

# FX **Tracker**

## **Synchronized Effects**

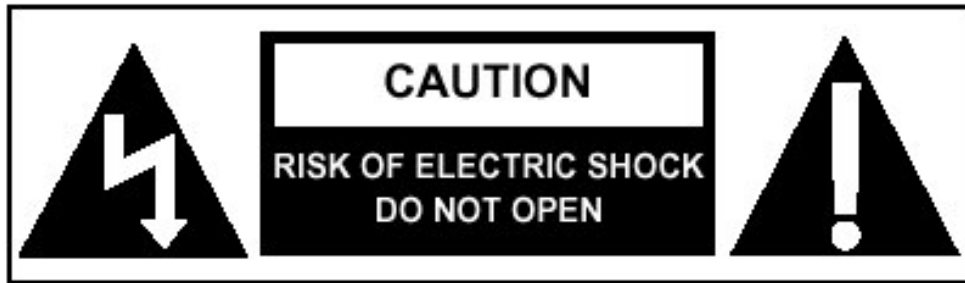
### **Users Manual Version 2.0**

For the latest Users Manual, go to:  
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**BackLine Engineering LLC**



Warning: Do not open chassis.



**NOTE:** Before using your FX-Tracker, carefully read these operating instructions and safety suggestions:

1. Repairs should be performed only by qualified service personnel.
2. Do not place this unit near heat sources, such as radiators, heat registers, or appliances that produce heat.
3. Guard against objects or liquids entering the enclosure.
4. Use only the supplied AC adaptor. Use of other AC adaptors may void the warranty.
5. Do not step on power cords. Do not place items on top of power cords so that they are pinched or leaned on. Pay particular attention to the cord at the plug end and the point where it connects to FX-Tracker.
6. Unplug FX-Tracker when not in use for extended periods of time.
7. Do not listen for prolonged periods at high volume levels as it may damage your hearing.

**CAUTION:** To reduce the risk of fire or electric shock, do not open the case. There are no user-serviceable parts inside. Refer servicing to qualified service personnel.

**WARNING:** To reduce the risk of fire or electric shock, do not expose this appliance to rain or moisture.

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## 1 Product Overview

Welcome to a world of audio effects that you have never heard or played before. FX-Tracker™ uses a set of sophisticated algorithms to provide a variety of effects that can adjust to your playing speed or your playing volume. Here is a list of some of the features available.

- Up to 87 effects and up to 100 preset locations
- Effect timing and effect depth can react to your playing speed and playing volume
- Seven main effects categories including delay, chorus, tremolo, flanger, filter, pitch shifter and MIDI output
- An additional delay effect can be placed before, after or in parallel with any of the six main effect types
- Delay time that can track your playing. Shorter delay with faster playing or longer delays with faster playing
- Your playing speed can change the modulation speed of chorus, tremolo, flanger, filter or pitch shifter
- Your playing speed or your playing volume can change the delay feedback level or the depth of the chorus, tremolo, flanger or filter effects
- Transition between a delay effect and any other effect by changing your playing speed or playing volume
- There are several automatic whammy and dive bomb effects available
- A reverse delay that plays from the current note back to the previous note
- Programmable arpeggiator patterns can provide unique harmony effects
- Several envelope effects for volume, chorus, flanger, filter or pitch shifter
- You can time the second delay effect to the chorus, tremolo, flanger or pitch shifter modulation speed
- You can use two types of delays at once and time them to each other or your playing
- Several different stereo effects including delay, chorus, tremolo and flanger
- Up to 60 seconds of stereo delay time including looping functions
- Full MIDI implementation. Control any parameter with an external MIDI controller or use MIDI messages to select from the 100 presets
- Synchronize a MIDI drum machine to your playing speed
- 17 ways to control external MIDI devices with effects such as envelopes, waveforms or arpeggio patterns
- Use an external MIDI expression pedal to manually modulate chorus, flanger, and filter or create a whammy pedal.
- You can download firmware updates to protect your investment

## Quick Start Guide

If you can't wait to get started, the following step-by-step process will allow you to start using the unit.

- 1) Use only the supplied AC adapter and power on the unit. The two LEDs will stay yellow and the display will be blank for about 10 seconds while a complete self-test is run on the unit. After that, the display will cycle from 0-99 and then 0-19 while the presets and arpeggiator patterns are loaded.
- 2) Connect the mono or stereo signal from your guitar or effects into the input jack and feed the output jack into the mono or stereo inputs of your mixer or amp. Place FX-Tracker before any high gain distortion effects so that it can identify the notes that you are playing.
- 3) Set the right slide switch to Preset and use the right control knob to select the desired preset number (see the preset selector guide).
- 4) Press the footswitch to activate the effect. If the effect is active, one of the LEDs will be green, other wise it will be red.
- 5) Change the preset number to try out other presets while the unit is active. This only works if the decimal point is not blinking (see below).
- 6) Adjust the input level for each preset so that the signal does not overdrive the input using the decimal point in the LED display as an indicator. You may need to increase the input level depending on your signal source. You can do a global adjustment of all preset input levels by setting the MIDI channel to zero and then pressing the left control knob (see section 3).
- 7) For any preset, you can adjust the Mix, Threshold, Tweak1 and Tweak2 controls to try other settings. When you adjust these settings, the decimal point will blink telling you that something has been changed. You can save your new settings by pressing the left control knob twice or restore the factory preset by pressing the right control knob once.

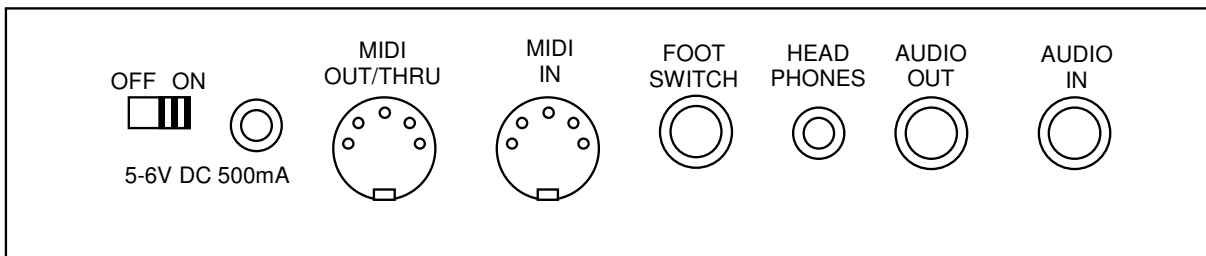
OK, this is a very simplistic description, and the product has many more features and effect types. Read the rest of this manual to learn more.

## 2 Interfaces and Controls

This section describes the user interfaces and controls. There are several example configurations and control setups described in later sections.

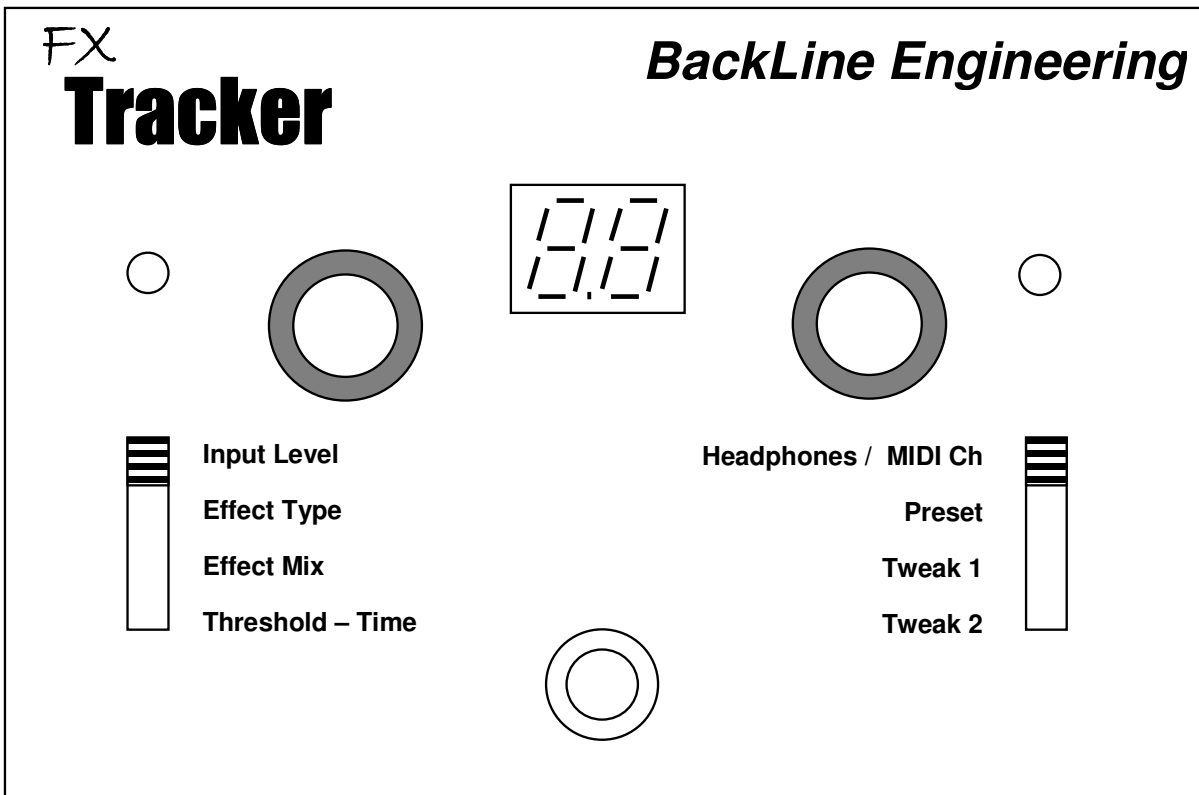
### Inputs and Outputs

The layout of the back panel is shown in the figure below. There is one 1/4" audio input jack and one 1/4" audio output jack. The input impedance is about 200K ohms. You can plug a mono or stereo (TRS) plug into these jacks. In many cases, both should be either mono or stereo, but there are some stereo effects that convert a mono source into a stereo output. There is also a 1/8" stereo headphone output. Other interfaces include a power switch, a power input for the included AC adapter and a 1/4" jack for connection to an optional external footswitch. There is also a MIDI input and a MIDI output/thru jack.



### Display

The layout of the top panel is shown in the figure below. The two-digit display is used for several purposes. It shows the value of the parameter currently selected by the right or left controls as described below. It also displays the note count during learn mode. In addition, the decimal point is used to indicate input overdrive conditions, or that a preset has been modified.



### LED Indicators

There are two multicolored LEDs that indicate the status of the unit. The general status associated with each color is listed below. The meaning may differ depending on the effect type.

Left LED red	Unit is bypassed, left control knob is active
Left LED yellow	Unit is in learn mode or recording in 60 second delay mode
Left LED green	Unit is active, left control knob is active
Right LED red	Unit is bypassed, right control knob is active
Right LED yellow	Unit is in learn mode or recording in 60 second delay mode
Right LED green	Unit is active, right control knob is active

## Left Switch and Control Knob

The left switch selects the parameter that can be controlled by the left knob. If the left switch or knob is changed, it will show that parameter in the display and the left LED will light up to identify that the left control knob is active. The left knob can also be pushed to save preset data, dump MIDI sysex files or change the display brightness as will be described later. The parameters that it controls are as follows:

### *Input Level*

The input level controls the digital gain of the incoming signal. It equally controls the left and right channel. The value ranges from 0 to 99. If the input level is too strong, the center decimal point will flash in the display. You can also change the output volume using MIDI controls (see section 11).

### *Effect Type*

There are several effect types that can be selected. The effect numbers are shown below. More operational details of these effects will be described in the following sections.

- 0 Learning mode that allows you to adjust the threshold to your playing
- 1-6 Fixed delay time effects.
- 7-10 Delay effects timed to you playing.
- 11-13 Stereo delay effects
- 14-15 Fixed period chorus effects.
- 16-17 Chorus period timed to your playing.
- 18-19 Fixed period stereo chorus effects.
- 20-21 Stereo chorus period timed to your playing.
- 22-25 Envelope chorus effects.
- 26-27 Fixed period tremolo effects.
- 28-29 Tremolo period timed to your playing.
- 30-31 Fixed period stereo tremolo effects.
- 32-33 Stereo tremolo period timed to your playing.
- 34-37 Envelope volume effects.
- 38 Fixed period flanger effect.
- 39 Flanger period timed to your playing.
- 40 Fixed period stereo flanger effects.
- 41 Stereo flanger period timed to your playing.
- 42-45 Envelope flanger effects.
- 46-47 Fixed period filter effect.
- 48-49 Filter period timed to your playing.
- 50-53 Envelope filter effects.
- 54-55 Fixed period pitch shift effects

56-57	Pitch shift period timed to your playing
58-63	Envelope pitch shift effects
64-65	Dynamic pitch shift effects
66-67	Arpeggiator pitch shift effects
68	Effects using a MIDI expression pedal
69	Delay effect that can be added to all other effects
70	MIDI output messages that can be added to all other effects
71-87	Effects to control external MIDI devices with CC messages

## ***Effect Mix***

This determines the strength of the wet and dry signals. A value of 0 plays only the dry signal. A value of 10 plays an equal amount of wet and dry signal. A value of 20 plays only the wet signal.

## ***Threshold – Time***

This control sets the threshold or the course time delay depending on the effect number. The threshold is a value that is used to determine the sensitivity to the notes that you play. Identified notes are used by the effects that are timed to your playing. As the value is adjusted lower, there will be more notes recognized per musical passage, until a point where too many notes may be recognized. As the value is adjusted higher, fewer notes will be recognized per musical passage, until a point where almost no notes are recognized. The best procedure is to set the unit in Learn mode and find a threshold that yields a count that works well with the number of notes or chords that are played. You can store this value with your presets. This control also acts as a course time value for static effects or a control value for other effects (see the following sections). This value ranges from 1 to 20.

*Note: In general, single note runs should use lower settings and power chords should use higher settings. If you drive the unit with high gain distortion or overdrive signals, it becomes difficult for the unit to recognize individual notes or chords. It is best to place these devices after FX-Tracker.*

## **Right Switch and Control Knob**

The right switch selects the parameter that can be changed by the right knob. If the right switch is changed, it will show that parameter in the display and the right LED will light up to identify that the left control knob is active. The parameters that it controls are as follows:

### ***Headphones / MIDI Channel***

Press down on the right control knob and the right LED will toggle between non-blinking and blinking. When not blinking, the right control knob sets the headphone volume. The volume can be adjusted between 0 and 99. While blinking, the right control knob sets the MIDI channel that will be used to recognize incoming MIDI signals. Values are 0-16. Channel 0 can be used to dump or load MIDI sysex

files containing all the preset data or adjusting the display brightness as will be described later. Channels 1-16 are used for normal MIDI operation.

*Note: MIDI channel 0 should not be used during normal operation as it can add audio artifacts to the signal.*

### **Preset**

The preset parameter sets the current active preset, which can range from 0 to 99. For each preset, ten values are stored including the input level, the effect type, the mix value the threshold, the tweak 1 value and the tweak 2 value. There are also parameters stored associated with the second delay unit including the delay and the feedback level, and two values stored associated with the MIDI output messages. These will be described further in the following sections.

If any of these parameters are changed, the decimal point will blink in the display except for preset 0. Preset 0 can be used to try things out without getting a flashing display. To save your changes to a different preset number, change the preset value while the decimal point is blinking. To restore the original values for a preset while the decimal point is blinking, press the right control knob.

A preset can be saved by pushing down on the left control knob (make sure the MIDI channel is not set to zero). When you press the left knob for the first time, the entire display will flash asking you to confirm the save. To save, press the left knob again. To abort the save, press the right knob, which will also restore the original preset values.

### **Tweak 1**

When this switch setting is selected, the right control knob adjusts one of several effects parameters depending on the current effect type. See the following sections for more information.

### **Tweak 2**

When this switch setting is selected, the right control knob adjusts one of several effects parameters depending on the current effect type. See the following sections for more information.

## **Footswitch**

FX-Tracker includes a built-in footswitch allowing it to be used as a stompbox. If you want to place the unit closer to your amp, there is a ¼" jack that can be used to plug in one of many off-the-shelf footswitch cables that are available. The footswitch must contain a single latching on-off type switch. A MIDI CC message can also be used to act as a footswitch press as described in section 11.

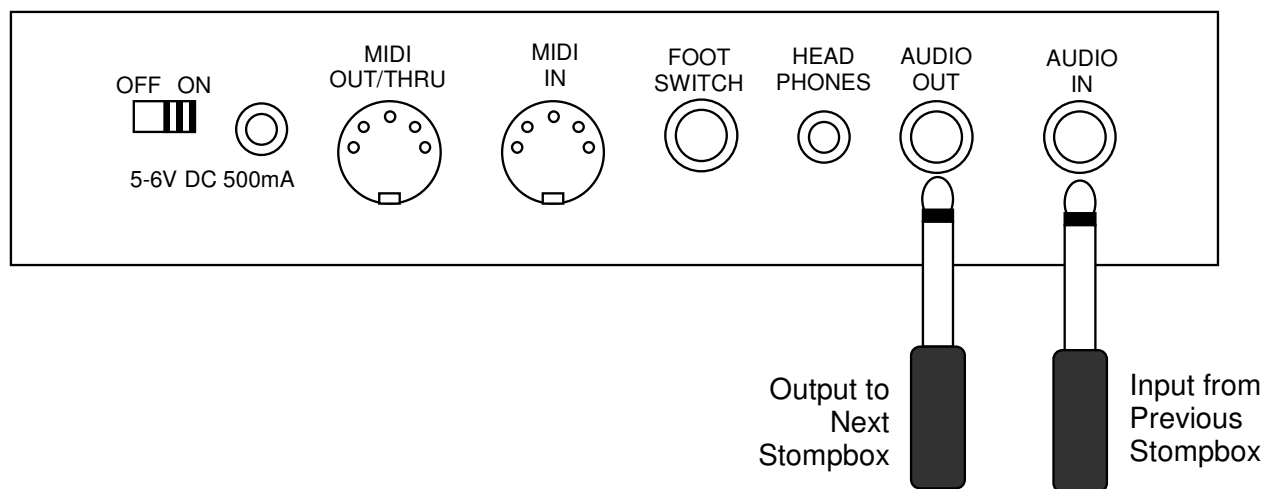
*Note: The external footswitch is in parallel with the internal footswitch. If the external footswitch is not working, press the internal footswitch once to disconnect it. Now the external footswitch should work fine.*

## 3 Basic Operation

This section gives an overview of the basic operation of FX-Tracker. It also includes a description of how to hook up FX-Tracker in various configurations.

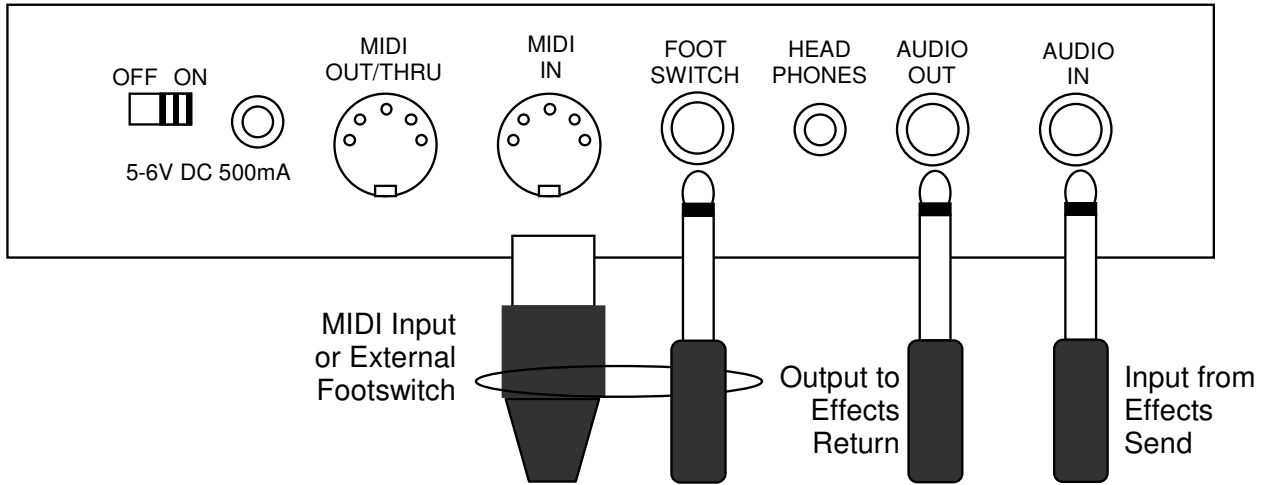
### Setting Up as an Effects Pedal

FX-Tracker can be used as a stompbox along with your other effects and floor pedals. In this case, you can connect a 1/4" mono plug from your guitar or the previous stompbox to the input audio jack, and a 1/4" mono plug from the output audio jack to the next stompbox as shown in the figure below.



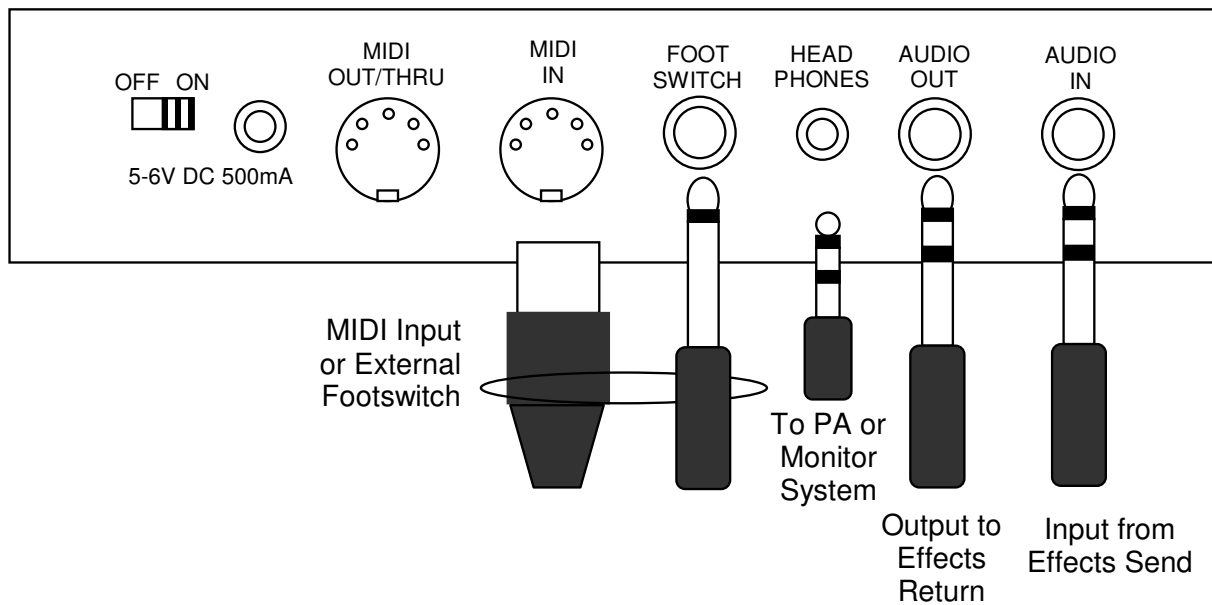
### Setting Up in a Mono Effects Loop

If you are using FX-Tracker in a mono effects loop of a guitar amp or other device, it may be easier to place the unit close to the amp in order to minimize the audio cable distances. In this case, a remote footswitch can be used to control the unit, or a MIDI controller can be used. Connect a 1/4" mono plug from the effects loop send to the input audio jack, and a 1/4" mono plug from the output audio jack to the effects loop return as shown in the figure below.



### Setting Up in a Stereo Effects Loop

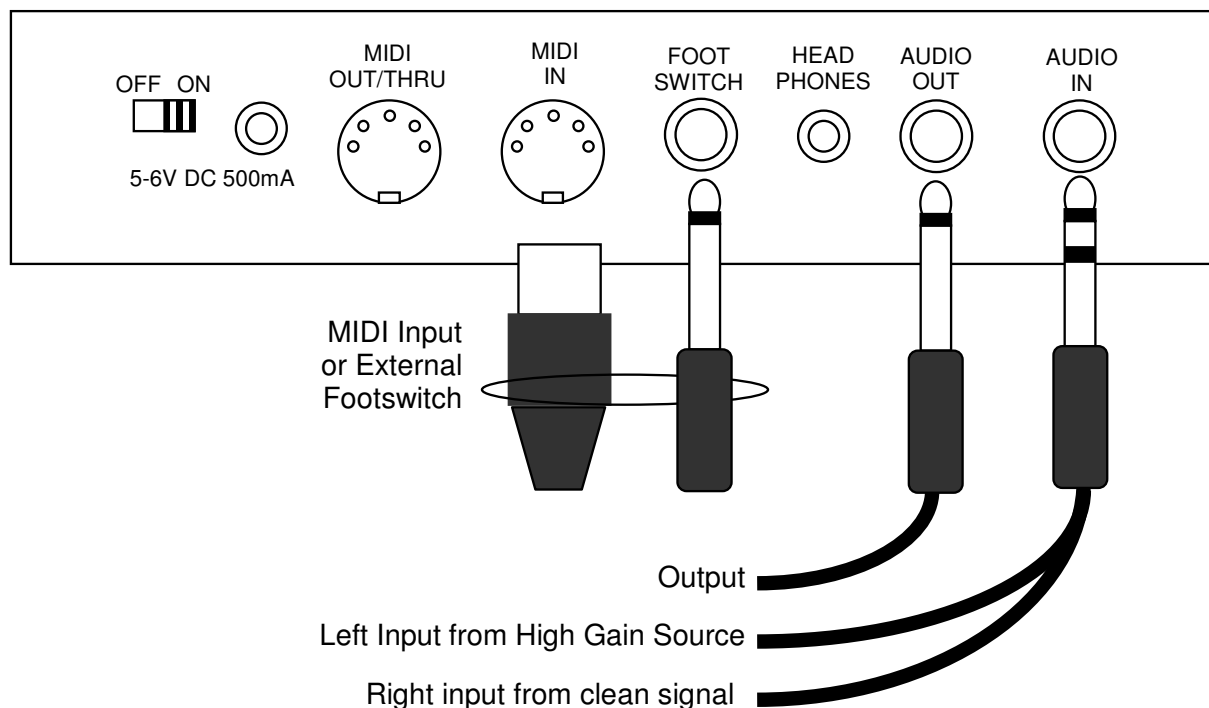
Many modern guitar amps, PA systems and effects racks have stereo capability. The figure below shows an example of using a stereo effects loop with FX-Tracker



In this case, you can connect a ¼” stereo TRS plug from the effects loop send to the input audio jack, and a ¼” stereo TRS plug from the output audio jack to the effects loop return. An external footswitch or MIDI controller can be used if the unit is placed near the amp or effects unit. In addition, if used in a guitar amp effects loop, the headphone jack can be used as an auxiliary send to the PA system or monitor system.

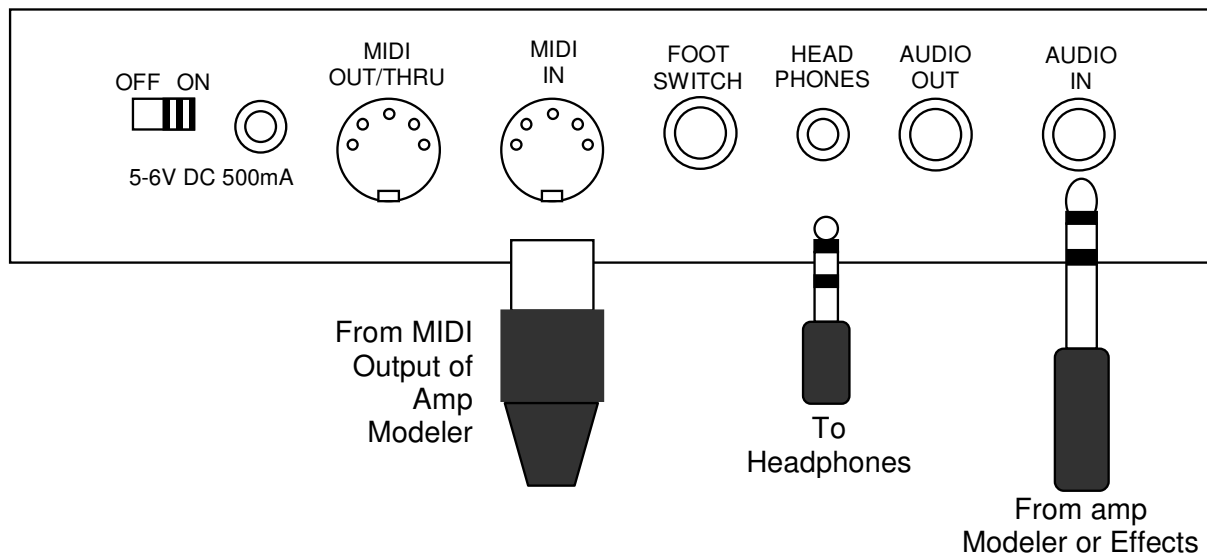
## Placing High Gain Units Before FX-Tracker

It is difficult for the unit to recognize notes when driven by high gain tones or distortion units. To solve this, you can drive one input with the high gain tone and the other input with a clean version of your playing. FX-Tracker will automatically select the clean tone from the left or right channel to identify the notes that you play. In the example below, the left input comes from the high gain source and the right input comes from the clean source. The clean signal will be used to recognize the notes that you play while the high gain tone (mono) output will contain the result of the effect.



## Setting Up for Silent Practice

For silent practice, the stereo output from an amp simulator or effects unit can be sent to the audio input as shown in the figure below. Use the headphone output to monitor your playing. The stereo output can also be sent to an external recording device. If you plan to use high gain tones, it will be best to place FX-Tracker before the high gain effects unit or use the method described above. The MIDI output from the amp simulator can be used to change the presets in FX-Tracker.



## Setting the Input Level

To avoid digital distortion, the input level needs to be adjusted based on the strength of the input signal. The input level can be adjusted between 0 and 99. Set the input level as high as you can, but make sure that the decimal point does not flash in the display with the loudest notes or chords you play. If you're using a volume pedal or boost before FX-Tracker, adjust the input signal using the highest volume input. Since the input level is saved in the preset, each preset can have a different input level setting, which can also allow it to act a volume cut or boost to an amp.

In some cases, you may want to change the input level on a global basis. You can set the input level to the same value for all presets as follows. Set the MIDI channel to zero (see section 2), set the left switch to Input Level and press down on the left control knob. This will cause the left LED to start blinking. You

can then adjust the input level as before. To exit this mode, press on the left control knob again. This will save the selected input level to all 100 preset locations.

## **Setting the Headphone Volume**

You can monitor the loop or practice in silence by using the headphone output. The headphone output can be adjusted between a value of 0 and 99.

## **Learn Mode**

Effect type 0 is the learn mode. Learn mode allows you to determine the proper settings for the threshold, which is used for the effects that are timed to your playing. In this mode, the display will increment with each note or chord that you play. In general, the increase in the display count should roughly equal the number of notes or chords that are played. To activate the unit while in learn mode, press the footswitch and both LEDs will turn solid yellow and the number of notes or chords will be updated in the display. To exit learn mode, press the footswitch again or change to another effect number.

## **Setting the Threshold**

While in learn mode, adjust the threshold until the display changes at a rate that roughly equals the number of notes played. Reducing the threshold will generally increase the number of notes recognized. Increasing the threshold will generally reduce the number of notes recognized. There is a maximum speed of playing that FX-Tracker can recognize. For example, it will not recognize all the notes during fast tapping, sweeping or shredding.

## **Using Auto Feedback or Auto Depth**

The delay, chorus, flanger and filter effects have feedback or depth values that can depend on your playing. If you set Tweak 1 to a value between 1 and 10, the feedback or depth will increase as you play slower. A value between 11-20 will increase the feedback or depth as you play faster. In both cases, a higher value of Tweak 1 requires a larger change in the speed of your playing for a larger change in feedback or depth.

If you set Tweak 1 to a value between 21-30, the feedback or depth will increase as you play softer. A value between 31-40 will increase the feedback or depth as you play louder. In both cases, a higher value of Tweak 1 requires a larger change in the input level for a larger change in feedback or depth. After you make the unit active by pressing the footswitch, your minimum and maximum volume levels are learned by FX-Tracker. To reset these values when you start a new playing style, disable and then re-enable the unit by pressing the footswitch or change the preset number.

For all these effects, a Tweak 1 value above 40 will provide fixed feedback or depth values that are independent of your playing speed or volume. You can override Tweak 1 completely by using a MIDI expression pedal to control depth. You can also output your playing speed or playing volume as MIDI messages to another effects unit. See section 11 for more details.

## Effects That Track Your Playing Speed

There are many different effects that track your playing speed. Make sure to use lower threshold values when playing single notes and higher threshold values when playing chords. Even with low threshold values, there is a limit on how fast FX-Tracker can follow your playing. Also keep in mind that your playing speed depends on the last two notes that you played and each effect has a limit on how long or short the distance between the two notes can be. For example, most modulation effects are limited to a maximum period of 10 seconds.

## Using Auto Period

For the chorus, tremolo, flanger, filter and pitch shifter, there are effect types where the modulation period or envelope period can be timed to your playing speed. For these effects, Tweak 2 sets the length of the period to be a fraction of the period between each note that you play, or in some cases, up to a multiple of the period between each note that you play. You can also select effects with fixed length periods.

## Using Period Averaging

There are two delay effects and two envelope tremolo effects allow you to average how fast FX-Tracker adjusts to your playing across several notes. In these cases, the value of Tweak 1 determines the number of notes to average. For example a value of 5 can average a tremolo envelope across the period of the last 5 notes that you played. This allows the envelope length changes to react slower to changes in your playing speed.

## Saving Presets

After you have determined settings that you like, you can store them in one of 100 present locations. If you make changes to any parameter while the preset value is set between 1 and 99, the decimal point will blink to show you that something has changed. You can save your changes to a different preset location by adjusting the preset value while the decimal point is blinking. To return a preset to its original parameter values, press the right control knob while the decimal point is blinking. For this to work, make sure the MIDI channel is not zero.

To save a preset, press the left control knob and the display will blink while waiting for you to confirm the save. Press the left knob again to confirm the save, or exit from saving by pressing the right knob. If you exit, this will also restore the original preset values as described above. When the unit is powered off, nothing is saved, but when a preset is saved, all global parameters are also saved. Section 11 describes how to save all 100 preset parameters and 20 arpeggio patterns into a MIDI sysex file.

## **Power-on Self Test**

When you turn the unit on, it takes about 10 seconds to run through a series of on board system tests. During that time, the two LEDs will be yellow and nothing will be shown in the display. All of the audio memory is tested along with most of the key components. Once the system tests are complete, a test tone will be played, and data will be loaded from memory while the display cycles through the preset numbers from 0 to 99 and the arpeggio patterns from 0-19.

## 4 The Delay Effects

There are a wide range of delay effects available including single repeat delays, delays with multiple repeats, delays timed to your playing speed and looping effects. For delays with multiple repeats, the delay feedback can be controlled by your playing speed or your playing volume. This section describes all of the different delay effects in detail. For each effect, the various control knobs will perform different operations as described below. In all cases, the mix controls the ratio of the wet and dry signal. This can range from only wet signal to only dry signal.

### Effect 1: Static Delay with Single Repeat (0.01 - 2 seconds)

This is a delay effect with a single repeat. The delay value can range from 0.01 to 2 seconds. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	0-19	Course delay time in 100mS steps
Tweak 1	Not used	
Tweak 2	1-10	Fine delay in 10mS steps

### Effect 2: Reverse Delay

This is a reverse delay where each time you play a note or chord, the signal is played back in reverse from the current note to the previous note that you played. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	Not used	
Tweak 2	Not used	

### Effect 3: Static Delay with Single Repeat (0.3 - 60 seconds)

This is a delay effect with a single repeat. The delay value can range from 0.3 to 60 seconds. When you press the footswitch to turn on this effect, the LEDs will turn yellow to tell you that the unit is recording what you are playing. Once the programmed delay time is reached, the LEDs will turn green. If you press the footswitch again before the LEDs turns green, the delay time will be set to the time that you pressed

the footswitch. This allows you to time the delay to what you are playing. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	0-19	Course delay time in 3000mS steps
Tweak 1	Not used	
Tweak 2	1-10	Fine delay in 300mS steps

## Effect 4: Static Delay with Multiple Repeats (0.01 – 2 seconds)

This is a delay effect with multiple repeats. The delay value can range from 0.01 to 2 seconds. Feedback controls how fast the delays fade away which can also be controlled by your playing speed or your playing volume. The left and right channels are treated the same. The functions of the controls are listed in the table below.

Control	Range	Description
Threshold - Time	0-19	Course delay time in 100mS steps
Tweak 1	1-50	Feedback or how fast the delays fade away 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fixed feedback levels
Tweak 2	1-10	Fine delay in 10mS steps

## Effect 5: Static Delay with Multiple Repeats (0.05 – 10 seconds)

This is a delay effect with multiple repeats. The delay value can range from 0.05 to 10 seconds. The feedback level controls how fast the delays fade away which can also be controlled by your playing speed or your playing volume. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	0-19	Course delay time in 500mS steps
Tweak 1	1-50	Feedback or how fast the delays fade away 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fixed feedback levels
Tweak 2	1-10	Fine delay in 50mS steps

### Effect 6: Static Delay with Multiple Repeats (0.3 - 60 seconds)

This is a delay effect with multiple repeats. The delay value can range from 0.3 to 60 seconds. The feedback level controls how fast the delays fade away which can also be controlled by your playing speed or your playing volume. When you press the footswitch to turn on this effect, the LEDs will turn yellow to tell you when the unit is recording what you are playing. Once the programmed delay time is reached, the LEDs will turn green. If you press the footswitch again before the LEDs turn green, the delay time will be set to the time that you pressed the footswitch. This allows you to time the delay to what you are playing.

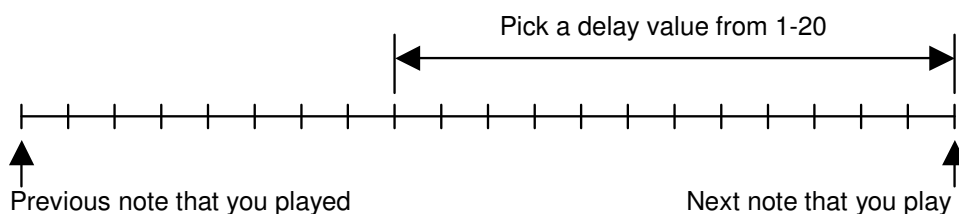
By setting the feedback level to 0, what you initially record will be played back over and over again without any additional layering. This provides up to 60 seconds of looping capability. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	0-19	Course delay time in 3000mS steps
Tweak 1	0-50	Feedback or how fast the delays fade away 0: Loop recording and playback 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fix feedback levels
Tweak 2	1-10	Fine delay in 300mS steps

## Effect 7: Delay is Timed to Your Playing, Single Repeat

This is a delay effect with a single repeat where the delay time is based on the time between each note that you play. Faster playing reduces the delay time, slower playing increases the delay time. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

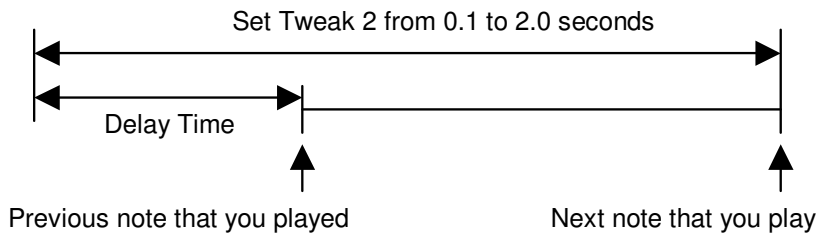
Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	1-20	Averages the delay time across the number of notes specified. This determines how fast the delay time adjusts to your playing.
Tweak 2	1-20	The time between each event is divided into 20 intervals. This control allows you to select which interval the delay falls on (see the figure below).



## Effect 8: Delay is Timed to Your Playing, Single Repeat

This is a delay effect with a single repeat where the delay time is based on the time between each note that you play. Slower playing reduces the delay time, faster playing increases the delay time. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	1-20	Averages the delay time across the number of notes specified. This determines how fast the delay time adjusts to your playing.
Tweak 2	1-20	Sets the maximum delay time from 0.1 to 2.0 seconds. The delay is this time minus the time between the notes that you play (see the figure below). If you play with a period longer than this value, no delay is heard.



### Effect 9: Delay is Timed to Your Playing, Multiple Repeats

This is a delay effect with multiple repeats where the delay time is based on the time between each note that you play. Faster playing reduces the delay time, slower playing increases the delay time. The feedback level controls how fast the delays fade away which can also be controlled by your playing speed or your playing volume. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	1-50	Feedback or how fast the delays fade away 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fixed feedback levels
Tweak 2	1-20	The time between each event is divided into 20 intervals. This control allows you to select which interval the delay falls on (see effect 7).

### Effect 10: Delay is Timed to Your Playing, Multiple Repeats

This is a delay effect with multiple repeats where the delay time is based on the time between each note that you play. Slower playing reduces the delay time, faster playing increases the delay time. The feedback level controls how fast the delays fade away which can also be controlled by your playing speed

or your playing volume. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	1-50	Feedback or how fast the delays fade away 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fixed feedback levels
Tweak 2	1-20	Sets the maximum delay time from 0.1 to 2.0 seconds. The delay is this time minus the time between the notes that you play (see effect 8). If you play with a period longer than this value, no delay is heard.

## Effect 11: Stereo Static Delay with Multiple Repeats (0.02 – 4.0 seconds)

This is a stereo delay effect with multiple repeats. The delay value can range from 0.02 to 4.0 seconds. The feedback level controls how fast the delays fade away which can also be controlled by your playing speed or your playing volume. Only the left channel input is used and the delay alternates between the left and right channel outputs. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	0-19	Course delay time in 200mS steps
Tweak 1	1-50	Feedback or how fast the delays fade away 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fixed feedback levels
Tweak 2	1-20	Fine delay in 20mS steps

## Effect 12: Stereo Delay is Timed to Your Playing, Multiple Repeats

This is a stereo delay effect with multiple repeats where the delay time is based on the time between each note that you play. Faster playing reduces the delay time, slower playing increases the delay time. The feedback level controls how fast the delays fade away which can also be controlled by your playing speed

or your playing volume. Only the left channel input is used and the delay alternates between the left and right channel outputs. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-50	Feedback or how fast the delays fade away 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fixed feedback levels
Tweak 2	1-20	The time between each event is divided into 20 intervals. This control allows you to select which interval the delay falls on (see effect 7)

### Effect 13: Stereo Delay is Timed to Your Playing, Multiple Repeats

This is a stereo delay effect with multiple repeats where the delay time is based on the time between each note that you play. Slower playing reduces the delay time, faster playing increases the delay time. The feedback level controls how fast the delays fade away which can also be controlled by your playing speed or your playing volume. Only the left channel input is used and the delay alternates between the left and right channel outputs. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	1-50	Feedback or how fast the delays fade away 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fixed feedback levels
Tweak 2	1-20	Sets the maximum delay time from 0.1 to 2.0 seconds. The delay is this time minus the time between the notes that you play (see effect 8). If you play with a period longer than this value, no delay is heard.

## 5 The Chorus Effects

Several chorus effects are available including traditional mono and stereo chorus with fixed periods along with chorus periods that track your playing speed. In addition, single chorus envelopes can be triggered each time you play a note. This section describes all of the different chorus effects in detail. For each effect, the various control knobs will perform different operations as described below. In all cases, the mix controls how much of the effect is mixed with the dry signal.

### Effect 14: Sine Chorus with Static Period

This is a chorus effect with a constant sine wave period. The period value can range from 0.05 to 10 seconds. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed or your playing volume. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	0-19	Course period time in 500mS steps
Tweak 1	1-50	Depth or intensity of the chorus effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth levels
Tweak 2	1-10	Fine period time in 50mS steps

### Effect 15: Square Chorus with Static Period

This is a chorus effect with a constant square wave period. The period value can range from 0.05 to 10 seconds. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed or your playing volume. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Course period time in 500mS steps
Tweak 1	1-50	Depth or intensity of the chorus effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth

		21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth levels
Tweak 2	1-10	Fine period time in 50mS steps

### Effect 16: Sine Chorus with Period That Depends on Your Playing

This is a chorus effect with a sine wave period that depends on your playing. The slower you play, the longer the period, the faster you play, the shorter the period. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed or your playing volume. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-50	Depth or intensity of the chorus effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values
Tweak 2	1-20	The chorus modulation speed controlled by the period between the notes that you play. This number is multiplied by one tenth of the time between the notes that you play. A value of 1 sets the chorus period to be 10 times faster than your playing. A value to 20 sets the chorus period to be two times as slow as your playing. A value of 10 matches the period to your playing.

### Effect 17: Square Chorus with Period That Depends on Your Playing

This is a chorus effect with a square wave period that depends on your playing. The slower you play, the longer the period, the faster you play, the shorter the period. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed or your playing volume. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-50	Depth or intensity of the chorus effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values
Tweak 2	1-20	The chorus modulation speed controlled by the period between the notes that you play (see effect 16).

## Effect 18: Stereo Sine Chorus with Static Period

This is a stereo chorus effect with a constant sine wave period. The period value can range from 0.05 to 10 seconds. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed. The chorus modulation of the left and right channel is 180 degrees out of phase. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Course period time in 500mS steps
Tweak 1	1-50	Depth or intensity of the chorus effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values
Tweak 2	1-10	Fine period time in 50mS steps

## Effect 19: Stereo Square Chorus with Static Period

This is a stereo chorus effect with a constant square wave period. The period value can range from 0.05 to 10 seconds. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed or your playing volume. The chorus modulation of the left and right channel is 180 degrees out of phase. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Course period time in 500mS steps
Tweak 1	1-50	Depth or intensity of the chorus effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values
Tweak 2	1-10	Fine period time in 50mS steps

### Effect 20: Stereo Sine Chorus with Period That Depends on Your Playing

This is a stereo chorus effect with a sine wave period that depends on your playing. The slower you play, the longer the period, the faster you play, the shorter the period. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed or your playing volume. The chorus modulation of the left and right channel is 180 degrees out of phase. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-50	Depth or intensity of the chorus effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values
Tweak 2	1-20	The chorus modulation speed controlled by the period between the notes that you play (see effect 16)

### Effect 21: Stereo Square Chorus with Period That Depends on Your Playing

This is a stereo chorus effect with a square wave period that depends on your playing. The slower you play, the longer the period, the faster you play, the shorter the period. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed or your playing volume. The

chorus modulation of the left and right channel is 180 degrees out of phase. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-50	Depth or intensity of the chorus effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values
Tweak 2	1-20	The chorus modulation speed controlled by the period between the notes that you play (see effect 16).

## Effect 22: Triggered Exponential Chorus Effect Variable Length

This is a chorus effect in which a single chorus envelope is triggered by your playing. The wave shape is an exponential waveform. The length of the envelope depends on the time between the notes that you play. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed or your playing volume. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-50	Depth or intensity of the chorus effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values
Tweak 2	1-20	Sets the envelope length based on 5% increments of the time between the notes that you play.

### Effect 23: Triggered Triangle Chorus Effect Variable Length

This is a chorus effect in which a single chorus envelope is triggered by your playing. The wave shape is a triangle waveform. The length of the envelope depends on the time between the notes that you play. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed or your playing volume. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-50	Depth or intensity of the chorus effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values
Tweak 2	1-20	Sets the envelope length based on 5% increments of the time between the notes that you play.

### Effect 24: Triggered Exponential Chorus Effect Static Length

This is a chorus effect in which a single chorus envelope is triggered by your playing. The wave shape is an exponential waveform. The length of the envelope can be fixed by the controls. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed or your playing volume. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	1-50	Depth or intensity of the chorus effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values
Tweak 2	1-20	The envelope length from 0.1 to 2 seconds

**Effect 25: Triggered Triangle Chorus Effect Static Length**

This is a chorus effect in which a single chorus envelope is triggered by your playing. The wave shape is a triangle waveform. The length of the envelope can be fixed by the controls. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed or your playing volume. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	1-50	Depth or intensity of the chorus effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values
Tweak 2	1-20	The envelope length from 0.1 to 2 seconds

## 6 The Tremolo Effects

Several tremolo effects are available including traditional mono and stereo tremolo with fixed periods along with tremolo periods that track your playing speed. The depth of the periodic tremolo effects can be controlled by your playing speed or your playing volume. In addition, single volume envelopes can be triggered each time you play a note. This section describes all of the different tremolo effects in detail. For each effect, the various control knobs will perform different operations as described below. In all cases, the mix controls how much of the effect is mixed with the dry signal.

### Effect 26: Sine Tremolo with Static Period

This is a tremolo effect with a constant sine wave period. The period value can range from 0.02 to 4 seconds. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	0-19	Course period time in 200mS steps
Tweak 1	1-50	Depth or intensity of the tremolo effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values
Tweak 2	1-10	Fine period time in 20mS steps

### Effect 27: Square Tremolo with Static Period

This is a tremolo effect with a constant square wave period. The period value can range from 0.02 to 4 seconds. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	0-19	Course period time in 200mS steps
Tweak 1	1-50	Depth or intensity of the tremolo effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth

		21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values
Tweak 2	1-10	Fine period time in 20mS steps

## Effect 28: Sine Tremolo with Period That Depends on Your Playing

This is a tremolo effect with a sine wave period that depends on your playing. The slower you play, the longer the period, the faster you play, the shorter the period. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-50	Depth or intensity of the tremolo effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values
Tweak 2	1-20	The tremolo modulation speed controlled by the period between the notes that you play. This number is multiplied by one tenth of the time between the notes that you play. So a value of 1 sets the tremolo period to be 10 times faster than your playing. A value to 20 sets the tremolo period to be two times as slow as your playing. A value of 10 matches the period to your playing.

## Effect 29: Square Tremolo with Period That Depends on Your Playing

This is a tremolo effect with a square wave period that depends on your playing. The slower you play, the longer the period, the faster you play, the shorter the period. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-50	Depth or intensity of the tremolo effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values
Tweak 2	1-20	The tremolo modulation speed controlled by the period between the notes that you play. (see effect 28).

### Effect 30: Stereo Sine Tremolo with Static Period

This is a stereo tremolo effect with a constant sine wave period. The period value can range from 0.02 to 4 seconds. The tremolo modulation of the left and right channel is 180 degrees out of phase. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	0-19	Course period time in 200mS steps
Tweak 1	1-50	Depth or intensity of the tremolo effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values
Tweak 2	1-10	Fine period time in 20mS steps

### Effect 31: Stereo Square Tremolo with Static Period

This is a stereo tremolo effect with a constant square wave period. The period value can range from 0.02 to 4 seconds. The tremolo modulation of the left and right channel is 180 degrees out of phase. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	0-19	Course period time in 200mS steps
Tweak 1	1-50	Depth or intensity of the tremolo effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values
Tweak 2	1-10	Fine period time in 20mS steps

## Effect 32: Stereo Sine Tremolo Period That Depends on Your Playing

This is a stereo tremolo effect with a sine wave period that depends on your playing. The slower you play, the longer the period, the faster you play, the shorter the period. The tremolo modulation of the left and right channel is 180 degrees out of phase. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-50	Depth or intensity of the tremolo effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values
Tweak 2	1-20	The tremolo modulation speed controlled by the period between the notes that you play (see effect 28).

## Effect 33: Stereo Square Tremolo Period That Depends on Your Playing

This is a stereo tremolo effect with a square wave period that depends on your playing. The slower you play, the longer the period, the faster you play, the shorter the period. The tremolo modulation of the left and right channel is 180 degrees out of phase. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-50	Depth or intensity of the tremolo effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values
Tweak 2	1-20	The tremolo modulation speed controlled by the period between the notes that you play (see effect 28).

### Effect 34: Triggered Exponential Tremolo Effect Variable Length

This is an effect in which a single volume envelope is triggered by your playing. The wave shape is an exponential waveform. The length of the envelope depends on the time between the notes that you play. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-20	Averages the envelope length across the number of notes specified. This determines how fast the envelope period adjusts to your playing.
Tweak 2	1-20	Sets the envelope length based on 5% increments of the time between the notes that you play.

### Effect 35: Triggered Volume Ramp Effect Variable Length

This is an effect in which a volume ramp envelope is triggered by each note that you play. The length of the ramp depends on the time between the notes that you play. After the ramp, the volume will hold until the note is released. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-20	Averages the ramp length across the number of notes specified. This determines how fast the ramp time adjusts to your playing.
Tweak 2	1-20	Sets the ramp length based on 5% increments of the time between the notes that you play.

## Effect 36: Triggered Square Tremolo Effect Static Length

This is an effect in which a single volume envelope is triggered by your playing. The wave shape is a square waveform with adjustable rise and fall times. Both the rise/fall time and the length of the high level can be controlled. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-20	Length of the high time from 0.1 to 2 seconds
Tweak 2	1-20	Length of the rise/fall times from 0.05 to 1 second

## Effect 37: Triggered Volume Ramp Effect Static Length

This is an effect in which a ramp envelope is triggered by your playing. The ramp time is set by the controls. After the ramp, the volume will hold until the note is released. The left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	Not used	
Tweak 2	1-20	Length of the ramp time from 0.1 to 2 seconds

## 7 The Flanger Effects

Several flanger effects are available including mono and stereo flanger with fixed periods along with flanger periods that track your playing speed. In addition, single flanger envelopes can be triggered each time you play a note. This section describes all of the different flanger effects in detail. For each effect, the various control knobs will perform different operations as described below. In all cases, the mix controls how much of the effect is mixed with the dry signal.

### Effect 38: Sine Flanger with Static Period

This is a flanger effect with a constant sine wave period. The period value can range from 0.05 to 10 seconds. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed or your playing volume. In addition, four feedback levels are available. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	0-19	Course period time in 500mS steps
Tweak 1	1-80	Depth or intensity of the flanger effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values, feedback level 1 51-60: Fixed depth values, feedback level 2 61-70: Fixed depth values, feedback level 3 71-80: Fixed depth values, feedback level 4
Tweak 2	1-10	Fine period time in 50mS steps

### Effect 39: Sine Flanger with Period That Depends on Your Playing

This is a flanger effect with a sine wave period that depends on your playing. The slower you play, the longer the period, the faster you play, the shorter the period. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed or your playing volume. In addition, four feedback levels are available. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-80	Depth or intensity of the flanger effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values, feedback level 1 51-60: Fixed depth values, feedback level 2 61-70: Fixed depth values, feedback level 3 71-80: Fixed depth values, feedback level 4
Tweak 2	1-20	The flanger modulation speed controlled by the period between the notes that you play. This number is multiplied by one tenth of the time between the notes that you play. So a value of 1 sets the flanger period to be 10 times faster than your playing. A value to 20 sets the flanger period to be two times as slow as your playing.

## Effect 40: Stereo Sine Flanger with Static Period

This is a stereo flanger effect with a constant sine wave period. The period value can range from 0.05 to 10 seconds. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed or your playing volume. In addition, four feedback levels are available. Only the left channel input is used and the modulation of the left and right channel outputs is 180 degrees out of phase. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	0-19	Course period time in 500mS steps
Tweak 1	1-80	Depth or intensity of the flanger effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values, feedback level 1 51-60: Fixed depth values, feedback level 2 61-70: Fixed depth values, feedback level 3 71-80: Fixed depth values, feedback level 4
Tweak 2	1-10	Fine period time in 50mS steps

### Effect 41: Stereo Sine Flanger with Period That Depends on Your Playing

This is a stereo flanger effect with a sine wave period that depends on your playing. The slower you play, the longer the period, the faster you play, the shorter the period. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed or your playing volume. In addition, four feedback levels are available. Only the left channel input is used and the modulation of the left and right channel outputs is 180 degrees out of phase. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-80	Depth or intensity of the flanger effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values, feedback level 1 51-60: Fixed depth values, feedback level 2 61-70: Fixed depth values, feedback level 3 71-80: Fixed depth values, feedback level 4
Tweak 2	1-20	The flanger modulation speed controlled by the period between the notes that you play (see effect 39).

### Effect 42: Triggered Exponential Flanger Effect Variable Length

This is a flanger effect in which a single flanger envelope is triggered by your playing. The wave shape is an exponential waveform. The length of the envelope depends on the time between the notes that you play. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed or your playing volume. In addition, four feedback levels are available. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-80	Depth or intensity of the flanger effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth

		31-40: Louder playing = more depth 41-50: Fixed depth values, feedback level 1 51-60: Fixed depth values, feedback level 2 61-70: Fixed depth values, feedback level 3 71-80: Fixed depth values, feedback level 4
Tweak 2	1-20	Sets the envelope length based on 5% increments of the time between the notes that you play.

## Effect 43: Triggered Triangle Flanger Effect Variable Length

This is a flanger effect in which a single flanger envelope is triggered by your playing. The wave shape is a triangle waveform. The length of the envelope depends on the time between the notes that you play. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed or your playing volume. In addition, four feedback levels are available. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-80	Depth or intensity of the flanger effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values, feedback level 1 51-60: Fixed depth values, feedback level 2 61-70: Fixed depth values, feedback level 3 71-80: Fixed depth values, feedback level 4
Tweak 2	1-20	Sets the envelope length based on 5% increments of the time between the notes that you play.

## Effect 44: Triggered Exponential Flanger Effect Static Length

This is a flanger effect in which a single flanger envelope is triggered by your playing. The wave shape is an exponential waveform. The length of the envelope can be fixed by the controls. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed or your

playing volume. In addition, four feedback levels are available. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-80	Depth or intensity of the flanger effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values, feedback level 1 51-60: Fixed depth values, feedback level 2 61-70: Fixed depth values, feedback level 3 71-80: Fixed depth values, feedback level 4
Tweak 2	1-20	The envelope length from 0.1 to 2 seconds

### Effect 45: Triggered Triangle Flanger Effect Static Length

This is a flanger effect in which a single flanger envelope is triggered by your playing. The wave shape is a triangle waveform. The length of the envelope can be fixed by the controls. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed or your playing volume. In addition, four feedback levels are available. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-80	Depth or intensity of the flanger effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values, feedback level 1 51-60: Fixed depth values, feedback level 2 61-70: Fixed depth values, feedback level 3 71-80: Fixed depth values, feedback level 4
Tweak 2	1-20	The envelope length from 0.1 to 2 seconds

## 8 The Filter Effects

Several band-pass sweeping filter effects are available including waveforms with fixed periods along with filter periods that track your playing speed. In addition, single filter envelopes can be triggered each time you play a note. This section describes all of the different filter effects in detail. For each effect, the various control knobs will perform different operations as described below. In all cases, the mix controls how much of the effect is mixed with the dry signal. In all the filter effects, only the left input is filtered and then output to both the left and right channel.

### Effect 46: Sine Filter with Static Period

This is a filter effect with a constant sine wave period. The period value can range from 0.05 to 10 seconds. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed or your playing volume. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	0-19	Course period time in 500mS steps
Tweak 1	1-50	Depth or intensity of the filter effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values
Tweak 2	1-10	Fine period time in 50mS steps

### Effect 47: Exponential Filter with Static Period

This is a filter effect with a constant exponential wave period. The period value can range from 0.05 to 10 seconds. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed or your playing volume. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	0-19	Course period time in 500mS steps
Tweak 1	1-50	Depth or intensity of the filter effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth

		31-40: Louder playing = more depth 41-50: Fixed depth values
Tweak 2	1-10	Fine period time in 50mS steps

### Effect 48: Sine Filter with Period That Depends on Your Playing

This is a filter effect with a sine wave period that depends on your playing. The slower you play, the longer the period, the faster you play, the shorter the period. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed or your playing volume. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-50	Depth or intensity of the filter effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values
Tweak 2	1-20	The filter sweep period controlled by the period between the notes that you play. This number is multiplied by one tenth of the time between the notes that you play. So a value of 1 sets the filter period to be 10 times faster than your playing. A value to 20 sets the filter period to be two times as slow as your playing. A value of 10 matches the period to your playing.

### Effect 49: Exponential Filter with Period That Depends on Your Playing

This is a filter effect with an exponential wave period that depends on your playing. The slower you play, the longer the period, the faster you play, the shorter the period. The depth level controls depth or amplitude of the effect, which can also be controlled by your playing speed or your playing volume. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-50	Depth or intensity of the filter effect 1-10: Slower playing = more depth 11-20: Faster playing = more depth 21-30: Softer playing = more depth 31-40: Louder playing = more depth 41-50: Fixed depth values
Tweak 2	1-20	The filter sweep period controlled by the period between the notes that you play (see effect 48).

## Effect 50: Triggered Exponential Filter Effect Variable Length

This is a filter effect in which a single filter envelope is triggered by your playing. The wave shape is an exponential waveform. The length of the envelope depends on the time between the notes that you play. The depth level controls depth or amplitude of the effect. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	1-10	Depth or intensity of the filter effect
Tweak 2	1-20	Sets the envelope length based on 5% increments of the time between the notes that you play.

## Effect 51: Triggered Ramp Filter Effect Variable Length

This is a filter effect in which a single filter ramp envelope is triggered by your playing. The length of the ramp depends on the time between the notes that you play. The depth level controls depth or amplitude of the effect. After the ramp, the filter value will hold until the note is released. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	1-10	Depth or intensity of the filter effect
Tweak 2	1-20	Sets the ramp time based on 5% increments of the time between the notes that you play.

### Effect 52: Triggered Exponential Filter Effect Static Length

This is a filter effect in which a single filter envelope is triggered by your playing. The wave shape is an exponential waveform. The length of the envelope can be set by the controls. The depth level controls depth or amplitude of the effect. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	1-10	Depth or intensity of the filter effect
Tweak 2	1-20	The envelope length from 0.1 to 2 seconds

### Effect 53: Triggered Ramp Filter Effect Static Length

This is a filter effect in which a single filter ramp envelope is triggered by your playing. The length of the ramp can be set by the controls. The depth level controls depth or amplitude of the effect. After the ramp, the filter value will hold until the note is released. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	1-10	Depth or intensity of the filter effect
Tweak 2	1-20	Ramp length from 0.1 to 2 seconds

## 9 The Pitch Shift Effects

Several pitch shifter effects are available including modulating the pitch with fixed periods along with pitch shift periods that track your playing speed. In addition, single pitch shift envelopes can be triggered each time you play a note to create automatic whammy effects or arpeggio effects. This section describes all of the different pitch shift effects in detail. For each effect, the various control knobs will perform different operations as described below. In all cases, the mix effect controls how much of the effect is mixed with the dry signal. The pitch shift depth can take on any fixed semitone value as listed in the table below.

*Note: The pitch shifter will also pitch shift any hum from your amp so it is best to place FX-Tracker in front of your amp or you should attempt to minimize any input noise.*

Tweak1	Pitch Shift Table
1	Pitch shift of -12 semitones (one octave below)
2	Pitch shift of -11 semitones
3	Pitch shift of -10 semitones
4	Pitch shift of -9 semitones
5	Pitch shift of -8 semitones
6	Pitch shift of -7 semitones
7	Pitch shift of -6 semitones
8	Pitch shift of -5 semitones
9	Pitch shift of -4 semitones
10	Pitch shift of -3 semitones
11	Pitch shift of -2 semitones
12	Pitch shift of -1 semitones
13	Pitch shift of +1 semitones
14	Pitch shift of +2 semitones
15	Pitch shift of +3 semitones
16	Pitch shift of +4 semitones
17	Pitch shift of +5 semitones
18	Pitch shift of +6 semitones
19	Pitch shift of +7 semitones
20	Pitch shift of +8 semitones
21	Pitch shift of +9 semitones
22	Pitch shift of +10 semitones
23	Pitch shift of +11 semitones
24	Pitch shift of +12 semitones (one octave above)

### Effect 54: Sine Pitch Shift with Static Period

This is a pitch shift effect with a constant sine wave period. The period value can range from 0.05 to 10 seconds. The Tweak 1 value controls the maximum pitch shift of the effect. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	0-19	Course period time in 500mS steps
Tweak 1	1-24	Maximum shift (see pitch shift table)
Tweak 2	1-10	Fine period time in 50mS steps

### Effect 55: Square Pitch Shift with Static Period

This is a pitch shift effect with a constant square wave period. The period value can range from 0.05 to 10 seconds. The Tweak 1 value controls the maximum pitch shift of the effect. A Tweak1 value of 0 provides a vibrato effect. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	0-19	Course period time in 500mS steps
Tweak 1	0-24	0: Vibrato effect 1-24: Maximum shift (see pitch shift table)
Tweak 2	1-10	Fine period time in 50mS steps

### Effect 56: Sine Pitch Shift with Period That Depends on Your Playing

This is a pitch shift effect with a sine wave period that depends on your playing. The slower you play, the longer the period, the faster you play, the shorter the period. The Tweak 1 value controls the maximum pitch shift of the effect. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	1-24	Maximum shift (see pitch shift table)

Tweak 2	1-20	The pitch shift period controlled by the period between the notes that you play. This number is multiplied by one tenth of the time between the notes that you play. So a value of 1 sets the period to be 10 times faster than your playing. A value to 20 sets the period to be two times as slow as your playing. A value of 10 matches the period to your playing.
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## Effect 57: Square Pitch Shift with Period That Depends on Your Playing

This is a pitch shift effect with a square wave period that depends on your playing. The slower you play, the longer the period, the faster you play, the shorter the period. The Tweak 1 value controls the maximum pitch shift of the effect. A Tweak1 value of 0 provides a vibrato effect. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	0-24	0: Vibrato effect 1-24: Maximum shift (see pitch shift table)
Tweak 2	1-20	The pitch shift period controlled by the period between the notes that you play (see effect 56).

## Effect 58: Triggered Exponential Pitch Shift Effect Variable Length

This is a pitch shift effect in which a single envelope is triggered by your playing. The wave shape is an exponential waveform. The length of the envelope depends on the time between the notes that you play. The Tweak 1 value controls the maximum pitch shift of the effect. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-24	Maximum shift (see pitch shift table)
Tweak 2	1-20	Sets the envelope length based on 5% increments of the time between the notes that you play.

### Effect 59: Triggered Triangle Pitch Shift Effect Variable Length

This is a pitch shift effect in which a single envelope is triggered by your playing. The wave shape is a triangle waveform. The length of the envelope depends on the time between the notes that you play. The Tweak 1 value controls the maximum pitch shift of the effect. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	1-24	Maximum shift (see pitch shift table)
Tweak 2	1-20	Sets the envelope length based on 5% increments of the time between the notes that you play.

### Effect 60: Triggered Ramp Pitch Shift Effect Variable Length

This is an effect in which a single pitch shift ramp envelope is triggered by your playing. The length of the ramp depends on the time between the notes that you play. The Tweak 1 value controls the maximum pitch shift of the effect. After the ramp, the pitch value will hold until the note is released. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-24	Maximum shift (see pitch shift table)
Tweak 2	1-20	Sets the ramp time based on 5% increments of the time between the notes that you play.

### Effect 61: Triggered Exponential Pitch Shift Effect Static Length

This is a pitch shift effect in which a single envelope is triggered by your playing. The wave shape is an exponential waveform. The length of the envelope can be set by the controls. The Tweak 1 value controls the maximum pitch shift of the effect. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-24	Maximum shift (see pitch shift table)
Tweak 2	1-20	The envelope length from 0.1 to 2 seconds

## Effect 62: Triggered Triangle Pitch Shift Effect Static Length

This is a pitch shift effect in which a single envelope is triggered by your playing. The wave shape is a triangle waveform. The length of the envelope can be set by the controls. The Tweak 1 value controls the maximum pitch shift of the effect. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play.
Tweak 1	1-24	Maximum shift (see pitch shift table)
Tweak 2	1-20	The envelope length from 0.1 to 2 seconds

## Effect 63: Triggered Ramp Pitch Shift Effect Static Length

This is a pitch shift effect in which a single ramp envelope is triggered by your playing. The length of the ramp can be set by the controls. The Tweak 1 value controls the maximum pitch shift of the effect. After the ramp, the pitch value will hold until the note is released. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	1-24	Maximum shift (see pitch shift table)
Tweak 2	1-20	Ramp length from 0.1 to 2 seconds

## Effect 64: Pitch Shift with Slower or Faster Playing

This is a pitch shift effect where if you play slower or faster than the reference delay, the note will be shifted by the number of semitones specified. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	1-24	Number of semitones (see pitch shift table)
Tweak 2	0-20	0 = Always pitch shift 1-10 = Pitch shift when slower than reference delay from 0.1 to 1 seconds 11-20 = Pitch shift when faster than reference delay from 0.1 to 1 seconds

### Effect 65: Pitch Shift with Softer or Louder Playing

This is a pitch shift effect where if you play softer or louder than the reference value, the note will be shifted by the number of semitones specified. The reference value is a value between your minimum and maximum playing volume as determined by FX-Tracker. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	1-24	Number of semitones (see pitch shift table)
Tweak 2	0-20	0 = Always pitch shift 1-10 = Pitch shift when playing softer than this reference value set between your minimum and maximum playing volume 11-20 = Pitch shift when playing louder than this reference value set between your minimum and maximum playing volume

### Effect 66: Arpeggiator Pitch shift

This is an arpeggiator pitch shift effect where the amount of the pitch shift changes with each note or set of notes that you play. You can select from 20 patterns that contain 8 steps each. You can also stay on each pitch shift step from one to ten notes in a row using the Tweak 2 control. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

# FX Tracker Synchronized Effects

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	1-20	Arpeggiator pattern (see table below)
Tweak 2	1-10	Number notes between each change in pitch
	11-20	Number of changes in pitch per note (1-10)

The table below shows default values for the 8 steps in each arpeggiator sequence. You can reprogram these sequences using MIDI CC messages as described in section 11. The various patterns can be selected using the tweak 1 control value. The values in the table are from the pitch shift table.

Tweak 1 Value	Default Pattern Name	Pattern step number							
		1st	2nd	3rd	4th	5 <sup>th</sup>	6th	7th	8th
1	Major chord	16	19	5	8	16	8	5	19
2	Minor chord	15	19	4	8	15	8	4	19
3	Augmented chord	16	20	5	9	16	9	5	20
4	Diminished chord	15	18	4	7	15	7	4	18
5	Major 7 <sup>th</sup> chord	0	16	19	23	1	5	8	12
6	Minor 7 <sup>th</sup> chord	0	15	19	22	1	4	8	11
7	Pentatonic low	1	4	6	8	11	8	6	4
8	Pentatonic high	0	15	17	19	22	19	17	15
9	Major scale low	1	3	5	6	8	10	12	0
10	Major scale high	0	14	16	17	19	21	23	24
11	Minor scale low	1	2	4	6	8	9	11	0
12	Minor scale high	0	13	15	17	19	20	22	24
13	Dorian scale low	1	3	4	6	8	10	11	0
14	Dorian scale high	0	14	15	17	19	21	22	24
15	Lydian scale low	1	3	5	7	8	10	12	0
16	Lydian scale high	0	14	16	18	19	21	23	24
17	Thirds up and down	1	4	0	15	1	4	0	15
18	Fifths up and down	1	6	0	17	1	6	0	17
19	Sevenths up and down	1	8	0	19	1	8	0	19
20	Steps	1	4	6	8	0	15	17	19

## Effect 67: Arpeggiator Pitch Shift with Ramp

This is an arpeggiator pitch shift effect where the amount of the pitch shift changes with each note or set of notes that you play. Each note ramps up to the final pitch value. You can select from several patterns that contain 8 steps each. You can also stay on each pitch shift step from one to ten notes in a row using the Tweak 2 control. Both the left and right channels are treated the same. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	1-20	Arpeggiator pattern (see table above)
Tweak 2	1-10	Number notes between each change in pitch
	11-20	Number of changes in pitch per note (1-10)

## 10 Other Effects

There are several other effects available including an effect that uses a MIDI expression pedal and also delay effects or MIDI output functions that can be added to any other effect. See the details below.

### Effect 68: MIDI Expression Pedal Control of Effect Depth

A MIDI expression pedal (CC= 4 or CC=11) can be used to sweep the depth of several effect parameters. These include the chorus, flanger, filter and pitch shifter. For example, this could be used to create a whammy pedal. See section 11 on MIDI controls for more information. The functions of the three controls are listed in the table below.

Control	Range	Description
Threshold - Time	1-7	Parameter to vary: 1 = Chorus depth 2 = Flanger depth with feedback level 1 3 = Flanger depth with feedback level 2 4 = Flanger depth with feedback level 3 5 = Flanger depth with feedback level 4 6 = Filter depth 7 = Pitch shift
Tweak 1	1-24	Maximum depth of the effect. For Pitch shift (see pitch shift table)
Tweak 2	1-20	Pedal reaction rate. For higher values, the effect reacts slower to pedal movement.

### Effect 69: Adding Delay to Other Effects

You can add an additional delay to any of the other effect including the delay effects that were described in section 4. You can place this delay effect before, after or in parallel with the other effect. You can create delay times that track your playing speed or that are timed to other static effects. You can also set the feedback level of this delay effect to be based on your playing speed or your playing volume. The maximum delay time will be limited to 2 seconds.

The Threshold value controls the type of delay. To add this delay to other effects, you need to first save the parameters that you set as shown in the tables below. These values will then become active for any

other effect. To turn off this delay, set the threshold to 0 and then save. Both the left and right channels are treated the same. When a delay type is selected that matches your playing speed, and the other effect uses the threshold control to set a time value, the internal threshold is locked to a value of 3.

### ***Delay Placed Before Other Effects***

By setting the threshold to values from 1-4, you can place the delay in front of other effects but after the point where notes are recognized. This means that the delay repeats will not trigger things such as envelope effects like the original signal does. When you turn down the mix control of the effect that the delay is in front of, it will also turn down the mix of the delay effect. The delay in this position will not lock to the static delay or period of other effects. For example, this allows you to use a tremolo with a fixed period along with a delay time that matches your playing speed.

### ***Delay Placed After Other Effects***

By setting the threshold to values from 5-8, you can place the delay after other effects in the signal chain. Among other things, this allows FX-Tracker to repeat triggered events such as envelope effects. The mix control does not do anything to the delay when it is in this position, but you can create delay effects where the delay time tracks the other effect fixed delay times or modulation periods. The delay will not track the fixed delays of effects 2, 3, 5 or 6 and will instead track your playing speed.

### ***Delay Placed in Parallel to Other Effects***

By setting the threshold to values from 9-12, you can place the delay in parallel with other effects. Only the delayed signal is heard and the other effect does not modify this delayed signal. The mix control does not do anything to the delay when it is in this position. The delay in this position will not lock to the static delay or period of other effects. For example, this allows you to use a tremolo with a fixed period along with a delay time that matches your playing speed.

### ***Delayed Signal Contains the Effect***

By setting the threshold to values from 13-16, you can place the delay after the other effect but only the delayed signal is modified by the effect. Among other things, this allows FX-Tracker to repeat triggered events such as envelope effects while leaving the original signal unchanged. The mix control does not do anything to the delay when it is in this position, but you can create delay effects where the delay time tracks the other effect fixed delay times or modulation periods. The delay will not track the fixed delays of effects 2, 3, 5 or 6 and will instead track your playing speed.

***Threshold 1: Static Delay with Single Repeat Before Other Effect***

Control	Range	Description
Tweak 1	1-50	Feedback or volume of the delay 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fixed feedback values
Tweak 2	1-20	Delay value from 0.1 to 2 seconds

***Threshold 2: Static Delay with Multiple Repeats Before Other Effect***

Control	Range	Description
Tweak 1	1-50	Feedback or how fast the delays fade away 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fixed feedback values
Tweak 2	1-20	Delay value from 0.1 to 2 seconds

***Threshold 3: Dynamic Delay with Single Repeat Before Other Effect***

Control	Range	Description
Tweak 1	1-50	Feedback or volume of the delay 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fixed feedback values
Tweak 2	1-20	A delay time is measured based on the time between each note that you play. This delay time is divided into 20 intervals. The Tweak 2 control allows you to select which interval to use for this delay (see Effect 7).

***Threshold 4: Dynamic Delay with Multiple Repeats Before Other Effect***

Control	Range	Description
Tweak 1	1-50	Feedback or how fast the delays fade away 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fixed feedback values
Tweak 2	1-20	A delay time is measured based on the time between each note that you play. This delay time is divided into 20 intervals. The Tweak 2 control allows you to select which interval to use for this delay (see Effect 7).

***Threshold 5: Static Delay with Single Repeat After Other Effect***

Control	Range	Description
Tweak 1	1-50	Feedback or volume of the delay 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fixed feedback values
Tweak 2	1-20	Delay value from 0.1 to 2 seconds

***Threshold 6: Static Delay with Multiple Repeats After Other Effect***

Control	Range	Description
Tweak 1	1-50	Feedback or how fast the delays fade away 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fixed feedback values
Tweak 2	1-20	Delay value from 0.1 to 2 seconds

***Threshold 7: Dynamic Delay with Single Repeat After Other Effect***

Control	Range	Description
Tweak 1	1-50	Feedback or volume of the delay 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fixed feedback values
Tweak 2	1-20	When added after dynamic effects, a delay time is measured based on the time between each note that you play. When added after effects that use a fixed delay or period, a delay time is used that tracks the delay or period of the other effect. This delay time is divided into 20 intervals. The Tweak 2 control allows you to select which interval to use for this delay (see Effect 7).

***Threshold 8: Dynamic Delay with Multiple Repeats After Other Effect***

Control	Range	Description
Tweak 1	1-50	Feedback or how fast the delays fade away 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fixed feedback values
Tweak 2	1-20	When added after dynamic effects, a delay time is measured based on the time between each note that you play. When added after effects that use a fixed delay or period, a delay time is used that tracks the delay or period of the other effect. This delay time is divided into 20 intervals. The Tweak 2 control allows you to select which interval to use for this delay (see Effect 7).

***Threshold 9: Static Delay with Single Repeat In Parallel with Other Effect***

Control	Range	Description
Tweak 1	1-50	Feedback or volume of the delay 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fixed feedback values
Tweak 2	1-20	Delay value from 0.1 to 2 seconds

***Threshold 10: Static Delay with Multiple Repeats In Parallel with Other Effect***

Control	Range	Description
Tweak 1	1-50	Feedback or how fast the delays fade away 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fixed feedback values
Tweak 2	1-20	Delay value from 0.1 to 2 seconds

***Threshold 11: Dynamic Delay with Single Repeat In Parallel with Other Effect***

Control	Range	Description
Tweak 1	1-50	Feedback or volume of the delay 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fixed feedback values
Tweak 2	1-20	A delay time is measured based on the time between each note that you play. This delay time is divided into 20 intervals. The Tweak 2 control allows you to select which interval to use for this delay (see Effect 7).

***Threshold 12: Dynamic Delay with Multiple Repeats In Parallel with Other Effect***

Control	Range	Description
Tweak 1	1-50	Feedback or how fast the delays fade away 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fixed feedback values
Tweak 2	1-20	A delay time is measured based on the time between each note that you play. This delay time is divided into 20 intervals. The Tweak 2 control allows you to select which interval to use for this delay (see Effect 7).

***Threshold 13: Static Delay with Single Repeat - Delayed Signal Contains Effect***

Control	Range	Description
Tweak 1	1-50	Feedback or volume of the delay 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fixed feedback values
Tweak 2	1-20	Delay value from 0.1 to 2 seconds

***Threshold 14: Static Delay with Multiple Repeats - Delayed Signal Contains Effect***

Control	Range	Description
Tweak 1	1-50	Feedback or how fast the delays fade away 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fixed feedback values
Tweak 2	1-20	Delay value from 0.1 to 2 seconds

***Threshold 15: Dynamic Delay with Single Repeat - Delayed Signal Contains Effect***

Control	Range	Description
Tweak 1	1-50	Feedback or volume of the delay 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fixed feedback values
Tweak 2	1-20	When added after dynamic effects, a delay time is measured based on the time between each note that you play. When added after effects that use a fixed delay or period, a delay time is used that tracks the delay or period of the other effect. This delay time is divided into 20 intervals. The Tweak 2 control allows you to select which interval to use for this delay (see Effect 7).

***Threshold 16: Dynamic Delay with Multiple Repeats - Delayed Signal Contains Effect***

Control	Range	Description
Tweak 1	1-50	Feedback or how fast the delays fade away 1-10: Slower playing = more feedback 11-20: Faster playing = more feedback 21-30: Softer playing = more feedback 31-40: Louder playing = more feedback 41-50: Fixed feedback values
Tweak 2	1-20	When added after dynamic effects, a delay time is measured based on the time between each note that you play. When added after effects that use a fixed delay or period, a delay time is used that tracks the delay or period of the other effect. This delay time is divided into 20 intervals. The Tweak 2 control allows you to select which interval to use for this delay (see Effect 7).

To save an effect with added delay:

- 1) Set the effect number to 69 and set the delay parameters as desired (above).
- 2) Save to the desired preset number.
- 3) Set the effect number to effect 1-68 where you want to add delay.
- 4) Set the effect parameters as desired.
- 5) Save to the same preset number.

Now when you recall this preset number, it will include a basic effect plus a layered delay effect.

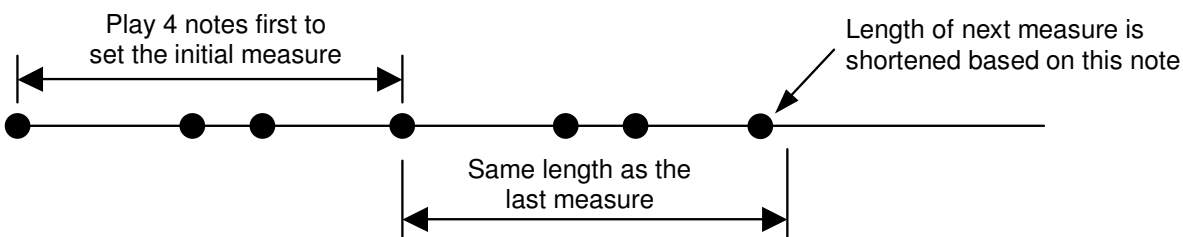
## Effect 70: Adding MIDI Output to Other Effect

You can synchronize an external MIDI drum machine to your playing, or you can output the amplitude or timing of your playing as MIDI CC messages. You can also use the notes you play as a MIDI output clock message. To do this, you need to save the MIDI clock parameters as shown in the tables below. These values will then become active for all other effects. The Threshold controls the type of MIDI output. To turn off the MIDI output, set the Threshold value to 0 and then save. The functions of the three controls are listed in the tables below.

### *Threshold 1: Output MIDI Clocks to a MIDI Drum Machine*

Control	Range	Description
Tweak 1	1-20	Number of quarter notes per measure
Tweak 2	1-20	The number of notes that you will play per measure. For each measure, the measure length will change to adjust to you playing speed.

In the example shown below, Tweak 2 is set to 3. Four notes after you press the footswitch, the measure length is set and the drum machine will start playing. After three more notes are played, the new measure length is compared to the last measure. If it is shorter, the new MIDI timing is reduced by up to 0.2 seconds. If it is longer, the new MIDI timing is increased by up to 0.4 seconds. This process continues until you press the footswitch at which point the drum machine will stop.



***Threshold 2: Output MIDI Clocks and MIDI CC Values that Reflect Playing Speed***

Control	Range	Description
Tweak 1	1-99	MIDI CC number to output with each MIDI CC message.
Tweak 2	1-10 11-20	Slower playing produces higher MIDI values Faster playing produces higher MIDI values

Each time a note is played, two MIDI values are output; a MIDI clock message and a MIDI CC message with a value proportional to the speed of your playing. The range of this value can be adjusted using Tweak 2 in multiples of 200mS. For example, if you set it to 10, your playing speed must range between 0 and 2 seconds to get a full range MIDI output (0-127). If you set this value to 5, your playing must range between 0 and 1 second to get a full MIDI output range. Playing slower than this time will give a MIDI output value of 0. The MIDI output values will change in a smooth manner to avoid sudden tone changes in the external MIDI device. Changing the value of Tweak 1 allows you to select which CC number is used in the output.

***Threshold 3: Output MIDI Clocks and MIDI CC Values that Reflect Playing Volume***

Control	Range	Description
Tweak 1	1-99	MIDI CC number to output with each MIDI CC message.
Tweak 2	1-10 11-20	Softer playing produces a higher MIDI values Louder playing produces a higher MIDI values

Each time a note is played, two MIDI values are output; a MIDI clock message and a MIDI CC message with a value proportional to the volume of your playing. The range of this value can be adjusted using

Tweak 2. For example, a value of 10 gives a full range based on your playing volume (0-127). A value of 5 gives a range from 0-63 based on your playing volume. The MIDI output values will change in a smooth manner to avoid sudden tone changes in the external MIDI device. Changing the value of Tweak 1 allows you to select which CC number is used in the output.

To save an effect with a MIDI output:

- 1) Set the effect number to 70 and set the MIDI clock parameters
- 2) Save to the desired preset number.
- 3) Set the effect number to effect 1-68 where you want to add MIDI output.
- 4) Set the effect parameters as desired.
- 5) Save to the same preset number.

Now when you recall this preset, it will include a basic effect plus output MIDI messages. This can also be combined with layered delay (effect 69). When a MIDI outputs are combined with another effect that uses the Threshold as a course time control, the internal threshold is locked to a value of 3.

## 11 MIDI Output Effects

If you activate MIDI CC outputs by using effect 70 above, you can combine this with effects 71-87 to allow better control of external MIDI devices such as amp modelers or synthesizers. These effects do not modify the audio signal like effects 1-68, but you can add a delay to the signal using effect 69 which was described above.

To use these effects, first set up effect 70 using a Threshold value of 2 or 3 and save it to the desired preset location. This sets up the basic MIDI CC output that can be used with any effect. Now if you want more control over the MIDI CC output, switch to effect 71-87, set the parameters listed below and save it to the same preset location. If you want to add a delay effect to this preset, switch to effect 69, set up the delay parameters and save it to the same preset number.

### Effect 71: MIDI Output That Matches Your Playing Speed or Volume

This is a MIDI output where the MIDI CC value depends on your playing speed or your playing volume. This provides additional control over effect 70 which was described above. The functions of the controls are listed in the table below.

Control	Range	Description
Mix	1-20	Controls how fast the MIDI outputs react to your playing.
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	0-63	Maximum MIDI CC value (0-126). This value cannot be set less than Tweak 2 plus 1.
Tweak 2	0-63	Minimum MIDI CC value (0-126)

### Effect 72: Sine MIDI Output with a Fixed Period

This is a MIDI output effect with a sine wave period that set by the controls. It does not react to your playing. The functions of the controls are listed in the table below.

Control	Range	Description
Mix	Not used	
Threshold - Time	1-20	The period from 0.05 to 3.0 seconds
Tweak 1	0-63	Maximum MIDI CC value (0-126)
Tweak 2	0-63	Minimum MIDI CC value (0-126)

### Effect 73: Triangle MIDI Output with a Fixed Period

This is a MIDI output effect with a triangle wave period that set by the controls. It does not react to your playing. The functions of the controls are listed in the table below.

Control	Range	Description
Mix	Not Used	
Threshold - Time	1-20	The period from 0.05 to 3.0 seconds
Tweak 1	0-63	Maximum MIDI CC value (0-126)
Tweak 2	0-63	Minimum MIDI CC value (0-126)

### Effect 74: Square MIDI Output with a Fixed Period

This is a MIDI output effect with a square wave period that set by the controls. It does not react to your playing. The functions of the controls are listed in the table below.

Control	Range	Description
Mix	Not Used	
Threshold - Time	1-20	The period from 0.05 to 3.0 seconds
Tweak 1	0-63	Maximum MIDI CC value (0-126)
Tweak 2	0-63	Minimum MIDI CC value (0-126)

### Effect 75: Sine MIDI Output with Period That Depends on Your Playing

This is a MIDI output effect with a sine wave period that depends on your playing. The slower you play, the longer the period, the faster you play, the shorter the period. The functions of the controls are listed in the table below.

Control	Range	Description
Mix	1-20	The period is controlled by the time between the notes that you play. This number is multiplied by one tenth of the time between the notes that you play. So a value of 1 sets the period to be 10 times faster than your playing. A value to 20 sets the period to be two times as slow as your playing. A value of 10 matches the period to your playing.
Threshold - Time	1-20	Determines the sensitivity to the notes you play

Tweak 1	0-63	Maximum MIDI CC value (0-126)
Tweak 2	0-63	Minimum MIDI CC value (0-126)

### Effect 76: Triangle MIDI Output with Period That Depends on Your Playing

This is a MIDI output effect with a triangle wave period that depends on your playing. The slower you play, the longer the period, the faster you play, the shorter the period. The functions of the controls are listed in the table below.

Control	Range	Description
Mix	1-20	See effect 75.
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	0-63	Maximum MIDI CC value (0-126)
Tweak 2	0-63	Minimum MIDI CC value (0-126)

### Effect 77: Square MIDI Output with Period That Depends on Your Playing

This is a MIDI output effect with a square wave period that depends on your playing. The slower you play, the longer the period, the faster you play, the shorter the period. The functions of the controls are listed in the table below.

Control	Range	Description
Mix	1-20	See effect 75.
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	0-63	Maximum MIDI CC value (0-126)
Tweak 2	0-63	Minimum MIDI CC value (0-126)

### Effect 78: Triggered Triangle MIDI Envelope with Variable Length

This is a MIDI output effect in which a single envelope is triggered by your playing. The wave shape is a triangle waveform. The length of the envelope depends on the time between the notes that you play. The functions of the controls are listed in the table below.

Control	Range	Description
Mix	1-20	Sets the envelope length based on 5% increments of the time between the notes that you play.
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	0-63	Initial MIDI CC value (0-126)
Tweak 2	0-63	Peak or valley MIDI CC value (0-126)

### Effect 79: Triggered Exponential MIDI Envelope with Variable Length

This is a MIDI output effect in which a single envelope is triggered by your playing. The wave shape is an exponential waveform. The length of the envelope depends on the time between the notes that you play. The functions of the controls are listed in the table below.

Control	Range	Description
Mix	1-20	Sets the envelope length based on 5% increments of the time between the notes that you play.
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	0-63	Initial MIDI CC value (0-126)
Tweak 2	0-63	Peak or valley MIDI CC value (0-126)

### Effect 80: Triggered Ramp MIDI Envelope with Variable Length

This is a MIDI output effect in which a single ramp envelope is triggered by your playing. The length of the ramp depends on the time between the notes that you play. The functions of the controls are listed in the table below.

Control	Range	Description
Mix	1-20	Sets the envelope length based on 5% increments of the time between the notes that you play.
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	0-63	Peak or valley MIDI CC value (0-126)
Tweak 2	0-63	Initial MIDI CC value (0-126)

### Effect 81: Triggered Triangle MIDI Output with Static Length

This is a MIDI output effect in which a single triangle envelope is triggered by your playing. The length of the envelope can be set by the controls. The functions of the controls are listed in the table below.

Control	Range	Description
Mix	1-20	Period length from 0.1 to 2.0 seconds.
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	0-63	Peak or valley MIDI CC value (0-126)
Tweak 2	0-63	Initial MIDI CC value (0-126)

### Effect 82: Triggered Exponential MIDI Output with Static Length

This is a MIDI output effect in which a single exponential envelope is triggered by your playing. The length of the envelope can be set by the controls. The functions of the controls are listed in the table below.

Control	Range	Description
Mix	1-20	Period length from 0.1 to 2.0 seconds.
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	0-63	Peak or valley MIDI CC value (0-126)
Tweak 2	0-63	Initial MIDI CC value (0-126)

### Effect 83: Triggered Ramp MIDI Output with Static Length

This is a MIDI output effect in which a single ramp envelope is triggered by your playing. The length of the ramp can be set by the controls. The functions of the controls are listed in the table below.

Control	Range	Description
Mix	1-20	Period length from 0.1 to 2.0 seconds.
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	0-63	Peak or valley MIDI CC value (0-126)
Tweak 2	0-63	Initial MIDI CC value (0-126)

## Effect 84: Arpeggiator MIDI Output

This is an arpeggiator MIDI output effect where the MIDI CC value changes based on the period set by the controls. You can select from 20 patterns that contain 8 steps each. The functions of the controls are listed in the table below.

Control	Range	Description
Mix	1-20	Arpeggiator pattern
Threshold - Time	1-20	The period between steps from 0.05 to 3.0 seconds
Tweak 1	0-63	Maximum MIDI CC value (0-126)
Tweak 2	0-63	Minimum MIDI CC value (0-126)

## Effect 85: Arpeggiator MIDI Output with Ramp

This is an arpeggiator MIDI output effect where the MIDI CC value changes based on the period set by the controls. Each note ramps up to the final MIDI CC value. You can select from 20 patterns that contain 8 steps each. The functions of the controls are listed in the table below.

Control	Range	Description
Mix	1-20	Arpeggiator pattern
Threshold - Time	1-20	The period between steps from 0.05 to 3.0 seconds
Tweak 1	0-63	Maximum MIDI CC value (0-126)
Tweak 2	0-63	Initial MIDI CC value (0-126)

## Effect 86: Triggered Arpeggiator MIDI Output

This is an arpeggiator MIDI output effect where the MIDI CC value changes with each note that you play. You can select from 20 patterns that contain 8 steps each. The functions of the controls are listed in the table below.

Control	Range	Description
Mix	1-20	Arpeggiator pattern
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	0-63	Maximum MIDI CC value (0-126)
Tweak 2	0-63	Minimum MIDI CC value (0-126)

### Effect 87: Triggered Arpeggiator MIDI Output with Ramp

This is an arpeggiator MIDI output effect where MIDI CC value changes with each note that you play. Each note ramps up to the final MIDI CC value. You can select from 20 patterns that contain 8 steps each. The functions of the controls are listed in the table below.

Control	Range	Description
Mix	1-20	Arpeggiator pattern
Threshold - Time	1-20	Determines the sensitivity to the notes you play
Tweak 1	0-63	Maximum MIDI CC value (0-126)
Tweak 2	0-63	Initial MIDI CC value (0-126)

## **12 Using MIDI**

FX-Tracker recognizes MIDI program change (PC) messages and MIDI continuous controller (CC) messages. It can output MIDI clock messages and MIDI CC messages. You can also backup and restore all of your presets and arpeggio patterns using MIDI sysex files. This section describes how to use these MIDI features.

### **Setting the MIDI Channel**

The MIDI input will only recognize MIDI commands that contain the correct MIDI channel number. When using FX-Tracker to output MIDI CC messages, it also uses this MIDI channel number. To set the MIDI channel number, move the right selector switch to 'Headphone Volume / MIDI Channel', press the right control knob so that the right LED is flashing and adjust the right control knob. The MIDI channel number can range from 1 to 16. Make sure this channel number matches the channel number that your MIDI footswitch, controller or drum machine is programmed to.

For received MIDI CC messages, MIDI channels 1-8 on FX-Tracker will be controlled by one MIDI channel higher on your MIDI footswitch or controller. For example, set the controller to MIDI channel 3 and FX-Tracker to MIDI channel 2 to receive CC messages. Or set the controller to MIDI channel 2 and FX-Tracker to MIDI channel 2 to receive PC messages. The reason for this is because you may want to use an effects floorboard to change your preset numbers with PC messages but not to change other parameters in FX-Tracker with CC messages. For MIDI channels 9-16, FX-Tracker will be controlled by the same MIDI channel as your MIDI footswitch or controller for both CC and PC messages. MIDI output CC messages always use the MIDI channel number directly.

To dump or receive MIDI sysex preset data or to change the display brightness, set the MIDI channel number to 0. MIDI channel 0 should not be used during normal operation as it can add audio artifacts to the signal.

### **MIDI In and MIDI Out/Thru**

There are two MIDI connectors on the back of the device. MIDI signals are captured by the MIDI In port and passed directly to the MIDI Out/Thru port. This allows you to place FX-Tracker in series with other MIDI devices in a daisy chain fashion. For example, if FX-Tracker is set to MIDI channel 10 and the MIDI Thru port is connected to a device using MIDI channel 12, all messages sent to FX-Tracker using MIDI channel 12 will simply pass through the FX-Tracker and will be passed on to the other device. All messages using MIDI channel 10 will control FX-Tracker and will do nothing to the other device.

## Program Change Messages

Program Change messages can be used to change the FX-Tracker preset number. For example, you can use the output of a MIDI effects pedal or floorboard to change the preset number on FX-Tracker at the same time it changes the preset number of other MIDI devices.

## Continuous Controller Input Messages

MIDI CC messages can be used to change almost any parameter in FX-Tracker. The CC numbers for these parameters are listed below. The output volume and expression pedal can only be controlled using MIDI CC values. The output volume, expression pedal, feedback/depth control and the mix control are all designed to be used with a MIDI expression pedal. The rest of the parameters should not be controlled by an expression pedal because this could cause audio glitches if changed rapidly.

<b>Parameter</b>	<b>CC Number</b>	<b>Value</b>
Output Volume	CC = 07	Value = 0-127 (MIDI only. 127 = default value)
Expression Pedal	CC = 04 or 11	Value = 0-127 (MIDI only, 127 = default value)
Feedback/Depth	CC = 12	Value = 1-127 (MIDI only, overrides Tweak1)
Mix value	CC = 13	Value = 0-20
Input Level	CC = 14	Value = 0-99 (Do not use as a volume pedal)
Effect Type	CC = 15	Value = 0-70
Threshold - Time	CC = 16	Value = 0-20 (Depends on effect type)
Tweak1	CC = 17	Value = 0-99 (Depends on effect type)
Tweak2	CC = 18	Value = 0-20 (Depends on effect type)
Delay	CC = 19	Value = 0 Layered delay off 1-20 (Static delay) 101-120 (Dynamic delay)
Feedback	CC = 20	Value = 1-50 (Multiple repeats) 51-100 (Single repeat)
Layer Delay Routing	CC = 21	Value = 1 before effect 2 after effect 3 in parallel, no dry delay 4 only delayed signal contains effect
Notes	CC = 22	Value = 0 MIDI output off 1-99 (See effect 70)
Window	CC = 23	Value = 1-20 (Output MIDI clocks) 21-40 (Output your playing speed) 41-60 (Output your playing volume)
Toggle On/Off	CC = 24	Value = 1

## Using a MIDI Expression Pedal

A MIDI expression pedal can be used to control various FX-Tracker parameters. Effect 68 allows you to manually sweep the chorus, flanger or filter depth. You can also use this effect number to create a whammy pedal. For all effects, you can control the output volume using MIDI CC number 7, the effect depth/feedback using MIDI CC number 12, or the effect mix using MIDI CC number 13.

To override the delay feedback or the chorus, flanger or filter depth level, use MIDI CC number 12. If this value is set to zero (the default value), Tweak 1 will set these parameters. If a CC value is received between 1 and 127, the MIDI input will control these parameters. This value can be reset to zero by changing the effect number, the preset number, or by pressing the footswitch off and on.

## Programming an Arpeggio Pattern

You can change the default arpeggio patterns using MIDI CC messages. The following three messages are used:

Arpeggio Pattern Number	CC = 85	Value = 1-20
Arpeggio Step Number	CC = 86	Value = 1-8
Arpeggio Note Value	CC = 87	Value = 0-24 (see pitch shift table)

The MIDI CC = 85 message can be used to set the arpeggio pattern that you want to modify. There are 20 different patterns stored in FX-Tracker. The MIDI CC = 86 message can be used to select one of the arpeggio steps within a pattern. There are 8 steps within each pattern. Once you have set these two values, you can use the MIDI CC = 87 message to set a note value at that location (see the pitch shift table). A value of 0 means no pitch shift at that location.

## Sending MIDI Data

Several MIDI output signals can be generated based on your playing. You can send MIDI clock messages to an external drum machine, which will adjust the drum machine tempo to your playing. You can output MIDI CC values that match your playing speed or playing volume using effect 71. You can also output MIDI CC waveforms, envelopes or arpeggio patterns using effects 72-87. See Effects 71 thru 87 for more information.

## Saving and Restoring Preset Data

All preset data and arpeggio patterns can be saved using MIDI sysex files. To dump a MIDI sysex file containing this data, set the MIDI channel to 0 and press the left control knob. Make sure the left switch is not set to Input Level as this is used to set the global input level for all patches. The resulting file

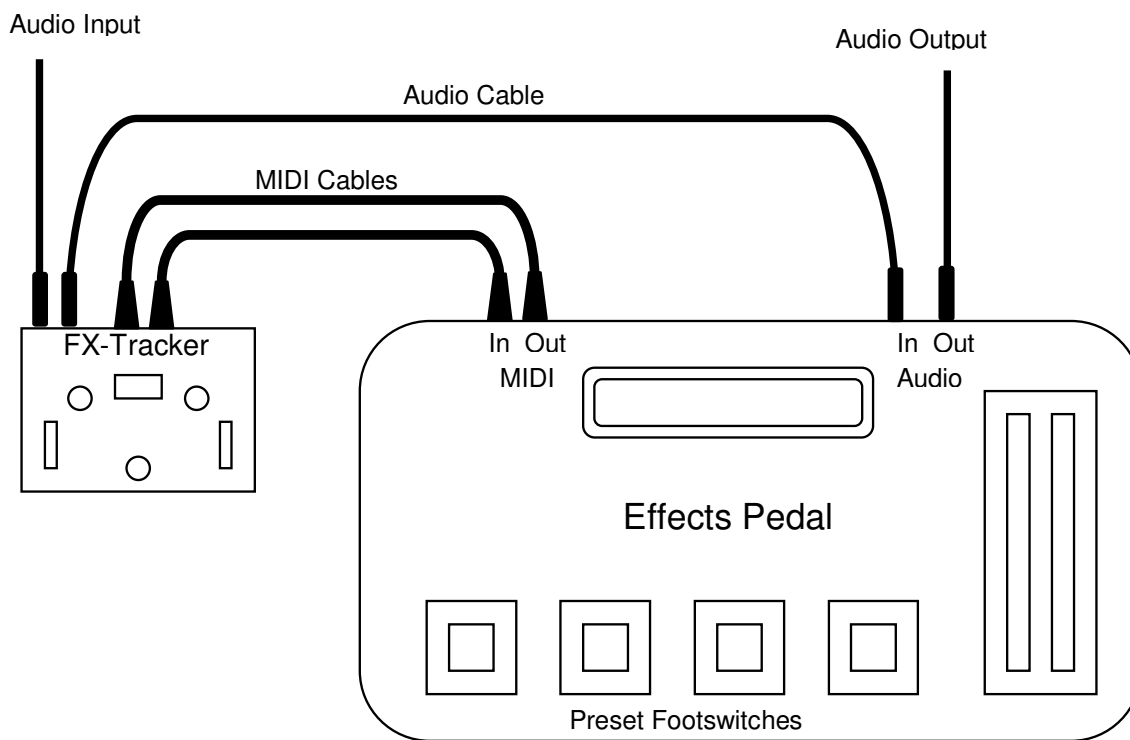
should be 1168 bytes in length. To restore all presets and arpeggio patterns, set the MIDI channel to 0 and send the sysex file to FX-Tracker. The display will cycle through all 100 presets and 20 arpeggio patterns as they are being restored. MIDI channel 0 should not be used during normal operation as it can add audio artifacts to the signal.

*Note: Do not send MIDI data to the unit while dumping a sysex file. It is best to unplug the MIDI input cable while performing a MIDI sysex dump.*

## Appendix A: Application Examples

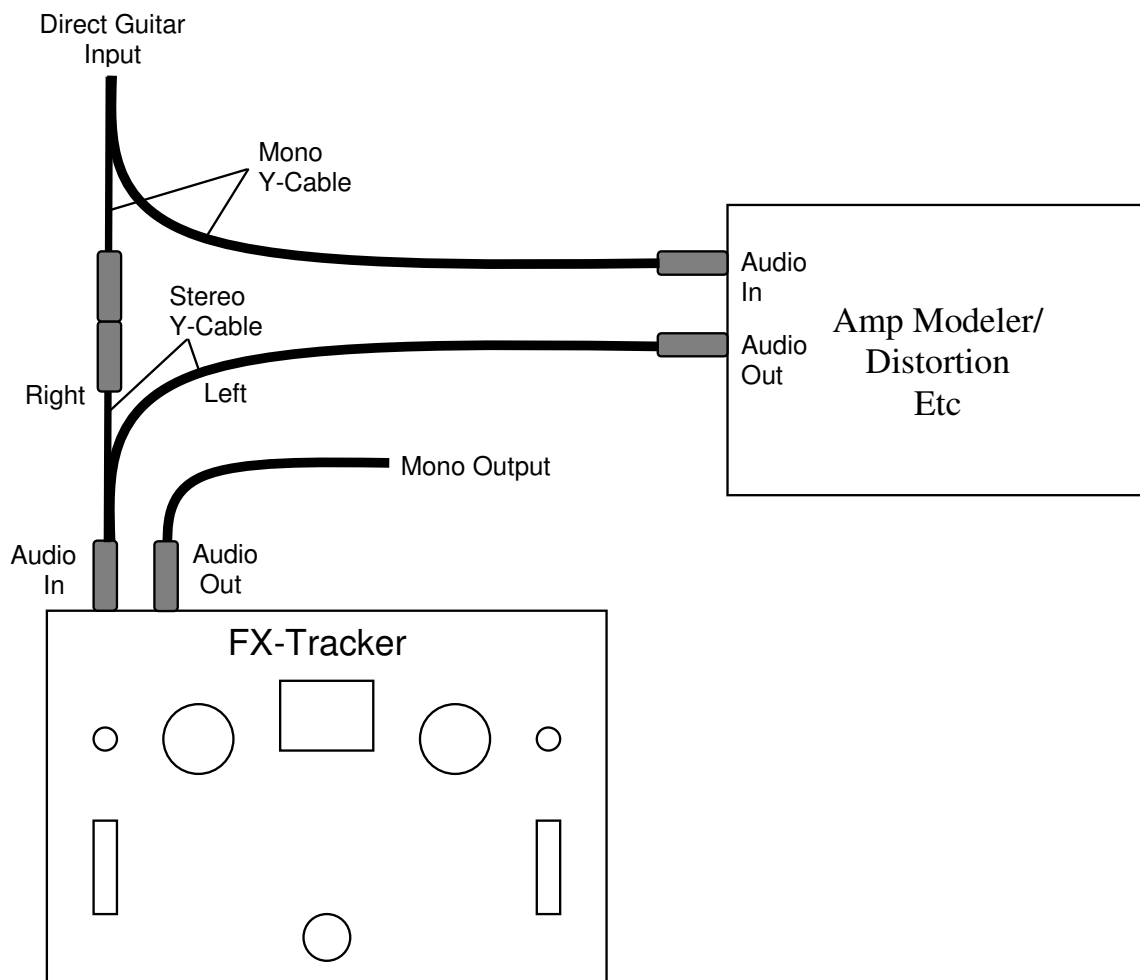
### Using FX-Tracker with a Stereo Effects Pedal

There are several stereo effects pedals available on the market today. Many of these effects pedals have MIDI outputs that send a MIDI program change message when a new preset is selected. They also have MIDI inputs that can be used to control a variety of effect parameters. FX-Tracker can be connected to these pedals as shown in the figure below. The MIDI output from the effects pedal is sent to the MIDI input of FX-Tracker to change the presets when the MIDI pedal presets are changed. The MIDI output of FX-Tracker is sent to the MIDI input of the effects pedal to control parameters such as the amp model drive based on your playing speed or playing volume (see effects 71-87).



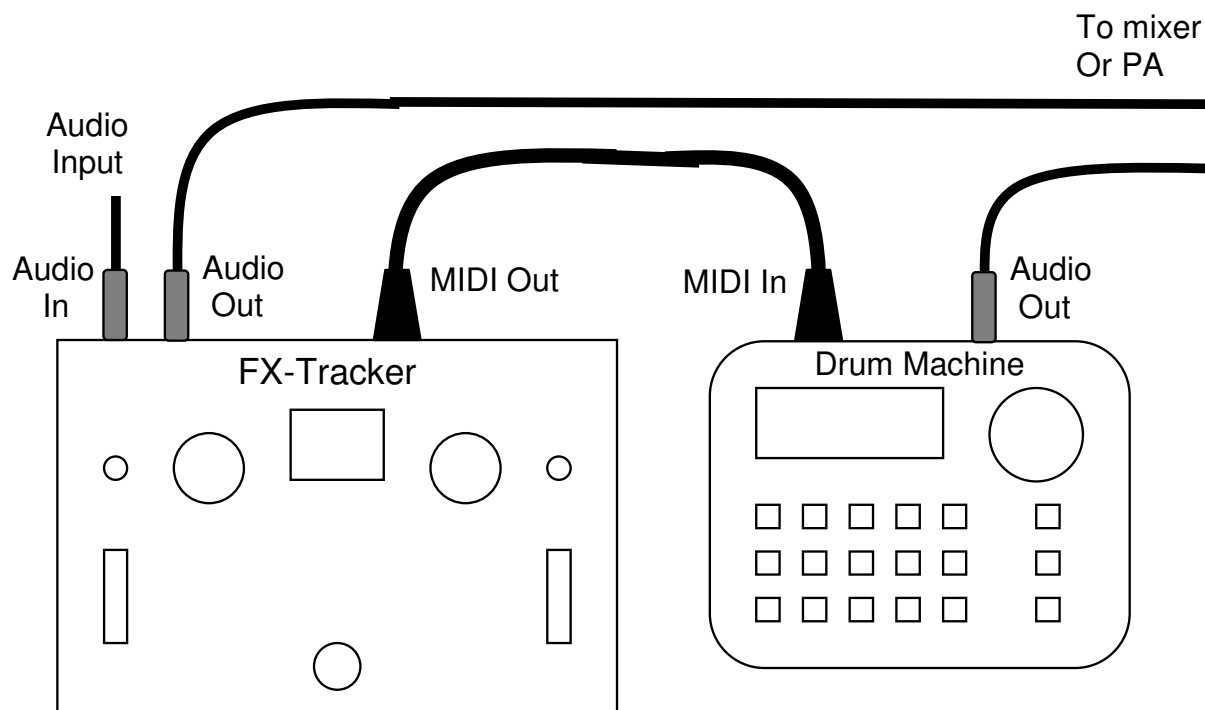
## Using FX-Tracker at the End of the Audio Chain

You can place FX-Tracker after high gain effects as shown in the figure below. In this setup, the right audio input is clean allowing FX-Tracker to identify the notes that you play, while the left input and mono output contain the audio path that is processed by the amp modeler or distortion unit.



## Synchronizing an External Drum Machine to FX-Tracker

You can greatly enhance your practicing experience by synchronizing a drum machine to your playing using FX-Tracker as shown in the figure below. To do this, connect the MIDI output from FX-Tracker to the MIDI input on the drum machine and use effect number 70 with the threshold set to 1. The Tweak 1 parameter should equal to the number of quarter notes within each measure that you play. The Tweak 2 parameter should equal the number of notes that you plan to play per measure. After you press the footswitch to activate the unit and play the first measure, FX-Tracker starts to send MIDI clocks to the drum machine, which synchronizes the drum machine to your playing. As you play, FX-Tracker monitors the note that you play during each measure and adjusts the drum machine timing accordingly. Turn off the drum machine by pressing the footswitch again to deactivate the FX-Tracker.



## Warranty Information

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