TEV – Twin Engined Verb
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latest version : 1.0.1.6
this document : 26/10/09

white label
www.roughdiamondproductions.com/whiteLABEL

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KVR Developer Challenge 2009 : www.kvraudio.com

Credits :

designed & built by :
Daz Disley using SynthEdit.

modules by :
David Haupt, Peter Schoffhauzer, Ralph Gonzalez, Kelly Lynch, Astral P and Daz Disley
contains code adapter from Jezar's Freeverb, with additional programming by Unkargherth

dll compression by UPX – Ultimate Packer for eXecutables

Overview :

Not just another Freeverb clone, Twin Engined Verb is a stereo dual delay, dual reverb effect with built-in enhancer. Use it to create a variety of delay and spatial effects ranging from subtle to brutal, pseudo-real to surreal. Instead of a plain 'ol pre-delay, TEV uses a damped echo as the source for each room, which then offers the usual size and width controls. The 2 rooms are split from the same source through a crossover so room one processes the lower band, and room two the upper. The Enhancer uses 6 different combinations of distortion, m/s dynamics processing and filtering to further modify the texture of the effect.

Installation :

To install TEV, simply copy the contents of the downloaded zip file into your VST Plugins folder. You can now run it from your host in the normal way. **Please Note : if you have been running an older version of TEV in a project, please first remove all instances of TEV from the project before installing the newer version.**
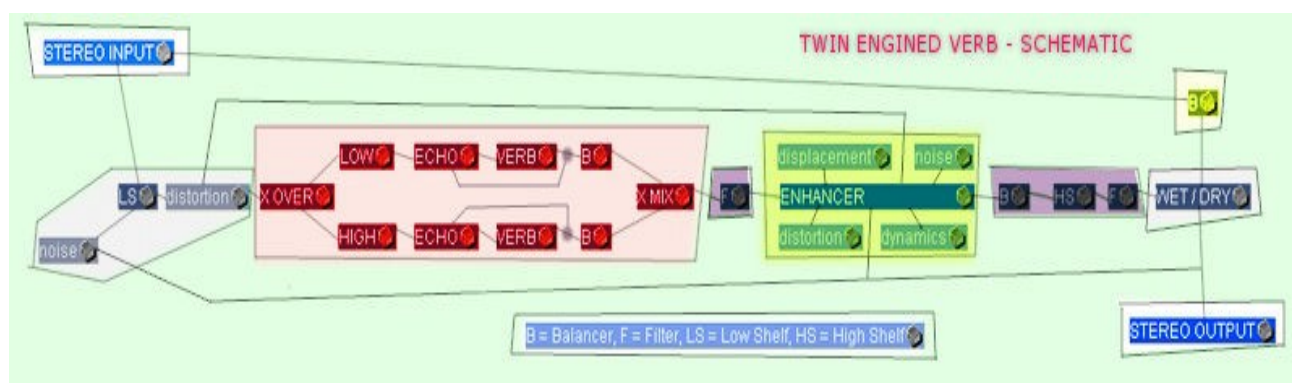
Getting Started (building an effect with TEV)
One way I've found to make a reasonable sound with TEV ...

Start by focussing on room 1, so switch everything else off – click around : the screen will tell you what's happening ... *If you're in doubt as to which control does what, refer to the image on the previous page*

With the crossover frequency at about 2.5khz the low band feeds into the delay which in turn feeds the room engine. In terms of predelay, each ms of delay time equates (roughly) to 30cm and could be set to roughly equal to the number of feet the sound has travelled between source, off a wall, and back to the listener. Feedback and damping can be set however you like – the higher the feedback, the more 'weight' the room will have, and the higher the damping, the more treble is cut from the pre feedback signal. I started off with values of about 130ms, feedback 20% and damping 6, or so.

All knobs are vertically controlled, all buttons click to toggle.

Now mix in some of the room sound using the silver knob-surround **[2]** and set room size **[1]** to about 4.5 and width **[3]** to about 3.

To fine-tune controls, hold down <control> before dragging the knob.

Now switch on room 2 **[4]**, and do similar, but use different settings. I found that a delay time of very roughly half that of room 1 worked quite nicely – 60ms or so with slightly higher feedback and damping. Again, varying the sizes and widths of the 2 rooms to roughly related, but not equal settings was nice.

From here re-adjust the crossover and room mix to suit, and head on over to the filters.
The main controls have <key>+click commands – see below for more.

Again, generally speaking, to make the sound brighter, mix towards room 2, and to soften it mix to room 1. Tweaking the crossover frequency can have an interesting effect when used in combination with the mix control – hence why they are on the same part of the panel (but different ends of a circuit).

The output mix control **[5]** (as different from the other room mix controls) mixes between dry input and post effect output, and the master damping control **[6]** applies equally to both room engines, but is independent of both pre echo damping controls.

Next up – the Enhancer. Turn the amount to 0 – hold z and click **[7]** or drag in the usual way, and then turn on the enhancer **[8].** The 6 built-in modes offer varying degrees of dynamic control and distortion – on high settings, you'll probably need to reach for the filters.

N.B. *With high feedback settings, its wise to turn down the output, or even put a limiter after TEV - it can spit out some hot signals !*

Algorithms, Modes, Filters and Flips :

To change the room and enhancer algorithms use the three small blue led-buttons below each main controls to access the three algorithms (here the enhancer is set to algorithm 3) :
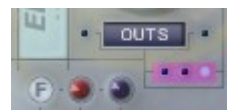
Low and high shelving filters – the control marked here in yellow switches the filter on or off, and the controls in green determine the frequency of the filter. The low shelf operates at 100, 200, 400, 800, 1600 and 3200 Hz and the high shelf at 400, 800, 1600, 3200, 6400 and 12800 Hz.


Enhancer modes : The enhancer's six modes are chosen in the same ways as the shelving filters – 6 buttons highlighted in green with a pink highlight for the on/off control. The six enhancer modes are **clean, light, gloss, flat, overdrive & distortion** reflecting roughly the intent of each mode.

Stereo Flip : Each room has its own flip switch, (highlighted in orange), as does the enhancer's output. These simply swaps left and right channels over - setting a room to flip generally makes the sound less defined – the control is the blue dual led to the top-right of each major control :

Mid / Side flip : A great way to get a variation on an effect is to toggle the mid/side flip switch. As the name suggests, this flips the mid and side channels before the signal enters the enhancer. Whatever reverb *was* in the middle ends up at the sides, and vice versa. Works great with enhancer algorithms 1 & 2, and not so great with algo #3
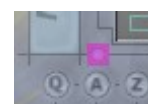
Auxilliary controls :

In each corner of TEV's panel, there is a blue led switch. The top two switch the input and output mode – illuminated indicates stereo and off: mono. You still get a stereo effect with a mono input if the output is stereo, but the input placement will be mono in the wet/dry mix, unless you use the input balancer (see below). The lower 2 buttons refer to TEV's midi implimentation. Again, input and output, on and off. The default setting is for the output to be on and the input to be off. Whenever a patch changes, the output is triggered, for use with a control surface, or situations where you want to chain one or more TEV in a larger-format effect.

TEV Screen Modes – to switch between the different modes, hit the vertical text marked "METERING".

WaveForm view (mirrored), shows representation of output channels as summed into one. Top VU is summed input, bottom VU is summed output. The text changes to reflect the position and value of whatever control you are editing.

Randomiser view : click a button to randomise the rooms and enhancer – the echos and reverbs can be randomised together, or individually – same for the enhancer and crossover, and if you want to randomise them all at the same time – you can. Additional output gain control just in case.

Balancer / FSU view : here you'll find TEV's 4 balancer controls – one each for input, room 1, room 2 and also output. In addition, the FSU section provides control over the enhancer's distortion and threshhold settings, and noise generator. "Follow noise" is the level of noise injected into the inputs as a result of measuring output level and enhancer amount, and "Bleed" is for blanket, volume independent noise injection – two colours for noise : white and pink, and duplicated output gain control.

Scope View : as with the waveform view, this shows an approximation of a summed mono output, with VU meters for input and output.

Width manipulation view : The 4 stage graphic compander applies to the side channel of the effect – the stereo signal. The more heavily this compresses, the denser and closer the room. M/S delay offset ranges from -100 to +100ms : and can be used to move the side and mid channels in time against each other. Independent mid and side gain, can again, cut and boost the width of the effect, and the vertical waveform shows the width, approximating a correlation meter. Double-click to reset faders.

Response Meter : TEV's unique stereo response meter displays the level of the side channel horizontally and the mid channel vertically. The 32-node animation gives an easy way to check both levels and shape of the effect – toggle this mode, and hit the impulse trigger, and you'll see what I mean.

Controls, Midi & Automation :

(by default, TEV's midi input is off. Additional buttons below the VU meters turn on or off the midi input & output)
**number indicates CC#, +/- indicates automation, * indicates keyboard modifiers**

Room one on / off	01	+	on / off
* Room one size	02	+	0 to 10
* Room one width	03	+	0 to 10
* Room one mix	04	+	100:0 to 0:100

Room two on / off	05	+	on / off
* Room two size	06	+	0 to 10
* Room two width	07	+	0 to 10
* Room two mix	08	+	100:0 to 0:100

Enhancer on / off	09	+	on / off
Enhancer mode	10	+	6 modes
* Enhancer amount	11	+	0 to 10
* Room damping	12	+	0 to 10

Low shelf frequency	13	+	6 modes
High shelf frequency	14	+	6 modes
* Output mix	15	+	100:0 to 0:100
Screen update speed	16	-	removed from gui to make way for additional controls so midi only - 20 hz by default.

Input mode	65	-	Mono / stereo
Output mode	66	-	Mono / stereo

Low shelf filter	29	-	on / off
High shelf filter	30	-	on / off

Room one echo time	17	-	0 to 1000 ms (also shown as BPM)
Room one echo feedback	18	-	0 to 100 %
Room one echo damping	19	-	0 to 100 %

Room two echo time	20	-	0 to 1000 ms (also shown as BPM)
Room two echo feedback	21	-	0 to 100 %
Room two echo damping	22	-	0 to 100 %

Room one stereo flip	26	-	on / off
Room two stereo flip	27	-	on / off
Pre-mix stereo flip	28	-	on / off

Rooms crossover frequency	23	-	80 to 2500 Hz
Rooms mix	24	-	100:0 to 0:100

Freeze mode	25	-	on / off
Pc keyboard locale	-	-	5 modes

NOTE : controls for room and enhancer algorithms, mid/side flip and all controls accessed through the screens **have no automation or midi support**. TEV is built this way to avoid the loading-time 'hit' that would otherwise occur, *it's not a bug, or an unimplemented feature, it's just the way it is*. If it's something there's a lot of demand for, I'll maybe consider changing this in future, but for now – these are GUI only settings.

Visuals and key commands :

Each of TEV's control elements marked * above, has a set of keyboard modifiers – hold down a key & click the element. The commands are on the four rows of keys [1-0. q-p. a-l. z-m for Qwerty] and you can choose Qwerty, Azerty, Qwertz, Dvorak and Colemac layouts – once clicked, this setting persists :
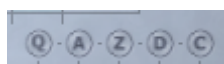
Depending on your host, there may be a setting for "plugins receive key commands" or simiar, which would be worth playing with if any problems arise – a setting that can be affected with "always on top" settings for plugins in hosts such as Cubase, for example.

Assuming qwerty layout, key modifiers are like so (hold+click):

1,2,3,4,5,6,7,8,9,0	:	set knob position to 0.1,0.2,0.3 etc
Q,W,E,R,T,Y,U,I,O,P	:	set knob position to 0.15,0.25,0.35 etc

G	:	toggle section on or off
A	:	momentary switch section on / off
Z	:	set element position to 0 – fully down
X	:	set element position to 10 – fully up
C	:	copy knob position to buffer *
V	:	paste knob position from buffer *
B	:	mirror knob position – 2 becomes 8, 4 becomes 6 and so on ...
N	:	decrement knob position
M	:	increment knob position

To reset an element to its default position, double-click it

To randomise an element, hold <ctrl> and double-click it

* = each element has its own buffer which means that copy and paste occurs within the element and not between elements .... copy individual elements between presets by holding c and clicking on each element to copy, changing preset, and then holding v and clicking on each element to "paste".

TEV as Surround Processor

To use TEV for surround-sound effects, use a multi-channel effects send / group channel (e.g. Quad, 5.1) and place several instances so that channels 1&2 have a TEV, 3&4 have a TEV and so on. Set the first TEV as "Master" with midi output enabled, and set the remaining TEV's as "Slaves" with midi input enabled. Now use a midi channel in the host to route the master midi output to the slaves, and whenever a control on the master is changed, the slaves are update too. **Please note :** if you're going to run multiple instances of TEV, only have one of them set to an animated view at a time, as I've had reports that the DAW GUI can get sluggish on older machines, when generating multiple simultaneous waveform / scope / width meters.

TEV as Sonic Weapon

The built-in impulse generator whilst intended as a quick and simple way to test a preset also doubles as an explosions generator. Add some distortion and noise to the effect, and a wide variety of bangs pops and boooooms can be created. **PLEASE** be careful with this function as it can and does kick-out some really heavy signals, especially with high follower noise – sometimes even enough to feedback the noise indefinitely – you have been warned :) The impulse generator is trigger by the illuminated button on the right – the left button displays the credits screen.
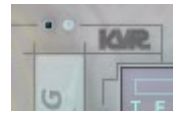
TEV's patch heirachy :

There are effectively 3 levels of patching going on in TEV

- **global level** for "machine settings" - settings you'd normally change with a screwdriver, effecting the character of the machine's sound – noise amounts * shape, distortion boost mode, mid/side flip

- **local level** for "eeprom settings" - these are the internal settings that the enhancer uses for each of the 6 enhancer modes – the mid/side dynamics curve and the distortion and drive threshhold. Once set, the setting applies to the mode

- **patch level** for everything else – all other controls are stored in the patch system ready to be exported as either fxb (for a bank) or fxp (for a patch)

Currently, local and global level settings are **not** saved with patches or banks as they are considered behind the scenes controls – they just happen to have been exposed, mostly throught the screen. Again, I don't consider this a bug or even particularly a design feature, its just how things panned-out, but it does mean if you change the enhancer dynamics, the changes won't be exported with the bank / preset. If you want to share a preset using modified dynamics, make a note of the settings, or take a screenshot, and pass these on alongside the fxb or fxp file.

Files and links :

Other than the TEV dll, the zip package should contain a copy of this manual, 3 preset banks and a text file with recent changes. The preset banks have 64 patches each catering for a wide range of sounds. The **default bank** focusses mainly on reverbs, the **plan B bank** is intended for use with the mid/side flip mode engaged, and also contains 32 tempo-synced delays and the **random damage bank** is meant for use with heavier distortion and noise settings.

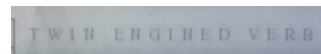**3 controls not yet mentioned that have no effect on the sound whatsoever :**

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Click the Twin Engined Verb legend text to open this manual :

Note about running multiple TEVs

TEV was built with SynthEdit 1.016, there exists the possibility that multiple instances may cause problems on some dual/multi-core cpu systems. If this is the case for your rig, one solution is to make multiple copies of TEV and rename the dll files – TEV1, TEV2, TEV3 and so on, and instead of using the primary dll for each instance, use the incremental versions.

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TEV

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