⌣ Softube

CHANDLER LIMITED®

USER MANUAL

Supporting VST/VST3/AU/AAX Native and AAX

Rev. Apr 07, 2020

Softube User Manual

Disclaimer

Every effort has been made to ensure that the information in this manual is accurate. However, there are a chance that we have made mistakes, and we hope that you understand that we are only humans. Please let us know about the mistake, and we'll fix it in the mix (or in the next version of this manual).

Support

On the Softube website (www.softube.com) you will find answers to common questions (FAQ) and other topics that might interest you.

Support questions can be posted at http://www.softube.com, where we will help you as fast as we can!

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Contents

1 Preset Collection

The Preset Collection is a tool to organize your presets in logic, simple, advanced or mysterious (?) ways (it's up to you!), or just a simple mechanism to save your favorite sounds and easily browse through artist's presets.

You can either use the simplified version in the menu bar of each Softube plug-in, or you can press the open window icon ⊡ to open the full Preset Collection.

Browsing presets

Use the ◀▶ buttons in the menu row at the top of the plug-in to step through presets. Click ▼ to open a menu to select presets. By default, presets are sorted by "collection", usually by artist or theme.

Saving Presets

Press "ADD PRESET…" in the dropdown menu to save the current settings as a new preset. Type the name of the preset and press enter. If you've made changes to a current preset and wish to overwrite that preset, just press "SAVE". Press "SAVE AS…" if you want to save it with a new name.

Searching for Presets

If you want to find a specific preset and have a lot of presets, there are many smart ways to search for preset, and all of them require that you open the Preset Collection by clicking the ⬚ button.

Search by tag

All presets have a number of tags associated with them, in general they describe the function ("DISTORTION", "EQ", "COMPRESSION"), the use case ("FEMALE VOCALS", "BASS") and the character ("CREAMY", "DARK"), etc. In plug-ins that use modules, such as MODULAR, the tags also include which modules are used by the preset (for example "SATURATION KNOB")

Prev/Next Preset

Current Preset

Factory Preset

Open Menu

Open Preset Collection in a separate window.

Presets are by default organized by collection
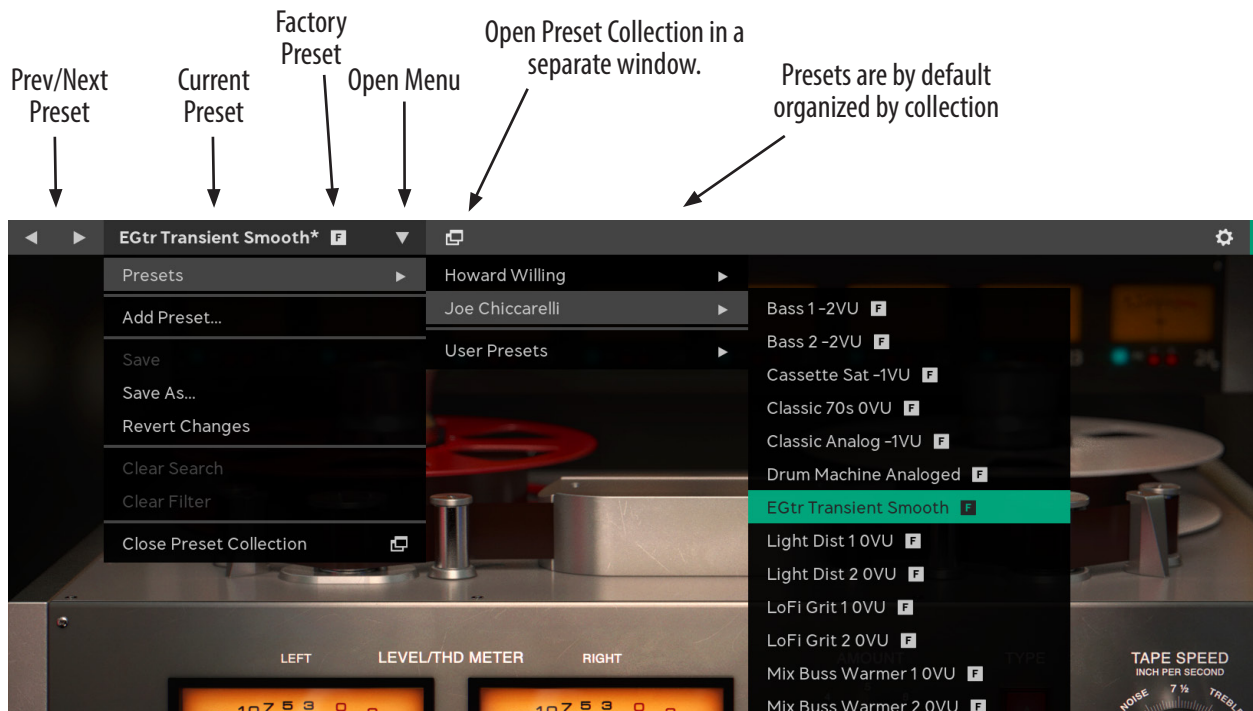
Browse presets directly from the menu bar at the top of the plug-in.
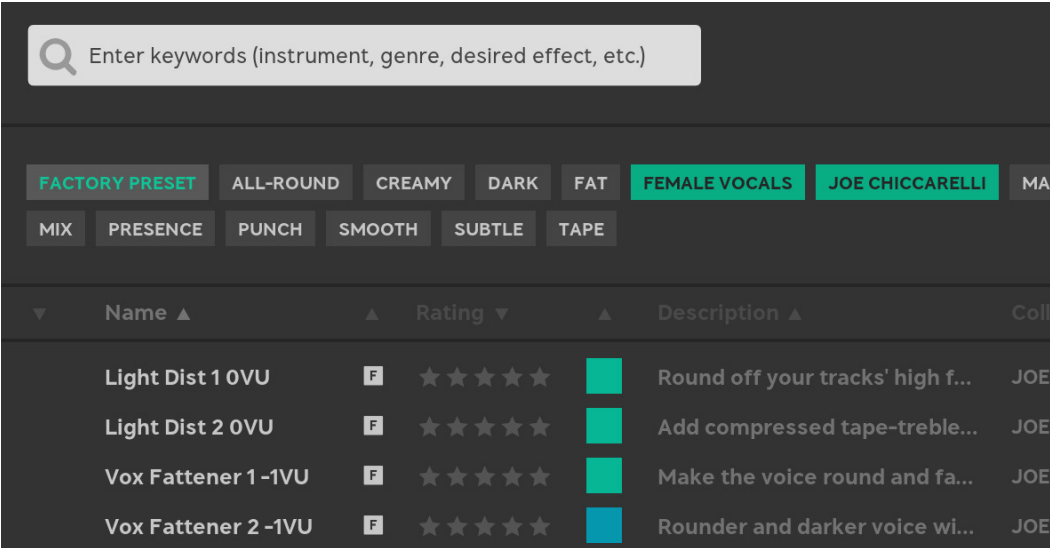
Two tags ("Female Vocals" and "Joe Chiccarelli") has been selected to show all Joe's presets suitable for female vocals.

Search box

A search in the SEARCH BOX will search through all metadata (name, tags, description, etc). If you want to narrow your search, you can specify what you want to search for by using a qualifier, such as "name:" or "description:".

Possible search qualifiers are *name, desc, description, tag, tags*, and *collection*.

Search in the menu bar

When you have selected a subset of presets, for example by searching for "vocals" or using a tag, the search results are available directly from the plug-in's menu bar. That means that you can easily step through the presets using the ◄► buttons.

Open the menu to see the search criteria or clear the search.
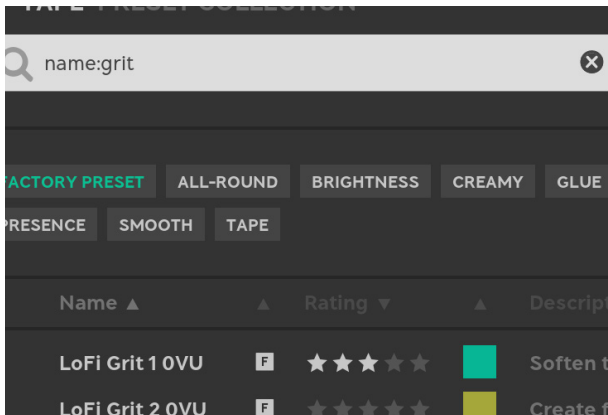
Type "name:" before the search criteria to limit the search to the name of the preset.
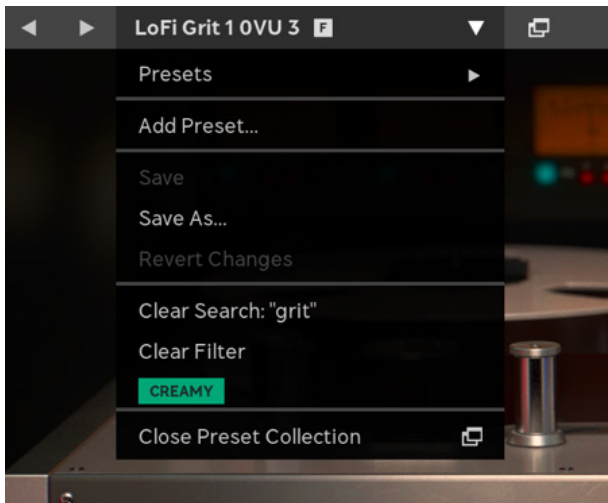
The menu shows the current search criteria, currently selected tags, and options to clear the filter and search criteria.

Plug-in Settings vs. "Metadata"

A Softube preset consists of two parts: the plug-in's settings and the description of it, what we call "*metadata*". Metadata is everything that's not the included in the plug-in's settings, for example preset name, description, color, rating, tags.

When you make a new preset by clicking "ADD NEW PRESET…" the only metadata that you save is the preset name. You need to open Preset Collection to add other metadata, such as a description and tags. If you instead use "SAVE AS…" when you save a preset, the metadata (for example tags) in the currently selected preset will be carried over to the new preset.

Whenever you change the settings in the plug-in, the preset name will be marked with an asterisk * to indicate the current settings are different from the current preset. It also indicates that the preset has changes that aren't saved. You need to click "SAVE" or "SAVE AS" to save those changes.

Asterisk (*) indicate that the settings of the plug-in is different from the saved preset.

When you make changes to the metadata, you don't have to save these. All metadata changes are saved immediately in the preset database.

*) An asterisk looks like this: *
*) ibid.

Preset Collection

Click ⊡ to open the Preset Collection. Here you can organize, colorize, tag, add icons and images and sort your presets.

Search field

Add or save presets

Set display options

Menu

Tags pane

Info pane

Preset pane

Group edit

Category

Name

Factory preset indicator
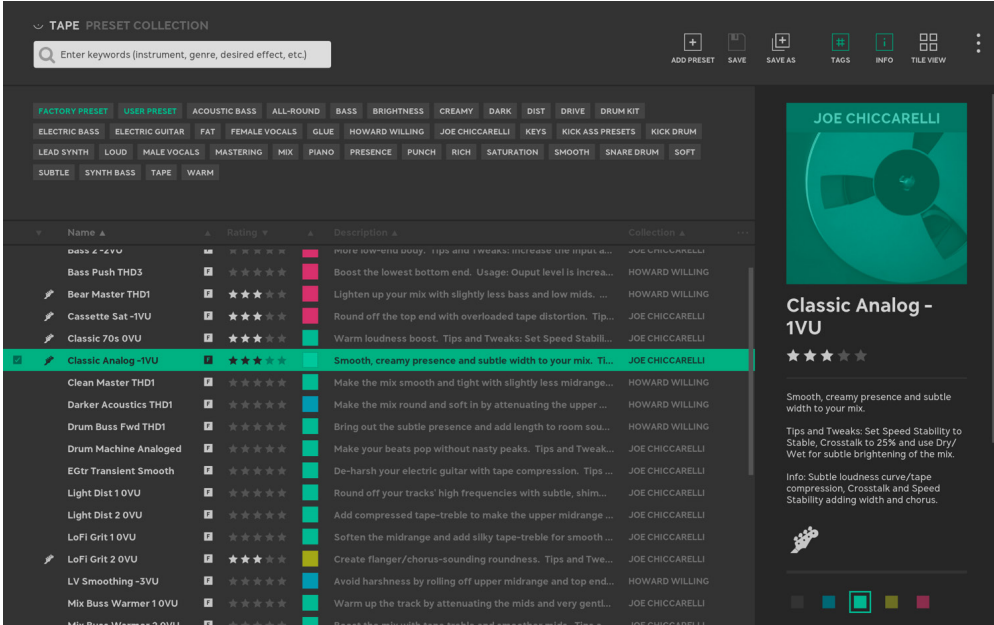
Preset name

Color

Description

Collection

Workflow

For a plug-in with hundreds of presets, the easiest way to start is to type something in the search field, such as "bass", or select an appropriate tag.
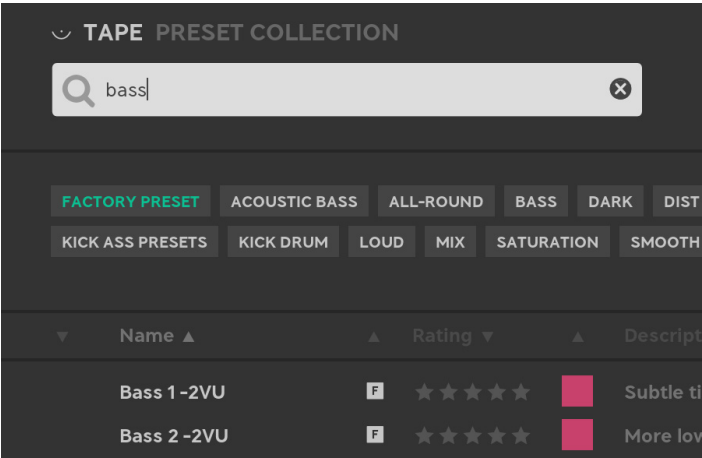
Type in the search field to find presets.

Use the keyboard up/down arrows to step through presets, and if you find something you like (or dislike), change the rating of that preset so that you can easily find it later.
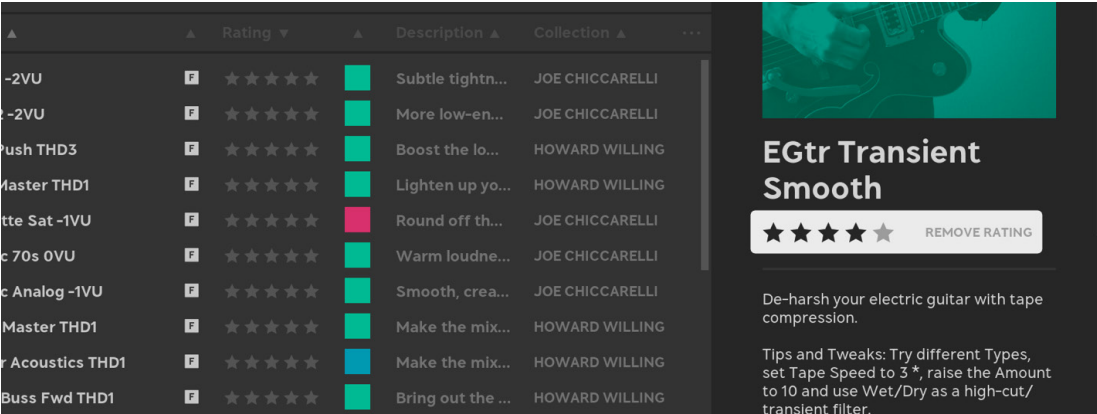
Click on the stars in the Info pane to change the rating. It is also possible to right-click the preset and change rating from the context menu.

Philosophy

The main ideas behind Preset Collection are

1. A preset name doesn't give enough information about how to use a preset. Sometimes you need more info, for example what to listen for, how to tweak it, in which context etc.

2. Everyone wants to organize their presets in different ways.

3. Tags are a simple way to create "folder like" structures, but without being limited by placing the preset in a single folder. A tag can be a use case, a project name, or just about anything!

With the preset's description you'll be able to add info, for instance how many dBs of gain reduction you need for the drum bus to really glue together, and with names, tags, ratings, categories, and colors you can organize those presets any way you want. The tags become powerful if you want to organize presets after projects you're working on. Tag each preset you make/use with the project name, and you'll have an extra dimension to use when you browse presets.

> Don't be afraid to add or change metadata in the factory presets. (And it's always possible to restore the original metadata later if you want to!)

Organizing presets

All factory presets come with tags and color, but you can remove those colors and tags and organize them in other ways. You can mark your favorite presets with a high rating, a specific tag ("kick ass presets!", "great for accordion"), a color, or a category, to make them easier to find later. You can select several presets at once to, for example, reset their color, and use your own color scheme. All fields, except COLLECTION, are possible to change.

Customizing the Preset Collection

You can decide yourself how much or how little info you want to show in the Preset Collection, and these settings are stored globally.
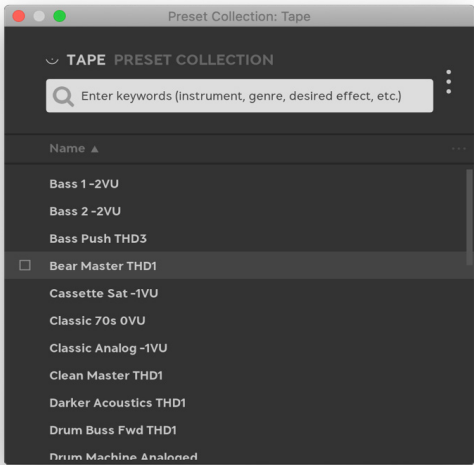
The minimal view of Preset Collection, only preset names and search field are visible.

Showing/hiding info panes

Click on ⊞ or ⓘ to show and hide the Tags and Info pane, respectively.

Showing/hiding columns

Click on the menu (•••) next to the columns header to turn on/off columns in the preset pane.
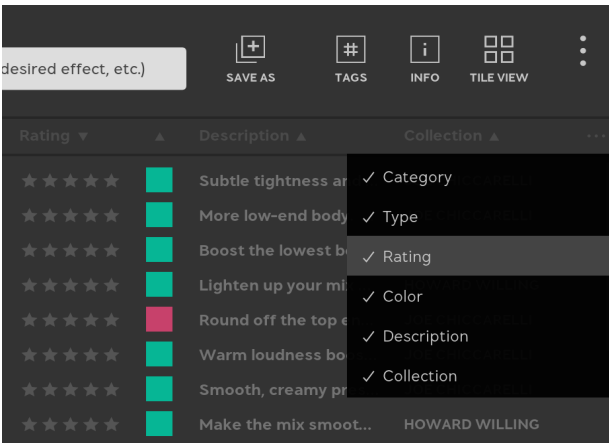
Select which columns are visible from the menu.

Sorting

Use the up/down arrows (▲▼) next the the column header to change preset sorting.

Tile view/List view

🔡 ☰ Click on Tile View 🔡 to show presets as tiles, or List View ☰ to get back to the default mode.
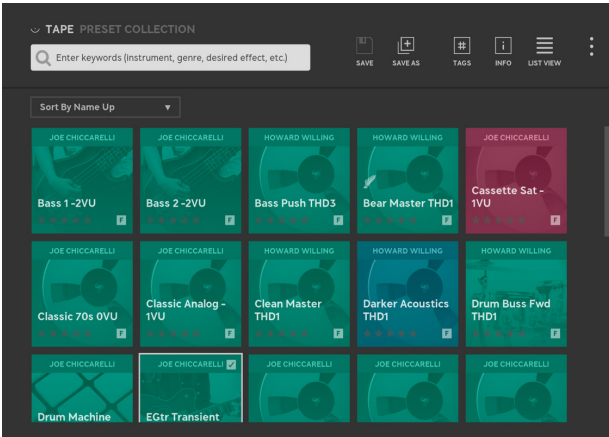
The Tile View.

Resizing tags pane or window

You can easily resize the Preset Collection window or the size of the TAGS pane by clicking the edge and drag it.

User Interface

🔍 **Search Row** Searches in name, description, tags, etc. To specify a particular field to search in, use one of these qualifiers: *name, desc, description, tag, tags*, and *collection*, for example "*collection:chiccarelli*"

⊞ **Add Preset** Create a new, empty, preset from the current plug-in settings.

💾 **Save Preset** Overwrite the selected preset with the current plug-in settings . Only possible with user presets. If the current preset is a factory preset, use "SAVE AS" instead.

⊞ **Save As** Save the current plug-in settings, together with the selected presets meta data (tags, description, etc) under a new name.

\# **Tags** Show/hide the TAGS pane.

ⓘ **Info** Show/hide the INFO pane.

🔡 **Tile view,**
☰ **List view** Switch between a list of presets (LIST VIEW) or tiled images (TILE VIEW)

⋮ Menu	Opens the menu with some additional options. See below for Menu options.

Menu Options

Add Preset	Add a new preset.
Save	Overwrite the selected preset with the current plug-in settings.
Save As	Copy the selected preset to a new preset with the current plug-in's settings.
Show/Hide Tags	Show/hide the TAGS pane.
Show/Hide Info	Show/hide the INFO pane.
Show Tile View	Show the TILE VIEW instead of LIST VIEW.
Import Preset(s)	Import presets from file, for instance if you downloaded a ".softubebundle" file from www.softube.com
Export Selected User Preset(s)	Exports the currently selected presets to a ".softubebundle" file, so that you can send them to a friend.
Enter Group Edit Mode	Let's you select several presets at once, which is useful if you want to export a batch of presets, or change tags, description or other meta data in several presets at once.
Preferences	Opens additional preferences, listed below.

Preferences

Warn When…	Turn warnings on/off when for example deleting or overwriting presets.
Show Images In Info Panel	Turn off to hide the image in the INFO PANEL.
Group presets by collection/group presets by category	Change how presets are grouped in the presets menu in the plug-in menu bar.

Pro tip: select "Group Presets By Category" to get a flat list for all uncategorized presets in the menu bar.

Tags pane ⊞
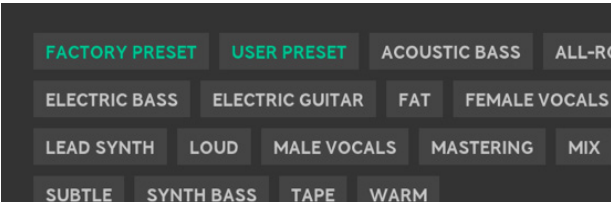
Use the Tags pane to filter presets by tag.

The TAGS PANE lets you filter presets by selecting one or several tags. Select for example the tag "MALE VOCALS" if you want to find all presets suitable for male vocals.

You can select several tags at once.

You can add tags to a preset by clicking "ADD TAG ✏" in the INFO PANE, and subsequently remove tags by clicking on the ⊗ on the tag.

Presets pane ⊞ ≡
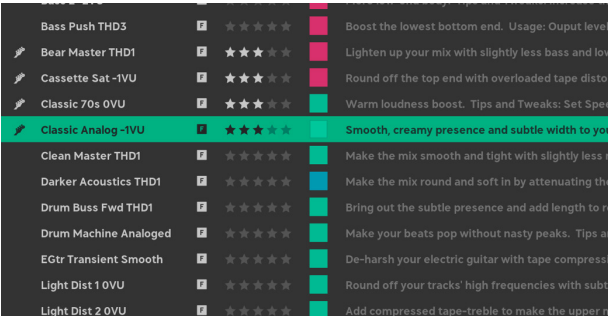
The Presets pane shows all presets in the current search or filter.

The PRESETS pane contains all presets in the current search. You can sort presets, select a preset, or edit a preset from the presets pane. The PRESETS pane can either be visualized as a list, or as a "TILE VIEW" with images for each preset.

Tip: Double click on the preset name to change it.

To sort presets in the LIST VIEW, click on ▲▼ for a column to sort down or up for that column. In the TILE VIEW, open the "SORT BY…" drop down to select sorting.

Context Menu (Right Click on a Preset)

Right-click on a preset to bring up a context menu with the following options:

Save	Save preset
Save As…	Save as a preset with a new name.
Revert Changes	Revert all changes made to the preset.
Rename…	Rename the current preset
Export…	Export the current preset
Delete	Delete the current preset
Restore Factory Metadata	If metadata edits, for example color, tags or ratings were made to a factory preset, you can revert them here.
Category	Sets the category of a preset. By default, no categories have been set.
Rating	Sets/changes the rating (0-5 stars) of a preset.
Color	Sets/changes the color of the preset.

Info pane ⓘ
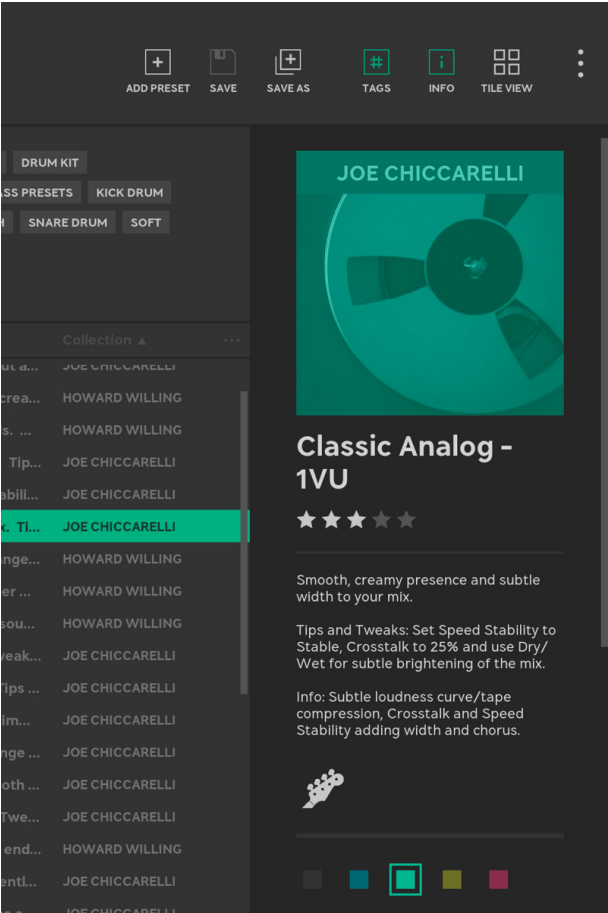
The Info pane contains all metadata for the currently selected preset and lets you edit these fields.

In the INFO pane you can edit the metadata of the selected preset. You can change image, name, rating, description, category, tags and color. Whenever it is possible to change a field, a pen icon 🖉 will appear. All changes made to the description of the plug-in are saved immediately.

Change Image

The image needs to be in PNG format, and will be converted to black-and-white on import.

Group Edit Mode

It's easy to edit several presets at once, for instance if you want to change rating or add a tag to multiple presets. Enter the GROUP EDIT mode by selecting several presets in the check box on the left. Once in GROUP EDIT mode, you can use SHIFT + click to select a range of presets.
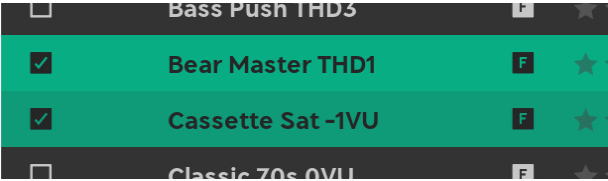
Select several presets by clicking the check box to the left.

In GROUP EDIT mode it is possible to edit several presets at the same time:

- Change rating, color, and category
- Append text to the name or description
- Add tags, or remove tags common for all selected presets

2 Curve Bender

CHANDLER LIMITED'S FOUNDER AND CHIEF designer **Wade Goeke** had many ideas for reimagining the historic console EQ to work in a modern context. After experimenting with a number of prototypes, Goeke incorporated several new features into the equalizer, creating what is now considered a modern classic — the **Chandler Limited Curve Bender EQ**.

Vintage Sound, Modern Features

That beast was called the **Chandler Limited EMI TG12345 Curve Bender**, and it was issued in celebration of the 75th birthday of Abbey Road Studios. Powerful functionality gives you serious sound shaping mojo. Wade Goeke turned the nine fixed frequency selections of the original Abbey Road desk into 51 EQ points. He also added the **Multiply** switch which increases the boost/cut ability from 5 to 15 dB, as well as sharpening the Q. He furthermore added high and low pass filters, and bell/shelf selections on the high and low bands.

So the Chandler Limited EMI TG12345 Curve Bender® is a classic equalizer reimagined from the glorious history of EMI and Abbey Road Studios which has come full circle, morphing into a modern powerhouse EQ perfect for all your recording, mixing, and mastering needs.

The Curve Bender's additions to the original TG12345 feature set are marked with yellow text color on the panel. The original features have white text color, except the Mid/Side and Link features.

User interface
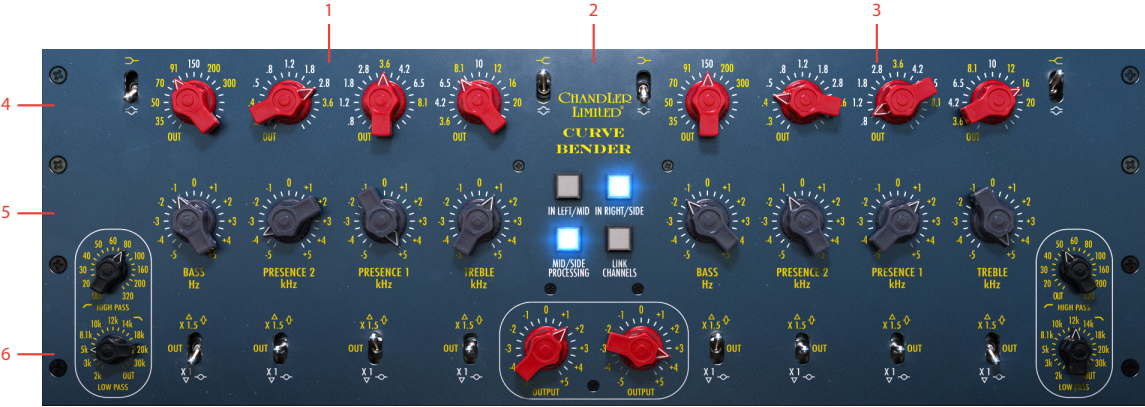
1. Left/Mid section
2. Center section
3. Right/Side section
4. Top row
5. Middle row
6. Bottom row

Parameters

Top row, left to right (duplicated for the RIGHT channel)

Bass Shelf/Bell switch	Switches the **Bass** band between SHELF or BELL operation.

Bass Frequency	Selects the operating frequency of the **Bass** band. The available frequencies are 35, 50, 70, 91, 150, 200 and 300 Hz. The band is bypassed in the OUT position.

Presence 2 Frequency	Selects the operating frequency of the **Presence 2** band. The available frequencies are 0.3, 0.4, 0.5, 0.8, 1.2, 1.8, 2.8 and 3.6 kHz. The band is bypassed in the OUT position.

Presence 1 Frequency	Selects the operating frequency of the **Presence 1** band. The available frequencies are 0.8, 1.2, 1.8, 2.8, 3.6, 4.2, 6.5 and 8.1 kHz. The band is bypassed in the OUT position.

Treble Frequency	Selects the operating frequency of the **Presence 2** band. The available frequencies are 3.6, 4.2, 6.5, 8.1, 10, 12, 16, and 20 kHz. The band is bypassed in the Out position.

Treble Shelf/Bell Switch	Switches the Treble band between SHELF or BELL operation.

Middle row, left to right (duplicated for the RIGHT channel):

High Pass	Selects the operating frequency of the **High Pass** filter, which has a fixed slope of 6 dB per octave. The available frequencies are 20, 30, 40, 50, 60, 80, 100, 160, 200 and 320 Hz. The filter is bypassed in the Out position.

Low Pass	Selects the operating frequency of the **Low Pass** filter, which has a fixed slope of 6 dB per octave. The available frequencies are 30, 20, 18, 14, 12, 10, 8.1, 5, 3 and 2 kHz. The filter is bypassed in the Out position.

Cut/Boost	Cuts or boosts the selected frequency with a range of either +/- 5 dB or +/- 15 dB, depending on the setting of the corresponding **Multiply** switch.

Bottom row, left to right (duplicated for the RIGHT channel):

Multiply switches	When set in the bottom position, cutting and boosting will have a maximum range of 5 dB. In the top position, the boost/cut range is increased to 15 dB to enable more aggressive equalization. This also decreases the width (Q) of the EQ curve for tonal variety. With the **Multiply** switch in its center position, the corresponding band is bypassed.

1. Bass shelf/bell

2. Bass band

3. Presence 2 band

4. Presence 1 band

5. Treble band

6. Treble shelf/bell

7. High pass

8. Low pass
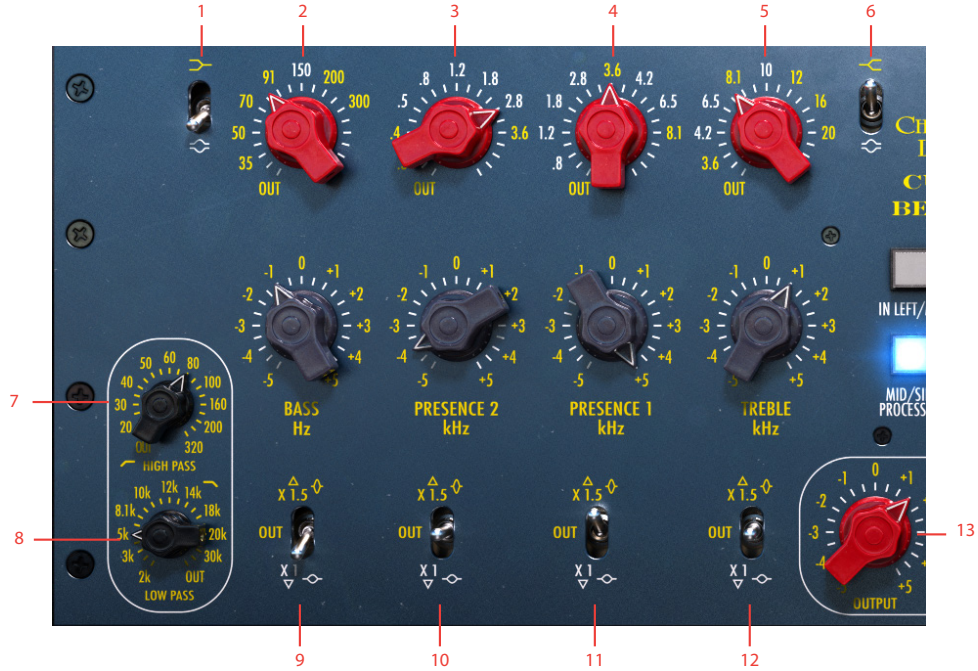
9. Bass: frequency, cut/boost, multiply

10. Presence 2: frequency, cut/boost, multiply

11. Presence 1: frequency, cut/boost, multiply

12. Treble: frequency, cut/boost, multiply

13. Output gain

Center Section

In Left/Mid	Activates or bypasses Curve Bender's processing of the LEFT or MID channel (depending on the position of the **Mid/Side Processing** button) to facilitate direct comparison of the processed and unprocessed sound.
In Right/Side	Activates or bypasses Curve Bender's processing of the RIGHT or SIDE channel (depending on the position of the **Mid/Side Processing** button) to facilitate direct comparison of the processed and unprocessed sound.
Mid/Side Processing	Enables MID/SIDE processing. When in MID/SIDE mode, the LEFT channel of the equalizer controls the MID channel, and RIGHT channel controls the SIDE channel.
Link Channels	Links the LEFT and RIGHT channels in STEREO mode, and MID and SIDE in MID/SIDE mode. When the channels are linked, any adjustments made to one channel will be automatically reflected in the other.

Center Section
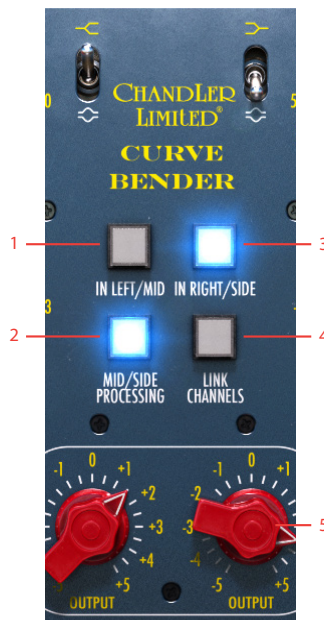
1. In left/mid
2. Mid/side processing
3. In right/side
4. Link channels
5. Output gains

Output Gain	Controls the output gain in 0.5 dB steps. Adjust this so the output level is reasonably matched to the unprocessed sound of the original sound source. This lets you accurately perform A/B comparisons of the Curve Bender bypassed and active.

In Use

The Curve Bender® alters the tonal content of the sound source in a musical, yet transparent, manner. It is equally useful during recording, mixing or mastering. The most common use is probably on a stereo source, with the unit in stereo mode and its left and right channels linked. This means that exactly the same processing is applied to both the left and right side of the sound source. But it works equally well on mono sources, and the ability to unlink the left and right channels means you can apply different equalization to the different sides, if necessary. For example, a stereo recording might have been made with slightly unmatched microphones—this can be remedied by unlinking the Curve Bender's channels and apply equalization to match one side to the other.

Mid/Side Tips

The Curve Bender® plug-in offers a mode which is not available on the hardware—the **Mid/Side** mode (MS).

In **Mid/Side** mode, the Curve Bender® will not process the left and right channels separately. Instead, the sound is separated into a MID portion of the sound, which contains only the material which is common to both left and right channels (the mono portion of the sound). The other portion is the SIDE portion of the sound, which contains only the material which differs between left and right.

Mid/Side for Mastering

Mid/Side processing is typically useful in a mastering situation, where you are working on stereo program material without access to the individual channels. For example, the lead vocal is typically placed firmly in the center of the stereo panorama and thus entirely resides in the MID portion of the sound, and not at all in the SIDE portion. So if you find a need to apply equalization to the lead vocal, but wish to avoid affecting the other instruments in the same frequency range, you can set

Curve Bender® to MID/SIDE mode, and only adjust the MID portion to achieve the desired effect on the vocal. Doing it this way leaves the SIDE portion untouched— where you in many cases will find panned guitars or stereo keyboards. You can of course also do the opposite, only affect the SIDE portion of the sound.

Stereo Widening

Mid/Side processing can also be used to make a stereo sound appear wider. You do this by slightly turning down the MID portion of the sound—but don't go too far as you might end up with a center "hole" in the mix.

Mono/Stereo Operation

The Curve Bender® is a stereo unit, but can also be used in MONO or MULTI-MONO.

Please note, when using Curve Bender® in MONO or MULTI-MONO, make sure the channels are linked and **Mid/Side Processing** is disengaged.

Credits

Kim Larsson, Arvid Rosén - modelling. **Niklas Odelholm** - graphic design. **Paul Shyrinskykh** - product owner, manual. **Patrik Holmström** - framework programing. **Ulf Ekelöf** - 3D rendering.

3   Germanium Compressor

"… like all the Germanium units, many of the parameters have been set by extensive listening and recording, not by technical analysis and equations. We feel this approach leads to very musical equipment that is more similar to a fine instrument. In many cases we actually TRIED NOT to "accidentally" discover the physics and math behind what we were doing, so that that nothing got in the way of what we were hearing :-)

This compressor has been in the design process for over two years. We really hope you'll like it!!!"

Wade Goeke, founder, owner and chief product designer at Chandler Limited®

The Germanium Compressor is like no other compressor. It is really different. The way it grabs the signal, the way it colors it and the way the knobs respond when you tweak them is different from other compressors we come across, and we've come across quite a few. It was also extremely hard to model, and that's largely because of the method with which Wade Goeke at Chandler Limiter® designed it. Instead of looking at hardware specs, noise floor, control theory and the math, Wade Goeke designed this almost exclusively by using extensive listening tests. The resulting circuits are therefor not always easy to understand, although the character of this compressor is obvious and in your face.

But the real master piece here is not just to design something different with lots of mojo, but to design something that's also extremely versatile. And Chandler Limited® managed to do that.

This is a compressor that excels at drums, vocals, bass, etc. but also at mix busses and masters. We hope you will enjoy it, because we are very proud of being able to bring this to you in software form.

Quoted parts in the manual are taken directly from the hardware manual of the Chandler Limited® Germanium Compressor

User interface

1. Left/Mid section
2. Right/Side section
3. Signal routing

Parameters

The user interface consists of two identical units, the top one for the left channel and the bottom one for the right. If you always want the same settings on both channels, just turn on **Link Channels** and the settings will be the same for both channels.

The lowest part of the user interface has an extra panel for routing the signal (**Mid/Side Mode, Link Channels**), external sidechain as well as an output volume control.

Compressor Parameters

Clean Comp/ Dirty Comp	The gain reduction element in the Germanium Compressor consists of a FET transistor, and these are known for the high amount of distortion. The design of the Germanium Compressor compensates for this, but if you want the dirty and uncompensated sound of the FET gain reduction, set this switch to DIRTY COMP
Input	Sets the amount of signal into the compressor, turn it up and get more compression. Depending on the gain staging you use in your DAW you might need more or less input gain to achieve the desired amount of compression. In the software version of Germanium Compressor we have increased the range of the **Input** knob so that it's easier to use.
Sidechain	Sidechain filter setting. Use this to set how much bass the compressor should react to. Frequencies below the set frequency is attenuated and will trigger the compressor less. When ever you use the compressor on something with a wide frequency range, such as a drum bus, a mix or sub groups, experiment with the setting of this control. It's almost magic!
Ratio	Controls the ratio of the compressor. Keep in mind that the original hardware was designed extensively through listening tests, as opposed to a mathematical approach. Instead they adjusted the individual settings while listening to various pre-recorded tracks and used what sounded best on most sources. The **Ratio** works intimately with the Comp Curve control. It is recommended that you first select the sound of the **Comp Curve** (the knee) and use the ratio to fine tune the compression from there.
Comp Curve	One of the most fun and most original part of the Germanium Compressor. The curve adjusts the knee of the compression with various diode combinations.

"Designing this section was one of the hardest and most rewarding parts of the Germanium Compressor. Simply put, we took every type of diode we could find and endlessly experimented with them in the curve section until we found the most useful combinations. Most Ratio/Curve controls are simple resistance circuits. Using diods add flavor and character. We ended up with six different combinations, using germanium, silicon and zener diodes in several configurations as well as a more standard resistance setting.

The individual choices were selected to give the best range of sounds on a variety of sources. Germanium diodes have a low forward voltage which translates to a very smooth compression knee. Silicon forward voltage is higher and makes the knee sharper. Zener diodes have another voltage characteristic that has an even more extreme effect on the knee."

R SOFT: The most neutral and gentle of the curves. It uses a standard resistance circuit and has the least coloration.

GERM SOFT: Uses a single germanium diode, that has a gentle diode curve. Slightly sharper knee than R SOFT, but with a nice color and vibe.

GERM MED: Five germanium diodes of another type than the one used in GERM SOFT. Even sharper knee, and a bit more vibe.

SILICON MED: A single silicon diode, has a sharper knee than GERM MEDIUM, but a different tone.

SILICON HARD: Two silicon diodes, an even sharper knee and more vibe.

ZENER HARD: Uses a single Zener diode with the sharpest knee of all settings. It also has a very different character compared to the other settings.

"Simply put, the knee of the curve gets sharper as you turn it up. Each diode has its own flavor as well. The R SOFT, GERM SOFT, GERM MED and SILICON MED tend to be the best for general use with each having its own tonality. For compression with the least artifacts or audibility choose the R SOFT or GERM SOFT settings. For a little more coloration and character, choose the GERM MED and SILICON MED.

GERM SOFT and GERM MED selections tend to be our favorite general use settings as they are the best compromise between coloration, tone, and punch. On drums, for example, you can use larger amounts of compression without losing the attack, punch and tone of the drum, while the germanium diode adds character.

For stereo buss or mastering, use the R SOFT or GERM SOFT settings. For hard smash, use the SILICON HARD or ZENER selections. For sub-mixing with the **Mix** control, use the harder presets."

Mix Blend between the compressed (WET) and un-compressed (DRY) signal. Mix the tight compressed sound together with the unprocessed original signal and get the best of both.

The dry signal is still affected by the tone of the **Germanium Drive** output circuit, so if you want to play around with that without any compression, just set **Mix** fully to DRY.

"A couple of favorite uses… For intense sub-mix sounds, use the HARD SILICON and ZENER curves with a faster attack. Set the **Mix** control on WET from three to zero.

For a more subtle sub-mix sound, where you just want to keep the track from sounding too soft, use the moderate curves with a medium attack. Mix in just enough dry signal to add some life back to the compressed sound.

One excellent use of this is to use two compressors in series. The first would be the Germanium Compressor set with the **Mix** at slightly DRY. You then use the second compressor to compress the remaining unprocessed sound. Interesting control of the tone as well as the dynamics can be achieved."

Attack   Sets the attack time of the compressor. Goes from "relatively fast" to "very slow".

Release   Sets the release time of the compressor.

"**Attack** was designed by listening to as much material as possible. We have never calculated the actual attack and release times in an attempt to keep them as musical and natural as possible. Another important feature of the **Attack** is the range it has. It is relatively fast, but more importantly it can be very slow! We found this extremely useful on drums, bass, guitars, mixes and mastering. For example on drums you can control the attitude, punch, and intensity by the attack setting. For tight drums, setting the attack from medium to slow lets you compress large amounts which will make them very punchy and will not overly soften the sound by dampening the attack. The same results apply with bass, etc. For general use we found medium attack times (2-6) very appropriate."

Germanium Drive   A gain switch in 3 dB steps. This is an output level control with built-in character. The actual amount of overall gain is affected by both the **Germanium Drive** and **Feedback** controls.

Using **Germanium Drive** and **Feedback** in different combinations is essential if you want to take advantage of all the different tones of the Germanium Compressor.

Feedback   Sets the vibe and tone of the output stage. At 0 you have more high frequencies, less distortion, less gain and a clearer tone. Increase it to get more distortion, gain, and a great deal of character in the bass and treble ranges.

On the original hardware, the effect of the **Feedback** control depends heavily on the equipment the Germanium Compressor is connected to, more precisely the input impedance of that unit. In the software version of the Germanium Compressor, we chose to "connect" it to an industry standard +4 line input, which is what a large majority of Germanium Compressor users do.

Routing Parameters

These parameters control the routing of the compressors, and allow you to link/unlink the compression, route mid/side, or use an external sidechain.

External Sidechain	External sidechain is engaged when this switch is in its up-most position.

Ext S/C Gain	Sets the gain of the input on the external sidechain.

In Left/Mid	
In Right/Side	Use to bypass the compressor.

Mid/Side Processing	Switches between Left/Right (normal) processing and Mid/Side processing.

In Mid/Side processing the top compressor is processing the Mid part of the input, which contains the mono information. The lower compressor is processing the side information. Mid/Side is extremely useful when working on drums buses or mixes. A small room can sound huge when processed in Mid/Side.

Please note that you need to unlink the channels (**Link Channels** set to OFF) to get true Mid/Side operation.

Tip: On a drum bus, turn on Mid/Side processing and dial-in a punchy 3-5 dB compression on the mid part. On the sides, use fast attack and release times to squash the signal as much as you can, while dialing in some dry using the Mix control. Use the Germanium Drive to balance the room tone (the side compressor) with the punch (the mid compressor).

Link Channels	Links the controls and the sidechain of both compressors.

Linked controls are just for your convenience, but the linked sidechain has a profound effect on the sound. With a linked sidechain, both sides will always get the same amount of gain reduction, and a loud sound in one channel will affect the gain of both. This is the preferred method when using much compression, because the sound stage might tilt to the left or right otherwise.

When using less compression, or mastering applications, it might be interesting to de-couple the left and right sides and get a more pronounced stereo image and "depth" that way.

Output Volume	Sets the output volume on both units. A completely colorless volume control from -24 to +24 dB.

Linked vs. Unlinked Channels

Normally, a stereo compressor will have the same amount of gain reduction on both channels, regardless of the difference of the channels. This is to, for example, avoid having the entire sound field tilt to the left when a loud sound is heard in the right channel. But for mastering purposes, and lower gain reduction amounts, it is often very useful to decouple these two channels in order to preserve a "depth" to the sound.

By engaging **Link Channels**, you'll get the "normal" stereo mode with linked gain reduction, as well as linked parameters. Set **Link Channels** to off and you get true, independent gain reduction.

This feature is even more important in **Mid/Side Processing** mode, where you seldom want to link the gain reduction.

Linking Best Practices

STEREO MODE: If you have lots of gain reduction, link your channels.

MID/SIDE MODE: Unlink them.

STEREO MODE: If you are mastering or applying small amounts of gain reduction, try to unlink them. But look out for sudden shifts in the stereo image related to the gain reduction.

As always, trust your ears. If it sounds good, it is good!

Credits

Hardware Modeling: **Jacopo Lovatello** (lead), **Björn Rödseth, Kim Larsson,** and **Arvid Rosén**

Original Hardware Design: **Wade Goeke**

GUI Design: **Niklas Odelholm, Ulf Ekelöf**

A/B and QA Testing: **Johan Bremin, Jacopo Lovatello, Wade Goeke,** and **Niklas Odelholm**

Manual: **Niklas Odelholm**, with excerpts from the hardware manual by **Wade Goeke**

Project Management: **Niklas Odelholm, Paul Shyrinskykh**

4 Zener-Bender

The Chandler Limited Zener-Bender consists of two classic Chandler Limited units, the Zener Limiter and the legendary Curve Bender. Both are classics on their own, but together they manage to bring some extra magic to the mix. Originally, our intention was to make a vintage mastering channel-strip, the Curve Bender has been a go-to analog mastering equalizer for decades, but then realized that this product isn't limited to mastering, it can also be amazing on a vocal track, a drum bus or pretty much any track!

User interface

The two units are almost exactly as the original units, and the separate plug-ins, with the exception of the center sections. For more information about the Zener Limiter and Curve Bender, please see it's respective chapter.

Zener Limiter (Top)

Compressor/Limiter/Saturator. Can be used as a gentle master compressor (COMP 1), a punchy limiter (LIMIT) or as a flat-out saturator (set switch to THD).

Curve Bender (Bottom)

Four bands of equalization plus high and low cut. For mastering purposes, set the switches in the lower row to X1 which gives the EQ a range of +/- 5 dB. For mixing purposes, set it to X1.5 and get a range of +/- 15 dB.

Center Section

The center section has options for linking and engaging the left and right sides, changing signal routing, external side chain and mid/side operation. The two yellow buttons (**EQ Before Limiter** and **Mid/Side Processing**) affects both the Zener Limiter and the Curve Bender, while the blue buttons (**In Left/Mid, In Right/Side, Link Channels**) only affects the operation of the adjacent unit.

In Left/Mid In Right/Side	Engages/bypasses the left or right side on the Zener Limiter or Curve Bender.
Link Channels	Links the left and right channels. For more information, please see the chapter on the Zener Limiter. Linking channels in this compressor is slightly more intricate than just setting the knobs to the same positions: a linked compressor uses a single compression on both channels while an unlinked compressor has dual compressors that operate individually on each channel.
	In short, if you use heavy compression (more than 3-4 dB of gain reduction) you'll want to link your channels to avoid the stereo image to shift to drastically. If you're using Mid/Side, you want to un-link the channels.
EQ Before Limiter	Changes signal routing. When engaged (lit up), the Curve Bender process audio before the Zener Limiter. When unlit, Zener Limiter process the audio before the Curve Bender.
Mid/Side Processing	Engages mid/side processing for both units.
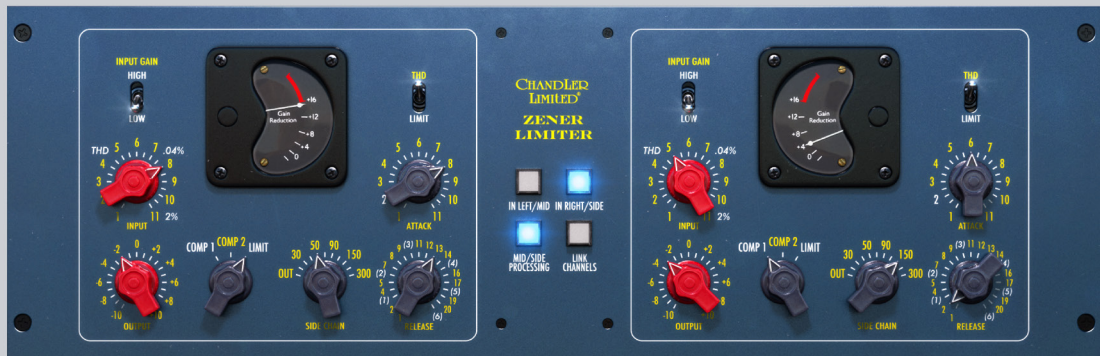
5 Zener-Limiter

THE CHANDLER LIMITED ZENER LIMITER is the ultimate TG limiter, issued in celebration of the 75th birthday of **Abbey Road Studios**. The Zener Limiter was conceived by Chandler Limited founder and Chief Designer, **Wade Goeke**, and is based on the vintage EMI circuits used to record **The Beatles** and **Pink Floyd**.

Chandler Limited's Zener Limiter continues the tradition of EMI Limiters started in 1954 with the **RS114** tube limiter and the 1968 **RS168 Zener Limiter**. Zener Limiters were also part of the 1969 **TG12345** console channels and the 1974 **TG12410** mastering desk. This newest version, reimagined to work in a modern context, borrows from the RS168 and TG12345 console channel strip limiter to make a new fully featured and flexible unit.

Center Section Controls

Wade Goeke added many new controls including switchable input impedance for hard or soft driving of the unit, 11-position attack, 21-position release, side chain filtering, and Comp 1, Comp 2, and limit settings.

The Chandler Limited Zener Limiter adds features and flexibility to the powerful and vintage sounding TG limiter circuits of a bygone era.

In Left/Mid	Activates or bypasses Zener's processing of the LEFT or MID channel (depending on the position of the **Mid/Side Processing** button) to facilitate direct comparison of the processed and unprocessed sound.
In Right/Side	Activates or bypasses Zener's processing of the RIGHT or SIDE channel (depending on the position of the **Mid/Side Processing** button) to facilitate direct comparison of the processed and unprocessed sound.

Mid/Side Processing Enables MID/SIDE processing. When in MID/SIDE mode, the LEFT channel of the limiter controls the MID channel, and RIGHT channel controls the SIDE channel.

Please note that you need to unlink the channels to get true, independent mid/side processing.

Link Channels Links the LEFT and RIGHT channels in STEREO mode, and MID and SIDE in MID/SIDE mode. When the channels are linked, any adjustments made to one channel will be automatically reflected in the other.

With unlinked channels you get a true dual channel processing with completely independent compressors. Link channels to get a more "normal" stereo compressor mode.

Center Section

In Left/Mid

In Right/Side

Mid/Side Processing

Link Channels
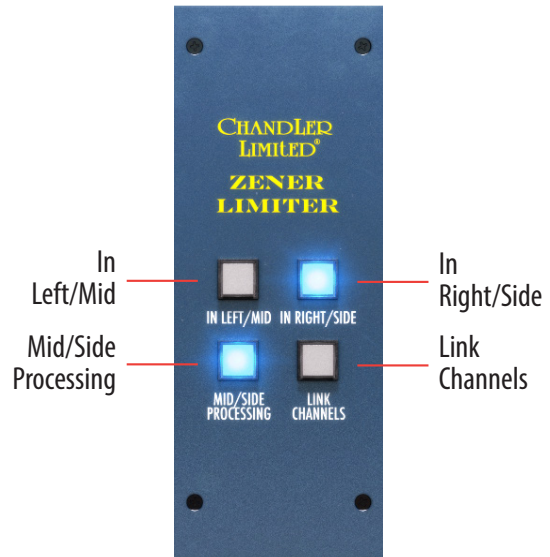
Left/Mid Section

Center Section

Right/Side Section

Left/Mid and Right/Side Section

1. Input Gain
2. Input
3. Output
4. Comp 1, Comp2, Limit
5. Side Chain
6. Release
7. Attack
8. THD

Compressor Controls

Input Gain The Zener has selectable input gain and input imped-ance via the input gain toggle on the top left of the control panel. This was added so the Limiter could more easily replicate different versions of the RS168 and TG12413 limiters. The high gain setting is 12dB higher and is similar to the "Vanderlism" setting of the RS168 Zener prototype

(please refer to the book "Recording the Beatles" for more). The low gain position is closer to the TG12345 console input, however, still hotter than the unity gain input of the TG12413 mastering console version. Input impedance is 300 ohm in High and 1200 ohm in Low.

Input This is a 21-position gold contact audio taper switch that controls the level going into the compressor/limiter. Simply turn it up to drive the unit into harder limiting.

THD The THD (total harmonic distortion) toggle on the top right of each channel disengages the limiter's threshold so that the channel will stop limiting, however, the signal still runs through the entire audio path and sidechain. The effect is a smooth pleasing distortion, featuring a high frequency bump caused by the discrete amplifiers and zener diode limiting circuit. Use the **Input** control switch to drive the signal for more or less distortion, as marked in white on the front panel. Interestingly, the THD function takes a clean sine wave signal and gradually triangulates it as you increase the input control, however importantly, it does not clip the signal in any way. It is possible to drive the THD past the 2% marking on the control panel by increasing the signal into the Zener from an outside source.

Output Another 21-position gold contact switch, set for +/-10 dB of gain control in 1 dB

steps. Use this for gain make up when hard limiting or to drive the second channel into a higher THD range when in THD mode as described above.

Hold SHIFT while adjusting either the **Input** or **Output** to adjust both simultaneously. Increasing **Input** will decrease the **Output**, and vice versa.

Comp 1/Comp 2/ Limit A very important control, used for tailoring the overall tone of the Zener Limiter. COMP 1 is a 2:1 ratio with slower time constants that was originally designed by EMI technical engineers to emulate Abbey Road's RS124 Compressor. LIMIT is much faster and designed to emulate the response curves of the studio's Fairchild 660s. COMP 2 is an modern setting placing the limiter halfway between the two original settings and essentially giving you the compression curve of COMP 1 with faster release times similar to LIMIT.

Sidechain Sidechain filtering was added to the Zener as part of the effort to make an ultimately flexible TG Limiter. In situations where a TG1 may be too aggressive, the sidechain filter, combined with other Zener modifications, makes this new TG limiter useable in nearly every situation.

With this control you can remove low frequency information (30 to 300 Hz) feeding the limiting circuit. It is *very* effective when you need a more gentle compression or limiting action while maintaining that special TG sound. Excellent for mixes, subgroups, bass, and even hard slamming kick drums!

Attack The **Attack** control combined with the **Sidechain** filter is the heart of the flexibility of the Zener. The RS168 and all TG versions of the limiter had fixed attack times, until now. You will notice that setting 2 is white, this is the original attack time with the remaining positions in yellow being new settings. Since the attack times were generally quite quick, especially in LIMIT mode, most additional settings are slower. These are extremely effective on drums and bass when combined with sidechain filter.

Release A special feature of all EMI limiters, from the RS114 tube limiter, RS124 compressor, RS168 Zener prototype, TG12345 console limiter, and TG12413 mastering desk limiter was that they all shared a special set of six recovery or release times.

These settings are a very important part of the EMI and TG sound. The Zener Limiter preserves these settings in all their glory, though also greatly expands on them, adding

further flexibility and tonal character. The new expanded release control features 21 positions with the original 1-6 release times marked in white among the modern additions presented in yellow, making it easy to recall the old school setting of your choice or experiment creatively with the new settings.

Some engineers may wish to use the new release times to tune the release to match the tempo of their source material or just enjoy the great variety of sounds attainable.

NOTE! The fastest release times, positions 1 and 2, marked in yellow, were mainly chosen for the generally slower acting COMP 1 and 2 modes. When LIMITING very hard on these settings, it may yield unpleasing artifacts and it generally is best to switch to the vintage (1) setting, presented in white; this was the standard fast setting on EMI Limiters.

Linked vs. Unlinked Channels

Normally, a stereo compressor will have the same amount of gain reduction on both channels, regardless of the difference of the channels. This is to, for example, avoid having the entire sound field tilt to the left when a loud sound is heard in the right channel. But for mastering purposes, and lower gain reduction amounts, it is often very useful to decouple these two channels in order to preserve a "depth" to the sound.

By engaging **Link Channels**, you'll get the "normal" stereo mode with linked gain reduction, as well as linked parameters. Set **Link Channels** to OFF and you get true, independent gain reduction.

This feature is even more important in **Mid/Side Processing** mode, where you seldom want to link the gain reduction.

Linking Best Practices

- STEREO MODE: If you have lots of gain reduction, link your channels.
- MID/SIDE MODE: Unlink them.
- STEREO MODE: If you are mastering or applying small amounts of gain reduction, try to unlink them. But look out for sudden shifts in the stereo image related to the gain reduction.

As always, trust your ears. If it sounds good, it is good!

Linking Input and Output Controls

If you want to adjust the input gain while simultaneously compensating with the output gain, hold SHIFT while adjusting the **Input** or **Output** knob.

The output level will be decreased if you increase the input level, and vice versa.

Mono Mode

When using the Zener Limiter in MONO, please set it in MID/SIDE MODE for correct gain staging.

In Use

At unity gain input with the **Input** control switch on full you will get about 2% THD (total harmonic distortion). If this is increased to +4–5 dB, distortion will increase to around 5%, which is many, many times that of tape and without clipping.

One excellent use of this is to patch the two Zener channels in series, using the first to limit and the second for THD. Use the **Output** control of the first channel to drive the input of the second into higher THD percentages, while lowering the output of the second to control overall level. Very retro!

Credits

Björn Rödseth - modelling. **Paul Shyrinskykh** - product owner, manual. **Niklas Odelholm** - graphic design. **Ulf Ekelöf** - 3D rendering.

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          or

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Brian Paul

Mesa 3-D graphics library

Version: 7.0

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