# FX"'2 Mixer Series 

## FX"'2 24 Channel $\bullet$ Four-Bus Mixing Consoles



## FX ${ }^{\text {TM }} 224$ Channel

4-Bus Console Mixers
Congratulations on purchasing the Peavey $\mathrm{FX}^{\mathrm{Tm}} 2$ 24, four-bus console mixer. These studio-quality mixing consoles are designed to meet diverse needs and feature Peavey-exclusive technology that enhances live studio reproduction as well as project studio recording. FX ${ }^{\text {TM }}$ Series mixers also feature built-in DSP effects that are useful in real-world recording and sound reinforcement, while parameter controls allow you to tailor each effect to meet your needs.

Please read this guide carefully to ensure your personal safety as well as the safety of your equipment.

## FEATURES:

- Silencer ${ }^{\text {TM }}$ mic preamps with current-source dual feedback design
- 20 XLR mic inputs on FX2 24
- Two stereo channels with direct-to-L/R assignment capability
- Three-band channel EQ on all input channels
- Sweepable mid-frequency control on all mono input channels
- Variable low-cut filter on all mono input channels, off to 300 Hz
- Inserts on all mono channels
- Four-bus design with direct group outputs and L/R assignment
- Four monitor sends per channel, pre-fader
- Two effects sends per channel, post-fader
- Pan and PFL on each channel
- Multi-point clip detection
- Signal presence LEDs on every input, group and return
- Mute switches with LED indicator on every input, group and return channel
- 48-volt phantom power switch
- Dual DSP engines for output processing, dual effects and digital I/O
- Output processing includes EQ, Delay and Compressor/Limiter
- Large LCD graphics user interface
- Dual USB ports
- Direct streaming of audio to and from your computer
- Built-in MP3 compression, direct recording and playback via USB removable data storage device
- Media inputs with level control assignable to L/R mix
- Headphone output with level control
- 12V BNC lamp jacks
- 100mm faders
- Feedback Ferret - Automated Feedback Elimination


## MONO INPUT CHANNELS

Gain
This control establishes the nominal operating level for the channel. The input gain can be adjusted over a wide range ( $0 \mathrm{~dB}-60 \mathrm{~dB}$ ) to compensate for soft voices or very loud drums. To maximize the signal-to-noise ratio, the gain should be set to the proper level, with the Channel Fader (13) set to o. It can be set by pressing the PFL Switch (12) and adjusting for odB on the output meter. If the clip LED comes on and remains lit, reduce the gain.
(2) Lo Cut

The low-cut filter is variable from off to 300 Hz . When engaged, it can improve clarity by removing low frequencies that make a mix sound muddy. This filter reduces handling and stage noise, breathing noise, and unwanted low frequency energy that can rob your sound system of power. Turning this control up will remove those frequencies from the system and restore power where needed.

## Hi EQ

This shelving type tone control adjusts treble frequency levels ( $\pm 15 \mathrm{~dB}$ at 10 KHz ), resulting in less noise or more brilliance.

## Mid EQ

This active tone control is a bandpass (peak/notch) type that varies mid-frequency response by $\pm 15 \mathrm{~dB}$ in a range from 100 Hz to 5 kHz . The center frequency is controlled by the Mid Freq (5) control.
(5) Mid Freq

This control determines the center frequency of the Mid EQ (4) control. Center frequency for the bandpass filter can be set from 100 Hz to 5 kHz .
6) Low EQ

This shelving-type tone control adjusts bass frequency levels ( $\pm 15 \mathrm{~dB}$ at 70 Hz ), adding depth to thin signals or clarity to overly thick signals.

Caution: Excessive low frequency boost causes increased power consumption and increases the possibility of speaker damage.

## AUX 1-4 Sends

These controls send the channel's pre-fader, post-EQ signal to each of four aux buses. These buses are normally used for monitor sends or for feeding a separate mix to external equipment. There are internal jumpers that can be switched to change the send point to pre-EQ. Unity gain is at the center detent position with up to 6 dB of gain in the fully clockwise position.

AUX 5-6/EFX 1-2 Sends
These controls send the channel's post-fader signal to each of two aux (effects) buses. These buses are normally used for effects sends or for feeding the internal effects processors. Unity gain is at the center detent position with up to 6 dB of gain in the fully clockwise position.


## Pan

This control determines the signal's position with respect to the assigned L/R and Group 1-4 buses. Rotating the control counterclockwise increases the amount of signal sent to $L$ and odd-numbered groups; rotating clockwise increases the amount sent to $R$ and even-numbered groups. For example, with the channel Bus Assign switch (10) in the $1 / 2$ position, rotating the control counterclockwise increases the amount of signal sent to Group 1, while rotating clockwise increases the amount sent to Group 2. The C position sends equal amounts to each.

1/2, 3/4, L/R Bus Assign Switches
These post-fader switches determine where the channel signal is being sent. For example, to send a signal to Groups $1 \& 2$, depress the $1 / 2$ button. The PAN control (9) determines the signal level that is sent to each signal bus.

## Mute Switch/Mute-Clip LED

This switch mutes all Aux, Group and L/R sends from the corresponding channel. This switch is equipped with a red LED that will illuminate when the channel is muted. When the MUTE button is out, the LED functions as a Clip indicator that will illuminate at 2 dB below clipping. Muting the channel does not prevent the PFL signal from being sent to the PFL/AFL mix when the PFL Switch (12) is in.

## PFL Switch/Signal-PFL LED

This switch connects the channel's pre-fader signal to the PFL/AFL mix. When the PFL button is in, the channel's signal can be monitored through the headphones and/or on the PFL/AFL display. A yellow LED in the Master section will blink to indicate that the signal on the Master LED display and at the headphone output is PFL. Selecting PFL allows the operator to monitor a channel even with the channel muted, and is especially useful for cuing CDs/tapes. When the PFL button is out, the yellow channel LED will function as a signal presence indicator ( -20 dBu ).

## Channel Fader

This control varies the signal level from $-\infty$ to +10 dB and sends the signal from the channel to the L/R and Group buses and to the Effects Sends. The optimum setting is the ø (unity gain) position.


## STEREO INPUT CHANNELS

## Mic Gain

This control establishes the nominal operating level for the mic input (XLR) of the channel. The mic gain can be adjusted over a wide range (o $d B-60 d B$ ) to compensate for soft voices or very loud drums. To maximize the signal-to-noise ratio, the gain should be set to the proper level, with the Channel Fader (13) set to $\emptyset$. The mic gain can be set by pressing the PFL button (12) and adjusting for $\varnothing \mathrm{dB}$ on the output meter. If the clip LED comes on and remains lit, reduce the gain.

## 15 Stereo Gain

This control establishes the nominal operating level for the stereo line inputs ( $1 / 4^{"}$ jacks) of the channel. The Stereo Gain can be adjusted over a sufficient range $(-\infty$ to $+20 \mathrm{~dB})$ to accommodate almost any input level. It operates in conjunction with the L/R-CH Switch (16) to route the stereo signal directly to the $L / R$ buses or through the channel strip.

## L/R-CH Switch

This switch establishes the routing of the stereo line input ( $1 / 4^{\prime \prime}$ jacks) signal. When the switch is out, the stereo line input signal is routed
 directly to the L/R buses, bypassing the channel strip. In this mode, the mic input (XLR) signal is routed through the channel. When the switch is in, the stereo line input signal is routed through the channel and the mic input signal is disconnected. The signal level is controlled via the Stereo Gain control (15).

## Input Select Stereo-USB Switch

This switch selects the input signal that will feed the stereo line input of the second stereo channel. When the switch is out, the signal from the stereo line inputs is routed to the Stereo Gain control (15). When the switch is in, the signal from the device connected to either USB port (60-61) is routed to the Stereo Gain control (15).
(18) Mid EQ

In the Stereo Input channels, this active tone control is a bandpass (peak/notch) type that varies mid-frequency response by $\pm 15 \mathrm{~dB}$ at a center frequency of 850 Hz .

## MASTER SECTION

## Auxiliary Masters 1-4

This control sets the output level of the AUX 1-4 mixes and is adjustable from $-\infty$ to +6 dB .

## Auxiliary Masters 5-6

This control sets the output level of the various AUX 5-6 mixes and is adjustable from $-\infty$ to +6 dB . These signals are also sent to the EFX1 and EFX2 internal effects processors, respectively.

## AFL Switch/AFL-Clip LED

This switch directs the post-fader (AFL) signal to the Headphone output (37) and activates the PFL/ AFL LED display. An adjacent red LED illuminates to signify this selection. If AFL is not selected, the LED functions as a Clip indicator. Selecting AFL allows monitoring of AUX Masters with the full PFL/AFL Level Display as well as allowing the operator to hear the output.
(22) Phantom Power Switch

This switch applies +48 VDC voltage to the input XLR connectors to power condenser microphones requiring phantom power. This switch is recessed into the console and requires a small "tool" such as a pencil or pen tip to activate. A regular low impedance dynamic mic such as the $\mathrm{PVM}^{\text {m }} 22$ will not be harmed. The Line inputs (49\&50) are not connected to the +48 V supply and are safe for balanced or unbalanced inputs. An adjacent LED illuminates when Phantom Power is activated.

## Caution:

If phantom power is used, do not connect unbalanced dynamic microphones or other devices to the XLR inputs. (Some wireless receivers may be damaged. Consult their manuals.)

## Note:

Make sure the Master Level Faders (40) are completely down when switching on the phantom power and when connecting microphones to the Mic inputs to prevent pops from affecting the loudspeakers.

23 Left, Right, Bus Assign Switches These post-fader switches determine where the Group mix signal is being sent. For example, if each individual drum mic is assigned to Group 1, depressing the Left button will send the drum mix to the Left bus and to the Left Out (54) on the rear panel.
(24) Mute Switch/Mute-Clip LED This switch mutes its respective Group send from the Group channel. This switch is equipped with a red LED that will illuminate when the Group is muted. When the Mute button is out, the LED functions as a Clip indicator that will illuminate at 2 dB below clipping.

(25) AFL Switch/Signal-AFL LED

This switch connects the Group's post-fader signal to the PFL/AFL mix. When the AFL button is in, the Group's signal can be monitored through the headphones and/or on the PFL/AFL display. A yellow LED in the Master section will blink to indicate that the signal on the Master LED display and the Headphone Output is the PFL/AFL mix. When the AFL button is out, the yellow group LED will blink as an indication of signal presence ( -20 dBu ).
26) Group Fader

This control varies the signal level from $-\infty$ to +10 dB and sends the signal from the Group to the Left and/or Right buses and to the Group Output jacks (53). The optimum setting is the ø (unity gain) position.
27) TO AUX 1 \& TO AUX 2 Controls

These controls determine the level of the respective Effects Return signal that is sent to the respective AUX bus, allowing musicians/singers to hear internal and/or external effects in their monitors.
NOTE: Due to the creation of an electronic feedback loop, do not use AUX Sends 1 or 2 as the path to external equipment that is to be sent back to the corresponding AUX mix (1 or 2).
(28)BAL

This control determines the placement of the Effects Return signal's position with respect to the assigned $\mathrm{L} / \mathrm{R}$ and Group 1-4 buses. Rotating the control counterclockwise ( L ) sends more signal to the LEFT output and odd-numbered GROUPS; rotating clockwise ( $R$ ) sends more signal to the RIGHT output and even-numbered GROUPS. The C position sends equal amounts to each.
29) EFX LEVEL Control

This control determines the level of the Effects Return signal being sent to its assigned buses. It functions similarly to the Channel Faders (13).
(30) 1/2, 3/4, L/R Bus Assign Switches

Like the channel assign switches, these buttons determine the bus assignment of the Effects Return signal. They determine where the signal is being sent.
(31) Mute Switch/Mute-Clip LED

This switch mutes its respective Effects Return from being sent to the buses. This switch is equipped with a red LED that will illuminate when the Effects Return is muted. When the Mute button is out, the LED functions as a Clip indicator that will illuminate at 2 dB below clipping.
(32) AFL Switch/Signal-AFL LED

This switch connects the Effects Return post-fader signal to the PFL/AFL mix. When the AFL button is in, the Effects Return signal can be monitored through the headphones and/or on the PFL/AFL display. A yellow LED in the Master section will blink to indicate that the signal on the Master LED display and the Headphone Output is the PFL/AFL mix. When the AFL button is out, the yellow Effects Return LED will blink as an indication of signal presence ( -20 dBu ).

## Effects 2 Patch Switch

This switch determines whether the Effects 2 processor will be used in the Return 2 or will be patched to an Input Channel or Group insert point. This switch can also be used to perform the bypass function. When the effects processor is assigned to the EFX 2 Return, the I/O jack (56) is bypassed. Similarly, when the effects processor is being patched externally, only the external Stereo Return jacks (57) are used to return a signal.
(34) Media In Level Control

Controls the level of the Media Input signal from the RCA jacks (58) to the Left and Right buses when the L/R switch (35) is in.

## Media In L/R Switch

Routes the Media Input signal to the Left and Right buses.
Record Out Control
Controls the Record Output level of the pre-fader Left and Right main output signal to the RCA jacks (59).
Regardless of the position of the L/R-Media Switch (39), when any PFL/AFL switch on the mixer is activated, this display indicates the signal level being sent to the PFL/AFL bus. The PFL/AFL indicator flashes if either mode (PFL or AFL) is selected.

## Headphone Output Jack

The Headphone Output is a $1 / 4$ " TRS (Tip= Left; Ring = Right; Sleeve $=$ Ground) jack. The signal sent to this output is normally the Left/Right mix. When the L/R-Media Switch (39) is engaged, the Media Input signal is selected and is monitored through headphones. An activated PFL or AFL button (indicated by a yellow flashing LED) switches the headphone output jack monitor to the selected signal.
(38) Headphone Level

This control sets the Headphone Output level. To avoid damage to your hearing, make sure to turn the control fully counterclockwise before using headphones. Slowly turn the knob clockwise until you reach a comfortable listening level. Normally, the signal in the headphones is the Left/Right signal. If the L/R-Media Switch (39) is engaged, the Media Input signal is selected and monitored through headphones. An activated PFL or AFL button (indicated by a yellow flashing LED) switches the headphone level monitoring to the selected signal.

## L/R-Media Switch

This switch selects the signal that is monitored by the headphones. When out, the Main Left/Right postfader signal is monitored. When in, the Media Input post-fader signal is monitored.
(40) Master Level Faders

The Master Faders control the levels sent to the Main Left/Right outputs (54). Best results are obtained when these controls are set near the o point.

41 Left/Right - PFL/AFL Level Displays
These indicators graphically display the level of the signal selected by the L/R-Media Switch (39). When the switch is in, these indicators show the amount of the post-fader level of the Media Input. When the switch is out, these indicators show the level of the Main Left and Right outputs. Signal is sampled at the summing amp and post-master faders to monitor clipping throughout the Left/Right section. The Clip LED indicator will illuminate when any level in the signal chain approaches ( -2 dB ) clipping.
NOTE: Clip LED can illuminate before the rest of the array indicating that the summing amp has reached clipping.
42 Power LED
This LED indicates that AC power is supplied to the unit, the power switch is on, and the unit is functioning properly.

43 Lamp 12 Vdc
These outputs are designed to power gooseneck lamps such as the Peavey ML-1.

## DIGITAL PROCESSOR

Page Select Switches (A-B-C)
Use these three switches to select the desired digital processor page that is shown in the LCD Graphics User interface (47) and controlled by the encoders (45) and the soft switches (46).

## (45) Software Encoders

These encoders allow you to edit the selected parameters as indicated on the LCD (47).
(46) Software Switches

These switches select the functions that are indicated on the LCD (47).
(47) LCD

The Liquid Crystal Display reveals all of the menus available for editing.

## DIGITAL PROCESSING ARENA

This is a brief overview of the digital processing capabilities of your new $\mathrm{FX}^{\mathrm{TM}} 2$ mixer. While you can expect incredible results following this guide, mastering the art of digital processing will be achieved through experimentation. Keep in mind that until you confirm your changes by pressing "save," no alterations have been made to the presets. Peavey engineers programmed your mixer with a variety of the most commonly used presets, which are ready to use right out of the box. However, your FX 2 mixer will only reach its full digital processing potential through your acquired expertise. Review the process below and begin exploring the digital mixing world beyond factory presets.

Effects: The Effects section of the FX mixer provides two discrete effects processors, each capable of chaining two (2) different effects at the same time. EFX1 (left side of screen) is permanently routed to the Aux5/EFX 1 send and return bus. EFX 2 (right side of screen) is routed to the Aux6/EFX2 bus, but can be routed from the EFX2 Patch Jack on the rear panel and routed to the insert of a single channel or inserted into a group/bus. Effects that modify amplitude such as compressors, limiters, gates, expanders and deessers, when used individually, work best when inserted into channels or busses.

While they may be edited, the edited versions may not be saved in positions 0-49. Presets 50-99 are user presets, custom and/or edited presets can be named and saved in these slots. Edited but unsaved EFX have an " "*" next to the preset number.

Selecting an Effects preset: Press the "Effects" button to activate the Effects window. Turn the encoder knobs until the desired preset number is in the window and press the encoder knob to "select" it. The "Select" button will turn into a "Recall" button. Pressing it will recall the last used preset. You may press the "Edit" button to adjust any parameters of the selected preset. You must "Save" a preset to save the adjusted parameters.

Creating a preset: Press the "Effects" button and turn either data knob to select any preset between 5099. Press "select" (flashing) and then "edit \#".

Press the "Type" button and the screen will display the DSP Library of available effects. You may scroll through the entire list by turning the left data knob.

Rotate the data knob to highlight the effect you wish and press "select" to add it.

Select a "style" from the available models. Press select to choose it and then "back" to return to the main page ... or ... cursor to another effect block and repeat the process.

Press "edit" to adjust the parameters of the effect types.

| CATHEDRAL | SMALL ROIM |  |  |
| :--- | :---: | :---: | :---: |
| TUBE HARD | DW EXPDR 4:1 |  |  |
| USER 34 | FACTDRY 111 |  |  |
| RECALL | EDIT 34 | EDIT 11 | RECALL |

Scroll through the parameters with the left knob and adjust the values with the right knob．Rotate the left encoder knob to view the entire list of parameters available as there may be more than those shown on the screen．Press＂back＂when completed．

Press＂save＂to save the preset．Press＂back＂to return to the main menu．
If you make a mistake editing a parameter for an effect，you do not have to start over．The＂undo＂button will revert the last change to its original setting，much like the undo command in a word processor．To make further refinements to any user－defined preset，you have two choices：press the＂back＂button and start completely over，or simply use the soft knobs（45－46）to return to the individual effect within a preset．Remember，factory presets cannot be altered by the user．If you choose to adjust or build on a factory preset（which we encourage you to do），your saved settings will be automatically directed to the next，unused，customized preset．

WARNING：When user－defined，customizable presets are saved，they will automatically replace the current settings for that preset UNLESS you assign a new preset number．If you overwrite the originally saved preset settings，the old settings are no longer retrievable．

User Tip：You can select up to two（2）of the internal effects and arrange them in series in any order using one instance of any effect in the chain．Since they are in series，the order will affect the sound quality． Adjustments to the Wet／Dry proportions can also make a big difference to the sound of the effect．

IMPORTANT：When a signal passes through a digital effects processor，a short delay results．When this same signal returns to the mixer and combines with
 the main output，the small delay difference results in a comb filter．（Short changing delays are the basis of wah－wah effects．）To prevent the comb－filter effect， increase the delay time simply by including an effect block such as reverb or delay．

Note that many effects like compressor，limiter，gate，chorus，etc．，do not work well when used alone on an effects send．Fortunately，the EFX 2 Patch Jack（56）can be patched directly into an Insert（48）on any channel or subgroup（Group Inserts（54））．Simply connect the EFX 2 Patch jack（56）to the desired insert jack with a stereo cable．Then，press the EFX 2 Patch Switch（33）to activate the patch．In this configura－ tion，comb filtering is eliminated because the only signal path is through the processor．

QUICK TIP：From anywhere within the digital arena，you can return to the main effects screen simply by pressing the Effects Button．

## OUTPUT PROCESSING：

The Peavey FX series mixers are equipped with Digital output processing on the Left and Right mains outputs．The processing may not be switched to the aux busses．

Modes：The FX mixers can operate in any of three（3） output modes．

Stereo：This is the normal output mode．In this mode， the output processors are tied together so that what you edit is applied equally to both channels at the same time．

Dual Mono：This mode sums the left and right busses together after the Feedback Ferret into a single mono output．The L \＆R outputs get the same mono signal but are capable of processing each output separately

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so that an adjustment made to the L output will not make that same adjustment to the R output. This would be handy should the L \& R outputs of your system be set up in an asymmetrical fashion (e.g., one speaker stack is set up near a corner and the other centered along a wall). This would probably require different EQ for each speaker to be balanced. It is also appropriate where one output drives a main speaker cluster and the other output drives a remote speaker (or a different speaker configuration).

Subwoofer: This again combines the L \& R busses and installs an electronic crossover in the output section. This crossover may be adjusted so that one output (Left main) drives the low or sub output and the other (Right main) drives the main or HF output. The Delays and the Limiters may be adjusted independently for the two different outputs. The crossover employs a 4 th order set of filters ( $24 \mathrm{~dB} / \mathrm{oct}$ ) and Butterworth or Linkwitz-Riley filters may be selected. CD horn compensation is available for Constant Directivity horns.

## PROCESSOR MODULES

## Feedback Ferret:

Press the "Output Processing" button.
Turn the left knob to highlight the first block (the Feedback Ferret block), and select it by pressing the knob.
Press "Type" and use the left knob to select "Feedback Ferret." Press it again to choose between "Dynamic" and "Static" mode.

Dynamic Mode: Dynamic mode, when on, will detect feedback and eliminate it automatically. Once a feedback elimination filter has been activated, it will be released after a certain amount of time to allow other feedback frequencies to be detected. If the feedback is severe enough, the feedback elimination filter for that frequency will lock in place, not allowing it to be released. The only way to release a locked filter is to select "Clear" on the "Edit" page, which will clear all of the current filters, locked or not.

Static Mode: Unlike Dynamic mode, Static mode involves a setup process and is the recommended mode for more robust feedback elimination. Once Static mode has been selected, select "Detect" to begin detecting feedback. In order for feedback to be eliminated, feedback must be present, so it is recommended to increase the gain of the mixer in order to achieve feedback. Once feedback is sufficiently present, a filter should be activated to eliminate the feedback and the number of available filters should decrement accordingly. Once you are satisfied with the feedback elimination filters, select "Back" to lock these filters in place. Once this is accomplished, feedback will no longer be detected and the filters in place will not release until "Detect" is selected again. A group of filters can be saved in the library by name and recalled when you play the venue again, although it would be best to repeat the setup process again as things will always change a little.

PEQ: Highlight the second box from the left and select "type." You can press the "Lib" button to select a saved setting, or you can edit the existing setting by navigating around the screen.

The left encoder knob selects the band (1-5) to edit. Once you have selected that band, pressing the left knob will allow you to adjust the center frequency of the filter selected. The right encoder knob toggles between "bandwidth" and "gain." Bandwidths between 0.3 octave and 2.0 octaves may be selected as well as gain levels from -12 dB to +12 dB . When you have made your adjustments, you may save them to the Library by pressing the "Lib" button and selecting "Save current settings." You can title your settings by selecting the name button and assigning a name or you can save it over an existing setting. Select a name or a "free" setting and press "save."

GEQ: Highlight the second box from the left and select "type." Scroll to "Graphic EQ" and select by pressing the left encoder knob.

The left encoder knob controls the selection of the frequency to be modified and the right encoder knob selects the gain, $+/-12 \mathrm{~dB}$. The left encoder knob can also select the left most slider for gain adjustment of the GEQ as a whole. Selecting the "Lib" button will allow you to save or recall your settings.

Delay: Highlight the third box from the left to select the "Delay" and press the "edit" knob down to adjust the amount of delay desired. You can select the "Lib" button to save the current adjustments to the library or to load from the library. The delay is most often used when remote speakers are set up away from the regular Main speakers. The number of ms of delay needed is close to the distance in feet plus 20 ms (so that a remote speaker located away from the Mains by 100 feet will need a delay of approximately 120 ms ). This should normally be done in the "Dual Mono" output mode.

This delay is very useful in the "Stereo" mode for adding delay to compensate for the distance between the backline amplifiers and the front Main speakers. It is probably best to set this in relationship to the loudest (peak) sound coming from the backline (usually the snare drum). If the snare drum is 12 feet from the front of the stage, start with about 12 ms of delay plus $10-30 \mathrm{~ms}$ for the Haas effect (so between 22 and 42 ms or to taste). By adjusting the backline to the FOH Main speakers, a sort of focus will take place. The audience will hear the sound as though it is coming from the band itself and not so much coming from the PA ... a good thing to do!

Limiter: Selecting this function sets a limiter on the L/R outputs of your FX mixer. This helps to prevent the mixer from clipping as well as overdriving the rest of the output chain. Press "edit" to adjust the parameters of the output limiter. The threshold should probably be adjusted to max ( +10 dB ) and the mode adjusted to "soft knee" in most cases. 50 ms of Attack and 500 ms of Release time are good starting points but may be adjusted as necessary. If you are "hearing" this limiter actually work, then you are probably driving too hard and should back off. This limiter is not intended to be a "sonic shaper" (use the "compressor" function in the "Effects" processors). You may "save" or "load" from the library as necessary.

## Digital I/O:

The digital I/O section of the FX mixer consists of the Utility and USB functions.

## UTILITY

Screen Adjustment: Turn knob to adjust the contrast of the screen. You may also choose to invert the screen colors. Press the "save" button to keep your adjustment or "back" to ignore.

Change Security Settings: The user can lock out others from changing effect, output or digital I/O presets by selecting the appropriate check boxes. Once a box is checked, a password will be required to make a change to that setting.

Change Password: A password may be set by turning the left encoder knob to select a character for each of the four placeholders. Once you have selected the characters, press the "enter" button and validate your choice. This password will now be necessary for making changes to any of the settings that have been selected in the "Security Settings" above. This password will also be necessary to do a factory reset.

| LTILITY |
| :---: |
| SCREEN ADJUSTMENT |
| CHANGE SECURITY SETTINGS |
| CHANGE PASSWIRD |
| RESTIRE FACTIRY SETTINGS |
| SELECT |
| BACK |

Restore Factory Settings: Resets all param-
eters to factory settings and will erase all user presets and passwords.

## USB

The FX2 mixer console allows the user to record or play back MP3's directly to/from a thumb drive placed in the USB A port. Note the USB B port directly streams audio in or out and is treated as a "sound card" by the computer. How you treat this output will depend on the computer you use and the software you are running to control it. Only one USB output may be connected at a time, and the USB B cable must be disconnected before a device in the USB A port is accessed, and vice versa.

Memory Stick Mode: Navigate to the Digital I/O screen. Select Memory Stick, the message "Media Not Detected, Please Re-Insert Memstick" will appear until a memory stick is plugged in to the USB port. Once inserted, the drive will be evaluated for available space. When ready, the menu will appear allowing the user to select MP3 Playback or MP3 Record.

MP3 Recording: The FX2 mixer can record MP3's at a sample rate of 48k and bit rates are selectable from 96 kbps to 320 kbps . The recording bit rate and gain can be adjusted by selecting the CFG button.

MP3 Playback: The FX2 mixer can play back MP3's at sample rates of 44.1 kHz and 48 kHz .
Once in the $\mathrm{MP}_{3}$ File Browse screen, you may select an $\mathrm{MP}_{3}$ file to play. The File Browse screen will only show Directories (marked with "٪…DIR....." on the right side of the screen), MP3 files (with the .mp3 extension excluded), and $M_{3} U$ playlist files. (Note: for $M_{3} U$ playlists, all files included in the playlist must be in the same directory in order for files to play correctly)

If you are in the root directory of the device, "[ROOT]" will be displayed at the top of the list. Select a directory to view the files in that directory, or select "[UP DIR]" to back out of a directory. Once an MP3 or M3U file is selected, the MP3 Playback Screen will be shown.

When an MP3 file is finished playing, the player will seek to the next file in the list, or if a playlist is selected it will seek to the next file in the playlist. Once the last file is reached, the player will loop back to the first file in the list. To scroll to a position in the song, spin the right encoder until the progress indicator triangle indicates the desired position, then press the right encoder to set the position.

Computer Mode: The USB B port streams 48k sample rate, 24 bit audio to an external computer or other recording device. To activate this mode, navigate to the Digital I/O screen and select Computer Mode. The screen will show a message saying "CHANGE MODE TO COMPUTER MODE?" Select OK to activate Computer Mode or CANCEL to exit this screen. Playback through this port may be assigned to the last stereo channel by pushing the "Input Select" button to the "USB" position. It then may be routed anywhere throughout the console by using the Aux Sends or Bus assignment buttons on that channel strip.

## FIRMWARE UPDATE

From time to time, there will be firmware updates that will address bugs or make performance improvements. To update the mixer to the latest firmware, please go to www.peavey.com for instructions.

## CONNECTIONS

Inserts: These jacks are 1/4" Tip/Ring/Sleeve (TRS) connectors that allow external signal processors to be inserted into the Input Channel signal path. Tip=Send; Ring=Return; Sleeve=Ground. One of the onboard effects processors can be patched to any channel with an Insert.

49 Line (1/4") Inputs: These jacks are $1 / 4$ " balanced (TRS) high-impedance inputs. The tip is the positive input and should be used for unbalanced inputs. It has 20 dB less gain than the XLR input and does not have phantom power available. The Mic and Line inputs should not be used simultaneously.

50 Mic (XLR) Inputs: XLR balanced inputs optimized for a microphone or other low impedance source. Pin 2 is the positive input. Because of the wide range of gain adjustment, signal levels up to +14 dBu can be accommodated.

51 Stereo (1/4") Inputs: These $1 / 4$ " unbalanced inputs work as a stereo line input using both jacks or as a mono input if the connection is made to the L/Mono input only.
52. Group Inserts: These jacks are 1/4" TRS connectors that allow external signal processors to be inserted into the Group signal path. Tip=Send; Ring=Return; Sleeve=Ground. One of the on-board effects processors can be patched to any Group Insert.

53 Group Outputs: These Group Outputs feature 1/4" TRS balanced jacks and provide output signal from the Groups. The output level is set by the Group Level faders (26).

54 Left/Right Outputs: The Left/Right Outputs feature two $1 / 4$ " TRS Z-balanced jacks and two fully balanced XLR outputs. The $1 / 4$ " outputs can be used with Tip, Ring, Sleeve (TRS) balanced or Tip, Sleeve (TS) unbalanced connectors. The output level is set by the Master Level faders (40). Both outputs can be used simultaneously.

55 AUX 1-6 Outputs: These AUX Outputs feature 1/4" TRS balanced jacks and provide signal from the Auxiliary Outputs. The output level is set by the AUX Level controls (19, 20).

56 Effects 2 Patch Jack: This $1 / 4$ " TRS jack allows the internal Effects 2 processor to be patched to an Input or Group Insert or to an external device. The tip carries the input (return)
 signal to the compressor and the ring carries the output (send).

EFX 2 Return Jacks: These 1/4" high-impedance balanced inputs can be used as stereo or individual returns. Designed for effects return, they can also be used as additional stereo inputs. The L/Mono input provides signal to both inputs if no connector is attached to the Right jack. The tip is the positive input for both balanced and unbalanced use.

Media In Jacks: The Media Input jacks are set up for a +4 dBu input from a stereo audio media source. The signal feeds the Media In level control (34).

59 Record Output Jacks: The output jacks can provide a +4 dBu output signal to a stereo recording device. The output level is controlled by the Record Output level control (36).

USB Memory Connector: Use this A-type USB connector to plug in a removable data storage device to read or write MP3- formatted files.

USB Computer Connector: Use this B-type USB connector to connect with a computer.
Power Switch: Pressing the power switch supplies power to the unit.
Removable Power Cord: This receptacle is for the IEC line cord (included) that provides AC power to the unit. Connect the line cord to this connector and to a properly grounded AC supply. Damage to the equipmint may occur if an improper line voltage is used (see voltage marking on unit).

Never remove or cut the ground pin of the line cord plug. The console is supplied with a properly rated line cord. If lost or damaged, replace this cord with one of the proper rating.
NOTE FOR UK ONLY: If the colors of the wires in the mains lead of this unit do not correspond with the colored markings identifying terminals in your plug, proceed as follows: (1) The wire that is colored green and yellow must be connected to the terminal marked by the letter E, or by the Earth symbol, or colored green or green and yellow. (2) The wire that is colored blue must be connected to the terminal that is marked with the letter N , or colored black. (3) The wire that is colored brown must be connected to the terminal that is marked with the letter Lo colored red.


## FX ${ }^{\text {T" }} 2$ Series Specifications

Inputs

| Function | Input Z <br> (Ohms min) | Input Gain Setting | Min* | Input Levels Nominal** | Max | Bal/ Unbal | Connector |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Microphone (150 Ohms) | 2.2k | Max Gain <br> ( 60 dB ) <br> Min Gain (o dB) | $\begin{aligned} & -76 \mathrm{dBu} \\ & -16 \mathrm{dBu} \end{aligned}$ | $\begin{aligned} & -56 \mathrm{dBu} \\ & +4 \mathrm{dBu} \end{aligned}$ | $-40 \mathrm{dBu}$ $+20 \mathrm{dBu}$ | Bal | XLR Pin 1 Gnd <br> Pin 2 (+) <br> Pin 3 (-) |
| Line (10 k Ohms) | 20k | Max Gain <br> ( 40 dB ) <br> Min Gain <br> (-20 dB) | $\begin{aligned} & -56 \mathrm{dBu} \\ & +4 \mathrm{dBu} \end{aligned}$ | $\begin{aligned} & -36 \mathrm{dBu} \\ & +24 \mathrm{dBu} \end{aligned}$ | $\begin{aligned} & -20 \mathrm{dBu} \\ & +40 \mathrm{dBu} \end{aligned}$ | Bal | 1/4" TRS; <br> Tip (+) <br> Ring (-) <br> Sleeve Ground |
| Stereo Line (direct to L/R) | 10k | Max Gain ( 20 dB ) <br> Nominal Gain (odB) | $\begin{aligned} & -26 \mathrm{dBu} \\ & -6 \mathrm{dBu} \end{aligned}$ | $\begin{aligned} & -16 \mathrm{dBu} \\ & +4 \mathrm{dBu} \end{aligned}$ | $\begin{aligned} & +2 \mathrm{dBu} \\ & +22 \mathrm{dBu} \end{aligned}$ | Unbal | $\begin{gathered} \text { 1/4" TS; } \\ \text { Tip (+) } \\ \text { Sleeve Ground } \end{gathered}$ |
| Stereo Line (via channel) | 10k | Max Gain ( 20 dB ) <br> Nom Gain (odB) | $\begin{aligned} & -36 \mathrm{dBu} \\ & -16 \mathrm{dBu} \end{aligned}$ | $\begin{aligned} & -16 \mathrm{dBu} \\ & +4 \mathrm{dBu} \end{aligned}$ | $\begin{aligned} & +2 \mathrm{dBu} \\ & +22 \mathrm{dBu} \end{aligned}$ | Unbal | $\begin{gathered} \text { 1/4" TS; } \\ \text { Tip (+) } \\ \text { Sleeve Ground } \end{gathered}$ |
| Channel and Group Insert Return | 22k | $\begin{gathered} \mathrm{N} / \mathrm{A} \\ (\mathrm{odB}) \end{gathered}$ | $-16 \mathrm{dBu}$ | +4 dBu | +22 dBu | Unbal | 1/4" TRS; Tip (send) Ring (return) Sleeve Ground |
| EFX2 Return | 20k | Max Gain ( 10 dB ) <br> Nom gain (odB) | $\begin{aligned} & -16 \mathrm{dBu} \\ & -6 \mathrm{dBu} \end{aligned}$ | $\begin{aligned} & -6 \mathrm{dBu} \\ & +4 \mathrm{dBu} \end{aligned}$ | $+12 \mathrm{dBu}$ $+22 \mathrm{dBu}$ | Bal | $\begin{gathered} \text { 1/4" TRS; Tip (+) } \\ \text { Ring (-) } \\ \text { Sleeve Ground } \end{gathered}$ |
| Media In | 10k | Max Gain (1odB) <br> Nom Gain (odb) | $\begin{aligned} & -16 \mathrm{dBu} \\ & -6 \mathrm{dBu} \end{aligned}$ | $-6 \mathrm{dBu}$ $+4 \mathrm{dBu}$ | $+10 \mathrm{dBu}$ $+20 \mathrm{dBu}$ | Unbal | RCA Jacks |
| $0 \mathrm{dBu}=0.775$ <br> * Min Input master fad ** Nominal Micropho | (RMS) <br> vel (sensitivi rs set for max ttings are de gain contro | ) is the smalle mum gain. ned as all cont is as specified. | signal th <br> s set at | will produce nom <br> (or 50\% rotati | nal output <br> for rotary | $-4 \mathrm{dBu}) \mathrm{wi}$ <br> ntrols) fo | h channel and nominal output. |

## Outputs

| Function | Min Load Z ( $\Omega$ ) | Output Levels |  | Bal/ | Connector |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Nominal | Max | Unbal |  |
|  |  | +4 dBu | +22 dBu |  | XLR Pin 1 Gnd Pin $2(+)$, Pin $3(-)$ |
|  |  | +4 dBu | +22 dBu |  | 1/4" TRS; Tip (+), Ring (-) Sleeve Ground |
| Groups 1-4 and Aux 1-6 | 600 | $+4 \mathrm{dBu}$ | +22 dBu | Bal | 1/4" TRS: Tip (+), Ring (-) Sleeve Ground |
| Record Out | 2k | +4 dBu | +22 dBu | Unbal | RCA Jacks |
| Channel and Group Insert Send | 600 | $+4 \mathrm{dBu}$ | +22 dBu | Unbal | 1/4" TRS; Tip (send), Ring (return) Sleeve Ground |
| Headphone | 8 | +4 dBu | +22 dBu | Unbal | 1/4" TRS; Tip (left), Ring (right) Sleeve Ground |
| o dBu=0.775 V (RMS) |  |  |  |  |  |

Gain

```
Mic Input Gain Adjustment Range: \(\quad \mathrm{odB}\) to +60 dB
Mic Input to Left/Right Balanced Output 80 dB (max gain)
Line Input Gain Range: -20 dB to +40 dB
Line Input to Left/Right Balanced Output 60 dB (max gain)
Stereo Line Input Gain Range: \(-\infty\) to +20 dB
Stereo Line Input to Left/Right Balanced Output +30 dB direct to L/R output - + 40 dB via channel (max gain)
```


## Frequency Response

Mic Input to Left/Right Output 20 Hz to 20 kHz o dB/-1 dB

## Total Harmonic Distortion \& Noise

$0.01 \% 20 \mathrm{~Hz}$ to 20 kHz Mic to Left/Right Output ( 22 Hz to 22 kHz BW) $0.005 \%$ Mic Pre-amp ( 22 Hz to 22 kHz BW)

## Hum and Noise

| Output | Residual Noise | S/N Ratio (Ref: +4dBu) | Test Conditions |
| :---: | :---: | :---: | :---: |
| Master Left/Right | $\begin{aligned} & -100 \mathrm{dBu} \\ & -82 \mathrm{dBu} \\ & -80 \mathrm{dBu} \end{aligned}$ | $\begin{gathered} 104 \mathrm{~dB} \\ 86 \mathrm{~dB} \\ 84 \mathrm{~dB} \end{gathered}$ | Master Fader Down, Channel Levels Down Master Fader Nominal, Channel Levels Down Master Fader Nominal, Channel Faders Nominal, Panned Odd Channels (left), Even Channels (right) |
| Groups 1-4 | $\begin{aligned} & -98 \mathrm{dBu} \\ & -90 \mathrm{dBu} \\ & -83 \mathrm{dBu} \end{aligned}$ | $\begin{gathered} 102 \mathrm{~dB} \\ 94 \mathrm{~dB} \\ 87 \mathrm{~dB} \end{gathered}$ | Master Fader Down, Channel Levels Down Master Fader Nominal, Channel Levels Down Master Fader Nominal, Channel Faders Nominal Panned Odd Channels (left), Even Channels (right) |
| Aux 1-6 <br> (Hum and noise meas | $\begin{gathered} -101 \mathrm{dBu} \\ -81 \mathrm{dBu} \end{gathered}$ <br> asurements: 22 Hz to 2 | $\begin{aligned} & 105 \mathrm{~dB} \\ & \mathrm{kHz} \text { BW) } \\ & 85 \mathrm{~dB} \end{aligned}$ | All controls off <br> All channel sends nominal, masters nominal |

## Equivalent Input Noise (EIN)

-129 dBu (Mic input terminated with 150 Ohms)

## Crosstalk/Attenuation

Adjacent Input Channels ( 1 kHz ) -70 dB typical Mute Button Attenuation ( 1 kHz ) -8o dB typical Left to Right Outputs ( 1 kHz ) -70 dB typical

Channel Fader Kill ( 1 kHz ) -8o dB typical

## Common Mode Rejection Ratio (Mic Input)

```
-50 dB minimum (20 Hz to 20 kHz)
-60 dB typical @ 1 kHz
```

Phantom Power
+48 volts

## Signal/Clip Indicators

Yellow: -20 dBu
Red: 2 dB below clipping

## Dimensions

$$
\begin{gathered}
\text { FX2 } 16: 8 " \mathrm{~h} \times 19.0 " \mathrm{w} \times 20.25 \text { "d on table top } \\
16.7^{\prime \prime} \text { wide without rack ears } \\
(20.32 \mathrm{~cm} \times 48.3 \mathrm{~cm} \times 51.44 \mathrm{~cm} \text { on table top) } \\
(42.4 \mathrm{~cm} \text { wide without rack ears) } \\
12 \mathrm{RU}\left(20^{\prime \prime}\right) \times 19.0^{\prime \prime} \times 8 \text { " in equipment rack; } \\
7 \text { " behind rack } \\
(44.3 \mathrm{~cm} \times 48.3 \mathrm{~cm} \times 20.32 \mathrm{~cm} \text { in equipment rack) } \\
(17.78 \mathrm{~cm} \text { behind rack) }
\end{gathered}
$$

FX2 24: $8^{\prime \prime}$ high $\times 24.65^{"}$ wide $\times 21.25^{\prime \prime}$ deep ( $20.32 \mathrm{~cm} \times 62.6 \mathrm{~cm} \times 53.975 \mathrm{~cm}$ )

FX2 32: 8 " high x $32.75^{"}$ wide $\times 21.25^{" ~ d e e p ~}$
( $20.32 \mathrm{~cm} \times 83.185 \mathrm{~cm} \times 53.975 \mathrm{~cm}$ )

Installation Note, Ventilation:
This unit must have the following clearances from any combustible surface: top: 8", sides: 12 ", back: 12"

## Weight

FX2 16: 22 lbs. ( 10.0 kg )
FX2 24: 25 lbs ( 11.4 kg )
FX2 32: 30 lbs . 13.6 kg )

## Power Requirements

FX2 16: 100-240 VAC $50 / 60 \mathrm{~Hz} 40$ watts nominal
FX2 24: 100-240 VAC 50/60 Hz 55 watts nominal
FX2 32: 100-240 VAC 50/60 Hz 60 watts nominal

Test Conditions: 120 VAC 60 Hz maintained throughout testing


