empress
effects

tremolo$_2$

user manual

Introduction

Back in 2005 we released our first pedal, the Tremolo. It was one of the first tap tempo tremolo on the market and, to this day, remains as sought after as when it was first released. We have built on everything we have learned over the past eight years, and are proud to release the next generation of tremolo, the Empress Tremolo$_2$.

The Empress Tremolo$_2$ has the same analog signal path as its predecessor, but we've added a bunch of features that make it more versatile. Now you can use up to 8 presets, and you can plug in a slew of things to control it, including expression pedal, external switches, and MIDI.

Please rock responsibly,

Steve Bragg

Quickstart

Plug your guitar into the lower jack on the right side. Plug your amplifier into the jack on the left side. Plug a 9-12V_{DC} power supply into the power jack on the left side (2.1mm barrel connector, negative tip). Set the mode switch to "knob," the waveform switch to "tube," the depth to half, rate to half, rhythm to 1, and output to half.

That's your standard tremolo.

Tap Tempo Mode

In tap tempo mode, use the "tap|preset" stompswitch to enter a speed for the tremolo. The tremolo will change to the new speed after 2 taps and will average the speed of the last 4 tap times. Use the ratio knob to change the ratio of tapped tempo to tremolo tempo. Available ratios are 1:1, 3:4, 1:2, 1:3, and 1:4.

Knob Mode

In knob mode, use the rate knob to set the speed of the tremolo. Hold down the "tap|preset" stompswitch as a brake that will slow down the tremolo speed while the stompswitch is held.

Preset Mode

Preset mode allows you to save and recall presets. All settings of the pedal are saved in a preset including tempo, front panel controls and expression pedal assignment. Each preset is represented by a different color in the "tap|preset" LED.

To load a preset, use the "tap|preset" stompswitch to scroll through presets sequentially. The LEDs will blink indicating the preset is ready to load. Press the bypass switch while the LEDs are blinking to engage the new preset.

To save a preset, set the Tremolo$_2$ to the settings you want to save. Use the "tap|preset" switch to scroll to the color where you would like to save the preset. Then, while the LEDs are blinking, hold down the save button and press the "tap|preset" stompswitch.

Changing the number of available presets: The Empress Tremolo$_2$ ships with 4 available presets, but you can use between 1 and 8 presets. Please see the "Advanced Configuration" section on how to change the number of available presets.

While in Preset mode, use the rate knob or an external tap switch to adjust the speed of the tremolo.

To modify tremolo parameters away from their saved value, simply move the knob or toggle.

Control Port

The control port jack allows the Empress Tremolo$_2$ to be controlled by a multitude of devices. The pedal ships configured to accept an expression pedal. Please see the "Advanced Configuration" section on how to configure the control port for the device you want to use.

Control Voltage (CV)

With CV control, the Empress Tremolo$_2$ responds to CV signals from 0 to 5 volts. Otherwise, the CV configuration works exactly like the expression pedal configuration.

External Tap Switch

The Empress Tremolo$_2$ can be used with an external switch. In tap tempo mode, both the pedal's "tap|preset" stompswitch and the external switch control the tap tempo. In knob mode, the external switch isn't utilized. In preset mode, the pedal's "tap|preset" stompswitch toggles through presets, the external switch controls tap tempo, and the "rate | ratio" knob controls the ratio.

Expression Pedal

Each parameter, with the exception of the mode switch, can be controlled simultaneously via the expression pedal.

To control a parameter with the expression pedal, move the parameter's knob to the desired heel setting, then hold down the save button and move the knob to the desired toe setting, then release the save button. Multiple parameters can assigned for expression pedal control simultaneously by repeating this process for each parameter to be assigned. Each parameter can be set with independent heel and toe settings.

To release a parameter from the expression pedal's control, simply move the knob or switch that controls that parameter. To clear all of the parameters from expression pedal control, press the save switch 3 times.

Any expression pedal used with the Empress Tremolo$_2$ should have the following connections: tip to signal, ring to power, and sleeve to ground.

Mode: Sets the operation mode of the pedal.

Tap Tempo: The rate of the tremolo is set by tapping on the tap stompswitch.

Knob: The rate of the tremolo is controlled by the rate knob.

Preset: Save and recall settings stored in up to 8 presets.

Power: + –⊙– - 9V - 12V

Save: Use to save presets and a

Depth: The amount of tremolo effect applied to signal.

Rate | Ratio: In knob mode, this sets the speed of the tremolo effect.
In tap tempo mode, this sets the ratio of foot taps to tremolo pulses. For example, at a 1:2 ratio, the tremolo will do eighth notes when you tap quarter notes.

Output

Tap | Preset: Perfoms a different function in each mode.

Tap Tempo: Tap to set the tempo of the tremolo effect. Tapped tempo is multiplied by the ratio to set the rate of the tremolo effect.

Knob: Press for a brake that slows the tempo of the tremolo while switch is held down.

Preset: Press to scroll through presets.

mode
tap tempo | knob | preset

1:2
3:4   1:3
1:1   1:4

depth   rate | ratio
(tap tempo

trem

emp

tap | preset

Bypass: Press to engage / byp illuminated, the tremolo is enga

Presets: When scrolling throug Press the bypass switch to enga

at a Glance

V DC. 100mA or greater

assign expression pedal control.

Waveform: Sets the shape of the tremolo envelope.

Triangle: Your standard tremolo waveform. Smooth ramp from loud to soft.

Tube: An asymetrical waveform modeled after classic tube amp tremolo.

Square: Tremolo turns on and off with no volume ramp. Great for choppy sounding effects.

waveform
triangle | tube | square

control port

Output: Sets the overall output level (volume) of the pedal.

Control Port: Control the tremolo via expression pedal, external tap, control voltage and MIDI.

3 4 5
2 6
1 7
8

rhythm   output

Input ◀

olo₂

press
fects

Made in Canada

bypass

ass the pedal. When the LED is aged.

h presets, this LED will flash. age the new preset.

Rhythm: Here are the eight rhythms with "**0**" being accented:

1) **0000** (normal tremolo)
2) **0**x**0**x
3) **0**xx**0**xx
4) **0**xxx**0**xxx
5) **0**xx**0**xx**0**x
6) **0**x**0**x**00**x**0**x**0** (this one is in 5/4)
7) **0**xx**0**xx**0**x**0**x
8) **0**xx**0**xx**0**xxx**0**x**0**xxx

Bypass Mode: Select to use true bypass or buffered bypass.

True Bypass (default): Set the mode toggle switch to the left (tap tempo).

Buffered Bypass: Set the mode toggle switch to the right (preset).

Preset Mode: Select how to change presets.

Two Button Switching (default): Set the rate|ratio knob all the way counter-clockwise.

One Button (instant) Switching: Set the rate|ratio knob all the way clockwise.

Ramp Speed: Select how long it takes to ramp from one preset to another.

Setting the depth knob fully counter-clockwise (default) will have no ramping; the rate changes immediately to the new preset's rate.

Setting the depth knob fully clockwise will have a long ramp between presets, much like a Leslie cabinet changing from slow to fast.

The knob can be set anywhere in between to fine tune the ramp time.
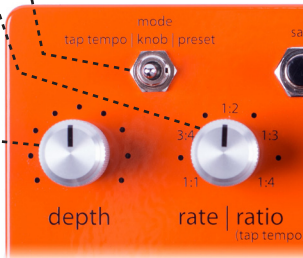
Entering Advanced Configura[...]
from the Empress Tremolo₂[...]
while holding down bot[...]
stompswitches. The bypass [...]
confirm that you are in the [...]
mode.

Modify Settings: Use the c[...]
configure the pedal as you l[...]
modified, the tap LED will [...]
change has been made.

Exiting Advanced Configura[...]
and bypass stompswitches [...]
bypass LED will blink twice to [...]
has exited the advanced con[...]
reboot into the standard ope[...]

Factory Reset: While in the advanced configuration, press the following [...]
dance to confirm that the tremolo has been reset to its factory settings. **Pl[...]**

e the functionality of the tremolo to suit your needs.

ration: Unplug the power
. Plug the power back in
h the tap and bypass
LED should blink twice to
e advanced configuration

controls outlined below to
ike. When a parameter is
blink to confirm that a

ration: Press both the tap
s at the same time. The
o confirm that the tremolo
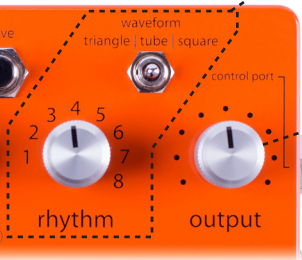nfiguration mode and will
eration mode.

Use the waveform switch to select which function to modify
then use the rhythm selector to set the value.

Number of Presets (default 4): Set the waveform switch to the
left (triangle) then use the rhythm knob to select from 1-8 presets.

MIDI Channel (default 1): Set the waveform switch to the right
(square) then use the rhythm knob to select from MIDI channel 1-8.

Control Port Configuration: Set the waveform switch to the
middle (tube) then use the rhythm knob to select how you would
like to use the control port from the chart below:

- **1 -** expression pedal (default)
- **2 -** control voltage
- **3 -** external tap switch (latching)
- **4 -** external tap switch (momentary - normally open)
- **5 -** external tap switch (momentary - normally closed)
- **6 -** MIDI

Presets Write Protect: Select if presets can be overwritten
and changed on the fly or locked to prevent accidental
changes.

Unlocked (default): Turn the output knob all the way
counter-clockwise.

Locked: Turn the output knob all the way clockwise.

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stompswitches in order: tap, bypass, tap, bypass. The LEDs will do a little
ease note that this overwrites the current presets with the factory presets.

MIDI Configuration

The Empress Tremolo$_2$ allows all of its parameters to be controlled via control change messages, it's presets to be selected with program change messages, and its tempo controlled with MIDI clock messages.

To use MIDI with your Empress Tremolo$_2$, you'll have to do the following:

1. Attach the Empress Midibox using a ¼" patch cable to the **control port**. The Midibox is not included with the Empress Tremolo$_2$.
2. Configure the pedal for MIDI control and set the MIDI channel. See the "Advanced Configuration" section for instructions on doing this. Choose a MIDI channel that won't conflict with other devices in your MIDI rig.

Recalling a preset via MIDI (Program Change Messages)

You can activate a preset by sending a MIDI Program Change message. For example, sending a Program Change message of 7 activates preset 7.

MIDI Clock (aka MIDI Beat Clock)

The Empress Tremolo$_2$ will respond to MIDI Clock messages. MIDI Clock specifies quarter notes, subdivided into 24 MIDI Messages. Each quarter note corresponds to 1 period of the tremolo's waveform.

Warning: The Tremolo$_2$ listens for MIDI Clock messages by default. If it receives a MIDI Clock message, it will rely on the messages for its tempo. This means that the Tremolo$_2$'s volume will freeze if the MIDI Clock messages are discontinued. To unfreeze the Tremolo$_2$, send a MIDI Clock Listener message (CC #51) with a value of 0.

Control Change Messages

The Empress Tremolo$_2$ can be controlled with MIDI control change messages. Below is a table that shows which MIDI control change channel controls each Tremolo$_2$ parameter.

Tremolo$_2$ Parameter	CC #:	Note:
Depth	20	Sending a value 0 would be equivalent to the knob completely counter clock-wise, sending 127 is equivalent to fully clock-wise.
Rate | Ratio	21	
Output	23	
Rhythm	22	Sending a value of 1 will set the rhythm to 1, sending 2 will set rhythm to 2, etc.
Mode	24	Sending 1 will set it to tap tempo mode, 2 knob mode, and 3 preset mode.
Waveform	25	Sending 1 will set it to triangle, 2 tube, 3 square.
Rhythm Downbeat	26	Value sent determines which beat of the rhythm will fall on the downbeat. A value of 3 will have the 3rd beat of the rhythm on the downbeat.

Waveform Phase	27	A Value of 64 has the waveform in phase. Higher values move the waveform ahead relative to the beat and smaller values move it behind.
Tap Switch	35	Sending a value of 127 simulates the switch being pressed. Sending a value of zero simulates releasing the switch.
Bypass Switch	36	Sending a value of 127 engages the pedal, sending a value of 0 bypasses the pedal.
Direct Control	40	Sending this message overrides all other settings and lets you set the amount of tremolo volume directly with MIDI values This mode would allow you to draw your own waveforms in a DAW and send them to the Empress Tremolo$_2$.
Exit Direct Control	50	Sending this message with any value will cause the pedal to exit direct control.
MIDI Clock Listener	51	Sending a value of 0 causes the pedal to ignore MIDI Clock messages. Sending a value of 127 causes the pedal to listen for MIDI Clock messages. (by default, the pedal listens for MIDI Clock messages)

Specifications

Input Impedance:	1M Ω
Output Impedance:	330 Ω
Frequency Response (-3dB):	4Hz – 30kHz
Output Headroom:	+9.2 dBu
Distortion:	0.081%
Signal to Noise Ratio:	-107.7dB
Input Voltage:	9VDC – 12VDC
Required Current:	100mA
Power Input Connector:	2.1mm Barrel Connector
Height (enclosure only):	1.5"
Height (including controls):	2"
Length:	3.5"
Width:	4.5"
Weight:	1lbs