WoodValvet

WIMS

Woodman's Immaculate Maple Syrup Studio

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1.What

WoodValvet is a tube emulated saturator with some extra features :

- has 3 tube stages each with their own "Drive"control.
- each stage can be set to a different tube type (ECC82, …)
- stage 2 & 3 can be set in series or in parallel to create different harmonics.
- stage 1 & 2 are class A circuits, stage 3 is a class AB circuit.
- an input band filter allows to add harmonics on the selected band only.
- has out-of-band gain control
- filter has selectable slope (12 .. 48 dB/oct)
- a post tube out lowpass filter allows to reduce the higher harmonics.
- has an extra control to change the tube bias of stage 2, again yielding different harmonics.
- a "Constant Level" setting matches the output level with the input level.
- has an LFO to modulate the drive and filter settings.
- side chain input can modulate the drive settings (increase or duck mode).
- has an "Auto Gain Input" mode to automatically bring quiet signals into range.
- has a Stereo spread control.
- has a brick-wall limiter on output
- has a DC blocking output filter
- has an output phase switch.
- inserted on a multi-channel bus (surround, 3D), each channel has a weight controlling the drive settings.
- has a visual representation of the generated harmonics.
- has oversampling (1 .. 8)
- has an extra inter modulation control for extra distortion.

1.1 Signal Flow
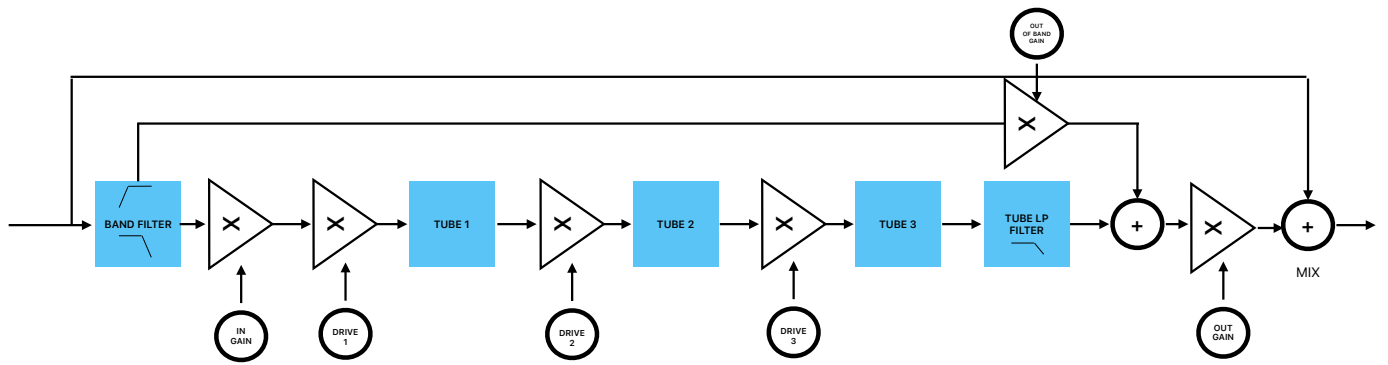
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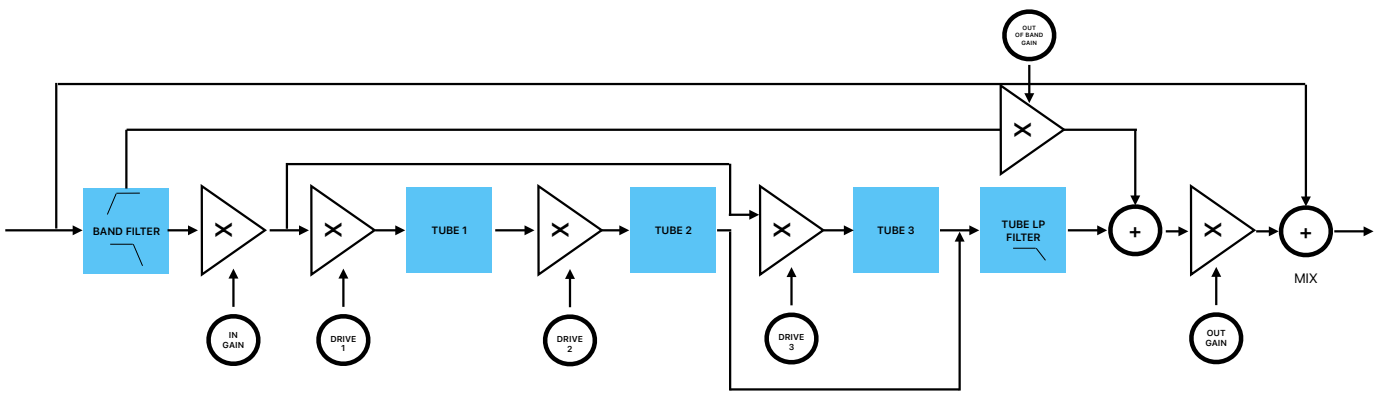
PARALLEL **ON**
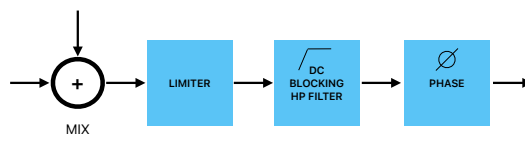
1.2 Versions

v1.1

- added oversampling (1,2,4,8).
- added input filter slope control : 12 .. 48 dB/oct.
- added "Out of Band" gain.
- added new "Inter Modulation" control (Stereo control moved to Advanced).
- added more presets.

v 1.2

- Added licensing via license code (MacOS plugins only).
- Factory presets not copied to user space any longer but read from the package.

2. Main window

Individual controls are explained below.

Resizing the plugin window (smaller only) scales the UI and saves the new size in the plugin state.

When the plugin is inserted on a track with more than 2 channels, an extra button ("W" from weights) in the header bar will become visible which allows to set channel weights in an extra panel similar to the Advanced panel.

You have pressed the Question-mark button already as you are reading this manual.

2.1 User Presets

User presets can normally be set via the DAW specific popup / controls. Those presets will be saved in a specific format and location dependant on the DAW.

User presets can also be set via WoodValvet's own popup in the header bar.

The preset.json files are saved in your iCloud Drive (when enabled) or else in the app's local folder: ~/Library/Application Support/WoodValvet/userPresets (~ is the user's home dir).

When saved to iCloud Drive the presets are automatically available (and synced) to all devices and all DAW's running WoodValvet and are obviously backed-up as well.

When iCloud Drive is enabled, previously local saved presets will also be shown in the preset popup with ".local" appended to their name. And when for some reason a new preset still has to be written to the local folder, this can be done by appending ".local" to the name typed in the text edit box.

When a preset is selected and any parameter is changed afterwards, the name of the preset will be marked with a * at the end to indicate the settings are now different than those from the saved preset. When this preset is re-saved the * will disappear again.

Groups (drums, Vocals, …) can be created by typing the group name followed by a "/" (backslash character) followed by the preset name. Multi level groups are possible as well.

The current selected preset can be removed by selecting "remove" from the popup however NO "Are you sure" warnings/popups are given. (I am sure you are sure).

The User presets can also be selected by a Midi Program Change. In the Advanced panel the Midi channel and Program Change mode can be set :
- mode "Index" : program change number is the index in the preset list
- mode "Name" : add ".midiXY" to the preset name to select it with program change XY. (e.g. the preset with name "Vocal Magic.midi3" will be selected by program change 3.

2.2 Factory Presets

From version 1.2 on, factory presets are stored and read from the app/plugin package.
This means they don't have to be copied any more to the User preset folder (with the "Copy Factory Presets") and that they can't be changed any more.

When changing parameters and choosing "Save Preset", a new User preset will be created with the same name in the User space.

Factory presets are shown on top of the User presets in the dropdown.

3. Advanced Panel and Channel Weights Panel

The Advanced panel can be made visible by pressing the "Advanced" button.

The Channel Weights Panel is shown when pressing the "W" button. This button is only visible when the plugin is inserted on a track with more than 2 channels or when group linking is on.

4. Main Controls

4.1 Drive 1,2 & 3

0 .. 11 (yes 1 louder than 10)

sets the gain applied to the tube stages.

Setting all drives to maximum will usually not yield the most harmonics as the tube stage will likely go into clipping/cutoff which may destroy some of the harmonics from the previous stages.

When the "Const Level" button is on, a calculated +- reverse gain will be applied after the tube stages to try to keep the level of in and out constant.

4.2 Tube selections

Each tube stage can set its own tube type.

Tubes :
- ECC82 : triode
- 12AX7   : triode
- EL34   : pentode
- WoodValve : mathematical emulation
- 12AX7 (B) : triode with alternative bias

Triodes will yield more even harmonics while pentodes will give more odd harmonics.

Stage 1 & 2 are class A amplifier circuits which will also give more even harmonics.
Stage 3 is a class AB amplifier which only gives odd harmonics.

4.3 In Gain

-30 dB … +30 dB

Very small signals going through the tubes will have almost no harmonics added while very strong signals will have a lot of harmonics and even go into clipping or cutoff.
This can be heard by guitarists using a tube amplifier (basically all of them :-) : when playing softly the sound is very clean but the louder they play the more distorted.

The In Gain allows to bring the input signal into the desired tube saturation range.

4.3.1 Auto Gain

Will try to bring the signal up to max -12dB so it is well in the saturation range.

The RMS time to calculate the gain can be set in Advanced.

Also the amount of gain applied when the signal is below -12dB can be set in Advanced.

4.4 Out Gain

-30 dB … +30 dB

Can be used to slightly adjust the output level when "Const Level" is on (but is not 100% correct) or definitely to lower the output level when "Const Level" is off.

4.5 Mix

0% … 100%

Allows to do parallel processing : 0% will output the original signal, 100% will only output the tube signal.

Note that even when Mix is set to zero that the limiter, cut-DC HP filter and phase are still applied on the signal.

Double clicking on the Mix rotary will jump alternatively to 0% and 100%.

4.6 BP Filter

Applies a filter on the input signal which is then going through the tubes.
The out-of band signal (not processed) will be added back in at the end.

The filter type and Q factor (for band-pass and notch filter) can be set in the Advanced panel.

4.6.1 BP Filter Frequency

50 Hz … 20 kHz

Sets the center (band-pass or notch) or cutoff (high-pass or low-pass) frequency.

4.6.2 "Listen" button

When on the plugin output is just the filtered original signal.

4.7 Tubes lowpass Filter

This filter works on the signal coming from the tubes but not on the final output signal when the input band filter is used as the out-of-band signal is mixed back in after this filter (see signal flow diagram).

A use case may be to insert WoodValvet on a drum bus, set the input band filter to the low end of the snare and add harmonics to the snare.
The Tubes lowpass can now reduce the highest harmonics (taste …) but will not filter the cymbals as those frequencies are not in the input band.

4.8 Bias (Stage 2)

As Stage2 is a class A amplifier a bias voltage is applied on the tube's grid. The incoming AC signal is then added to this bias voltage which normally keeps the tube working without going into cut-off (negative grid voltage too high) or clipping (maximum current determined by the load resistor flowing through the tube).

This control changes the bias voltage which will cause the tube to operate in a different part of its curve and hence create different harmonics.
When getting close to the min or max bias value the tube will go into cut-off or clipping.

4.9 Parallel Button

When on, the output of stage 2 is not fed to the stage3 input but is added to the output of stage3 (see signal flow).

This will give a different harmonic behaviour as harmonics generated by stage1 & 2 will not be altered by stage3.

4.10 Full Grid Buttons

This applies a gain boost on the input signal before it is added to the bias voltage to obtain a max voltage swing on the grid.
This will (more) likely cause the signal to be clipped as the tube will get into its cut-off or clipping region.

4.11 Inter Modulation control

Simulates different parts of a tube circuit modulating each other.
Will generate a different mix of harmonics up to distortion.

The InterMod control can itself be modulated by the LFO.

4.12 Limiter button

This limiter is at the end of all processing and will ensure no values will exceed -0.1 dB.
The limiter will try to preserve the waveform as much as possible and has a separate release control (in Advanced Settings). It also has a fixed small lookahead of 100 samples.
When this limiter is active (meaning limiting values over -0.1 dB) a yellow led will light up.

4.12.1 Clip led

When the brick-wall limiter is off, this (red) light will go on when a sample value exceeds 0dB.
The led will be reset when the transport is restarted or when the area around the clip led is touched.

4.13 Block DC High-pass filter On

As a class A tube amplifier treats the upper and lower half of a sine wave differently, some DC offset may occur.

This filter will remove any DC offset.

It is the equivalent of the analog output capacitor.

4.14 Phase Button

Simply reverses the output phase.

5. Advanced Controls (Advanced Panel)

5.1 LFO waveform button

Waveforms can be :

- Sine wave
- Square wave (Triangle waveform can be obtained by setting the Slew rate to 100%)
- Sawtooth Down
- Sawtooth Up
- Triangle
- Pulse
- Random (white noise sample & hold)

5.2 LFO Modulation depth rotary

0 … 100%

5.3 Modulation destination popup

Destinations can be :

- Drive 1
- Drive 2
- Drive 3
- Drive 1,2 & 3
- Input Band Filter Freq
- Tubes Lowpass Filter Freq
- InterMod

5.4 Modulation LFO frequency rotary

LFO frequency in Hz : 0 … 400 Hz

5.5 Modulation LFO beat/bar popup

When set to a fraction of the BPM, the LFO frequency will automatically be calculated and be adjusted when the DAW BPM changes.

5.6 Side Chain

Allows to have an external signal to modulate the drive settings.
Use case would be to set the side chain to the kick and put WoodValvet on the bass.

Each DAW will also have some specific way to select the side chain audio which will be routed to WoodValvet.

5.6.1 Side Chain Depth rotary

0 .. 100%

5.6.2 Side Chain Release rotary

0 .. 4000 ms

Can be compared to a compressor release.

Is especially useful when the side chain is set to percussive instruments (very short and high peak) to extend the effect of the peak.

5.6.3 Side Chain Destination

- Drive 1
- Drive 2
- Drive 3
- Drive 1,2 & 3

5.6.4 Side Chain Mode

- Increase
- Duck

5.7 Input Band Filter

5.7.1 Filter Type

Type can be set to band-pass, low-pass, high-pass and notch

5.7.2 "Q" rotary

0.1 … 10

Q is only active for bandpass and notch filter types.

5.7.3 Filter slope

12 .. 48 dB / oct

5.8 Auto Input Gain controls

5.8.1 RMS time

0 .. 10000 ms

5.8.2 Amount

0 .. 100%

At 100%, auto gain will try to get the signal level to -12 dB however with a maximum gain of 30 dB.

5.9 Limiter Release

0 .. 200 ms

5.10 Midi Receive from DAW button

Normally WoodValvet listens for external midi commands (sent by devices or apps outside the DAW).

However if you want to receive midi commands generated by or inside the DAW (internal keyboard, midi track on which WoodValvet is inserted, …), set this to on. You still may have to do additional midi routing in the DAW.

5.11 Stereo Spread

Applies a small difference in drive settings for the Left and Right signals.

This creates a subtle stereo effect (as only the harmonics will be different) and is not so drastic as for example applying a sample delay between L & R.

5.12 Oversampling

factors : 1 (= off), 2, 4, 8

Oversampling reduces the non-harmonic frequencies generated by digital aliasing.

This effect is especially noticeable for higher frequencies : the harmonics generated by the tubes will be above the Nyquist frequency (= Sample rate / 2) and hence lead to aliasing frequencies (much) lower than the ground note frequency.

Be aware that higher factors will have a serious impact on the cpu load.

5.13 Out of Band Gain

-30 .. +30 dB

when using the input filter to select a smaller region of frequencies for which harmonics will be generated and hence will sound louder, the frequencies outside the selected region may sound quieter relative to the in-band.
This perceived loudness can be adjusted with this gain control.

For example when selecting a narrow snare region, the kick and base may be perceived to be more quiet in the mix.

6. Running on iOS (iPad, iPhone)

The WoodValvet app supports IAA (Inter App Audio) which allows audio host apps (supporting IAA) to use WoodValvet.
Without a host app the use case for the WoodValvet standalone app could be to use your iOS device as a "hardware saturator " sending and receiving audio via the mic/headphone connector or via some audio docking station.

The WoodValvet app also contains the AUv3 audio unit plugin. Host apps using the AUv3 plugin will present the WoodValvet UI in their own window which usually can be resized. The WoodValvet UI will scale to follow the resizing.

The number of channels will normally be limited to stereo.

6.1 Presets

Presets can be loaded/saved via WoodValvet's preset popup.
The preset.json files are saved in iCloud Drive when enabled or else in the app's local Documents folder.
When saved to iCloud Drive the presets are automatically available (and synced) to all devices running WoodValvet and are obviously backed-up as well.

When iCloud Drive is enabled, previously local saved presets will also be shown in the preset popup with ".local" appended to their name.

To Enable iCloud Drive you should be signed-in in iCloud (normally the case when you also want Contacts, Calendars, Mail, etc to be synced to iCloud) and the iCloud Drive switch should be on. Under iCloud Drive all apps using iCloud Drive are listed and obviously WoodValvet should be on as well (which it is by default).

Preset groups are possible by typing the group name followed by a "/" (backslash character) followed by the preset name.

Presets for the AUv3 plugin can also be provided by the host app or can be saved/loaded via WoodValvet's popup as described above.

The User presets can also be selected by a Midi Program Change. In the Advanced panel the Midi channel and Program Change mode can be set :

- mode "Index" : program change number is the index in the preset list
- mode "Name" : add ".midiXY" to the preset name to select it with program change XY. (e.g. the preset with name "snaredrum.midi3" will be selected by program change 3. This method is preferred as the selection will not change when presets are added or removed.

6.2 DAW Side Chain

Most DAW's allow to send audio from another track to the side chain input of WoodValvet on another track.

In AUM on iOS for example it looks like below : the second track is sending its audio to the side chain input of WoodValvet on the first track. Note that the WoodValvet seen in the second track is actually the same as the one in the first track.
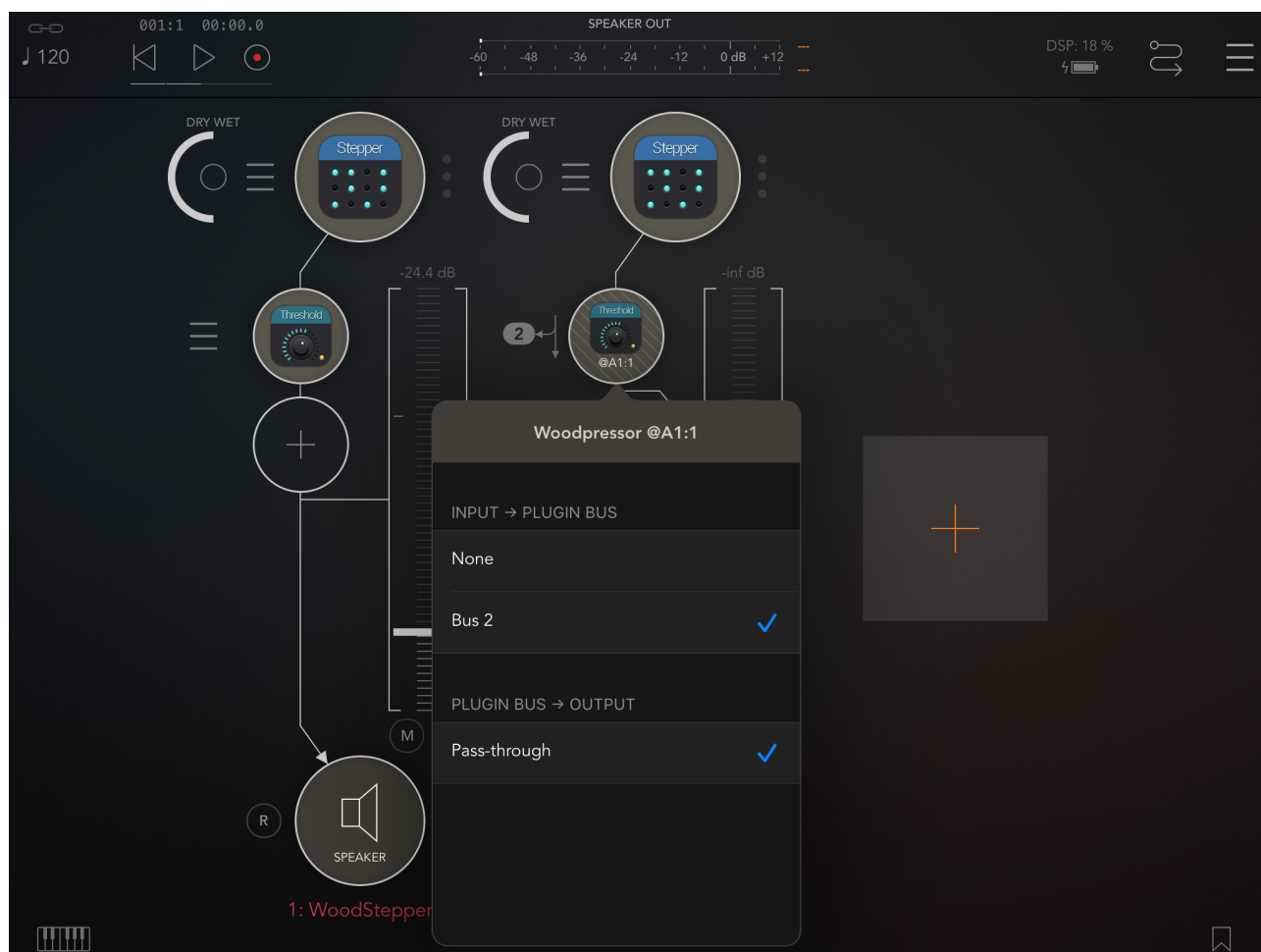
6.3 UI Zoom

Especially when used as AUv3 plugin in a host app, it can happen that the window in which the WoodValvet plugin is presented is too small (and sometimes can't be resized)

Pressing the "WoodValvet" logo (top left) will zoom in 3 steps to a maximum size.
Next press will cycle back to the un-zoomed state.

When zoomed the UI can be panned by dragging in any spot which is not a control.

7. Running on MacOS

The standalone WoodValvet app downloaded from the Mac App Store can be used as such but mainly acts as the license for all WoodValvet plugins (AAX , AU , VST3).

This means there is no limit to the number of Macs on which you can run WoodValvet (as long as the standalone app is in the Applications folder).

Due to Mac App sandbox security, you have to download the plugin(s) installer from my website. The installer will copy the plugins to the appropriate plugin folder :
   - for AAX : /Library/Application Support/Avid/Audio/Plug-Ins
   - for AU   : /Library/Audio/Plug-Ins/Components
   - for VST3 : /Library/Audio/Plug-Ins/VST3

When the standalone app is not present, the plugins will run in trial mode : every 60s the audio will be silent for 2s.

From version 1.2 on, there is another licensing mechanism by using a license code obtained by registering a coupon on our website. Coupons can or will be sold for promotions, sales, etc on partner websites.
To enter the license code, click on the "No license found" label.