
A: Warm And Proud*
A→B
Load
Save
ST DUO MS
INPUT
TAPE EQUALIZER
POLE L
TRANSPOSE
BAL
PHASE
TG12411
INPUT
KHz
LOW PASS
PRESENCE
dB
Hz
HIGH PASS
TG12414
FILTER
ORIGINAL
MODERN
LIMIT
RECOVERY
MAKE UP
RATIO
SC FILTERS
MIX
GR
TG12413
LIMITER
KHz
Hz
FREQUENCY
GAIN
SHAPE
TG12412
TONE
Abbey Road Studios
TG Mastering Chain
SPREADER
STEREO
MONO
OUTPUT
TRACK NAME

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INTRODUCTION

Thanks for choosing Waves. To get the most out of your Abbey Road TG Mastering Chain plugin, please take a few minutes to read this user guide.

To register and activate your new products, check for upgrades, and manage your account, log in to your Waves account. If you don't already have a Waves account, click Create Account in the top right corner of the Waves.com homepage.

Download and install your new Waves software with the Waves Central application, which you can also use to download the latest version of plugins, move licenses from your Waves Cloud to any computer, and make offline installers so you can install current software on computers not connected to the internet.

Finally, we suggest that you visit Waves Support, where you'll find an extensive answer base, system and host requirements, troubleshooting guides, and much more.

About the Abbey Road TG Mastering Chain Plugin

Abbey Road TG Mastering Chain is a modular plugin for mastering and mixing, modeled after the original **EMI TG12410 Transfer Console** used in all Abbey Road Studios' mastering suites from the early '70s to this day.

The plugin can be used for both mastering and mixing – on the master bus, on groups or on individual tracks – to lend them the distinct sound of the original console, as heard on albums from Pink Floyd's Dark Side of the Moon to Radiohead's OK Computer and beyond.

Like the original EMI TG12410 console, the Abbey Road TG Mastering Chain plugin consists of the following modules:

1. **TG12411 Input Module** – handles all input tasks (phase, L/R balance, etc.)

2. **TG12412 Tone Module** – a musical, versatile 4-band EQ with 5 filter types per band

3. **TG12413 Limiter Module** – includes three compressor/limiter types:

Original	Aggressive and 'dirty', precision-modeled after the unit's original Zener diode limiter
Modern	Pristine-sounding, with higher levels of perceived loudness; an original Waves and Abbey Road design
Limit	Based on the limiter mode of the console's original Zener diode. The knee is much harder compared to the "Original" compressor ["Original"]

4. **TG12414 Filter Module** – includes low-pass & high-pass filters and a presence bell

5. **TG12416 Output Module** – complete with a spreader (stereo spread enhancer)

The individual modules can be re-ordered (except for the Input and Output modules which remain at the start and end of the chain) and switched on/off, letting you create differently ordered chains and a modular, customizable processing flow.

The Abbey Road TG Mastering Chain plugin also comes with the **Abbey Road TG Meter Bridge** component (a separate plugin), which is based on the original set of PPM, VU and phase correlation meters used by Abbey Road's engineers in conjunction with the EMI TG12410 Transfer Console.

QUICK START

This quick start guide suggests the basics of how to use the Abbey Road TG Mastering Chain plugin when mastering a track. To learn more about controlling the plugin and how to fine-tune its sound, in mixing as well as mastering sessions, read the “Interface and Controls” section later in this user guide.

1. Insert the plugin on the master channel. (If you are using the plugin to mix rather than master, you can of course insert it on any individual channel or group.)
2. Use the TG12411 Input module to adjust input gain or to handle phase and balance issues (for more on how to do this, see the TG12411 Input Module section later in this user guide). You may also want to use the module’s Tape Equalizer control for its unique sonic color.
3. Open the TG Meter Bridge on any channel.
4. Set the Meter bridge to read the instance you are working on.
5. Adjust the input level to get a good 0VU input reading on the meter bridge. This will assure enough headroom.
6. Experiment with the TG12412 Tone module to get a good frequency balance.
7. When mastering a track to meet modern mastering requirements, we recommend you use the Modern mode of the TG12413 Limiter module, which is best suited for today’s mastering requirements.
8. In the TG12413 Limiter module, experiment with the Recovery control to get the best time-constant results for the song you are working on. 3, 4 and 5 are the ones we’ve found most suitable for mastering: 3 for more upbeat songs, 5 for slower ones.
9. The key to getting a good compression sound is playing with the TG12413 Limiter module’s Ratio and Mix controls, in order to achieve the best compression balance. Try somewhere around Ratio = 30–40 and Mix = 40–50.
10. In the Limiter’s expanded view, turn on the high-pass filter and find a good-sounding point anywhere between 120–200 Hz. This will make the compression better correlated to the music (as sub frequencies will tend to suffocate the compression).

11. Use the TG12414 Filter module to clean unwanted frequency ranges and add some presence if needed.

12. A/B between the unprocessed and processed signal, using the bypass control. Make sure you adjust the overall level of processed signal to match the unprocessed level, so the A/B comparison does not introduce gain changes which might easily throw you off.

COMPONENTS

The Abbey Road TG Mastering Chain plugin has four components:

> Mono

> Stereo

> Live Mono

> Live Stereo

The Live components are optimized for live use, where extremely low latency and minimal CPU usage are required. The non-Live components have up-sampling at lower sample rates; the Live components remove the up-sampling in order to reduce latency. The non-Live components use very sharp linear phase FIR sidechain filters that introduce latency; the Live components use non-linear phase IIR sidechain filters to minimize both latency and CPU usage.

THE WAVESYSTEM TOOLBAR

The WaveSystem toolbar, located at the top of the plugin, takes care of most of the administrative functions you will encounter while working with your Waves software, including Undo and Redo, loading and saving presets, and more. The features of the WaveSystem toolbar are the same on practically all Waves plugins. For more information on how to use it, see the WaveSystem User Guide.

INTERFACE



Please note: This is the default order of the plugin's five modules, from left to right: Input, Tone, Limiter, Filter, Output. To create your own customized chain, you can easily change the order of the Tone, Limiter and Filter modules by dragging each to the desired location within the chain.

MODULES AND CONTROLS

Controls Available in All Modules

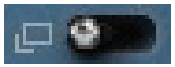
The following controls appear at the top of each module (except Output):

On/Off



Each of the plugin's modules can be turned on or off by pressing this button. While off, the module does not consume any CPU power. All modules are first turned off by default. To turn each on, click on the individual module's on/off control. (Please note that in the plugin's Live components, turning a module off will *not* change CPU consumption.)

Expand/Collapse



Expands/collapses the module.

ST/DUO/MS (Stereo component only)



In the plugin's stereo component, within each module, you can choose between three modes of processing a stereo signal: Stereo (ST), Duo, and Mid-Sides (MS).

Regardless of a module's stereo mode – ST, DUO, or MS – its output is always stereo. If needed, it will be converted into MS at the input of the next module in the chain. This allows re-ordering of the modules on the fly with no impact on the stereo processing.

The collapsed view of each module shows just one control per function (e.g., frequency, gain), regardless of whether the signal is mono or stereo.

The expanded view of each stereo module shows each control twice. In Stereo and Duo modes, the left and right control sections are labeled L and R. In MS mode, the labels will change to M and S, for mid and side.

Link



In the collapsed view, the left and right (or mid and side) channels are always linked: that is, both channels are controlled together, and by default, with the same values.

The expanded view of each module includes a square **Link** button at the top. When Link is on, the controls for both sides remain linked. Switches (such as EQ type, filter on/off, SC on/off) remain linked as well: clicking a left or right switch will set both controls to the same value.

To decouple the left and right (or mid and side) controls, simply turn the Link button off. This will allow you to adjust each side separately. Once L and R are re-linked, any offset between them will be maintained.

Expanded Module Navigation



Once a module is expanded, you can navigate directly to the expanded view of any other module in the plugin by clicking on any of the module navigation buttons at the top.

Track Name

Each instance of the plugin will show the track name it is instantiated on. You can use this information to move between different meter readings on the TG Meter Bridge.

Please note that some DAWs do not support track naming. When working with such DAWs, you can fill in the Track Name manually.

TG12411 Input Module



Collapsed View



Expanded View (Stereo)

Input

Controls the input level to the plugin.

Range: -24 to +24 dB in 0.1-dB increments.

Tape Equalizer

Applies a filter to flatten out the frequency spectrum.

Originally, in the hardware domain, this was done when playing back the track from NAB or IEC tape machines at either 7.5 or 15 ips, in order to provide the equalization required for playing NAB-equalized tape on an IEC machine and vice versa.

In your digital mixes, you will not need to use this control for that historic purpose. We have decided to keep this control, however, due to its great sonic character, and you may find that it gives your tracks interesting sonic characteristics.

Options:

NAB-to-IEC: 7.5 ips and 15 ips

IEC-to-NAB: 15 ips and 7.5 ips

Default: Flat

Pole

Flips the input phase by 180 degrees.

The Stereo component includes Pole L and Pole R. Clicking on Pole L will only flip the phase for the Left channel. To flip the overall phase for both channels, you will have to expand the Input module and click on Pole R as well.

Default: Off

Transpose

Transposes the Left and Right channels.

Default: Off

Balance (BAL)

Changes the level relations between Left and Right channels. Moving towards the right side will increase the level on the right and decrease the level on the left, and vice versa.

Range: -5 to +5 dB in 0.05-dB increments.

Default: 0

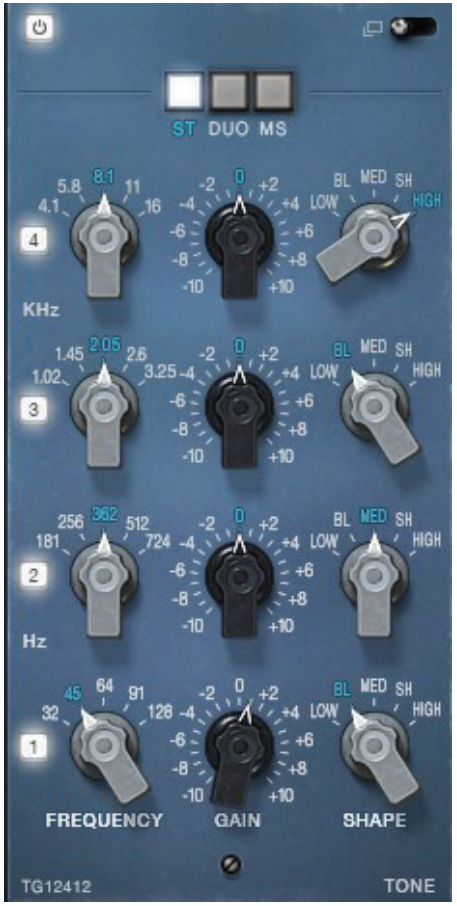
Phase

Shifts the phase of one channel relative to the other by 90 degrees. This is good for stereo tracks that have phase correlation problems between Left and Right.

Options: Stereo, L+90, R+90

Default: Stereo

TG12412 Tone Module



Collapsed View



Expanded View (Stereo)

The Tone module is a highly musical and versatile 4-band EQ. Each band has 5 fixed cutoff points and 5 filter shapes.

Frequency

Determines the cutoff point for each band:

Band 1	32, 45, 64, 91, 128 Hz
Band 2	181, 256, 362, 512, 724 Hz
Band 3	1.02, 1.45, 2.05, 2.6, 3.25 kHz
Band 4	4.1, 5.8, 8.1, 11, 16 kHz

Gain

Determines the level for each band.

Range: -10 to +10 dB in 0.05-dB increments.

Shape

Determines the filter type for each band:

Low	A low-shelf filter
BL	Blunt – a very wide bell filter
MED	Medium Blunt – a moderately wide bell filter
SH	Sharp – a very narrow bell filter
High	A high-shelf filter

Band On/Off

Each band has a dedicated on/off switch, so you can easily monitor the processing of each band.

Band Monitoring (expanded view only)

 Clicking this button will allow you to solo the band and hear its filtering separately.

TG12413 Limiter Module



Collapsed View



Expanded View (Stereo)

The Limiter module lets you choose between the module's original Zener compressor and limiter, and a modern compressor designed to meet modern mastering requirements. It is coupled with linear phase filters for super-clean filtering, and phase-coherent sidechain filters.

Type

Toggles between 3 modes of dynamic processing:

Original The TG12413's original Zener diode compressor.

Modern VCA-based compressor, newly designed with low-level compression in mind in order to meet modern-day mastering requirements.

Limit This is the limiter mode of the Zener diode. The knee is much harder compared to the compressor ["Original"]. Please note that this is *not* a brick-wall limiter: transients are expected to pass.

Please note: The Type selector is the only control in this module that cannot be set differently on the L and R stereo channels: for example, if the Type control is set to Modern on the L channel, it will be set to Modern on the R channel as well.

Recovery

Selects between six recovery times, depending on the Type you use (Original or Modern). These recovery times are very hard to put in terms of exact milliseconds. Think of them in the following terms: the higher the recovery state, the longer the attack/release time. You will need to experiment in order to hear the exact difference.

Range: 1-6

Default: 3

Make Up

Use this control to manually adjust the makeup gain of the compressed signal. The plugin does apply automatic makeup gain to the compressed signal, and for most input signals it will do a good job; but sometimes you need a minor tweak to make it perfect.

Please note that the makeup gain is applied on the compressed signal only, not on the direct signal. This is important to know when the Mix control (see below) is set to anything other than 100, meaning that your signal blends both the compressed and the direct signal.

Range: -12 to +12 dB

Default: 0 dB

Ratio

Sets a ratio to the VCA input/output curve. For example, if for a certain point on the VCA curve an input of -12 dBFS will result in an output of -24 dBFS at 100 ratio, then at 50 ratio the same input of -12 dBFS will result in -18 dBFS.

Range: 1–100

Default: 50

Sidechain Filters (SC Filters)

As an original addition to the Waves Abbey Road TG Mastering Chain plugin, we have added three linear phase filters to the dynamics sidechain of the compressor/limiter module. Linear phase filters are important to keep the phase aligned in the sidechain, so that the plugin's attack/release will work well on phase-aligned signals.

(Please note that the linear phase FIR sidechain filters are used only in the plugin's 'regular' Mono and Stereo components, not in the two Live components that are optimized for live use. In the Live components, the linear phase FIR filters are replaced with non-linear phase IIR filters.)

The module's collapsed view includes a red global On/Off switch for all the sidechain filters.

The sidechain filters are all off by default. Engage each by clicking the square button next to its name. Once you engage one of the sidechain filters, it will become available for you on both the collapsed and the expanded views. Clicking the global On/Off control will turn all sidechain filters off: this will help you easily monitor the addition of the sidechain filters to the compression sound.

The following sidechain filters are available in the module's expanded view:

High Pass	25 Hz–1Khz; 48 dB per octave
Bell	100 Hz–12 kHz; -40 to +40 dB in 0.1-dB increments
Low Pass	1 kHz–22 kHz; 48 dB per octave



Clicking this button (in the expanded view) will enable you to separately monitor the sidechain, including the sidechain filters you've applied.

Please note: In the TG12413 Limiter module, the ST/DUO/MS selection determines how the sidechain is processed:

Stereo	Left and right channels are summed in the sidechain. The sidechain values are the same for left and right, so dynamic processing will apply equally to both channels.
Duo	Left and right channels of the sidechain are processed separately, so dynamic processing may not be the same for the left and right channels.
MS	Mid and side channels of the sidechain are processed separately, so dynamic processing may not be the same for the mid and side channels.*

Mix

Determines the balance between the uncompressed and the compressed signal.

GR

Gain reduction meter.

* Please note: Pro Tools allows only a mono sidechain.

TG12414 Filter Module



Collapsed View



Expanded View (Stereo)

The Filter module is a simple, highly musical 3-band filter with high-pass, low-pass and presence controls.

High Pass

Choose from 4 selected HP frequencies: 40 Hz, 63 Hz, 80 Hz, 110 Hz

'Low' functions as off.

Presence

Choose from 8 fixed cutoff points of a Med Blunt bell: 0.5 khz, 0.8 kHz, 1.2 kHz, 1.8 kHz, 2.8 kHz, 4.2 kHz, 6.5 kHz, 10 kHz

dB range: -10 to +10 dB in 0.1-dB increments.

Low Pass

Choose from 5 fixed cutoff points: 20 kHz, 15 kHz, 12 kHz, 10 kHz, 8 kHz

'High' functions as off.

TG12416 Output Module

Spreader

This is a stereo spread enhancer, precision-modeled on the spreader from the original EMI TG12416 unit. It applies a Sum and Diff matrix to the signal and manipulates the gain relations between them to provide the stereo image wider or narrower.

Range: -5 to +5 dB in 0.1-dB increments.

Default: 0



Monitoring

This section allows you to easily monitor the output signal in the following ways:

L	Monitor the Left channel only, keeping the signal on the left side of the speakers
Stereo	The default monitoring option: regular stereo output
R	Monitor the Right channel only, keeping the signal on the right side of the speakers
M (Mid)	Monitor the signal summed to Mid (L+R/2)
Mono	Monitor the signal summed to mono
S (Sides)	Monitor the sides, that is, the difference between L and R (L-R/2).

Output Fader

Controls the plugin's overall output level.

Range: -24 dB to +12 dB in 0.1-dB increments.

Output Fader Link

 Links Left and Right faders in a relative link.

Output Meter

Shows a peak reading of the output level.

ABBEY ROAD TG METER BRIDGE



The mastering engineers at Abbey Road Studios rely on a set of three meters when working with the EMI TG12410 Transfer Console:

> **PPM meter** (Genesis Systems DPM 101) for metering peak levels

> **VU meter** for metering averaged signal levels

> **Phase correlation meter**

Your copy of the Abbey Road TG Mastering Chain plugin comes with a bonus component – a separate plugin, really – which includes all three meters in one. This is the Abbey Road Meter Bridge. Using this plugin, you can easily open all three meters at once, just like Abbey Road's engineers.

We have added three metering options to the Abbey Road TG Meter Bridge:

IN Input
GR Gain Reduction
OUT Output

Connecting the Meter Bridge with the Abbey Road TG Mastering Chain Plugin

One instance of the Abbey Road TG Meter Bridge can communicate with all instances of the Abbey Road TG Mastering Chain plugin, inserted on any track in the same session.

If you open the Meter Bridge on a particular track, it will monitor that track by default.

To meter a different track in the same session, simply select its name in the "Track Name" window of the Meter Bridge interface; you are now connected to the instance of the Abbey Road TG Mastering Chain plugin that is open on that other track, and can meter its input, gain reduction and output.