



ASSIMILATOR

USER MANUAL

ENGLISH

INTRODUCTION

Did you ever ask yourself “Why doesn’t my mix sound like THAT?” If you have asked yourself this question, then ASSIMILATOR is your Plug-In. With ASSIMILATOR, you can learn the frequency curve of your favorite mix or solo instrument track and apply that frequency curve to your mix or track; sort of like an “automatic equalizer”. Simply put, ASSIMILATOR is an equalization tool that delivers excellent results while removing the tedious work from equalizing and fine tuning your mix. What’s more, ASSIMILATOR is a phase linear equalization tool, freeing you from needless worries about artifacts related to phase distortion. Without such phase interference, you get the most transparent and musical processing possible. Best of all, ASSIMILATOR is a Plug-In that demonstrates the most significant benefit of the POWERCORE platform: Extreme processing, without bogging your host CPU down.

Enjoy!

The TC WORKS Team

ATTENTION!

THIS IS A POWERCORE PLUG-IN AND REQUIRES POWERCORE TO BE INSTALLED IN THE COMPUTER! THIS PLUG-IN WILL NOT RUN WITHOUT POWERCORE.

ATTENTION!

ASSIMILATOR is a Hybrid POWERCORE and Native Plug-In. To maximize the performance of this Plug-In while maintaining the best sound quality, the limiter will run “Native” on your host CPU. This will not place a heavy load on your host CPU and will reduce ASSIMILATOR’s DSP use for non-critical tasks such as gain staging.

GETTING STARTED

SYSTEM REQUIREMENTS

Windows

- POWERCORE running system 1.6.5 or later
- Windows 98SE, ME, 2000 or XP
- PIII 500 or faster
- 128 MB RAM
- VST compatible host application
- System must meet requirements of the host application

Mac OS

- POWERCORE running system 1.6.5 or later
- Mac OS 9.04 or higher (including Mac OS X)
- G3/300 or faster
- 128 MB RAM
- VST or MAS compatible host application
- System must meet requirements of the host application

ASSIMILATOR BASICS

The ASSIMILATOR is an extremely powerful equalization tool for POWERCORE and it is unlike anything else. The idea is simple: you “learn” the frequency curve of one piece of audio and apply it to another audio file. It is best to think of it in terms of sampling:

- You “sample” the frequency curve of the audio that you want your audio to sound like. (Learn the “reference” audio.)
- You “sample” the frequency curve of the audio that you want to process. (Learn the “target” audio.)
- You “apply” the “reference” curve to the “target” curve to meet your needs.

Simple, isn't it? The ASSIMILATOR compares the frequency curves of the two audio sources and interpolates between the two to generate the ideal EQ curve for the target audio.

ASSIMILATOR APPLICATIONS

The ASSIMILATOR is perfectly suited for:

- Matching a live mix to a studio mix (...or vice versa.)
- Matching tracks on an album to “even out” the overall EQ across the entire project.
- Applying the frequency curve of your favorite song to your song.
- Applying the frequency curve of your favorite track to your track, i.e. vocals, a snare, etc.
- Matching the sound of multiple environments and morphing between them, as an audio post effect for film or video.

GLOSSARY OF TERMS

- Analysis Curve:** The “analysis curve” is based on a frequency analysis – or spectral snap-shot – of any audio source, such as a complete mix or an individual audio track. The “analysis curve” can be stored for later use.
- Assimilation:** The process of making the overall spectral information – or equalization – of one piece of audio similar to another.
- EQ Curve:** The “EQ curve” is the calculated equalization applied to the target curve. The EQ curve is an interpolation between the reference analysis curve and the target analysis curve.
- Learn:** The “Learn” function is how you can sample (or grab) the spectral curve of any audio file or source.
- Reference:** This is the desired analysis curve or the audio you want to sound like.
- Target:** This analysis curve is based on your audio; or, the audio you want to process with the “reference” analysis curve.

WHY LEARN TWO CURVES?

Learning just one curve would be insufficient for proper assimilation. Consider the concept as a whole: how else does the ASSIMILATOR Plug-In know how to make your “target” sound like the “reference”? Here are two examples that show the value of learning two curves.

ONE CURVE IS INSUFFICIENT FOR PROPER ASSIMILATION

1. “Learn” the analysis curve of the audio that you want your audio to sound like (“reference”).
2. “Apply” the analysis curve to the “target” audio.

What are the results? In this example, there is the risk that the results will not meet your expectations. Consider what happens when we process our target audio using the method from the example above. If the “reference curve” has a level of +12dB at 100 Hz and then you apply that to your target, which already has +6 db at 100 Hz, then the total boost at 100 Hz would be +18dB. The conclusion is that if we apply the reference curve to the target without also learning the target, then there will be a 6dB difference at 100 Hz and the two pieces of audio will not share a common frequency response!

PROPER ASSIMILATION REQUIRES TWO CURVES

With the additional step of learning the analysis curve of your “target” audio, or the audio you want to process with the “reference” analysis curve, then there is the ability to do a highly accurate comparison between the two curves and interpolate an ideal EQ curve.

Let’s expand on our previous example adding only one step to correctly use the ASSIMILATOR.

1. “Learn” the analysis curve of the audio that you want your audio to sound like (“reference”).
2. “Learn” the analysis curve of the audio that you want to process (“target”).
3. “Apply” the interpolated “EQ curve” to the “target” audio.

Now what are the results? Quite good! If we process our “target” audio from the example above, we have an interpolation process that compares the two curves prior to processing. If the reference curve has a level of +12 dB at 100 Hz, and then you apply that to your target, which already has +6db at 100 Hz, then the total boost would be +6dB at 100 Hz. 6dB is the difference between the two curves, so the sum will result in something extremely different – and much more useful – than in the first example.

PRESET MANAGEMENT

Unlike other Plug-Ins, ASSIMILATOR has two types of presets.

CURVE

After you have learned the audio spectrum of one piece of audio, you can save it as an analysis curve. Once the analysis curve is saved, it can be loaded as either a “reference” or “target” curve from one of the File menus.

PRESET

The preset is the global setting of the entire Plug-In. Saving a preset will store the reference and target curves for both the A and B views of the Plug-In, as well as any settings made in the Morph view. This global type preset is similar to those handled by your host application, the difference is that using ASSIMILATORs preset manager will ensure that you can share your presets with other users, regardless of host application or platform.

ASSIMILATOR’s comprehensive file based preset architecture makes archiving presets and curves a breeze. This allows you to organize your presets the way you find most comfortable for your workflow, and to exchange presets and curves with other users, no matter what platform or application they are using.

Presets are saved as discrete files on your hard drive. Once a preset is saved into the default location, it will automatically appear in the “File” menu every time you use the Plug-In. The files can then be arranged in subfolders, which will also be recognized by the Plug-In.

FILE

Pressing the “File” button will open the File menu. The following options are available from the File menu.

LOAD PRESET / CURVE

By selecting “Load”, you can navigate to any folder on the system, including any “Shared” folder. By default, these will be loaded from the default location for ASSIMILATOR presets.

Only presets located in the default file location will appear in ASSIMILATOR’s pop-up preset menu.

SAVE PRESET / CURVE

By selecting “Save”, you can save your preset to any folder on the system, including any shared folder. By default, presets will be saved to the default location for ASSIMILATOR presets.



ASSIMILATOR can arrange presets and analysis curves into different subfolders. These subfolders are sorted into basic music genres and applications such as Classical, Jazz, Psychedelic Pop etc.

You can delete, rearrange or create your own folders to accommodate your needs. You could, for example, create preset folders for projects, customers or by genre.

This figure demonstrates various analysis curves that can be used either as reference or target curves.

DEFAULT PRESET LOCATIONS:

The following locations will describe where you can find your ASSIMILATOR analysis curves and presets, which are stored in different folders.

Mac OS Classic: Files are stored in the System folder.

System Folder: Application Support: TCWorks: ASSIMILATOR: Presets

System Folder: Application Support: TCWorks: ASSIMILATOR: Curves

Mac OS X: Files are stored in your user folder.

Users: Your Name: Library: Application Support: TCWorks: ASSIMILATOR: Presets

Users: Your Name: Library: Application Support: TCWorks: ASSIMILATOR: Curves

Windows: Files are stored on the Windows OS hard drive.

System Hard Drive:\Program Files\TCWorks\System\Application Support\ASSIMILATOR\Presets

System Hard Drive:\Program Files\TCWorks\System\Application Support\ASSIMILATOR\Curves

- To delete a file, simply move it to the “Trash” or “Recycle bin”.
- To create a new subfolder that appears in the Plug-In menu, simply create a new folder in the Plug-In folder that resides in the PRESETS folder of the ASSIMILATOR default preset location.

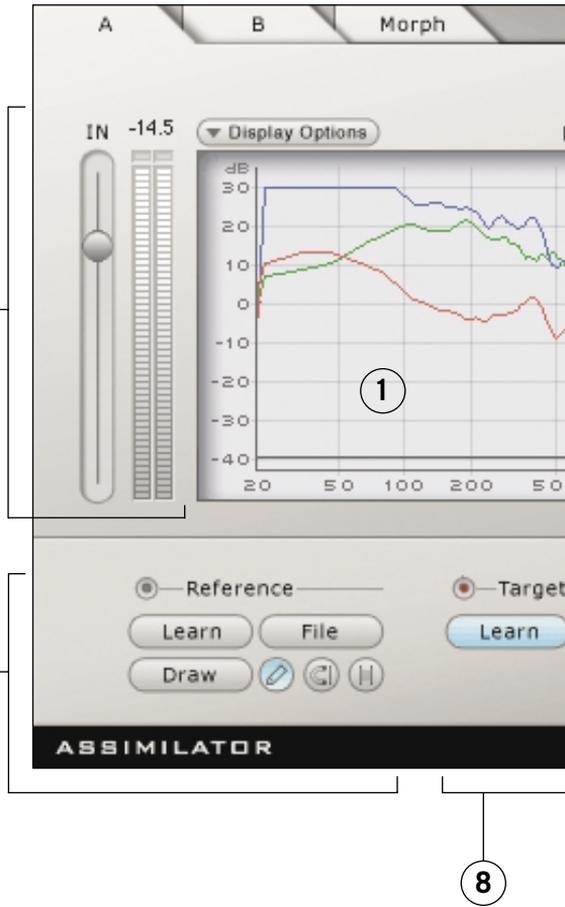
ACCESS PRIVILEGES IN Mac OS X

If you want to share your files with another user, it is advised that you copy your presets to the “Shared” folder before the other user logs in.

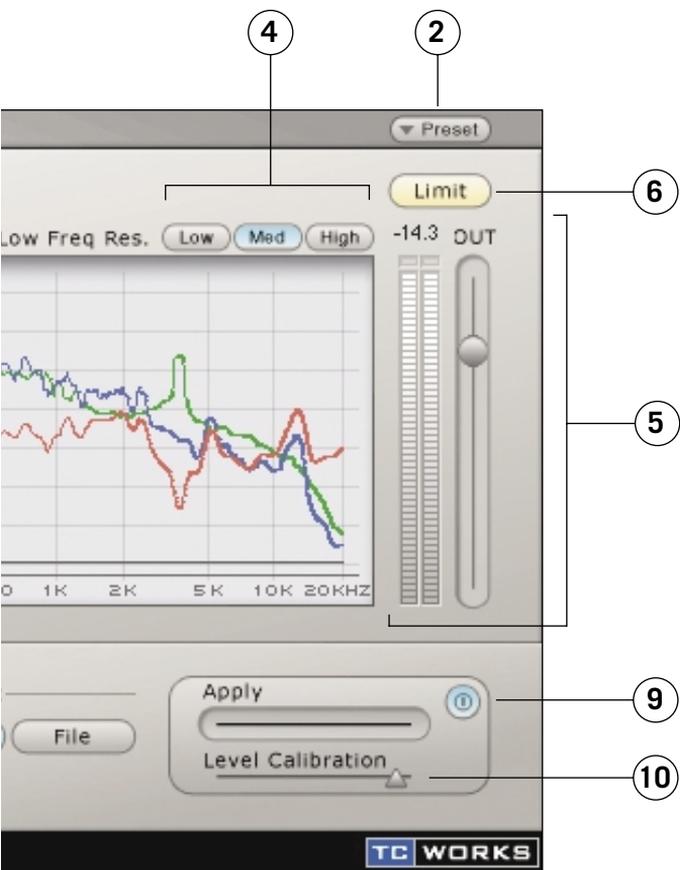
If you save files into the System folder, make sure that you have the appropriate Administrator rights.

Preset subfolders will not appear in the File menu unless there is at least one file in that subfolder.

OVERVIEW



1. Analysis Display
2. Preset Handling
3. Input Gain and Meter
4. Low Frequency Resolution Size
5. Output Gain and Meter
6. Limiter Enable and Limiter Activity Indicator
7. Reference Analysis Curve Section
8. Target Analysis Curve Section
9. Apply EQ Curve Fader
10. Level Calibration Fader



ANALYSIS DISPLAY

On the A and B views, the display shows the frequency of the reference analysis curve, target analysis curve and the interpolated EQ curve. The Analysis display will appear differently when the Morph view is active. For details, refer to the Morph section at the end of the manual.

- Blue Indicates the reference analysis curve
- Green Indicates the target analysis curve
- Black Indicates the real time Analysis of the signal after processing.
- Red Indicates the amount of the EQ curve that is applied to the target. At zero, when there is no application of the EQ curve to the target, the red application curve will be flat.

DISPLAY OPTIONS

By selecting the Display Options, you can enable and disable any of the curves from being visible in the display. Disabling a curve from the display will NOT deactivate the curve. Only the metering will be hidden.

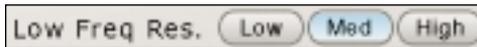
INPUT GAIN AND METER

The Input gain fader and meter manage the input signal to the ASSIMILATOR. The clip indicators at the top of the meters should never be active. Remember: POWERCORE is a fixed processing system and it is not possible to drive the signal above 0dB without distorting the signal. If the clip indicators are active, reduce the Input gain fader until no clips are indicated on the input clip LEDs.

LOW FREQUENCY RESOLUTION

The Resolution Sizes of the FFT:

- Low 2048 Points
- Med 4096 Points
- High 8192 Points



By default, the Resolution of ASSIMILATOR's FFT is "Med". In most cases, this is all that is needed for processing. The "High" resolution is recommended for situations where you must ensure accurate analysis of the bass frequencies, especially in a full mix. The "Low" setting is only advised for use with an individual track, rather than a full mix. As an example, the "Low" setting is sufficient for matching vocals from one recording session to another.

OUTPUT GAIN AND METER

This is a standard gain fader and meter – measured in dB – that indicates the output gain stage of the Plug-In. The clip indicators at the top of the meters should never be active. Remember: POWERCORE is a fixed processing system and serious clipping

can occur if the output signal is above 0dB. If the clip indicators are active, reduce the Output gain fader setting or adjust the Gain Calibration (described later in this manual) until no clips are indicated on the Output clip LEDs.

APPLY

This fader will apply the reference analysis curve – indicated by the blue curve – to the target audio. When Apply is set to 0%, the “apply curve” – indicated by the red curve – will be flat. As the Apply fader is increased, the red curve will change to indicate the EQ interpolated between the target and reference curves. At 100%, there will be a 100% interpolation of the EQ.

CALIBRATION

The calibration tool allows you to adjust the gain of the applied EQ curve so that you can evenly match levels with and without processing. With this function, you can bypass the Plug-In and compare the signal at exactly the same levels, allowing you to best monitor the equalization.

LIMITER ENABLE AND ACTIVITY INDICATOR

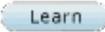
 The Limiter will ensure that the output of the Plug-In never exceeds 0dB. When the Limiter is engaged, it will have an orange color.

When the Limiter flashes Red, this indicates that the Limiter is active.

REFERENCE CURVE

As described in the “ASSIMILATOR BASICS” Section of this manual, the “reference curve” is the desired curve, or the audio you want to sound like. The “reference” could be another track, another recording session, or even a song from a CD that you would like your audio to sound like.

LEARN

 The “Learn” function is how you can sample (or grab) the spectral curve of any audio file or source. Simply engage the “Learn” button and begin playback. When you are finished – for example, when the song has completed playback – disengage the “Learn” button and the curve will become active.

FILE

The “File” Dialog is where you can save or load your curves. For details about managing analysis curve files, please refer to the “PRESET MANAGEMENT” section of this manual.

DRAW

It may be desirable to edit the reference curve with one of the draw tools.



PENCIL TOOL

ASSIMILATOR's "Pencil Tool" allows you to draw a reference curve on the display. Say, for example, you wish to use a reference curve that has a very good bass spectrum, but when you apply the reference curve to your target, the high frequencies are not boosted enough. If this is the case, you can keep the bass frequencies in tact and draw a boost in the high frequencies with the Pencil.



MAGNET TOOL

ASSIMILATOR's "Magnet Tool" allows you to snap a reference curve to a target curve on the display. Say, for example, you wish to use a reference curve that has a very good bass spectrum, but you love the high frequency content of your target. Simply use the "Magnet Tool" to snap the reference curve to your target curve in the area where you do not want processing applied.



RANGE TOOL

ASSIMILATOR's "Range Tool" allows you to group a range of points on the spectrum and move them up or down in unison. Say, for example, you like the bass frequencies of your reference curve, but you find that when you apply the EQ curve to your target, there is just a little too much boost in the bass. Simply use the "Range Tool" to group the bass frequencies and gently pull them down with your mouse until they sound correct.

TARGET CURVE

As described in the "ASSIMILATOR BASICS" section of this manual, the "target curve" is the frequency spectrum of your audio or the audio you want to process to make it sound like the "reference". The "target" could be an audio track, a mix from another recording session or even another take recorded earlier that does meet your expectations.

LEARN



The "Learn" function is how you can sample (or grab) the spectral curve of any audio file or source. Simply engage the "Learn" button and begin playback. When you are finished – for example, when the song has completed playback – disengage the "Learn" button and the curve will become active.

FILE

The "File" Dialog is where you can save or load your curves. For details about managing curve files, please refer to the "PRESET MANAGEMENT" section of this manual.

ASSIMILATOR VIEWS

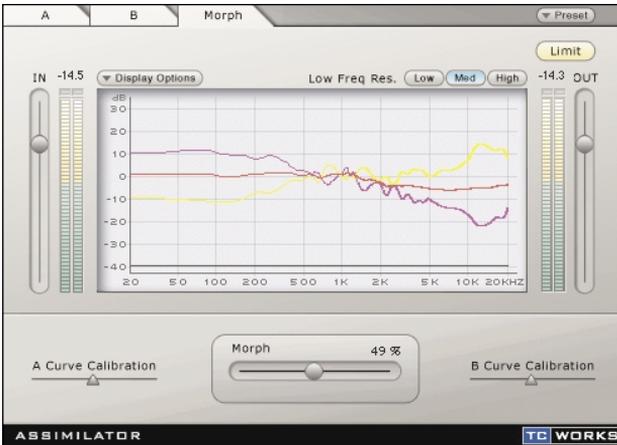
ASSIMILATOR has three views that each have a range of functions.



- The “A” and “B” views allow you to have two complete reference and target settings.
- Morph allows you to Morph between the A and B View settings.

A and B Views

ASSIMILATOR’s “A” and “B” views have an identical user interface, but allow you to have two complete sets of reference and target curves. These views can be used to do quick A to B comparisons of different settings. The “A” and “B” views become interesting with the addition of the “Morph” view.

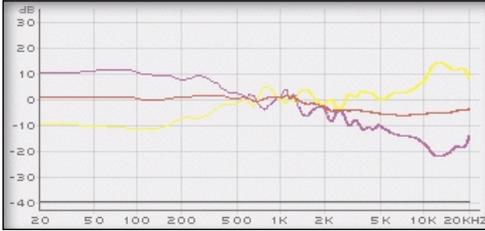


MORPH

ASSIMILATOR’s “Morph” function provides unprecedented power. The Morph slider can be used to transition the processing from A to B or B to A, depending on which direction you move the fader. This could be used to morph from one equalization curve in the intro and verse to a completely different equalization curve for the chorus. The morph function could also be used in film and television post where you smoothly transform the EQ curve of one environment to another in order to match sound to picture.

ANALYSIS DISPLAY

On the Morph view, the display will show the frequency analysis of the A analysis curve, the B analysis curve, and the morphed EQ curve.



The **yellow** curve indicates the EQ curve view A.

The **red** curve indicates the morph curve. At zero, the morph curve is set to the settings from the A view. As you move right with the Morph fader, the applied EQ curves will morph to the settings from view B.

The **purple** curve indicates the EQ curve from view B.

The **black** curve indicates the real time analysis of the signal after processing.

Display Options

By selecting the Display Options, you can enable and disable any of the curves from being visible in the display. Disabling a curve from the display will NOT deactivate the curve. Only the metering will be hidden.

Morph Slider

This slider will morph between the settings made in the A and B views of the Plug-In. For this to be effective, you must “learn” reference and target curves for both the A and B views.

When the Morph slider is set to A, only the settings in the A section are applied to the audio, and the red “apply curve” will be identical to yellow A curve.

When the Morph slider is set to B, only the settings in the B section are applied to the audio, and the red “apply curve” will be identical to purple B curve.

Curve Calibration

These calibration tools allow you to adjust the gain of the curves from the A and B views. This allows you to adjust the curves so that morphing is possible without changing the output level. This way, you can be certain that the level is the same between the A and B curves when morphing is applied.

TUTORIALS

INSTRUMENT MATCHING

In the first example, let's review how ASSIMILATOR is used as an insert effect for matching instrument tracks in a multi-track application. Our goal is to create an acoustic guitar sound that sounds identical to your favorite guitar track. The two guitar tracks are somewhat similar, i.e. your guitar track – the target – and your ideal guitar sound – the reference – are both 6 string nylon guitars.

1. Insert ASSIMILATOR into the channel processing your 6 string nylon guitar track.
2. From the Target section of the interface, select “Learn” and begin playback.
3. When the audio track has completed playback, press “Learn” again to disengage the Learn function.
4. Now, we will be loading one of the default presets that will be used to equalize your track. From the “File” menu in the Reference section, load the preset curve “6 String Nylon”.
5. Begin playback of your track and – from the user interface – begin moving the “Apply” fader to the right until the equalization of the guitar track sounds right.

MASTERING

In this example, let's review how this Plug-In is used in a mastering application such as Spark or WaveLab. Our goal is to create a mix that sounds like another mix that was professionally mastered. The two songs use similar arrangements, i.e. they have more or less the same type of tracks with a similar overall spectral balance. In this example, we will use Spark LE as our editor.

1. Grab the audio from the track on the CD that you would like to use as the reference, or “Master”, audio track. Load this audio into your Spark LE or whatever audio editor you typically use for mastering and sample editing.
2. From the Reference section, select “Learn” and begin playback.
3. When the CD track has completed playback, press “Learn” again to disengage the Learn function.

If you want to recall this analysis curve at a later time, save the analysis curve from the File menu of the Reference section.

4. Now, we will be using your track. Make sure it is loaded into the file view or audio pool of mastering editor.
5. Select “Learn” from the Target section to learn the analysis curve for your mix.
6. Begin playback of your track. When your song has finished playing through, press “Learn” again to disengage the Learn function.

7. Save your analysis curve as “My Song” or whatsoever from the File menu of the Target section.
8. Now, in the Reference section you have the analysis curve of the “professionally” mastered song, and the Target section has the analysis curve of your track.
9. Begin playback of your track, and begin moving the “Apply” fader to the right until the overall equalization sounds good to you.
10. Once you have found an apply setting that you like, you can “bounce” your new mix to disk as a new audio file.
11. If you want to edit the overall EQ curve, this can be done in the reference curve using one of the draw tools. Editing the reference curve will adjust the EQ curve that is applied to the target audio.

MORPHING

You are mastering a rock tune. You want the intro and the verse to have a Lo-Fi sound – as though it is coming from an AM Radio – but you want the bridge to transform into a High-Fidelity sound as it approaches the chorus. By the time you reach the chorus, you want the song to have completely High Fidelity equalization. With ASSIMILATOR, this is easy to accomplish.

1. Make sure that the “A” view is visible.
2. “Learn” a Low Fidelity audio mix in the Reference section or use one of the included “Lo-Fi” presets.
3. When the Low Fidelity song has completed playback, press “Learn” again to disengage the Learn function.

If you want to recall this analysis curve at a later time, save the analysis curve as “Lo Fi” or whatsoever from the File menu of the Reference section.

4. “Learn” the analysis curve for your mix in the Target section.
5. When your song has completed playback, press “Learn” again to disengage the Learn function.
6. Save your analysis curve as “My Hit Song” or whatsoever from the File menu of the Target section.
7. Now that you have the “Lo Fi” as your reference and your mix as the target, switch to the “B” view by selecting the “B” View tab.
8. In the Reference section of the “B” View, “Learn” a High Fidelity track you would like your chorus section to sound like.
9. From the File menu in the Target section, load the analysis curve “My Hit Song”.
10. Once you have a complete range of settings in both the “A” and “B” views, switch to the Morph view by selecting the “Morph” view tab.

11. Set the fader to the far left or to 0% Morphing.
12. Play back the song using an application that can automate Plug-In parameters.
13. During the intro and the verse, leave the Morph fader at 0% to hear the Low Fidelity portion of your audio.
14. As the bridge begins playback, start moving the Morph fader from 0% reaching 100% when the chorus of your song begins.

CONTACT DETAILS

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TECHNICAL SUPPORT

Details on how to obtain technical support can be found in the included Customer Support Document. For immediate answers on many support questions, visit the TC SUPPORT INTERACTIVE pages on www.tcworks.de