Added FAS Boost to Amp block input boost types.

Added Output Mode to Amp block. The default value, FRFR, is the classic mode and designed for use with monitors or recording. The SS PA + Cab mode is intended for use with a solid-state power amp and conventional guitar cab. In this mode speaker compression modeling behaves differently relying on the speaker for compression while still simulating the interaction with the power amp. NOTE: this mode is not intended for use with current drive power amps, i.e. tube power amps, Class-D current feedback amps (Quilter Tone Block), etc. NOTE: this mode CAN be used with FRFR monitors in high volume applications where the monitor's speakers are compressing thereby achieving a more dynamic response.

Added 10-band, 2/3 octave types to Graphic EQ block. These types center the filter frequencies on a narrower range best suited to finely sculpting guitar tones.

Added 10-band, 2/3 octave graphic equalizer to Drive block. The EQ can be enabled/disabled via the Graphic EQ parameter which is also modifiable.

Added 8-band, 2/3 octave graphic equalizer to Wah block. The EQ can be enabled/disabled via the EQ parameter which is also modifiable.

Fixed moving cabs with Axe-Edit causes corrupted empty slots.

Fixed Looper status not reported correctly via MIDI.

Fixed Looper doesn't always start if threshold is off.

Fixed metronome turning on when executing Reset System Parameters.

Various fixes and changes for FC series foot controllers.

1.15

Added (2) IR Player blocks. These are simple versions of the Cabinet block that can be used to process IRs for various purposes such as applying Tone Matches separate from the Tone Match block.   For example, an IR Player block can be used to apply a Tone Match of a guitar at the beginning of a chain leaving the Tone Match block available for amp matching.

Added Output 1 Volume Increment and Output 1 Volume Decrement CC assignments. When the CC assigned to Volume Increment/Decrement is received the scene volume for Output 1 is incremented or decremented by 1 dB and the preset automatically saved.

Added Metronome function. To enable the metronome press the Tempo button and adjust the level for the desired output(s). Note: the metronome levels persist across presets and are reset to OFF at power on.

Improved Looper block:
1. Added Record Threshold parameter. When set to a value greater than -80 dB recording will not start until the input signal exceeds the set value. The Record icon will blink when the Looper is armed for recording and will turn solid when recording starts. The meter at the bottom of the page can be used to help set the Threshold. Use the soft knob or main Value knob to adjust the threshold value (or use the Record Threshold parameter on the Config page).
2. Added Trim Start and Trim End parameters to the Looper block. These parameters can be used to adjust the start and end points of the loop. The graph on the Control page provides visualization of the loop and the start/end points.
3. Added Quantize parameter. When set to ON the loop length is quantized to the nearest beat.
4. Added Record 2nd Press parameter. Choices are Overdub – existing behavior, second press of Record ends loop and enters overdub; Play – second press of Record ends loop and enters play; Stop – second press of Record ends loop.
5. Added Speed parameter. When Speed is set to HALF the virtual tape runs at half the normal speed. The speed can be also be toggled via a MIDI CC message.
6. Improved cross-fading at the start and end of the loop.

Added Mode parameter to Tone Match block. When set to OFF-LINE the processing is adjusted to better suit matching recorded sources such as guitar stems. When set to LIVE the processing is as before and better suited to matching a real-time source such as the output of a guitar amp.

Added Damping Time to Sequencer. This controls the time it takes to slew from the one value to the next.

Improved CPU usage for Synthesizer block when oscillator type is white or pink noise.

Improved Tuner.

Various GUI tweaks and improvements.

Changes/improvements to 3rd-Party MIDI device support (see AXE-FX III MIDI FOR THIRD-PARTY DEVICES document for details).

Fixed ADSR graphs not initializing properly on preset recall.

Fixed some parameter displays dependent on Tempo, i.e. Delay Time, not updating when new Tempo is entered.

Fixed Mixer and Multiplexer blocks shouldn't be bypassable.

Fixed Tremolo block bug when LFO Type set to SAW DOWN.

1.14

Added MIDI CC for Looper Stop. This allows stopping recording or playback of the Looper via MIDI automation.

Added Friedman HBE 2018 C45 amp model.

Added gain monitoring for Input Dynamics control in Amp block.

Fixed MIDI status dump not working correctly.

Fixed divide-by-zero fault if turning Master Volume to zero on JS410 amp models.

1.13

Added "Dual Chorus" type to Chorus block. This type has independent LFOs for the left and right delay lines. Delay lines are BBD emulations.

Added "SSB Upper" and "SSB Lower" types to Ring Modulator block. These select the upper and lower sidebands of the modulation, respectively.

Added single-sideband ring modulators to Multidelay block. These can be used to create strange and interesting echo sounds. To defeat the modulators turn Master Ring Mod Mix to 0.

Added chorusing to individual delay lines in Multidelay block. There are four LFOs, one for each delay line. The rate and depth of each LFO is individually adjustable. These add to the main LFOs which modulate each delay line at the same frequency but different phases. By using short delay times the Multidelay block can now act as four parallel choruses, each with independent rate and depth.

Added Quad-Tap Band Delay type to Multidelay block. This type has the same configuration as the Quad-Tap delay except the filters are outside the feedback paths.

Added band highlighting to RTA block. Turn Value knob to select desired band. The frequency of the selected band is displayed in the upper left corner.

Increased number of channels in Multiplexer block to six, one for each row.

Changed preset recall behavior if Ignore Redundant PC is on. If Ignore Redundant PC is on and the desired scene (set via PC mapping) is different than the current scene the preset is not loaded but the scene IS changed.

Added MIDI support for 3rd-party devices to set/get scene, channel, bypass, scene names and preset names, control the Looper, tap tempo, etc. via System Exclusive messages. See the Axe-Fx III MIDI for Third-Party Devices document for implementation details.

Added Preset Increment/Decrement controllers. These can be used to increment/decrement the current preset. The Preset Start and Preset End parameters control the range of presets selected and selection wraps at the limits. Preset mapping and offsets are ignored.

Improved Tempo accuracy for MIDI clock.

Fixed Barberpole type in Phaser block broken.

Fixed no preset loading on startup if Ignore Redundant PC is on.

Fixed Scratchpad Cab #1 not loading automatically when doing an IR capture.

Various changes and fixes for FC controllers.

1.12

Added Global Block support for Input 1 block.

Added Scene Volumes to Output block.

Improved Multidelay block. The Band Delay type has been replaced by a more flexible Quad Parallel Delay. The Quad Parallel Delay and the Quad Series Delay now feature four delay lines in a parallel or

series configuration, respectively, as before, with the output of each delay line feeding a series combination of a bandpass filter and a resonator. Added drive, low-cut and hi-cut filters allow further tone sculpting. To defeat the bandpass filters set Master Q to minimum. To defeat the resonators set Master Resonator Feedback to 0.

Improved Spring Reverb algorithm. New algorithm features improved dispersion modeling and adjustable low and high frequency decay time ratios.

Improved knob response for fine adjustments.

Fixed Reverb GUI so that only valid parameters show on All page for selected type.

Fixed system backup hanging if on preset containing certain types of foot controller data.

Fixed engaging Tuner causes reset of External Controller values.

Fixed Ignore Redundant PC not working.

Fixed Tremolo block not updating rate when entering tempo.

1.11

Fixed Multiband Compressor and Output GUI.

Fixed Looper block Dry Level not working.

1.10

Improved Scene/Channel switching.

Added "Stereoizer" type to Enhancer block. While the Classic and Modern types rely on micro-delays and inversions to create artificial stereo, the new Stereoizer uses multiple high-order filters to create a realistic stereo image.

Fixed Phaser block level dropping 3 dB when effect is engaged.

1.09

Added "Effect Bypass Mode" to MIDI menu. When set to "Value" the bypass state of an effect assigned to a CC is controlled by the CC value. When set to "Toggle" the bypass state toggles whenever the CC message is received, regardless of the value.

Added "Default Scene" parameter to Global menu. When set to "As Saved" the scene selected when recalling a preset is the scene that was active when the preset was saved. When set to a particular scene value that scene will always be selected when a preset is recalled.

Added Channel parameter to modifiers. This allows applying the modifier to all channels or only a selected channel of an effect block.

Added Tilt EQ to Amp block Input EQ types.

Added Boost Type and Boost Level to Amp block. There are seven boost types: Neutral, T808, T808 Mod, Super OD, Full OD, AC Boost and Shimmer. All boosts act as "clean boosts" replicating the oft-used "Drive on 0, adjust Level as desired" boost technique. The boost allows boosting the amp block without requiring a separate Drive block. The Boost Level parameter controls the amount of boost.

Added Modifier ability to Formant block Resonance parameter.

Added "Prompt on Edited Preset Change" parameter to Global Settings. When set to ON the unit will prompt before changing presets if the current preset has been edited (and prevent you from losing your edits). NOTE: Be sure to change this value to OFF before performing!

Added Global Blocks. There are 8 Global Blocks per effect instance. Not all effects support Global Blocks (i.e. Mixer, RTA, etc.). There are four operations associated with a Global Block:
1. Link To Global Block: This operation links the selected effect with a Global Block. The Global Block data is NOT loaded. Upon saving the preset the Global Block is saved. Any other presets linked to this Global Block will load the Global Block data upon recall.
2. Load From Global Block: This operation loads data from a selected Global Block but does NOT link the block.
3. Link To and Load From Global Block: This operation links an effect to a Global Block AND loads data from the Global Block. Upon saving the preset the Global Block is saved. Any other presets linked to this Global Block will load the Global Block data upon recall.
4. Unlink From Global Block. This operation disassociates the effect from any Global Blocks.

Global Block operations are accessible from the Tools page in the Layout menu.

Improved scene switching algorithm resulting in much faster, smoother scene changes.

Improved Reverb algorithms.

Changed Looper behavior:
1. Pressing Undo while recording undoes the last recorded layer, as before. Pressing Undo when the loop is stopped now erases the loop data. Pressing Undo during playback undoes the last recorded layer. Pressing Undo again (during playback) restores the undone layer. Subsequent presses toggle the layer on and off.
2. Pressing Record now always starts a new layer (previously pressing Record during the first layer stopped recording and entered playback).
3. Pressing Once while recording stops the loop.

Added Dry Level parameter to Looper Block.

Improved Input block noise gate. When the Type is set to Intelligent (default) the noise gate now provides smart EMI filtering which reduces hum and buzz. NOTE: For best results the AC Line Frequency parameter in the Global Settings menu should be set to match the power line frequency of your country (i.e. 60 Hz for North America, 50 Hz for EU, etc.).

Improved Amp block output transformer modeling.

Various changes to support Axe-Edit.

Various changes to support FC-6/12 controllers.

Changed default value for Setup -> MIDI -> Program Change to ON.

Fixed Scene MIDI block not sending correct data on preset change.

Fixed cabinet names not showing up in cab picker until background tasks are finished.

Fixed wrong Preamp Bias value in Plexi 2204 model.

Fixed Pitch block LFO Tempo not being updated on tempo changes.

Fixed RTA block not updating on preset change.

Fixed noise in Looper block when pressing Undo.

Fixed Modifier Auto-Engage working erratically if Update Rate set to Slow or Medium.

Fixed MIDI PC Offset not being applied.

Fixed crash if flooding unit with MIDI data during boot.

Fixed hang if MIDI Send PC is set to OMNI.

1.08

Various changes to support Axe-Edit.

Fixed Channels not copying correctly when using Scene copy utility function.

Fixed Global data not being saved after import (restore).

Fixed Reverb hold not working for Spring types.

1.07

Fixed Pitch block not setting number of voices correctly, i.e. Whammy modes should have one voice but two voices were audible.

Fixed Input 1 Level Meters not scaled properly when input source is USB.

Fixed minor bug in Rotary GUI.

Fixed wrong default Output Level value in Return block.

Fixed garbage data in SPDIF output buffer if no Output 1 block in layout.

Added "Update Rate" parameter to Modifiers. Values are Slow | Medium | Fast. The Update Rate selects the rate at which the modifier updates the target parameter. For most applications a slow rate is sufficient. Under some circumstances a slow rate may cause "zipper noise".   Increasing the rate will reduce the noise at the expense of increased CPU usage.

1.06

Added "Solo" ability to Cab block.

Added "Plexi 2204" Amp model based on a 1981 JMP 50W Master Volume head.

Added modifier capability to Resonator block Chord and Frequency parameters.

Fixed Output block buffer stuck when bypassed causing high pitched tone.

Fixed Pitch block not initializing correctly on patch change.

Fixed Pitch block sometimes getting "stuck" on negative harmony shifts.

Fixed distortion on Crystal Echoes pitch type if Direction is set to Reverse and Shift is set to +4.

Fixed MIDI message(s) immediately following a PC message being ignored, i.e. Scene Select CC.

Fixed some minor GUI bugs.

1.05

Added ability to route block when Layout is zoomed out.

Added Input Source select to ADSR and Envelope in Control block.

Fixed MIDI bank select.

Fixed Scene Copy function not copying Amp block bypass states.

Fixed can't select Amp type when creating a new preset if the previous preset had the Amp block channel as anything other than 'A'.

Fixed External Controller initial values not being applied and garbage values in any of these controllers that are not assigned.

1.04

Fixed low-cut and high-cut filters not working in Multitap Delay block.

Fixed Amp blocks bypass states not being preserved across preset changes.

Fixed Tone Match block Smoothing parameter not working.

Fixed Quad Tape Delay missing modifier for Motor Speed (formerly labeled Tape Speed).

Fixed MIDI CC Channel changes not responding above values of 3.

Various GUI enhancements and improvements.

1.03

First public firmware release.