COOPER FX: OUTWARD

*****************NOTE!!!! Very important. The EXP jack can only take CV signals up to +5v. FIVE VOLTS ONLY. Any higher than this will destroy the pedal. Additionally, you must use a STEREO jack for CV, sending the CV through the tip of the jack, and ground through the sleeve. Again, using a mono jack will damage the pedal. Either of these actions will void the warranty and will require a $50 service fee******************

The Outward is a digital sampling device that records audio and plays it back in different ways, depending on the mode. With freezing, stutter, and time stretching effects, there's a lot the Outward is capable of.

CLOCK: Adjusts the speed at which the DSP chip runs, ranging from 10kHz (CCW) to 60 kHz (CW). When CCW, the sampling time will be extended, but will be noisier and of lower audio quality.

CLOCK ALT: Snaps the clock to fifths and octaves. Turn the alt control all the way CCW to have no quantization, turn past noon to enable the clock to snap to fifths and octaves.

TONE: Low pass filter control, useful for cutting down on noise resulting from decreasing the CLOCK control, and in taming the harshness of the digital signal. **CANNOT BE SAVED TO A PRESET

MIX: Balance between the dry and wet volumes. **CANNOT BE SAVED TO A PRESET

VOL: Volume of the wet signal. **CANNOT BE SAVED TO A PRESET

FRZ|TAP: Can be used to lock the recorded sample into the buffer, preventing it from being overwritten, as well as being used to tap in a tempo. Note, the tap control does not apply to every mode. To initiate tap, press the footswitch at least twice. To override the tap control, simply adjust the knob the tap control is affecting (ie, to turn off tap on SPD but not the SIZE, turn the SPD knob and not the SIZE knob).

The FRZ function is both latching and momentary. If you do a quick press on the button, the FRZ will be latching. Hold the footswitch (>1/2 second) and you will have the FRZ control be momentary.

**A note on tap tempo visualization: The top pushbutton/led will indicate the LFO tempo, the bottom pushbutton/led will blink in time with the SIZE tempo. These will only flash if the tap tempo is assigned to a parameter (ie, if the bottom led is flashing, then you are seeing the SIZE value you tapped in. If the top led is flashing, then you are seeing the LFO speed you tapped in. If one or both of the LEDs are not flashing, then tap tempo is not applied to the specified control)

BYPASS: Relay true bypass control. Can either be momentary or latching, depending on how long the switch is held. Hold for >1/2 second to use it as momentary. Tap it quickly to have the control be latching.

PRST BUTTON: quickly press to scroll up through modes. Preset selection/loading will be entered by holding the button until the push buttons begin to blink in unison.

ALT BUTTON: quickly press to scroll down through the modes. To enter the alt control mode, hold the alt button, wait for the corresponding mode LED to begin flashing, then adjust desired knob's secondary control.

PRESETS: The Outward has four onboard presets. Enter preset selection/save mode by holding the PRST button until both buttons are blinking in unison. Scroll up/down preset slots (indicated by the three smaller LED's) using

the pushbuttons. When on the desired preset you can either LOAD what you have saved in the selected slot by holding the FRZ footswitch. You can alternatively SAVE to the selected preset slot by holding down the BYPASS footswitch. Mix, Tone, and Volume settings will not be saved into the preset slot.

NOTE that there are no presets saved on the Outward when initially shipped. All presets will be user created

EXP/CV: Assign expression or CV to any of the digital controls (SPD|SNS, SIZE, PIT|DIR, CLOCK) by doing the following:

-Insert EXP or CV

- with the EXP at heel down or CV at a minimum, set the minimum value of the exp/cv sweep using the knobs.
- With EXP at toe down or CV at a maximum, set the maximum value of the exp/cv sweep again using the desired knob.
- EX: desire to control SPD with expression (useful in MANUAL direction in Time-Stretch B)
    - Insert expression pedal
    - With your Heel down, set the knob at the desired position.
    - With toe down, select the knob to the desired toe position
    - Now the exp is assigned to the SPD knob and will scroll through the buffer with start and end points dictated by the heel down and toe down positions.

**EXP VALUES CANNOT BE SAVED TO A PRESET

WARRANTY

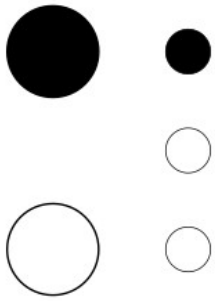
Lifetime warranty for all manufacturer errors. If it is my fault, I will fix it. This **can** be voided by doing things such as but not limited to: plugging in 18v, inserting more than +5v on the expression/cv jack, using a mono cable in the exp/cv jack, etc. Otherwise I will likely fix it for free.

Questions, comments, concerns: tom@cooperfx.com

Thank you!!!

Condensed Control Guide:

		SPD | SNS		SIZE		PIT | DIR	
	MODE	***PRIMARY***	***ALTERNATE***	***PRIMARY***	***ALTERNATE***	***PRIMARY***	***ALTERNATE***
1	Smooth Env	Sensitivity	Input Attenuation	Smearing	N/A	(+/-) Oct Blend	Pitch LFO Speed
2	Smooth LFO	LFO Speed	LFO Mult				
3	Freeze	Digital Mix	N/A				
4	Choppy Env	Sensitivity	Input Attenuation	Buffer Size	Size Mult		
5	Choppy LFO	LFO Speed	LFO Mult				
6	Stutter	Digital Mix	Tap Tempo Disable				
7	Time Stretch A	TS Speed	N/A	Grain Size	Size Rand Prob	Dir: Fwd, Rev, Ping Pong	Randomization Speed
8	Time Stretch B	TS Speed or Position	Position Rand Probability			Dir: Fwd Rand, Rand Ping Pong, Manual	



MODE 1: SMOOTH ENVELOPE

In this mode your input signal is tracked by an envelope detector. When your audio exceeds a specified threshold, it will be locked into a buffer and “frozen” until the envelope is triggered again.

CONTROLS:

SPD|SNS

PRIMARY: Sensitivity of envelope detector. CCW, least sensitive, CW envelope easily triggered

ALTERNATE: Sensitivity attenuation, lowers the volume coming into the envelope detector. Useful for quieting loud incoming signals going into the envelope without changing the output volume of the effect.

SIZE

PRIMARY: Adjusts the ‘smearing’ of the audio. CCW the audio will be made of distinct chunks of sound. As you increase the control, the chunks of sound will blend together and become more smoothed out almost sounding like a reverb.

ALTERNATE: N/A

PIT|DIR

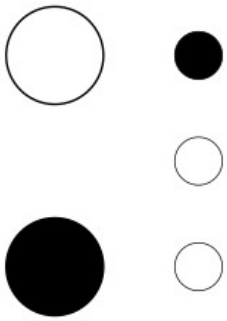
PRIMARY: Sets the balance of dry signal and octave signal. With this control at 12:00, there will be no octave effect. As you turn it CCW, you blend in a lower octave. Turning the control CW will introduce an upper octave.

ALTERNATE: SEE NOTE

FRZ|TAP

FRZ**:** Prevent the input signal from triggering the envelope detector, effectively looping the sample indefinitely.

TAP: Not available.



MODE 2: SMOOTH LFO

Imagine a pedal that “freezes” your audio. To trigger the “freezing” effect you normally have to stomp on a footswitch. This mode is similar, but instead of pressing a footswitch, a square wave LFO automates that “freezing” process.

CONTROLS:

SPD|SNS

PRIMARY: Sets the speed of the LFO

ALTERNATE: Sets the multiplier of the LFO speed, when the tap tempo function is enabled. (CCW x4, x3, x2, x1.5, x1 CW)

SIZE

PRIMARY: Adjusts the ‘smearing’ of the audio. CCW the audio will be made of distinct chunks of sound. As you increase the control, the chunks of sound will blend together and become more smoothed out almost sounding like a reverb.

ALTERNATE: N/A

PIT|DIR

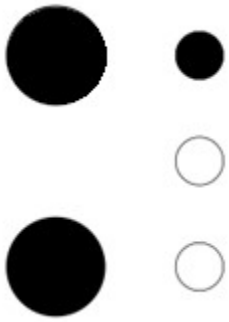
PRIMARY: Sets the balance of dry signal and octave signal. With this control at 12:00, there will be no octave effect. As you turn it CCW, you blend in a lower octave. Turning the control CW will introduce an upper octave.

ALTERNATE: SEE NOTE

FRZ|TAP

FRZ**:** Stop the LFO, effectively looping the sample indefinitely.

TAP: Available only to set the speed of the LFO



MODE 3: FREEZE

This is your typical “freeze” effect, with the additional functionality of the previous two modes. Stomp on the FRZ footswitch to playback the frozen chunk of sound.

CONTROLS:

SPD|SNS

PRIMARY: Digital mix control. There is some slight latency with the digital processor, especially with lower clock speeds. Because of this, your dry signal has an identical copy of itself delayed by a tiny amount; as a result, you get some unpleasant tones when using the MIX knob to bring in the dry signal. The SPD|SNS knob becomes useful as a mix control and eliminates the problems resulting from the slight latency.

ALTERNATE: N/A

SIZE

PRIMARY: Adjusts the ‘smearing’ of the audio. CCW the audio will be made of distinct chunks of sound. As you increase the control, the chunks of sound will blend together and become more smoothed out almost sounding like a reverb.

ALTERNATE: N/A

PIT|DIR

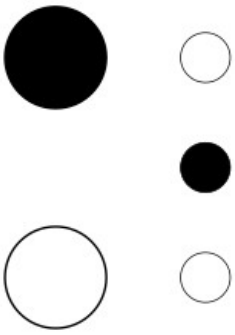
PRIMARY: Sets the balance of dry signal and octave signal. With this control at 12:00, there will be no octave effect. As you turn it CCW, you blend in a lower octave. Turning the control CW will introduce an upper octave.

ALTERNATE: SEE NOTE

FRZ|TAP

FRZ**:** Stop the LFO, effectively looping the sample indefinitely.

TAP: Available only to set the speed of the LF



MODE 4: CHOPPY ENVELOPE

Similar to the first mode, your input signal is tracked by an envelope detector. When your audio exceeds a specified threshold, it will be locked into a buffer and repeated until the envelope is triggered again. It differs from the first mode in that it is more like a delay than a reverb and can get much longer sampling times.

CONTROLS:

SPD|SNS

PRIMARY: Sensitivity of envelope detector. CCW is least sensitive, CW envelope easily triggered

ALTERNATE: Sensitivity attenuation, lowers the volume coming into the envelope detector. Useful for quieting loud incoming signals going into the envelope without changing the output volume of the effect.

SIZE

PRIMARY: Sets the size of the sample. Dependent on the CLOCK control. Turn the CLOCK control down to get long delay times, it will act like a short looper.

ALTERNATE: Tap Tempo Delay time multiplier, (CCW: x1/4,x1/3,x1/2,x3/4,x1 CW)

PIT|DIR

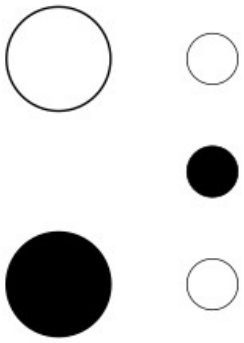
PRIMARY: Sets the balance of dry signal and octave signal. With this control at 12:00, there will be no octave effect. As you turn it CCW, you blend in a lower octave. Turning the control CW will introduce an upper octave.

ALTERNATE: SEE NOTE

FRZ|TAP

FRZ**:** Prevent the input signal from triggering the envelope detector, effectively looping the sample indefinitely.

TAP: Tap in the SIZE of the sample



MODE 5: CHOPPY LFO

This mode acts like the SMOOTH LFO mode, but instead of “freezing” your sample, it will repeat it in a fashion similar to a “stutter” effect.

CONTROLS:

SPD|SNS

PRIMARY:	Sets the speed of the LFO
ALTERNATE:	Sets the multiplier of the LFO speed, when the tap tempo function is enabled. (CCW x4, x3, x2, x1.5, x1 CW)

SIZE

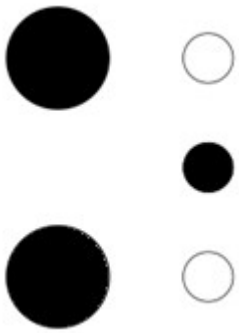
PRIMARY:	Adjusts the size of the sample, again dependent on the CLOCK control.
ALTERNATE:	Tap Tempo Delay time multiplier, (CCW: x1/4,x1/3,x1/2,x3/4,x1 CW)

PIT|DIR

PRIMARY:	Sets the balance of dry signal and octave signal. With this control at 12:00, there will be no octave effect. As you turn it CCW, you blend in a lower octave. Turning the control CW will introduce an upper octave.
ALTERNATE:	SEE NOTE

FRZ|TAP

FRZ**:**	Stop the LFO, effectively looping the sample indefinitely.
TAP:	Tap in the SIZE of the sample



MODE 6: STUTTER

This is your classic stutter sound with a few extra add-ons.

CONTROLS:

SPD|SNS

PRIMARY: Digital Mix (see the control description from Mode 3: freeze)

ALTERNATE: Tap Tempo Disable: it may be useful to ignore quick taps to the footswitch which may cause you to change the tempo of the stutter effect by accident. Turn fully counter clockwise to disable tap tempo reading. If you had a tempo previously tapped in, this will lock that tempo in place until you adjust the SIZE knob.

SIZE

PRIMARY: Sets the size of the sample. Dependent on the CLOCK control. Turn the CLOCK control down to get long delay times, it will act like a short looper.

ALTERNATE: Tap Tempo Delay time multiplier, (CCW: x1/4,x1/3,x1/2,x3/4,x1 CW)

PIT|DIR

PRIMARY: Sets the balance of dry signal and octave signal. With this control at 12:00, there will be no octave effect. As you turn it CCW, you blend in a lower octave. Turning the control CW will introduce an upper octave.

ALTERNATE: SEE NOTE

FRZ|TAP

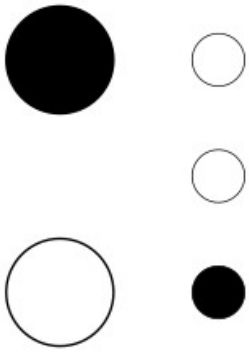
FRZ**:** Prevent the input signal from triggering the envelope detector, effectively looping the sample indefinitely.

TAP: Tap in the SIZE of the sample

*****NOTE ON THE PIT|DIR ALTERNATE CONTROL*****

For the above four modes, the commonality is that they all have the +/- octave blending. Upon default this pitch shifting value is static, unchanging, steady. Press the ALT button to change that. Turning the alternate control of the PIT|DIR knob will introduce a sin wave LFO that will center about your non pitch shifted signal and bounce between a lower and upper octave blend. The depth of this LFO will now be controlled by the primary PIT|DIR knob, and the speed of the LFO will be set by the Alternate control of the PIT|DIR knob. To turn off the LFO simply press and hold the ALT button and turn the PIT|DIR knob all the way down.

MODE 7: TIME-STRETCHING A



This mode will sample a period of your incoming signal (sample length dependent on the CLOCK control), chops it up into many small chunks, and arranges them so that you experience a time stretching effect. The bottom LED will flash in time with the buffer size, this is a good indicator of the amount of audio you will be able to record at any given sample rate.

CONTROLS:

SPD|SNS

PRIMARY: Sets the speed of the time stretching effect
ALTERNATE: N/A

SIZE

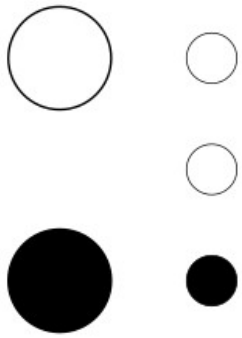
PRIMARY: Adjusts the size chunks of audio, turn CCW to create small grains.
ALTERNATE: Probability that the grain size will be randomized (ie, CCW, the grain size will be the size specified by your primary SIZE control. At 12:00, there is a 50% probability that the size will be either a random size, or the size set by your primary size control. Fully CW, the grain size will always be randomized.

PIT|DIR

PRIMARY: Sets the direction of the time-stretching. Fully CCW, will be forward, 12:00 the audio will be reversed, and fully CW will be alternate between forward and reverse, “ping ponging”
ALTERNATE: Speed at which a random number is generated, and therefore the speed at which the SIZE control is randomized (if size randomization is activated). Slower randomization speeds are counter clockwise, with the speed increasing as you turn the knob clockwise.

FRZ|TAP

FRZ**:** Stop the audio from being recorded, lock in the sample that is already in the buffer.
TAP: N/A



MODE 8: TIME-STRETCHING B

Very similar to the previous time stretching mode, except it uses more random probability than in the other mode. Whereas the first time stretch mode scrolled through the buffer in a consistent manner, these time stretching modes allow you to randomize the position within the time stretching buffer. The top LED will flash in time with the buffer size, giving you an idea of how much audio will be recorded into the buffer.

CONTROLS:

SPD|SNS

PRIMARY: Sets the speed of the time stretching effect **except when DIR is set CW

ALTERNATE: Read the PIT|DIR control info before reading this:

PIT|DIR setting: (CCW = Rand Fwd Sweep, Noon = Rand Ping Pong, CW = Manual)

-Random Forward Sweep – when the Alternate control is set to 0, the grains in the buffer will be played sequentially in the forward direction. As you turn up the ALTERNATE control, the likelihood of the grains being arranged sequentially decreases and the probability of a randomly placed grain occurring will increase.

-Random Ping Pong – Set alt control to 0 and the grains will play in the forward direction, 12:00 the grains will have a 50/50 chance of being played in forward or reverse, and fully CW the grains will be played in reverse.

-Manual – If the alternate control is set to 0, the position you are at in the buffer will be dictated by the SPD|SNS control. As you increase the alternate control, the likelihood of the position within the buffer being randomized (aka differing from the position of the SPD|SNS knob) increases. Fully CW the buffer position is completely randomized.

SIZE

PRIMARY: Adjusts the size chunks of audio, turn CCW to create small grains.

ALTERNATE: Probability that the grain size will be randomized (ie, CCW, the grain size will be the size specified by your primary SIZE control. At 12:00, there is a 50% probability that the size will be either a random size, or the size set by your primary size control. Fully CW, the grain size will always be randomized.

PIT|DIR

PRIMARY: Sets the direction of the time-stretching. Fully CCW, will be random forward sweep, 12:00 the audio will be random “ping-pong”, and fully CW is manual sweep (ie, the SPD knob will now sweep through the audio buffer manually)

ALTERNATE: Speed at which a random number is generated, and therefore the speed at which the random elements are randomized.

FRZ|TAP

FRZ**:** Stop the audio from being recorded, lock in the sample that is already in the buffer.

TAP: N/A