SPEC 4.3.3 & ZAG 1.8

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What's New in Spec 4.3.3

- Licensing Change Only. Spec is now "donationware".

Spec 4.3.2

- No need to remove old plugins
    - Old layouts will continue to work with old plugins
    - New layouts use new plugins with no conflict
- Spec Controls
    - "Bass Test Tone" and controls
- New ArcTan
    - Improved math routines for image width's less than 360 degrees
- Spec Method Controls Grouped for ease of "Per Track Automation"
- New Normalization Group
    - Selection for Normalization from original stereo or set all tracks to same volume (for compilations)
    - Play signal from audio player now properly synced into ZAG
- New Preset Manager Group to assist with Per Track Automation of settings
    - Reserve presets for "Master" or "Default" use.
    - Map any number tracks to any number of Presets
- ZAG 1.8
    - Results window shows final Peak and RMS values
- ZAG 1.7.2 and higher
    - "Track" parameter can be linked to "Preset Number" in method controls for Per Track Automation of settings
- Preset Manager – assists in mapping the number of tracks in your conversion into the number of presets you have (Per Track Automation)
- ZPlayer – a player for individual track files in the media pool (RAM), ZPlayer has controls to navigate and loop on sections of music to help you refine your conversion settings

Requirements:

Plogue 0.9705 or newer (32 bit standalone, even if you have a 64 bit OS)
http:www.plogue.com/bidule/latest

Review the Plogue Guide, for Plogue preferences:
http:www.surroundbyus.com/sbu/viewtopic.php?f=7&t=2

You need: Microsoft Visual C++ 2008 SP1 Redistributable Package installed:

http://www.microsoft.com/downloads/details.aspx?familyid=A5C84275-3B97-4AB7-A40D-3802B2AF5FC2&displaylang=en

Installation:

Use the included installer. Just double click on XP_intaller.bat , for Windows XP, or Vista_7_Installer.vbs for Vista or Windows 7 (32 or 64 bit).

Suggested (Free) VSTs:

ReaPlugs VST FX Suite installed from:
http://www.cockos.com/reaper/reaplugs/reaplugs20-install.exe

The PeakCompressor VST from:
http://www.sinusweb.de/peak272mono.zip

Install these in Plogue Bidule's VSTPlugins folder. Usually:

C:\Program Files (x86)\Plogue\Bidule\VSTPlugins
Or
C:\Program Files\Plogue\Bidule\VSTPlugins

Video Guides:

The quickest way to get started is to watch the video guides at:

http://www.surroundbyus.com/sbu/viewtopic.php?f=8&t=171
And
http://www.surroundbyus.com/sbu/viewforum.php?f=7

Included Stereo to Surround Methods and Components:

SLICE – Slices the Stereo field up into SL, FL, C, RF, SR, using multiple stages of SPEC Center Cut.

CC – Center Cut. An algorithm borrowed from Center Cut GUI but implemented using Plogue Spectral Bidules.

LCR – Algorithms that came before ambisonics, implemented using Plogue Spectral Bidules.

ArCTan – Smoothly expands and spreads the stereo field up to 360 degrees

ArcTan with Blended SLICE Rears

Zpan – A Constant Power Panner to allow you to widen or narrow your sound field and make your speakers disappear into the sound field (used mostly with CC, and SLICE methods).

ZAG – Z Automatic Gain Control to allow you to balance the volume of the individual channels within a song, the relative volume of each song, and the loudest peak in an album. ZAG also allows you to automate any setting in SPEC/Plogue on a per song (we will use the term "track") basis.

Preset Manager – assists in mapping the number of tracks in your conversion into the number of presets you have (Per Track Automation)

ZMON - A live monitoring control panel to allow you to mute or "solo" and channel or channels, and also easily compare the surround sound to the original stereo.

SYNC groups – to ensure accurate recording, gain control, and automation of audio start, stop, and track transitions, given any latency in the layouts in SPEC, or VSTs.

Normalization group – Selection for track to track volume normalization from original stereo or set all tracks to same volume (for compilations). The Normalization group also provides the sync function for ZAG and ZMon.

Bass Test Tones and LFE controls – to allow you to add and LFE channel, should you desire.

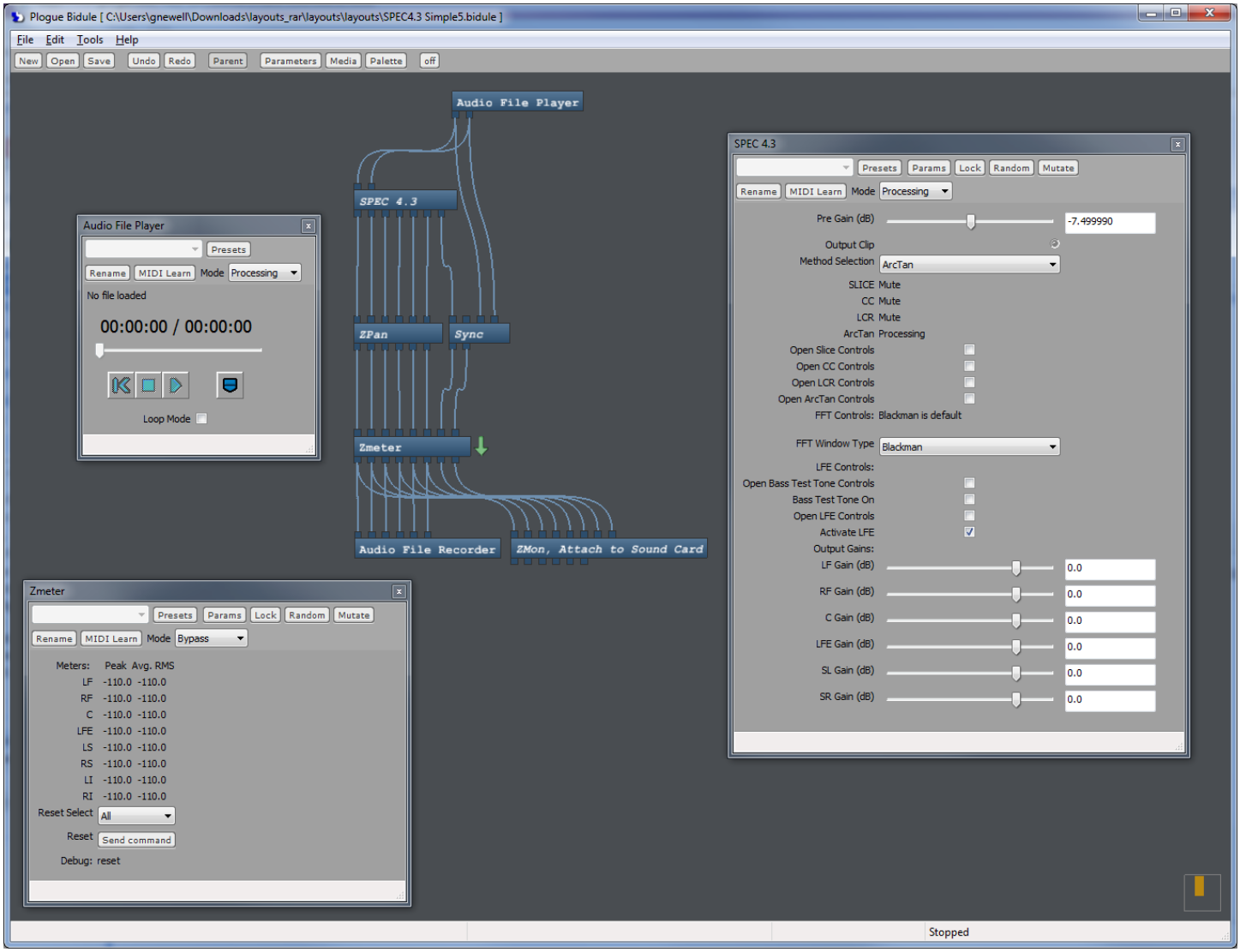
ZPlayer – a player for individual track files in the media pool (RAM), ZPlayer has controls to navigate and loop on sections of music to help you refine your conversion settings

With the suggested (Free) VSTs:

Mastering multi-band compressors and Peak Limiters

Quick Start:

Start Plogue and open the “SPEC4.3.3 Simple.bidule” layout:



If none of the boxes are **red**, you have properly installed SPEC.

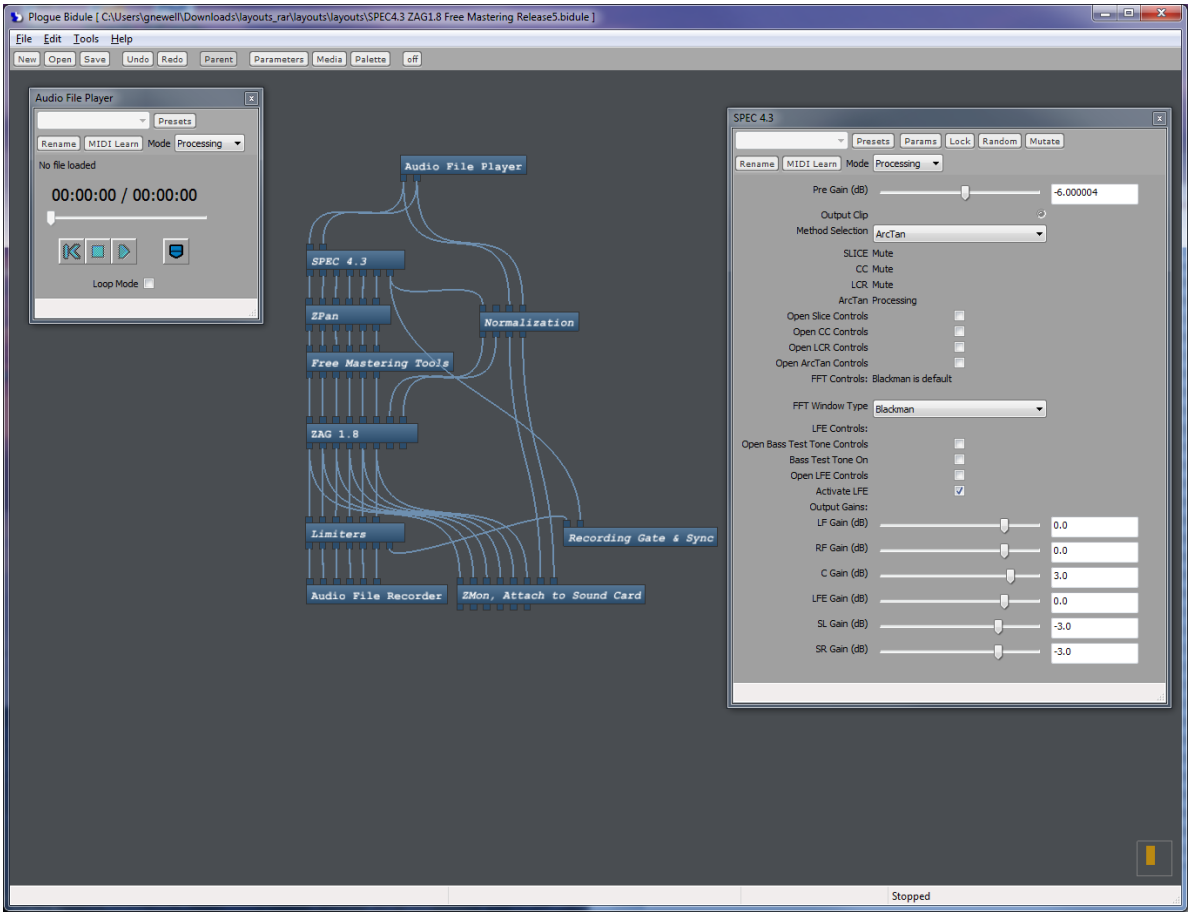
This “Simple” layout is the most basic, not using any mastering VSTs or plugins to adjust channel and track levels. While it’s good layout to get started converting with, it does mean you have to manually adjust the levels yourself.

To assist you this layout includes “Zmeter” which measures the Peak and Average RMS levels of each surround channel and the original stereo (LI and RI) for comparison.

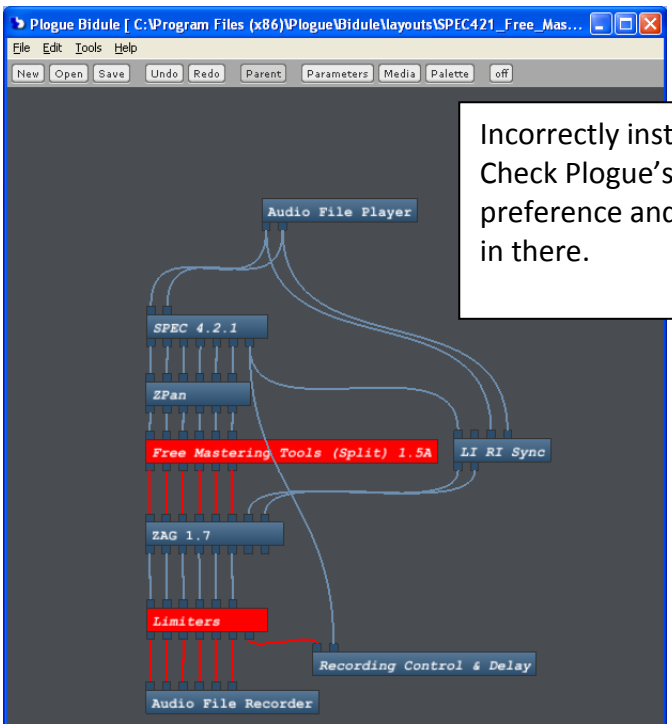
The measurements are for the entire album up to the point you look at Zmeter. Zmeter will automatically reset when you hit the “home” button on the Audio File Player (|<) and will “freeze” whenever you hit stop or turn processing off.

The other layouts included have increasing levels of controls and automation, and are therefore more complicated.

Now open the “SPEC4.3.2 ZAG1.8 Free Mastering Release.bidule” layout:

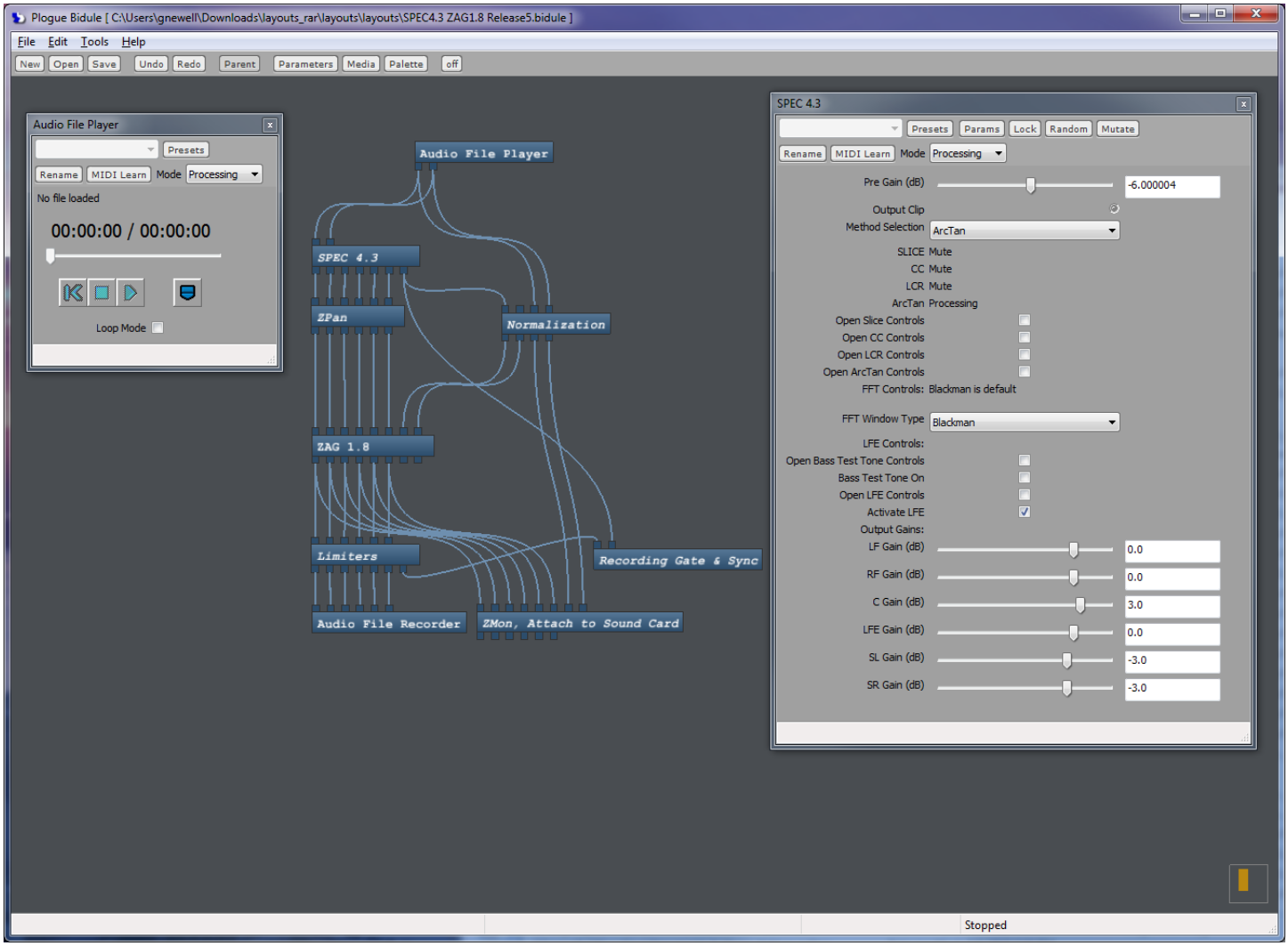


If none of the boxes are **red**, you have properly installed the recommended (Free) VSTs.



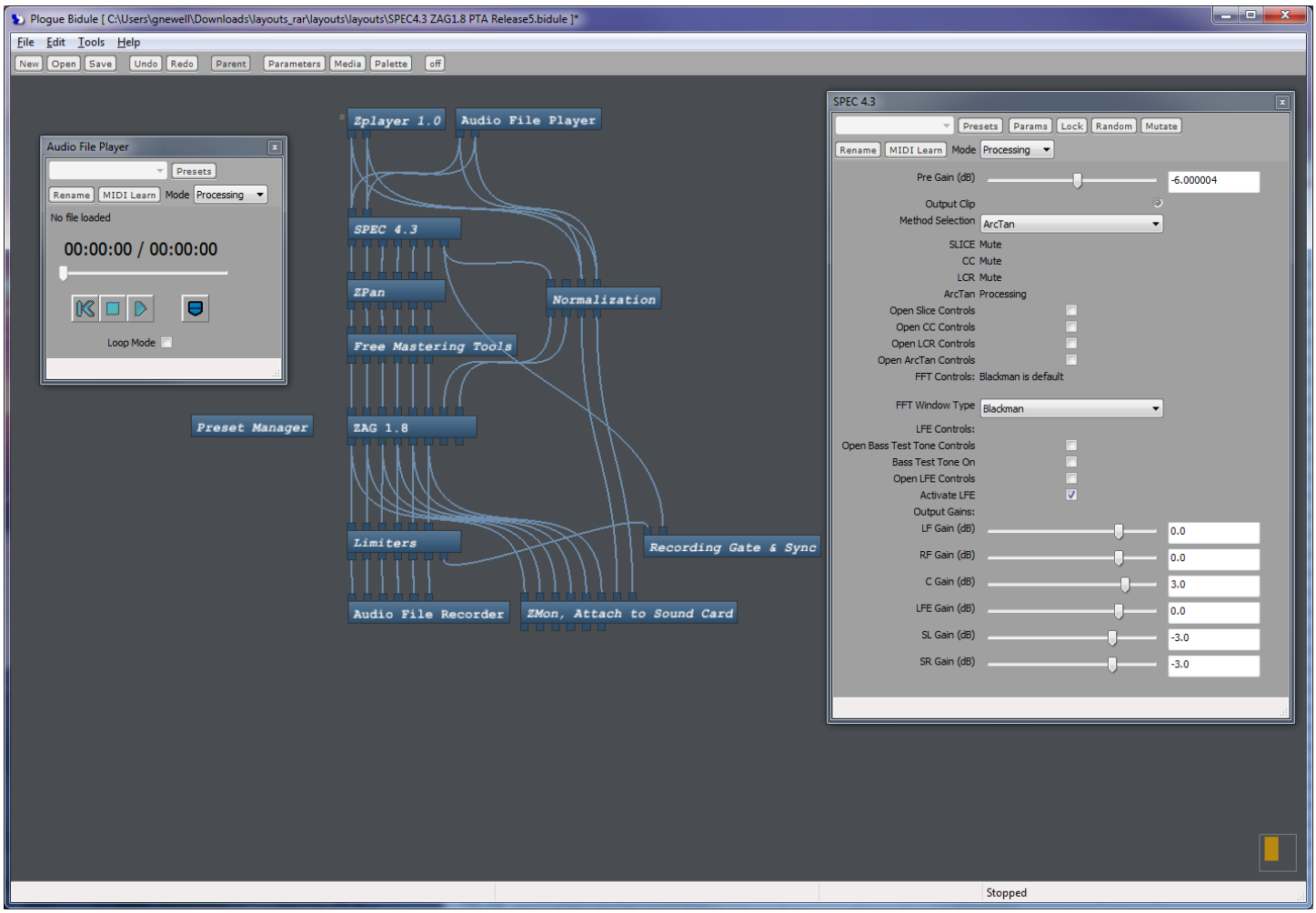
Incorrectly installed VSTs.
Check Plogue’s VSTPlugins folder preference and that you put your VSTs in there.

Now open the “SPEC4.3.2 ZAG18 Release.bidule” layout:



This layout has the Peak Limiter VSTs included, but not the Multi-band Compressors. This is the most commonly used layout (unless you want Per Track Automation).

Now open the “SPEC4.3.2 ZAG18 PTA Release.bidule” layout:



This is the “All the Bells and Whistles” layout used for Per Track Automation. Additional components in this layout, on top of the Free Mastering layout, are ZPlayer and the Preset Manager. The layout also includes links from the Preset Manager to all relevant group’s “Preset Number” parameter.

See the section on Per Track Automation for details.

Now that everything is installed properly, please watch the video guides at:

http://www.surroundbyus.com/sbu/viewtopic.php?f=8&t=171
And
http://www.surroundbyus.com/sbu/viewforum.php?f=7

offline

SBU Wiki Team

Joined: Sun Aug 30, 2009 12:01 pm
Posts: 134

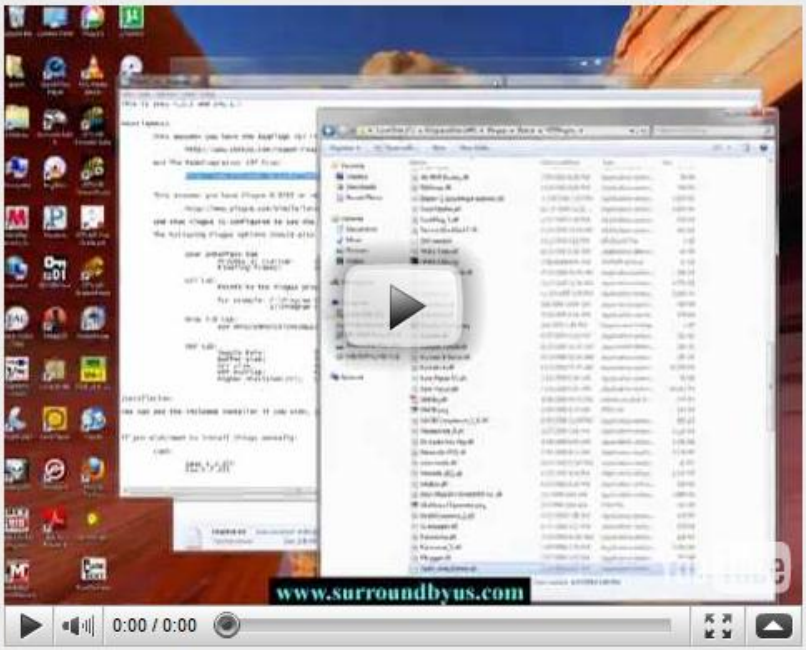
More video guides on Plogue are located here:

http://www.surroundbyus.com/sbu/viewtopic.php?f=7&t=164&p=1132#p1132

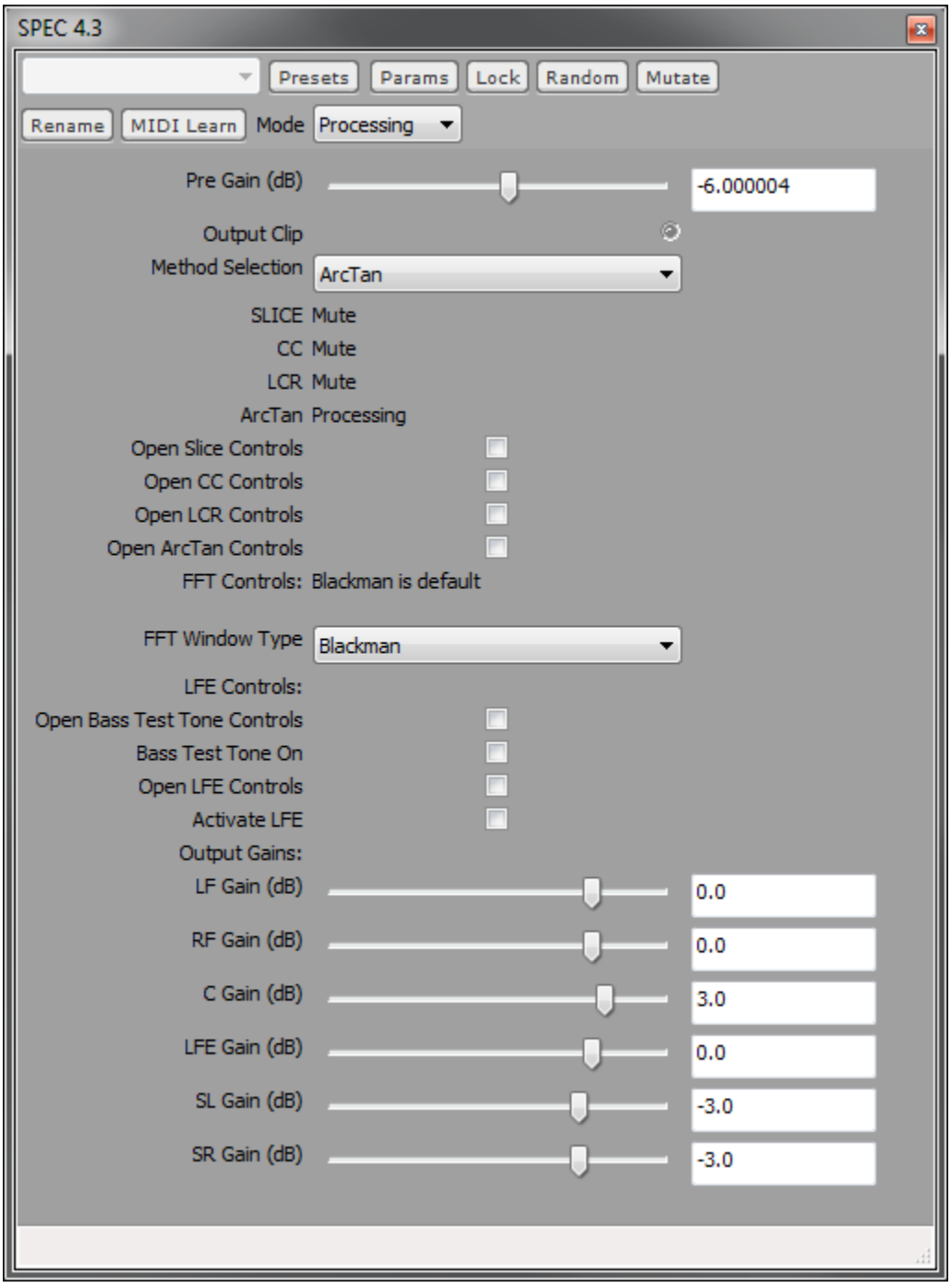
These Videos are about SPEC:

10 min Quick Start Guide:

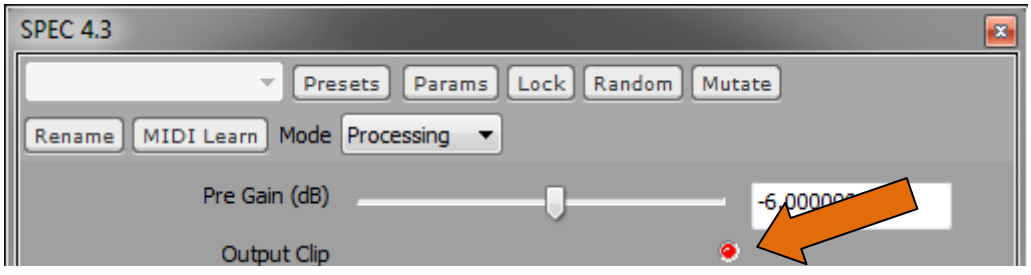
Chapter 1 - SPEC Installation:



SPEC 4.3.2 Controls:



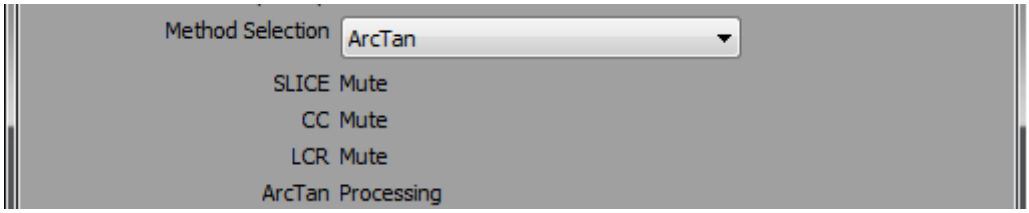
1) ***Pre Gain*** – Input Gain (typically -6 to – 12 dB – Listen for distortion and/or watch the Output Clip Light as you adjust the Pre Gain:



The Pre gain level will be different for each Method Selected.

In order to prevent any distortion in the mix, it is important that you adjust your pre-gain to a level where the output clip does not light up. A few flashes of the clip indicator in a song are not a reason to start a whole conversion over again (as we are doing 32 bit float processing) but you should check a "loud" portion of your stereo before moving on to other SPEC settings. Keep an eye on the clip indicator as you make other setting changes, as the different methods, and the output gains, will affect the final output level.

2) ***Method Selection*** – You need to have processing turned on when you change methods. Check the processing indicators, below the method selection drop down, to make sure your selection is processing. Also note, you need to select the CC method when setting the FFT Latency. Once set, change your method back to the one you want to use for conversion



3) ***Method Controls*** – Use these checkboxes to open or close the additional method specific controls

4) ***FFT Window Type*** – All of these sound pretty similar except Rectangular. Choose the one you like (Rectangular may require a more negative pre-gain than the others). We think Blackman gives the best overall results.

On faster computers, your DSP settings (In Plogue's preferences) should be:

FFT Window Size: 8192
FFT Overlap: 16
Higher Precision FFT: Checked

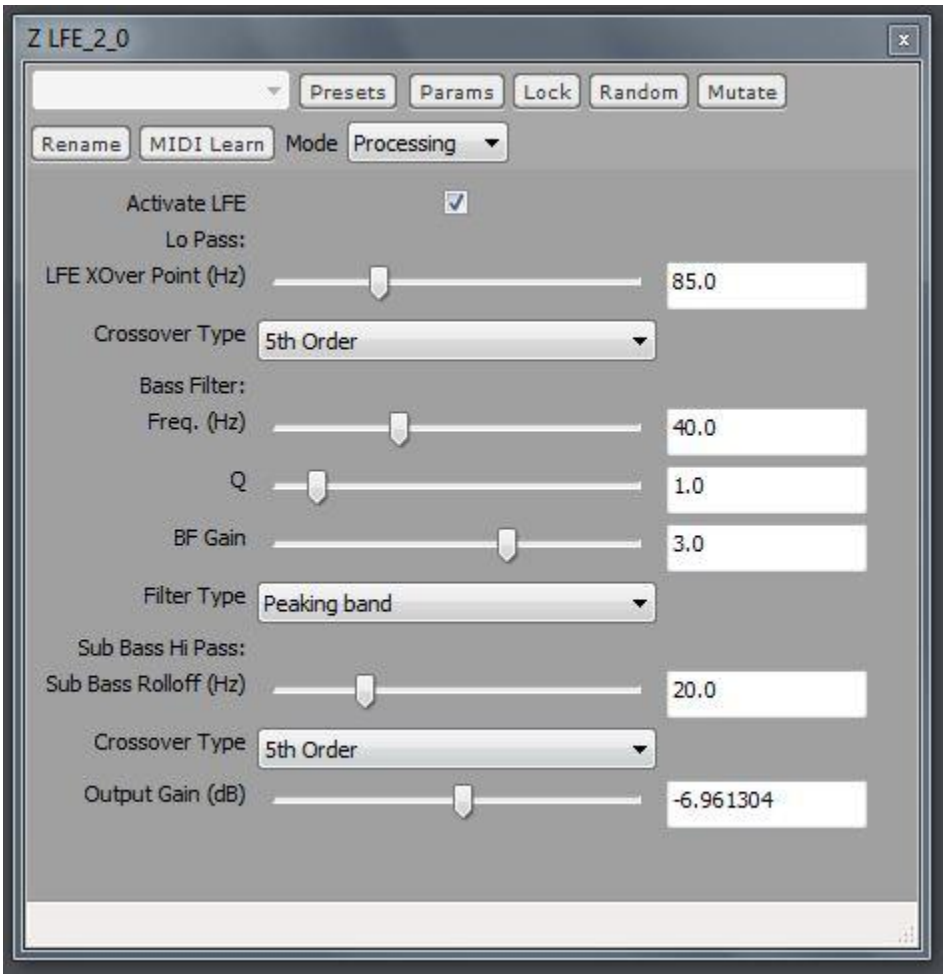
However if that creates too much DSP load you can still get good quality with:
FFT Window Size: 4096
FFT Overlap: 4
Higher Precision FFT: Checked

The "overlap" seems to be what affects the DSP load the most. You can also live monitor at lower window sizes and/or overlap and then go back to higher settings for off-line recording. Just be aware that Plogue sometimes crashes when changing FFT settings so be sure to save your layouts first.

Note that if you are going to be on up converting (re-sample to 88.2 or 96 Khz), you will need a higher FFT Window Size to achieve the same quality.

5) LFE Controls

SPEC 4.3.2 has a "bass boost" filter which acts similar to what you would see in a subwoofer amp. To turn it one, check the "Activate LFE" box. To see the LFE controls, check the "Open LFE Controls" box.



The LFE "bass boost" consists of 3 stages and an output gain control.

1) A Low Pass filter
    a. LFE cross over frequency (usually between 75 and 110 Hz)
    b. Crossover Type – the steepness of the crossover filter. 5th order is recommended
2) A "Peaking" filter (default settings shown give you a nice 40 Hz peak)
    a. Peak Frequency (usually 40hz)

b. Q – how wide or narrow the peak boost range is (usually set to 1)
c. Bass Peak Filter Gain (Usually 3 dB, set to 0 dB for no peak)

3) A Sub Bass filter
   a. Sub Bass cross over frequency (usually 20Hz)
   b. Crossover Type – the steepness of the crossover filter. 5th order is recommended

We won't debate the merits or issues with adding an LFE channel to your surround mix here, but should you choose to do so this "Bass Boost" filter is designed to give you a "tighter" "punchier" bass than what was in SPEC 4.0 and earlier.

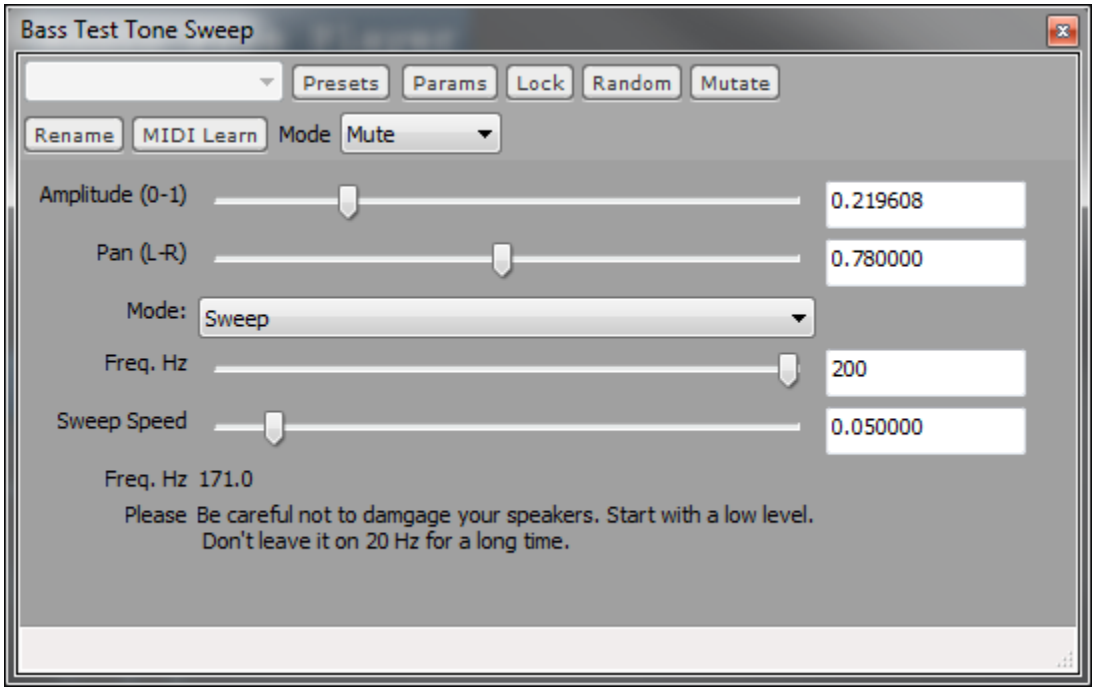
The new LFE has been set up to be automatically time/phase aligned with the other surround channels, with stages one and two set for 5th order, regardless of your sample rate. The time/phase alignment may not be correct for One-Pole, One Zero settings.

SPEC 4.3.2 also has a "Bass Test Tone" included. This will either give a constant volume sweep from 200 to 20 Hz (THX recommended method for sub woofer setup) or give a fixed frequency (please don't blow up your speakers!).

The idea is that a properly setup HT (Home Theatre), and music played on it, should not exhibit any change in volume as the frequency sweeps through the crossover frequency from your 5.0 speakers to your subwoofer.

To see the Bass Test Tone controls, check the "Open Bass Test Tone Controls" box.

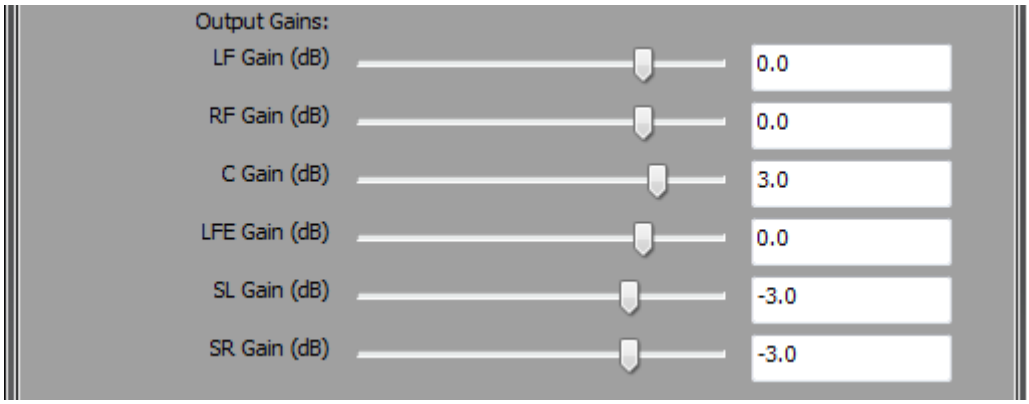
To turn the test tone on, check the "Bass Test Tone On" box.



Amplitude – Tone Volume
Pan – Where in the stereo field to place the tone
Mode – Sweep or Variable (Variable controlled by the “Freq. Hz” slider)
Sweep Speed – To the left is a faster sweep.

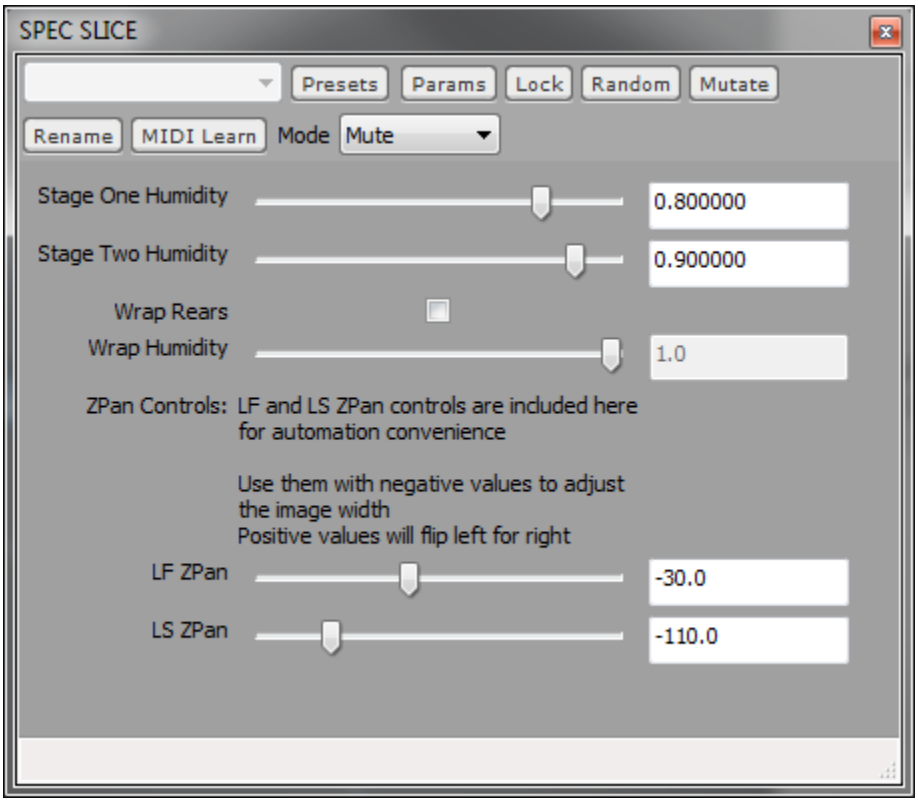
The “Freq Hz” label will show the current frequency (useful during sweep for identifying the frequency of any volume change in your HT System or Conversion.

6) ***Output Gains*** – Use to control surround balance in standalone methods, or to control the levels to other bidules in your layout. The FL and SL Gains will move the FR and SR gains as a pair, but you can adjust the FR and SR gains independently if you need to.



Method Specific Controls

SLICE



SLICE Method Stage Humidity Sliders – Stage one is the humidity setting for the input of stage 2, affects FL, FR, SL, and SR. Stage two is the humidity setting for the SL and SR outputs. The Wrap Humidity is enables when the Wrap Rears checkbox is checked

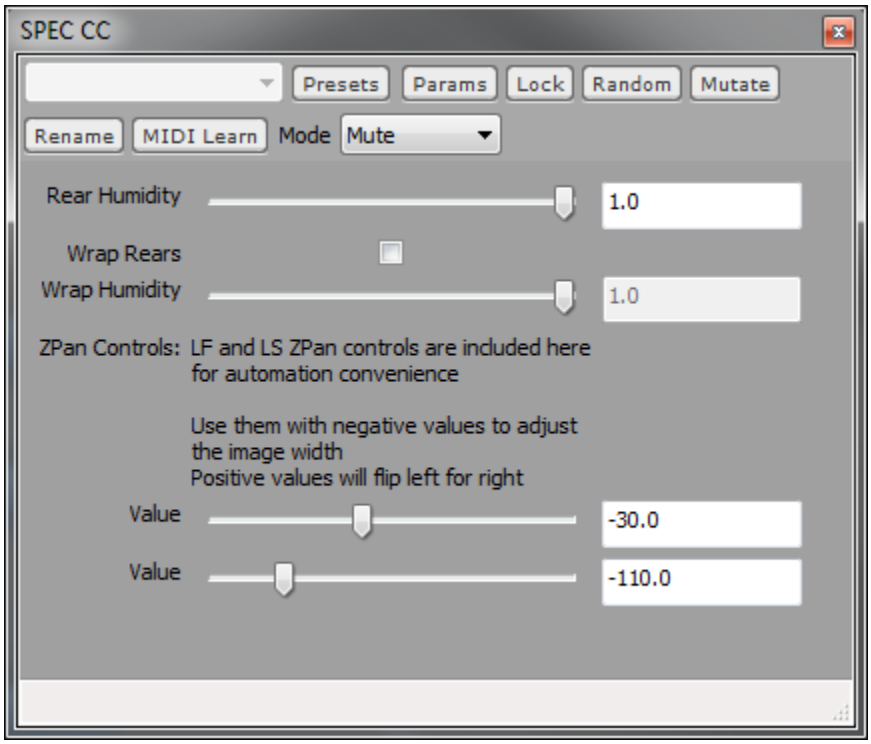
A Humidity of 1 = 100% wet, or SLICE processed signal. A Humidity of 0 = 0% wet or 100% dry signal from the previous stage (or original left and right in the case of stage one). Humilities near one are used to decrease and artifacts heard in the outputs.

Recommended settings to start with are 0.8 for stage one and 0.9 for stage two.

Wrap Rears adds a third stage of separation. This has the effect of taking what was the extreme outside of the original stereo field and placing it in **both** rear speakers, creating a virtual center rear. This causes the sound field to wrap around you 360 degrees. Checking the “Wrap Rears” box activates the feature and enables the “Wrap Humidity) slider.

The Zpan sliders are linked to their associated Zpan controls. See the ZPan section and the Per Track Automation section.

CC Controls

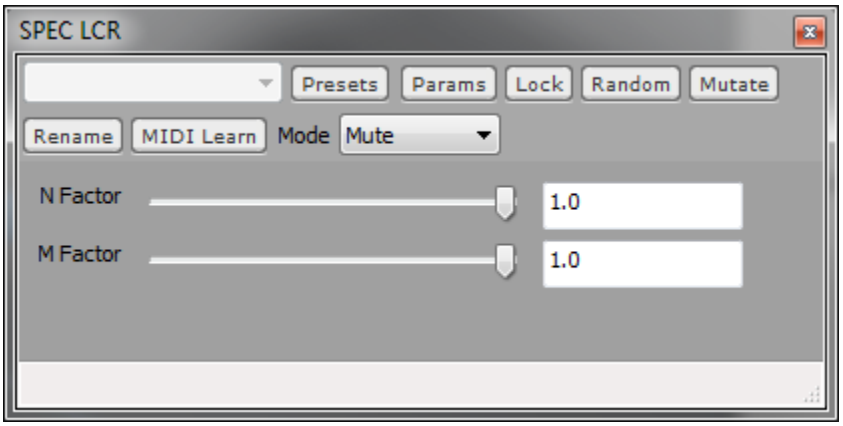


CC Method Humidity – Sets the Humidity for the SL and SR outputs
A Humidity of 1 = 100% wet, or SLICE processed signal. A Humidity of 0 = 0% wet or 100% dry signal from the previous stage (or original left and right in the case of stage one). Humilities near one are used to decrease and artifacts heard in the outputs.

Wrap Rears adds a third stage of separation. This has the effect of taking what was the extreme outside of the original stereo field and placing it in **both** rear speakers, creating a virtual center rear. This causes the sound field to wrap around you 360 degrees. Checking the “Wrap Rears” box activates the feature and enables the “Wrap Humidity) slider.

The Zpan sliders are linked to their associated Zpan controls. See the ZPan section and the Per Track Automation section.

LCR Controls



LCR Method N+M Factors

Default settings for the N amd M factors are 1.0.
These settings affect only the SL and SR output channels, but Psycho-acoustically they interact with all the other channels (and their output Gains).

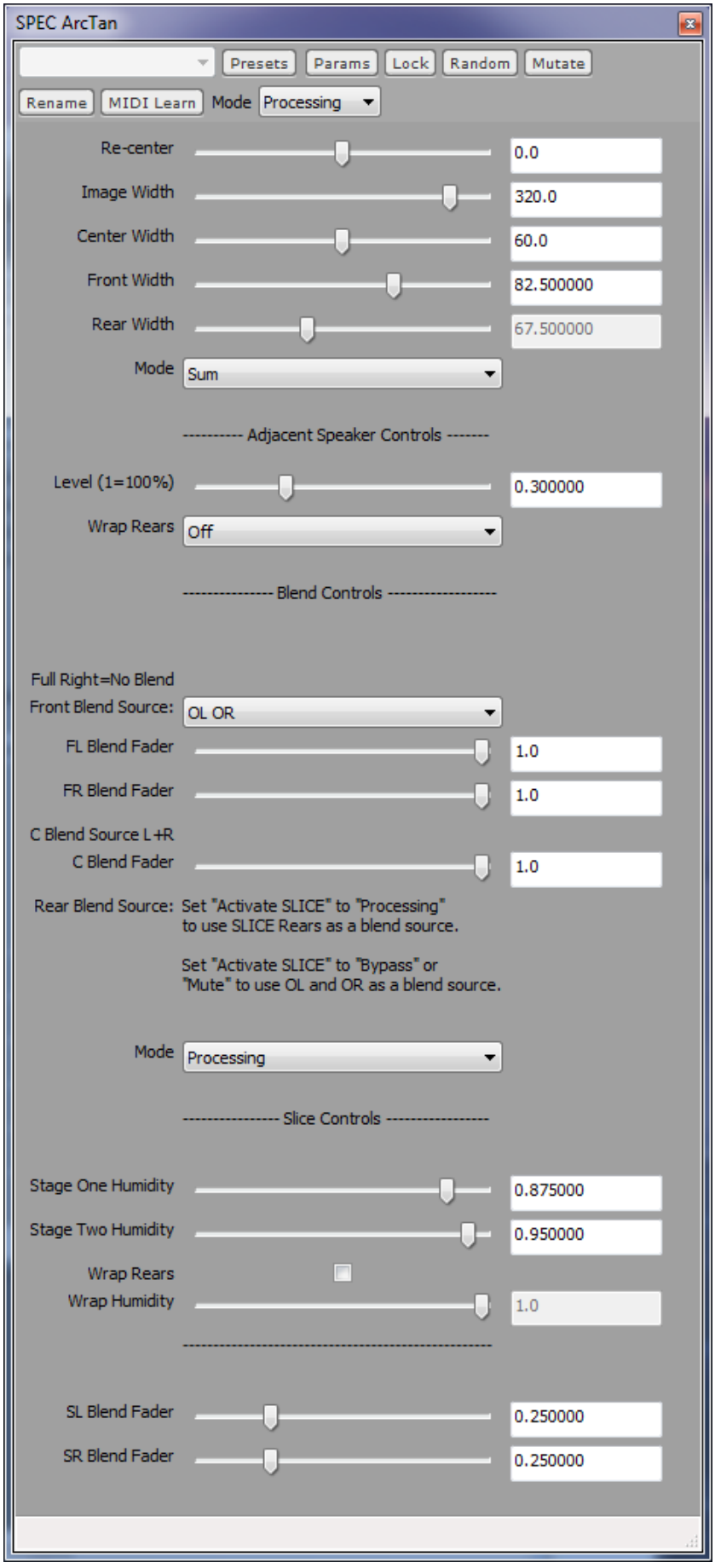
Some other settings to try:

Gerzon: Set N to 0.885 and M to 0.115 (Try other values of N and M that add up to 1.0)

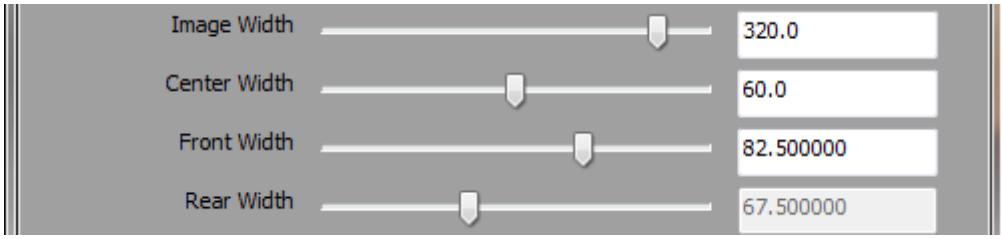
LCR M: Set N to 1.0 and vary M.

LCR G: Set N to 1.0 and vary M and the Center output gain inversely.

ArcTan Controls:

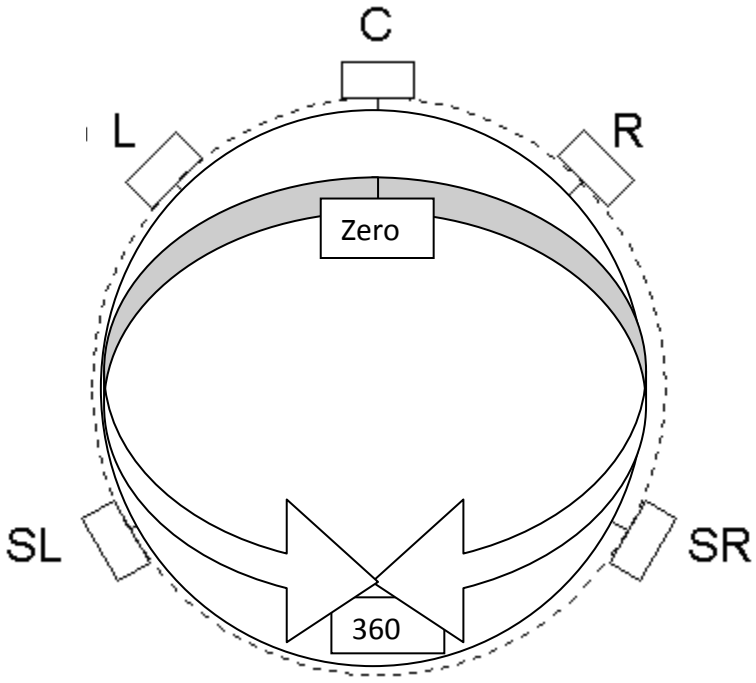


ArcTan is a spectral method that uses the Arc Tangent of the ratio of each of the Left and Right frequency magnitude bins to determine the “angle” of the sound the producer created for that frequency in the stereo field. This angle is then magnified to fill a 360 or smaller degree sound field using the “Image Width” control.

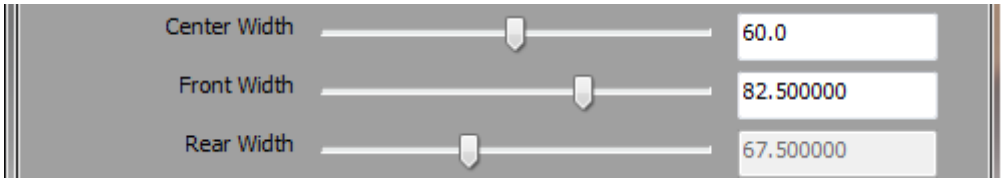


The “Image Width” control can set from 0 to 360 degrees. A setting of zero will result in all of the sound coming from only the center channel (assuming no “Adjacent Speaker” or “Blend Controls” are used). A setting of 90 degrees should recreate the stereo image (but utilizing all three front speakers). A setting equal to the larger angle between your rear speakers will spread the stereo image from center all the way around to your rears, and a setting of 360 degrees will spread the stereo image 360 degrees around you so that what was the extreme outsides of the stereo field appear to come from behind you, between the rear speakers (as in SLCE or CC with “Wrap” turned on).

While any setting between zero and 360 degrees can be used, it is assumed that settings between the larger angle between your rear speakers and 360 degrees (inclusive) would be used in conversions (for instance if the larger angle between your rear speakers is 240 degrees, you would probably want to experiment with “Image Width” settings between 240 and 360 degrees inclusive) .



In ArcTan you can further modify the sound field with width controls individually for center, front, and rear (rear image width is automatically set based on what is “left over” from your center and front image setting).



These controls change the relationship between the ArcTan angle (as modified by the width control) and the actual angle each frequency bin is output at. Larger widths mean more of the stereo sound field will be mapped into those speakers, and smaller widths mean less. With the controls set at 72 degrees the relationship is basically 1:1 . The output angle is “capped” at the value of the width control.

As you move the Center width control to the right you may find that the center channel sound “slips away” from the center channel to one side or the other. In order to bring the “central” sound back the center speaker a “Re-Center” control has been added. This simply adjusts the balance between the left and right audio signals at the input to ArcTan.

Following the above described controls, ArcTan has three different modes of distributing the sound into the surround field:

1) Sum - The original Left and Right magnitudes of the frequency bins are added together and output at the calculated angle. This should be the most accurate reproduction/expansion of the original mix

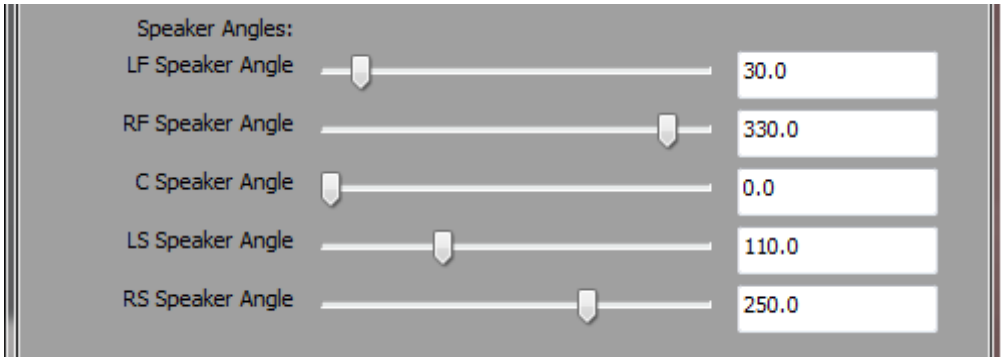
2) Across – The louder of the original left and right magnitude is output at the calculated angle, and the quieter signal is output at an equal angle on the other side of zero degrees. This will give a more “full” sound, with more sound being concentrated toward the front and center speakers

3) Diagonal - The louder of the original left and right magnitude is output at the calculated angle, and the quieter signal is output at an angle 180 degrees from the calculated angle. This has the interesting effect of putting sounds that are slightly off center behind you, in both rears. We’ve found this to be particularly useful in songs where harmony vocals are panned just a little left or right (vs. the lead vocal in the center).

   Note that larger Center Width vs. Front Width settings are another possible way to spread out things panned only slightly off center in the original stereo.

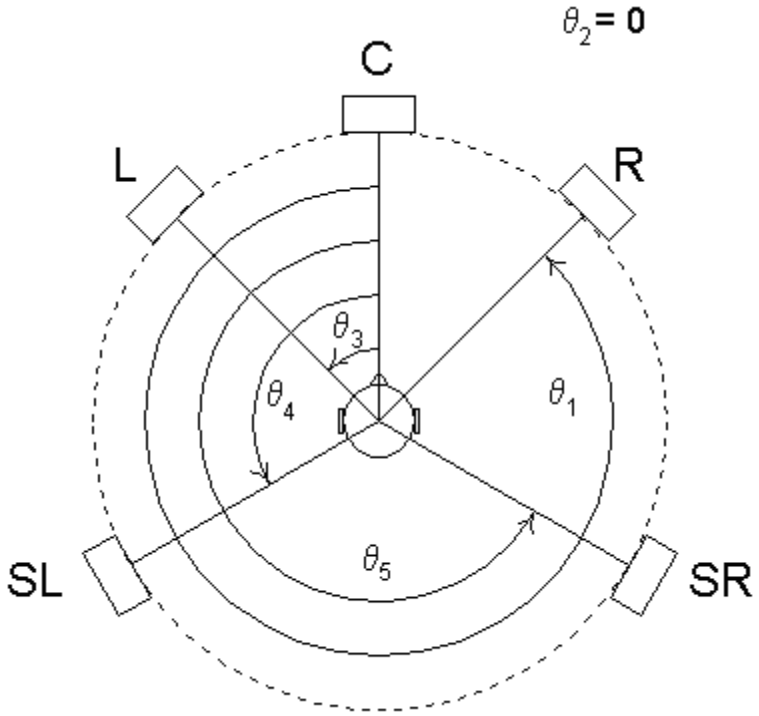
At the output of all the above controls (inside ArcTan) a Constant Power Panner is used to “pan” each frequency between the appropriate pair of speakers to make the sound appear to come from the targeted angle.

In order for the Constant Power Panner to perform the correct calculation, it needs to know where your speakers are located.



Rather than assuming ITU speaker positions, ArcTan uses the Speaker Angle sliders in ZPan for you to input the precise speaker angles of your system. Note that processing should be "on" when you adjust the Speaker Angle Sliders in ZPan.

Speaker angles are measured in degrees counter clockwise from the (normal) center channel position.



Note that in this layout the ArcTan speaker angles are linked from the ZPan speaker angles, so you can set your speaker angles once in ZPan, and have ArcTan also be set correctly (the reverse is not true).

The last page of this document contains a 360 degree chart to assist you in measuring your speaker positions.

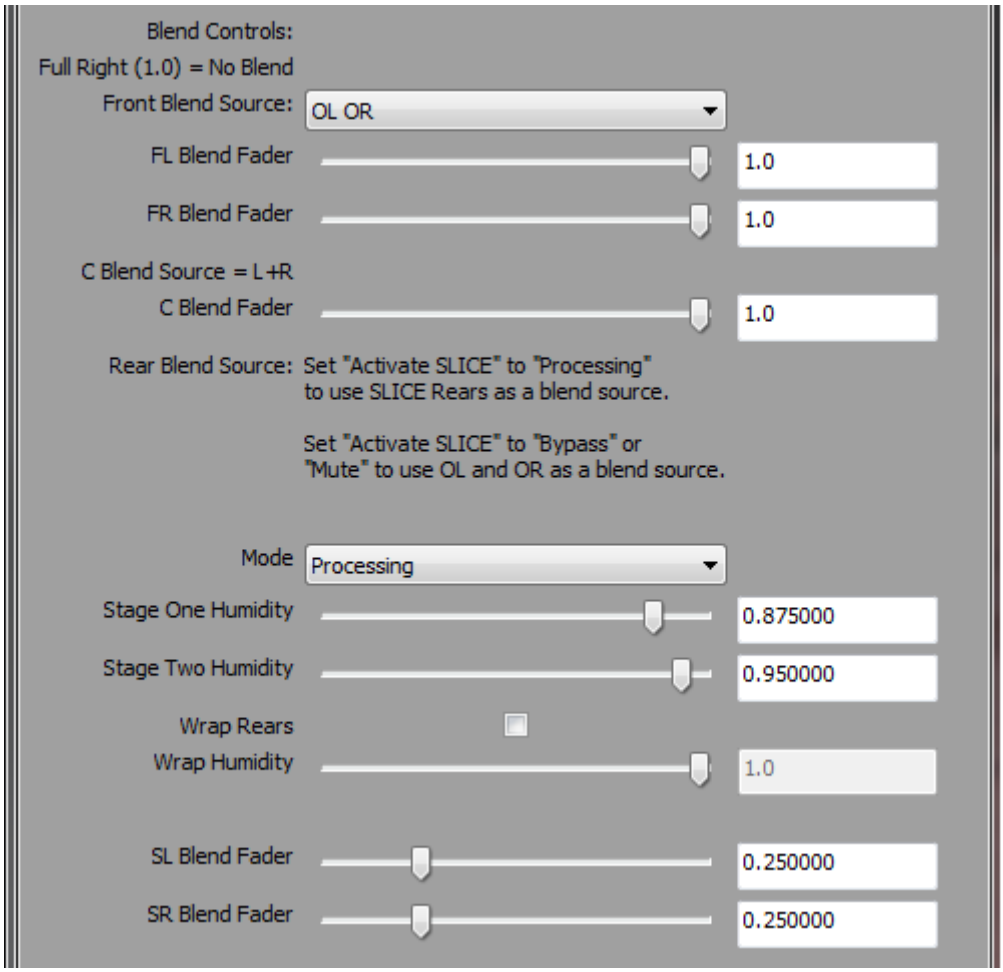
Adjacent Speaker control

The adjacent speaker control lets you add in some signal destined for each speaker to the speakers on either side of it. This can “fatten” or “fill in” the sound. We have found that 0.3 is a good setting for this control.

With the control all the way to the left this control is “off”.
Also included is a selection to have the opposite rear speaker included (Wrap Rears ON) or not.

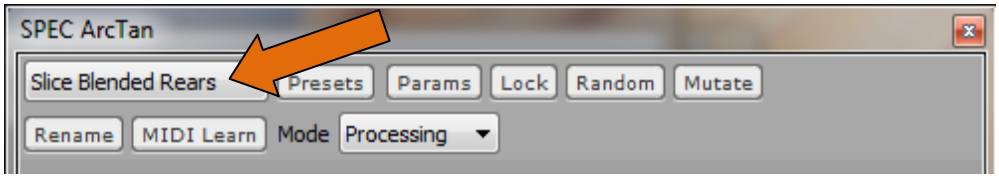
Blend Controls

Rather than simple humidity controls, ArcTan’s Blend Controls let you select the source of the “dry” signal to blend with its outputs. With all controls set to 1.0 you will hear the “pure” output of the ArcTan method. Feel free to experiment.



The Rear Blend faders allow you blend in rears from the SLICE method. We have found that ArcTan fronts and 25% blended SLICE rears (75% SLICE, 0.25 on the sliders) is an excellent combination for many types of music.

Using ArcTan AND SLICE at the same time does increas the DSP load however, so you should keep the "Activate SLICE" drop down on "MUTE" if your not using SLICE blended rears.
We've included two presets in the ArcTan Controls. On for Slice Blended Rears and one for ArcTan Rears:



The Slice Blended Rears Preset has Slice Processing, Stage One Humidity 0.875, Stage Two Humidity 0.95 and Wrap Rears off. These are good starting point settings for Slice Blended Rears.

The ArcTan Rears Preset has good starting point settings for ArcTan Rears.

Note that these presets are not marked "Read Only", so if you want to keep them as defaults you should mark them "Read Only" as just changing a setting and saving the layout will overwrite the presets (if not marked Read Only).

Also note that you will need to delete (or make copies of) these presets if you are going to use "Per Track Automation".

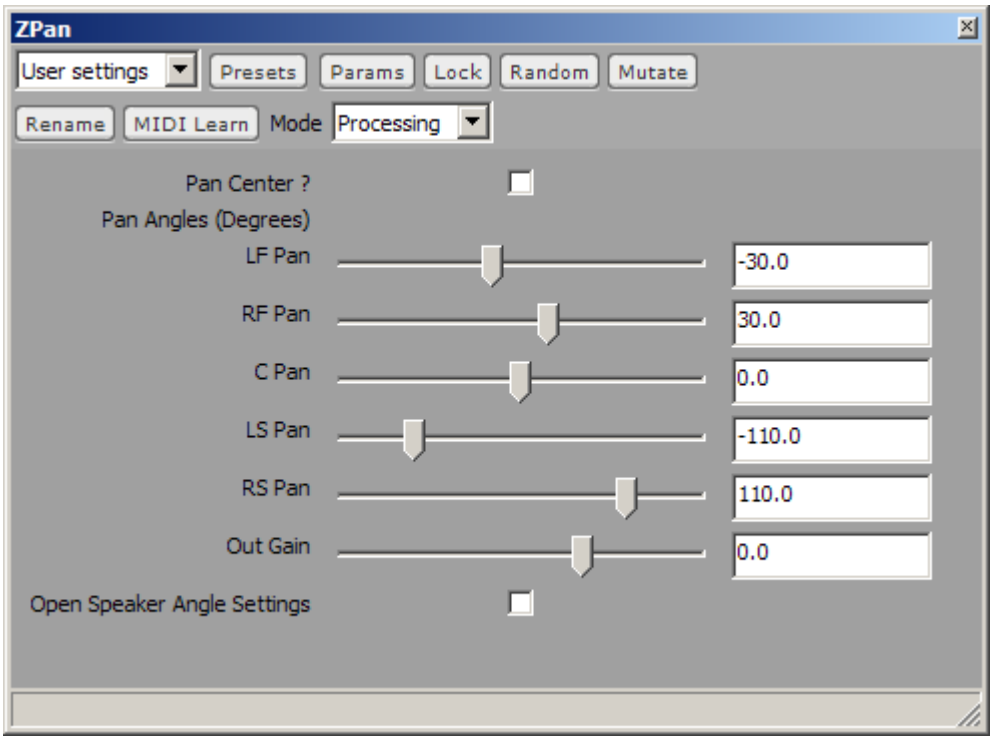
These two presets were just included as an easy way to show you some initial "good sounding" settings.

ZPan

Zpan allows you to place the sound output from SPEC (or another method) *between* speakers vs. having the sound come directly from the speakers. This allows your widen or “open up” the sound (or narrow it) as well as creating a balanced sound field in which your speakers “disappear”.

Thus Zpan can replace 5 channel input/output Ambisonic methods, *and* do so without adding any significant DSP load to your layout.

Note that Zpan is probably not needed for ArcTan, as ArcTan already creates a continuous sound field, vs. discrete speaker channels , but the other SPEC methods (SLICE, CC, LCR) can definitely benefit from using ZPan.



Pan Angles are measured in degrees clockwise from center (positive) and degrees counter clockwise from zero (negative). So the range of panning is from -180 degrees to 180 degrees. Note that both 180 degrees and -180 degrees create a pan angle that causes the sound to come from directly behind you, between the rear speakers.

A negative pan angle equal to the angle from center to your left rear speaker would result in the sound coming directly from your left rear speaker. The easiest way to get a feel for this is to use the Output Gain controls in SPEC to turn off all but one channel, and then move the ZPan pan control for that channel around to hear the result.

The “C Pan” Control has no effect unless you check off the “Pan Center ?” checkbox. This is to save DSP load.

You will notice that similarly to the output gain controls in SPEC, the Zpan pan left and right pan controls are linked so that if you move a “left” pan control the corresponding “right” pan control moves at the same time

(processing must be “on”). This allows you to smoothly hear the effect of widening or narrowing the front or rear sound field by moving the LF or LS pan controls only.

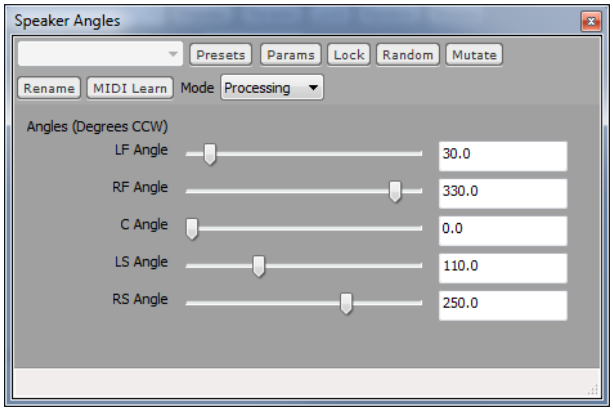
> Linked copies of the LF and LS pan controls are now included in the SLICE and CC method controls for that reason and specifically to set the image width when using “Per Track Automation”.

You can set different pan angles for Left and Right speaker pairs by moving first the left Pan control and then the corresponding right control.

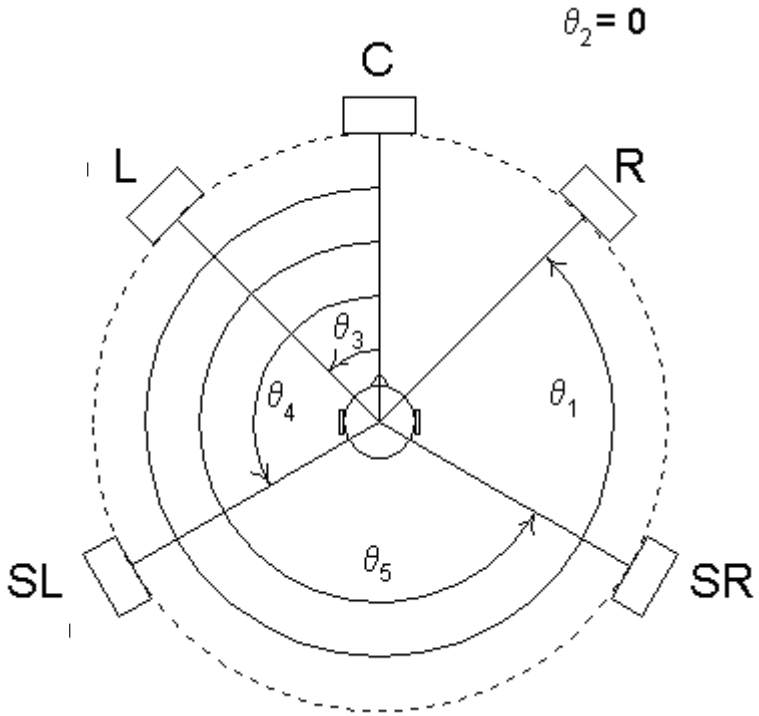
You will also quickly notice that the control linking behavior is different from the SPEC Output gain controls in that the pan controls move OPPOSITE to each other, and that this movement only occurs when processing is turned on (Because we need to do math between the links).

In order for the Constant Power Panner to perform the correct calculation, it needs to know where your speakers are located.

Rather than assuming ITU speaker positions, ZPan provides sliders for you to input the precise speaker angles of your system. These settings are also used by ArcTan.



The angles are measured in degrees counter clockwise from the (normal) center channel position.



One could assume that the target audience has ITU setups, in which case it might make sense to set the speaker angles to ITU angles AFTER you have balanced our sound but before you do your conversion, but this assumption has not been tested (perhaps a poll of actual speaker angles would need to be done to determine the average speaker positions?).

However in general the idea is that you set your speaker angles to match the position of your speakers once, and only adjust the Pan Angles per conversion (or track).

Note that if the Pan Angles are set to match the position of your speakers ZPan has no effect on the sound (remembering that pan angles are measured from -180 (left) to +180 (right) and speaker angles are measured zero to 360 degrees counter clockwise).

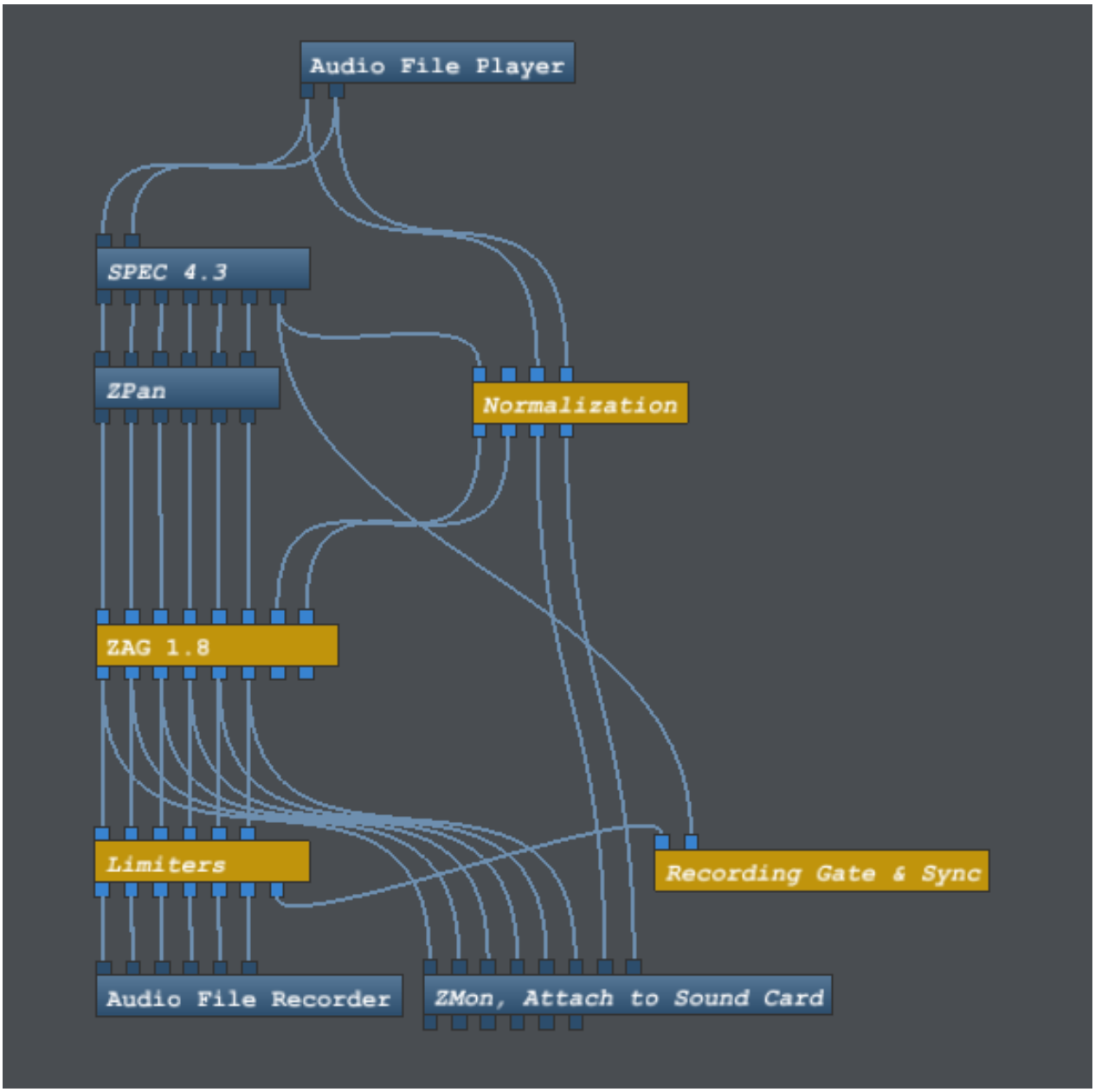
Note that processing should be “on” during setting of the Speaker Angles.

A chart is included at the end of these instructions to help you set your speaker angles.

ZAG 1.8

ZAG stands for “Z Automated Gains.” It is the most streamlined approach to automated channel gain balancing developed yet, requiring minimal steps on the converter’s part. As a matter of fact, remember that gain spreadsheet Excel sheet from the main SPEC guide and AutoV2? Feel free to dump that in your Recycle Bin. You no longer need it!

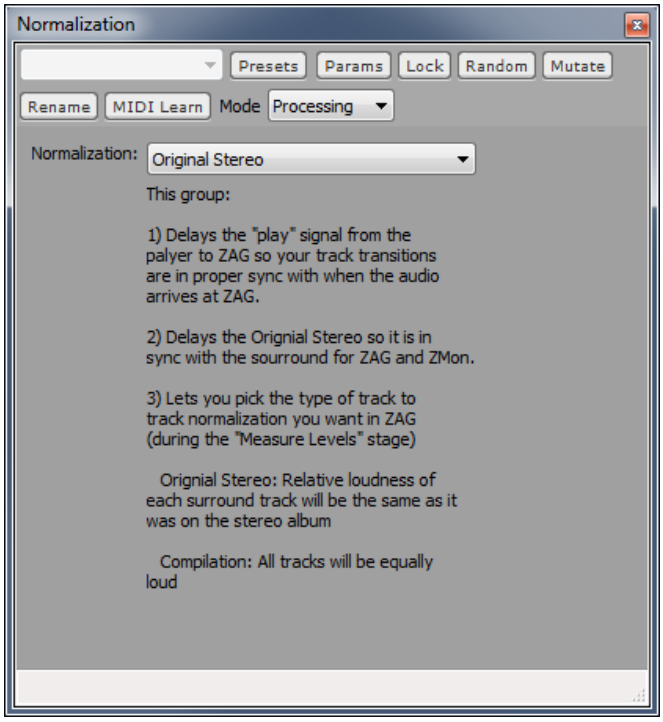
Here’s a look at a SPEC 4.3.2 + ZAG 1.8 layout, with the new or changed bidules highlighted:



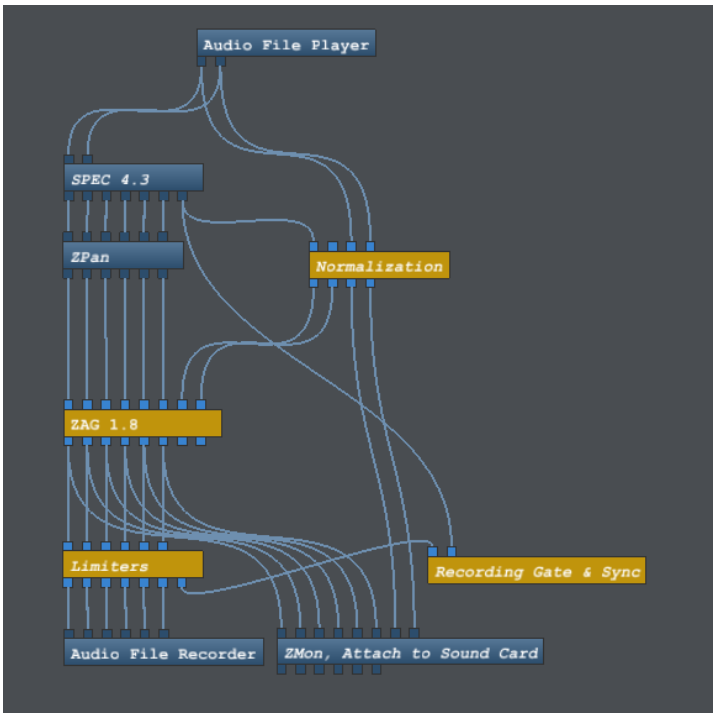
ZAG uses the original stereo (LI and RI) signals to assist in track to track normalization, so those signals must be in sync with the surround channels coming out of SPEC. The “Normalization” group has been added to take care of that (as well as delaying the “Play” signal from the “Audio File Player”).

It's called the "Normalization" group because it also lets you pick whether you want ZAG to normalize the relative volume of your tracks based on the original stereo (you are converting a stereo album) or you want ZAG to make all tracks the same volume (you are converting a compilation of tracks from different albums).

Double clicking on the "Normalization" group gives you:

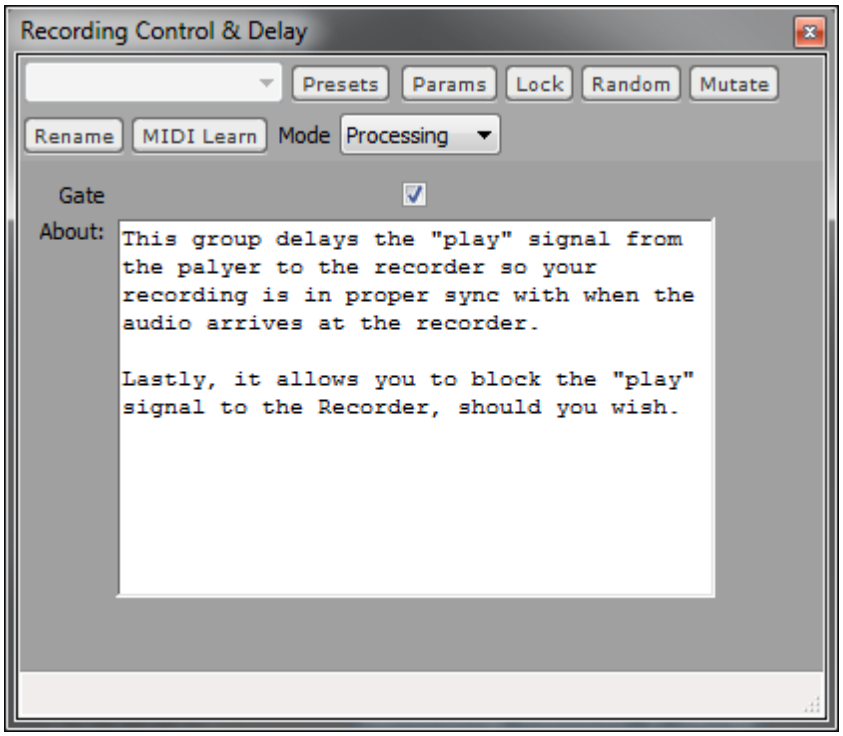


Back to ZAG itself, the first two inputs are for "delay in samples", the last two inputs are for "Left In" and "Right In" The outputs are the synced Left and Right channels (The "Play" signal is connected via parameter links).


Audio File Player
SPEC 4.3
ZPan
Normalization
ZAG 1.8
Limiters
Recording Gate & Sync
Audio File Recorder
ZMon, Attach to Sound Card

We'll discuss the limiters and ZAG itself in a moment, but since we've added the limiters (which have latency) we need an updated Recording Control & Delay group as well.

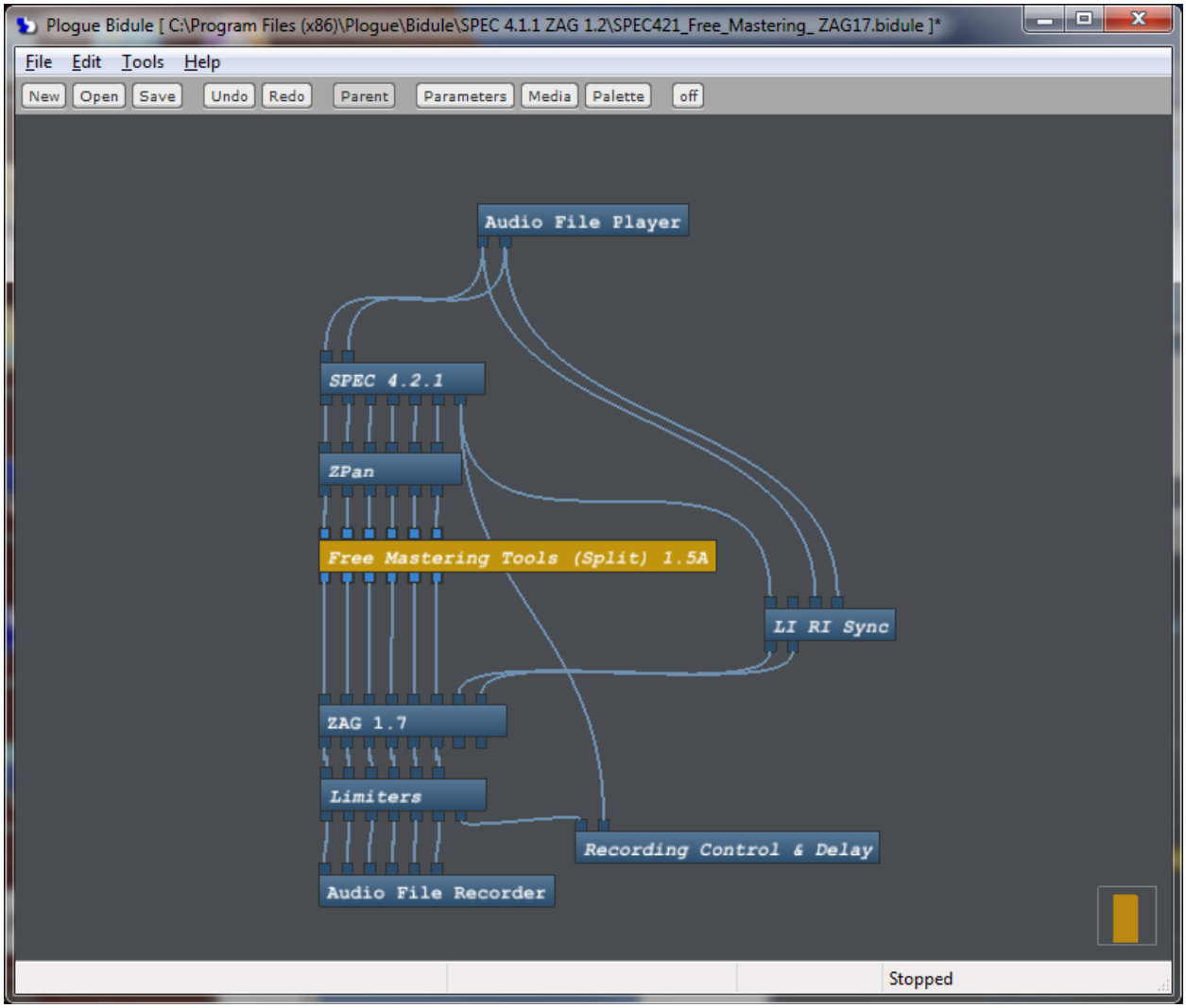
Double clicking on the "Recording Control & Delay group gives you"



Un-checking the "Gate" box will break the link between the player and the recorder. Checking "Gate" enables the (delayed) link.

Both inputs are for "delay in samples", however should you need more, remember that you can connect multiple output signals to a single input in Plogue, and the input will get the sum of the connected outputs.

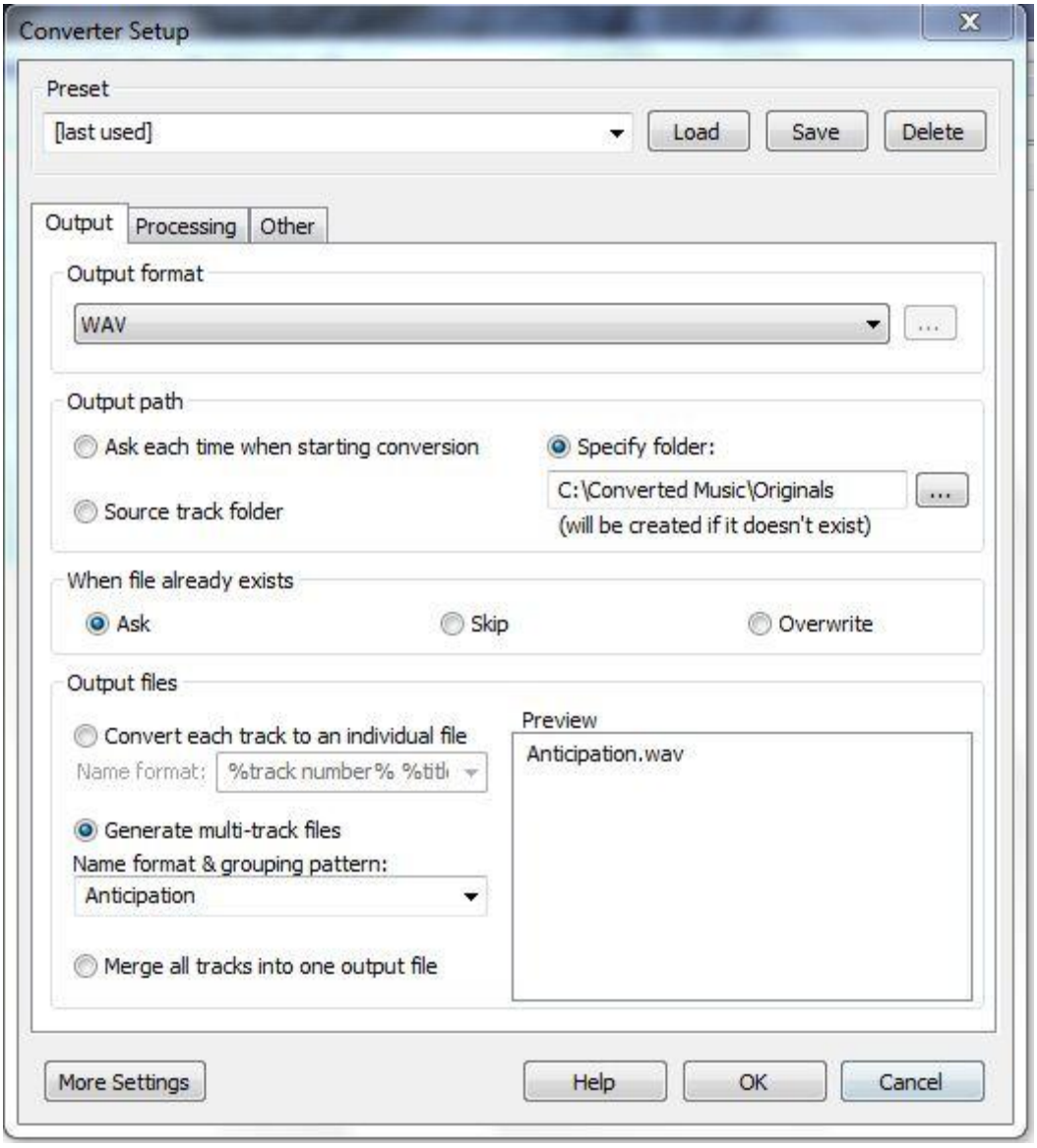
Another variant of the SPEC 4.3.2 + ZAG 1.8 layout has the compressors from the Free Mastering group ahead of ZAG (Free Mastering group shown highlighted):



This is the position in the layout where mastering tools should go (ahead of ZAG). The Free Mastering group doesn't have any latency but if you choose to replace it with a mastering tool that does you will need to connect its delay output pin to one of the delay input pins on LI RI Sync.

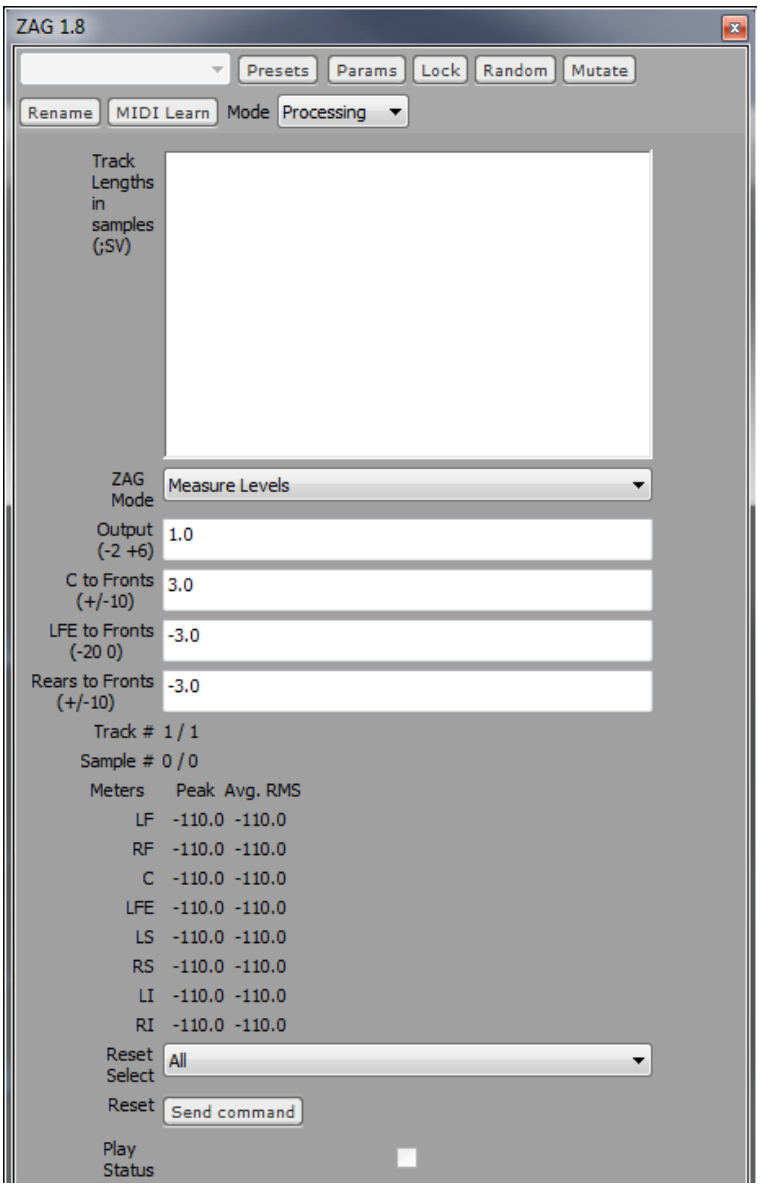
Now let's get into the details of ZAG.

Like AutoV2 and ARTGC, ZAG is designed to work with a single album-length track. If you are working with individual files for each track on an album, you can combine them into an album-length track, and create an accompanying Cue sheet, using Foobar2000. Drag and drop your single song files onto Foobar, highlight them all, and right-click and choose "Convert."

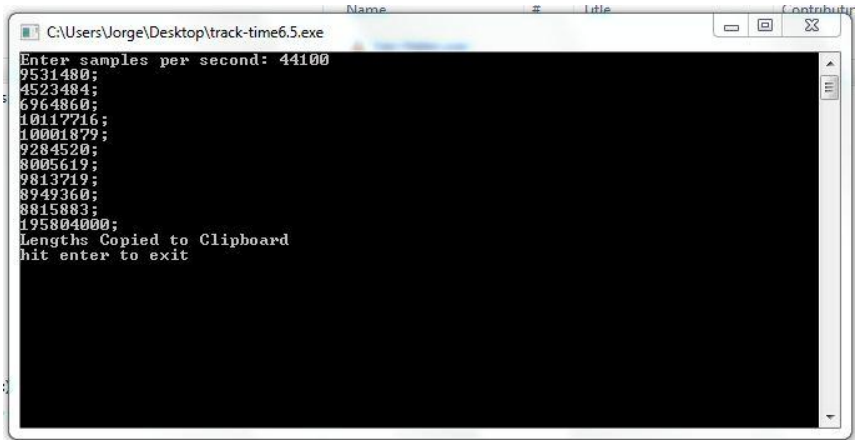


Selecting the "Generate multi-track files" option will create a single album-length file, with an accompanying cue sheet. Obviously, where you place those files is up to you.

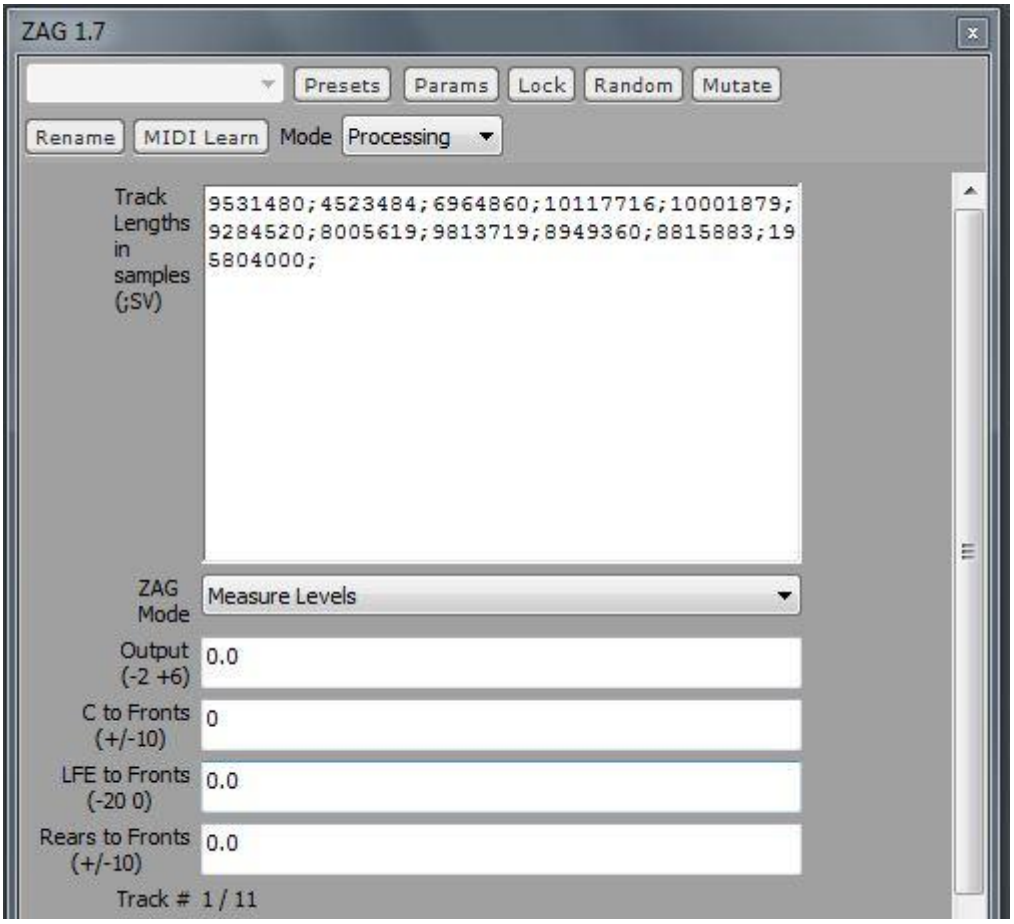
Let's take a quick look at the top half of the ZAG UI:



What we are going to do is convert the track lengths for each cue point into samples so that ZAG knows where each song begins and ends. We do this through use of TrackTime6.5. Make sure TrackTime6.5.exe is kept on your desktop. As with the previous version used with AutoV2, you are dragging and dropping your cue file onto the Track Time 6.5.exe Icon. This should result:

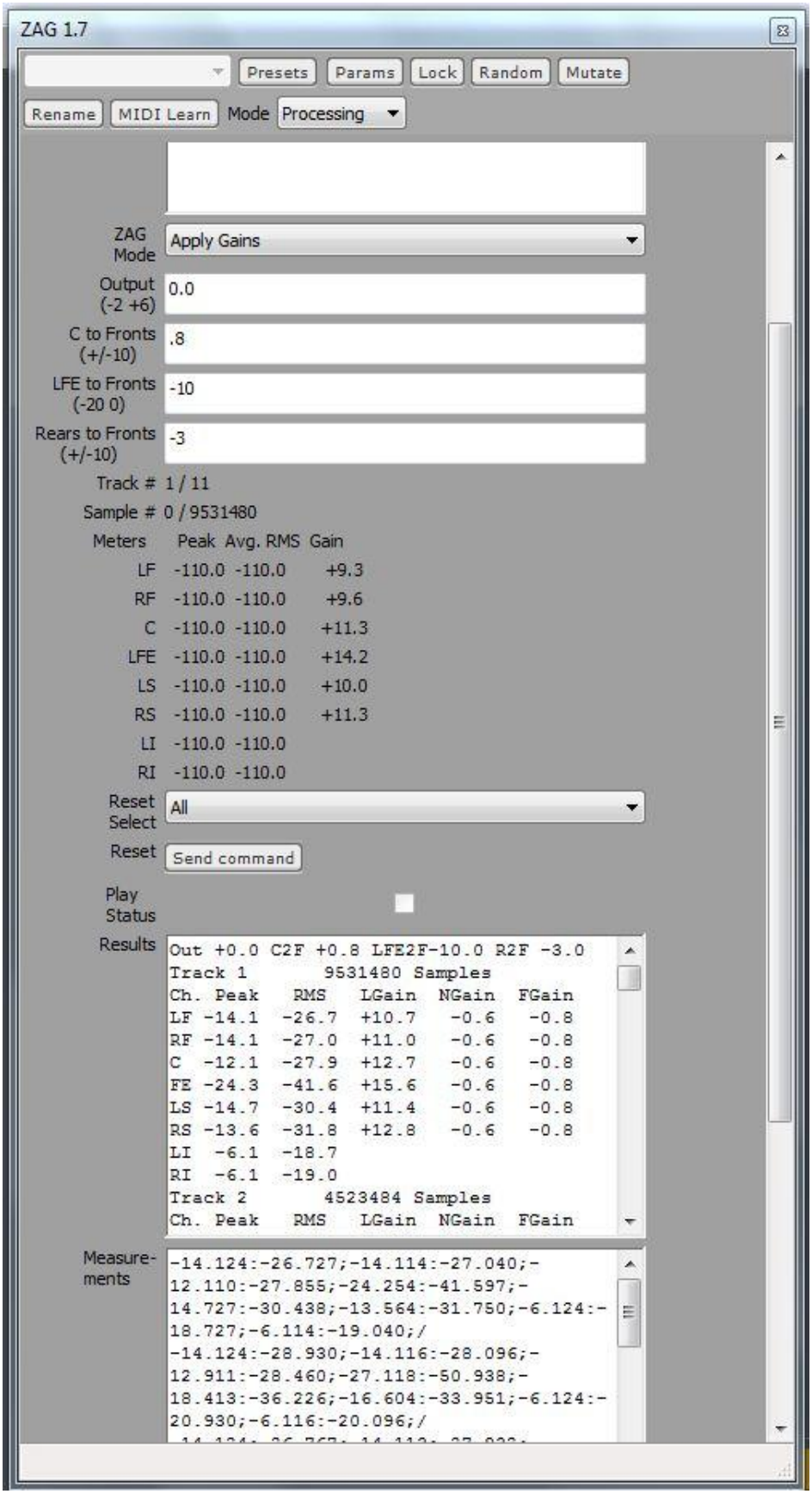


If you notice, TrackTime6.5 now takes the converted track lengths and copies them onto the clipboard. This saves you some time, since your next step will be to simple paste those into the "Track Lengths in Samples" box inside ZAG:



Notice how the track # on the bottom now reflects the number of songs on the album. Leave the other controls on ZAG where they are for now and go ahead and set up SPEC to the parameters you want for this album.

Make sure your album-long track is loaded into the player as well. Keep ZAG Mode at “Measure Levels” for now and simply hit “Play.” If you see the ZAG meters begin to actually measure RMS levels, you are good to go. Walk away, make a sandwich, dance with your spouse, etc. Come back when your album is done, hit the off button, and switch ZAG Mode to “Apply Gains.”



The “Results” box will now show you peak levels, RMS values, and three sets of gains for each track on the album.

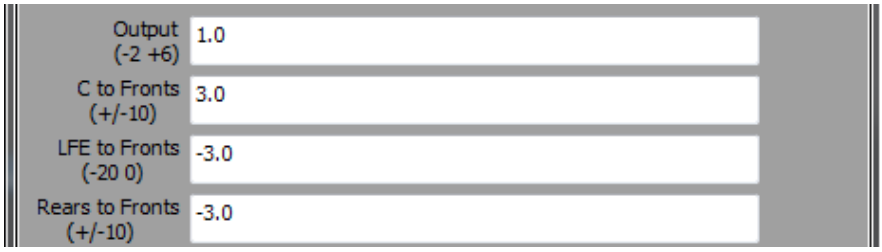
The “LGain” is the Level adjustment formula from the spread sheet (Remember the spread sheet?). Each surround channel will (probably) have a different LGain.

The “NGain” is the track to track Normalization. This ensures that the relative volumes of each surround track are the same as for the original stereo. Each track will have the same NGain for all channels.

The “FGain” is the Final gain needed to bring the loudest peak of the entire album to the output level you have set in the “Output” box. Every channel of every track will have the same FGain.

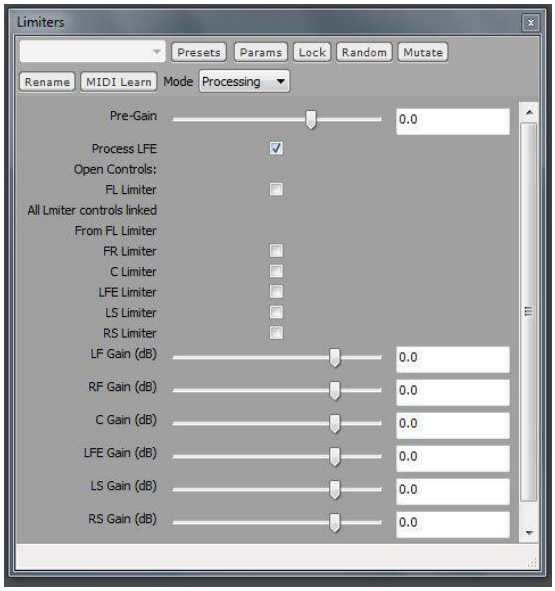
In ZAG 1.8 the Peak and RMS levels of the surround channels are the calculated final results of ZAG, not the measured values. You can still see the measured values (Peak, then RMS, in ITU order) in the Measurements window. If you subtract the sum of LGain, NGain, and FGain from the calculated Peak and RMS values, you will arrive at the measured Peak and RMS values for that channel.

Before, we decide to record, though, let’s go back up to the four boxes below ZAG Mode:



Output refers to where you want to set the highest possible peak value for your entire conversion. The range here is -2 to +6. Setting it to zero, or lower, will result in a fully normalized mix with no positive peak values (no clipping), however, you may find that your mix is too low in volume, or lacking in power. This is why our range allows you to the push the highest possible peak value all the way up to +6, and why we include use of a limiter to round that peak value off at the end of the layout. While excessive use of a limiter is never recommended, when used with some restraint, chances are what you are rounding off is the rare transient on the album which is not going to negatively affect your overall sound quality.

If using the limiter option, open up the main UI:



Open up “FL Limiter,” which controls the settings for each channel, and make sure your limiter settings look like this:

Pay special attention to the “LookAhead” slider. It should be all the way to the right. Something in this VST doesn’t always save that setting.

Going back to the ZAG UI, you should now enter your parameters for where you want your center channel, LFE, and rears to be relationally in volume to one another. What you see above (.8 for center, -10 for LFE, and -3 for rears) is a safe set of defaults for most sources with most SPEC variants, but you should always feel free to make adjustments according to both source and your own tastes. In SPEC 4.3.2 ZAG 1.8 the defaults are Output 1.0, CtoF 3.0, LFE to Fronts -3.0 and RtoF -3.0.

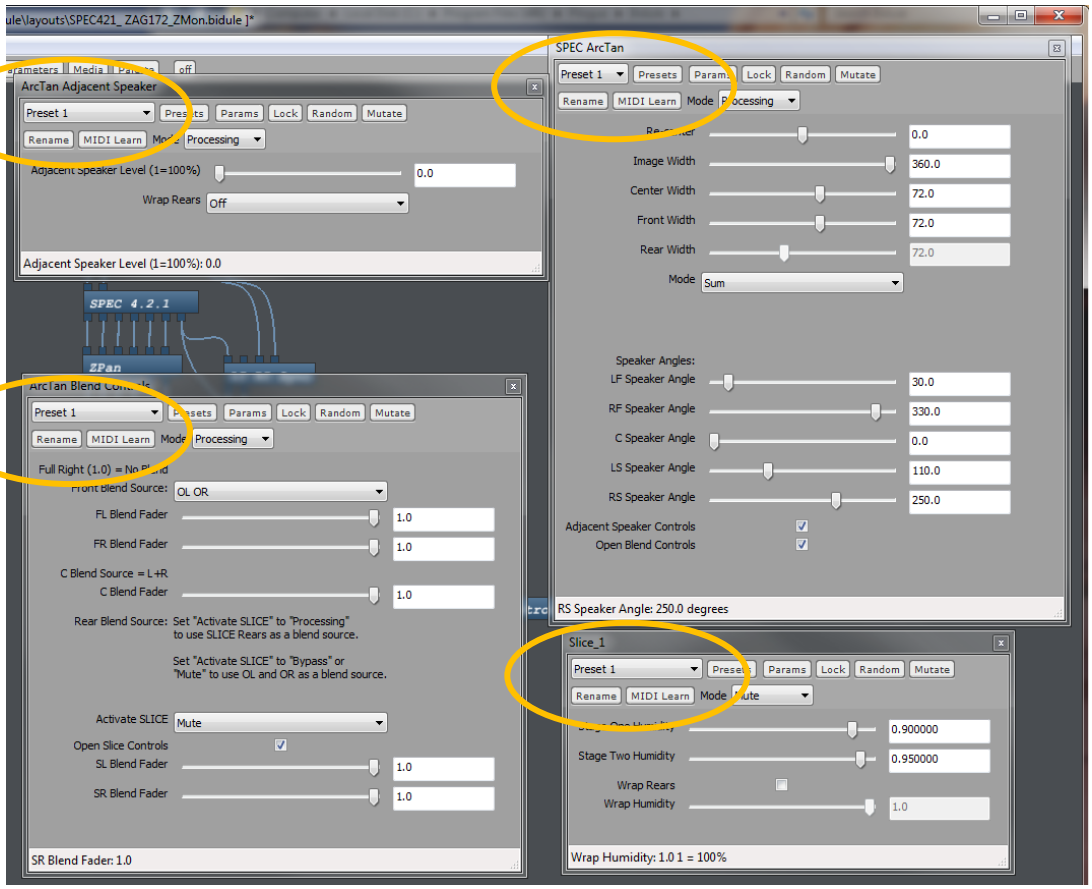
Once all these steps are done, you are ready to record your six mono wavs. Now tell me that wasn’t much easier than previous methods…

We’ll discuss the “Preset Manager” group in the next section.

Per Track Automation of SPEC Settings

Methodology

For each group of controls you want to automate, create a “preset” for each track. With **ZAG bypassed**, run through each track, adjusting the controls for the optimum values for that track, and save them to a preset (Presets ordered by track number).



Use the parameters window to link ZAG’s “Track” Parameter to each group of control’s “Preset Number” parameter (This has been done for you in the “PTA” layout).

Set ZAG to processing and do your measurement and apply gains steps. The presets will change at each track transition.

Note

SPEC Output Gains

Automation of SPEC Output Gains won’t work well because ZAG will “undo” those according to the output level controls in ZAG.

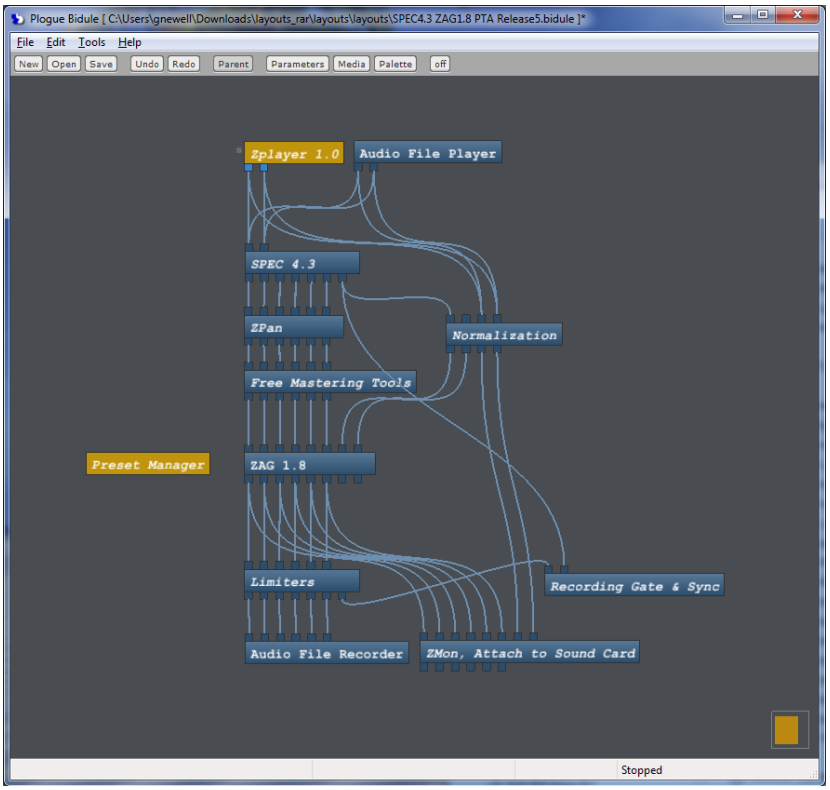
VSTs

Your ability to automate VST settings with this method will be highly dependent on the VST. If the VST allows you to create modifiable (number of tracks) presets in the first number of tracks presets slots then you can use this method.

Optionally you could make a bidule with a bunch of sliders, linking those to the parameters of your VST you want to automate, then make presets for those sliders.

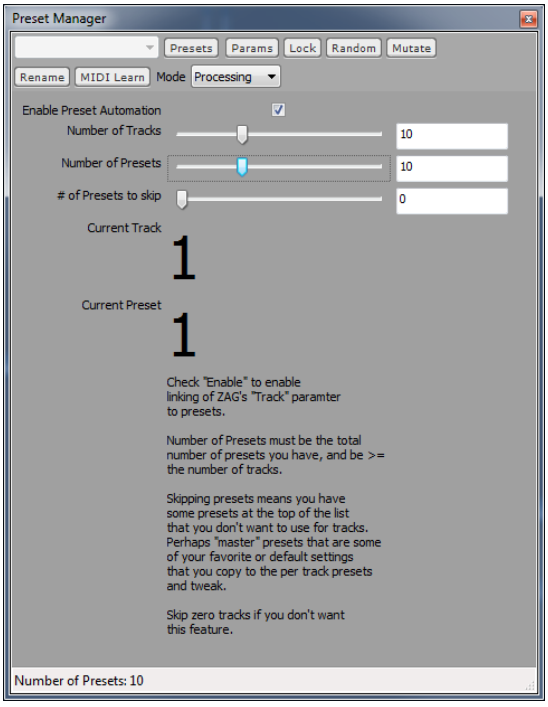
The" PTA" Layout

The "SPEC4.3.2 ZAG18 PTA Release.bidule" layout (with the additional components highlighted):

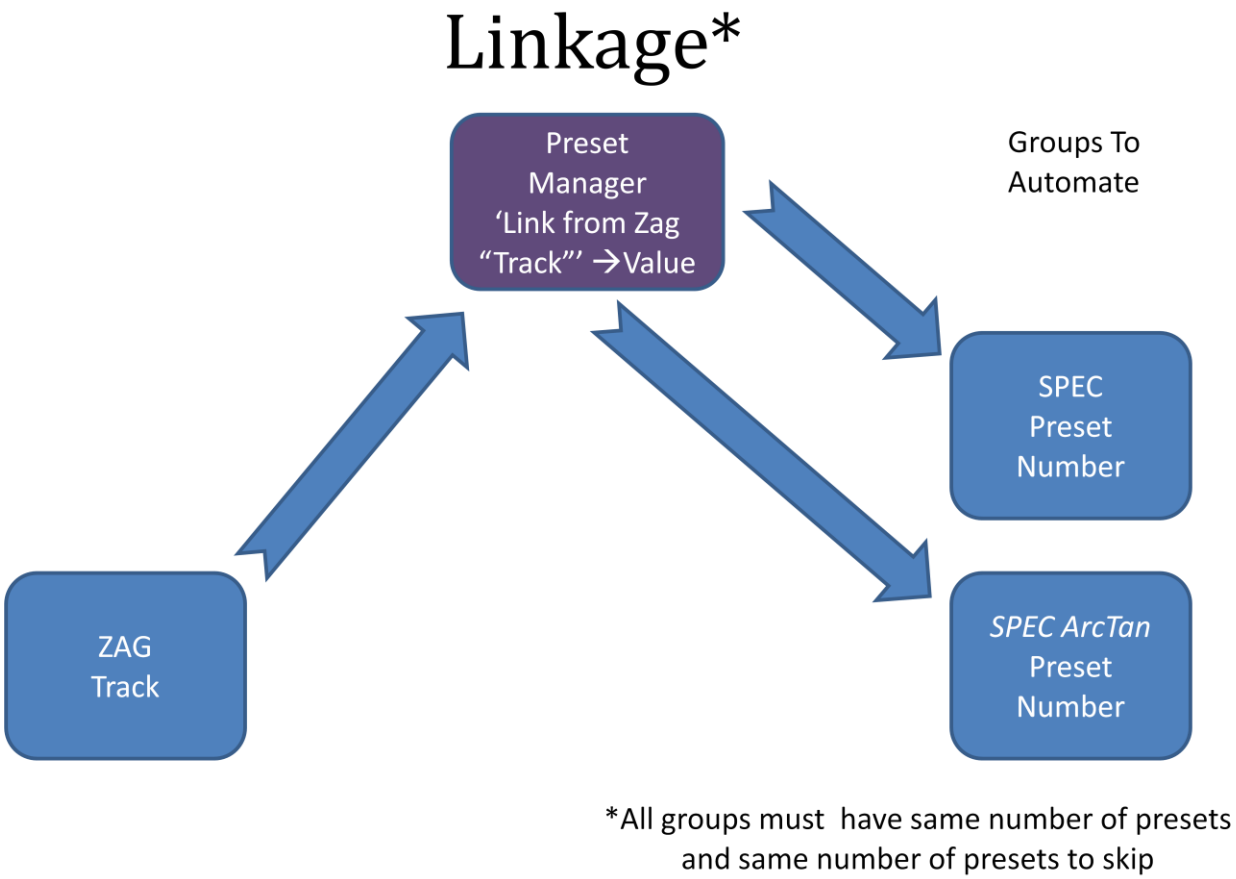


Has additional components and parameter links to assist in Per Track Automation.

The Preset Manager:



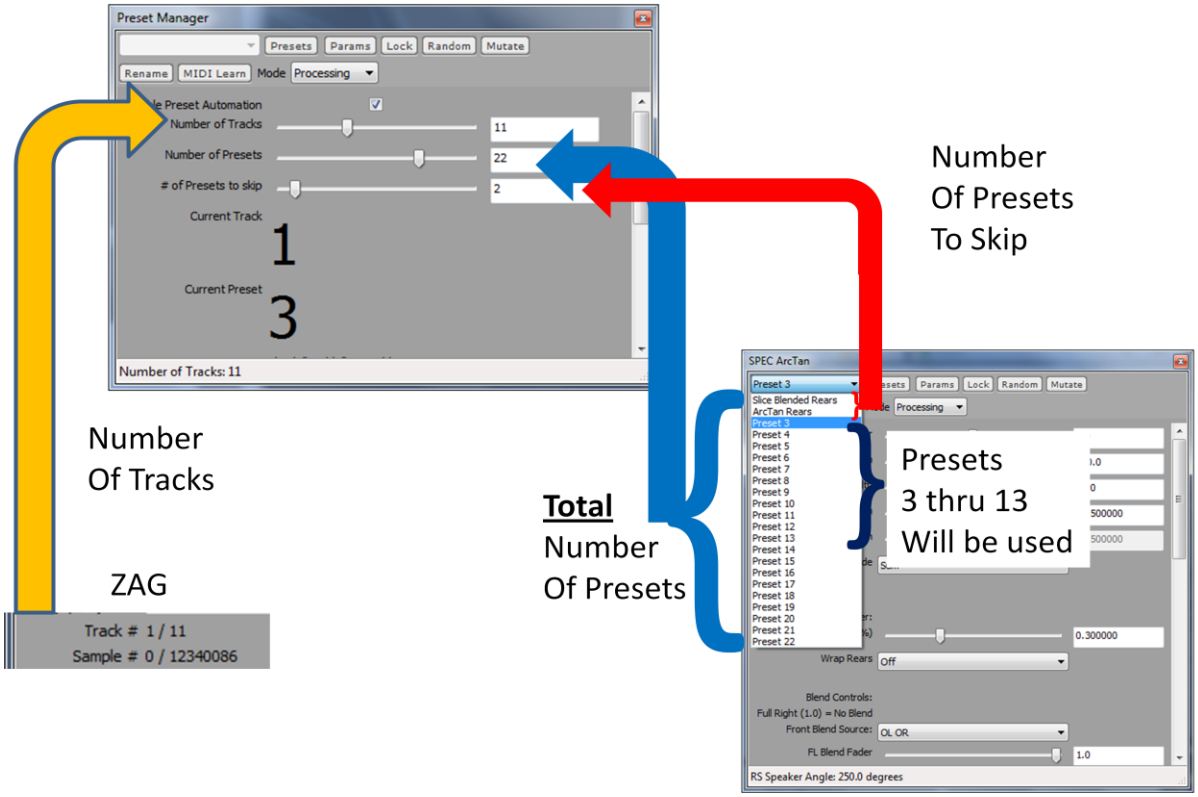
Serves as a “bridge” between ZAG and the Presets of all the other groups in the Layout you might want to edit on a per track basis.



In the PTA layout these links have been made for you.

The Preset Manager allows you to have more presets than you have tracks in your conversion, and also allows you to skip one or more presets at the top of the list, should you want to use those as “master” read only settings that you copy to other presets before per track adjustments.

Preset Manager Settings



In the PTA layout the “Slice Blended Rears” and “ArcTan Rears” presets have been removed from ArcTan but those could be examples of presets to skip.

The Preset Manager also has a checkbox to disable the linkage of Track number to presets. You would disable “Preset Automation” during Preset adjustment, and enable it during the ZAG “measure levels” and “Apply Gains” steps of your conversion.

In the PTA layout, the groups that are linked to the Preset Manager are:

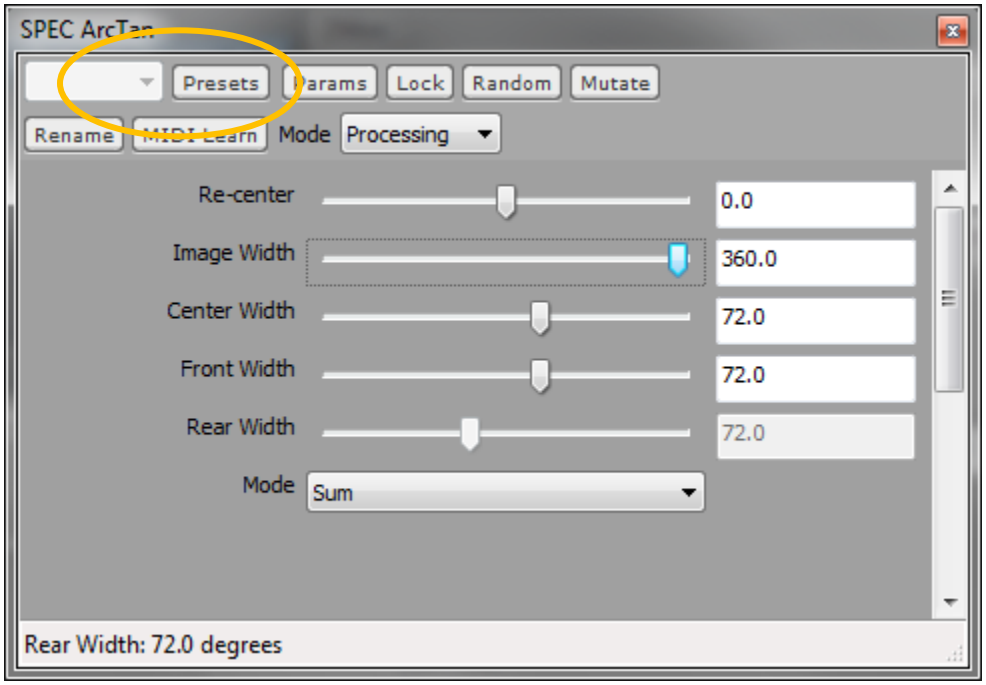
SPEC
SPEC SLICE
SPEC CC
SPEC LCR
SPEC ArcTan
ZPan
Free Mastering
Limiters
LFE Controls

ZPlayer, also included in the PTA layout, will be discussed in a separate section.

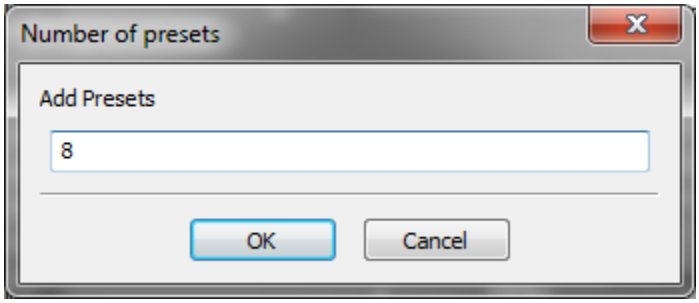
Per Track Automation Detailed Instructions

Setting up Presets

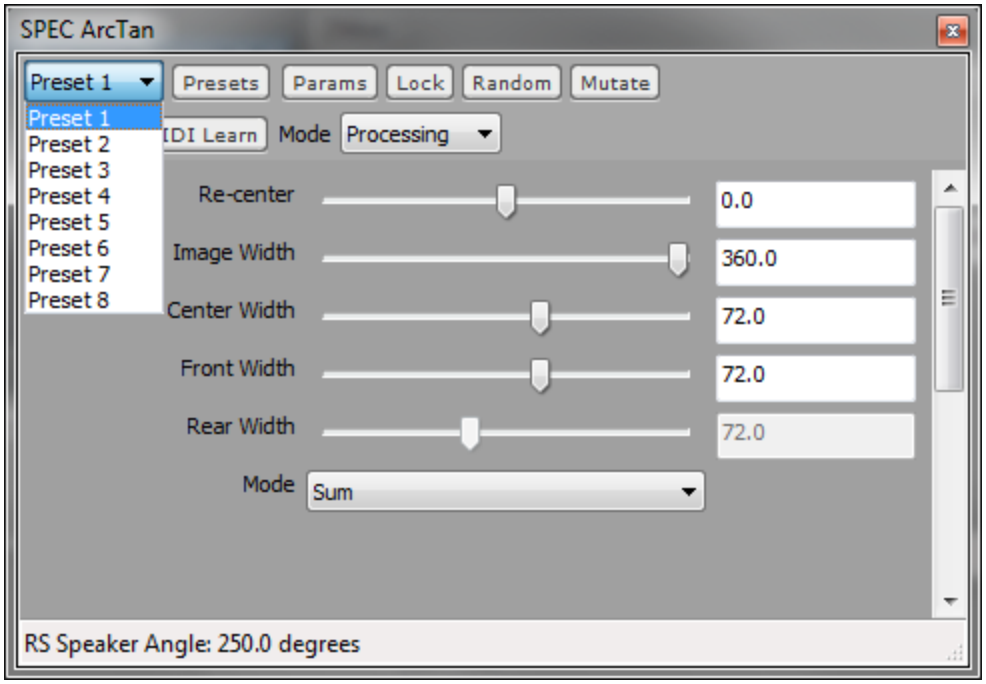
Let's assume you want to automate ArcTan Controls.



Click on the "Presets" button and select "Add N Copies".



Enter the number of tracks in your album (or compilation). The ArcTan controls will now have a preset for each track in your album (Assumes you started with one preset)



Saving your settings for automation

Disable "Preset Automation" in the Preset Manager or Put ZAG in bypass mode.

Put ArcTan on "Preset 1" and listen to track one, adjusting the ArcTan controls for the optimum sound.

Put ArcTan on "Preset 2" and listen to track two, adjusting the ArcTan controls for the optimum sound.

Repeat for each track on the album. You may want to save your layout each time you finalize your adjustments for a track. If you don't save your layout, be careful not to make any adjustment to a control if you are listening to a different track than your current preset. There's no way to undo the change.*

Playing Back Your Automation

Enable "Preset Automation" in the Preset Manager and Set ZAG to Processing mode and go through your "Measure Levels" and "Apply Gains" steps as before. Your presets will change at the track transitions.

That's it!

Layout re-use

To reuse the layout for subsequent albums you can remove the presets or un-mark them "Read-Only"* and save new settings in them, using the presets dialog.

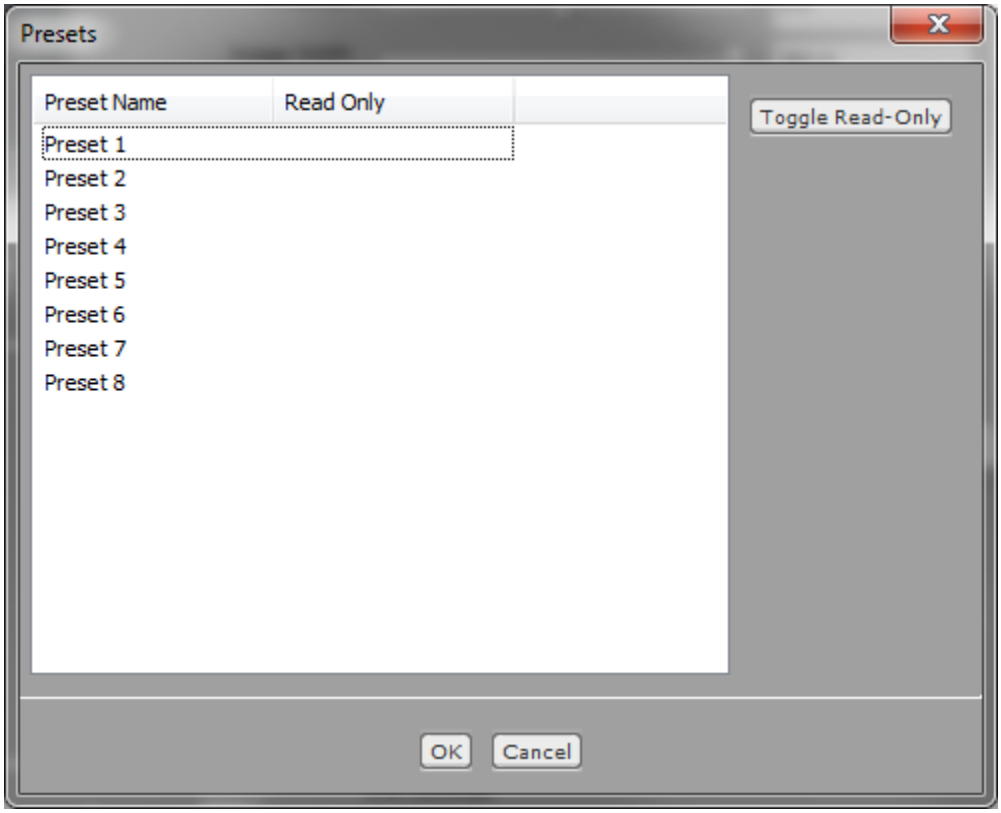
Note that it is OK to have control groups linked to ZAG or the Preset Manager and have zero or one preset in them, if you don't want per track automation for that group of controls on your current

album. That way you could link all the control groups once and reuse the layout regardless of which controls you wanted to automate. Just remember; zero or one (default) preset for no automation, “number of tracks” presets for per track automation.

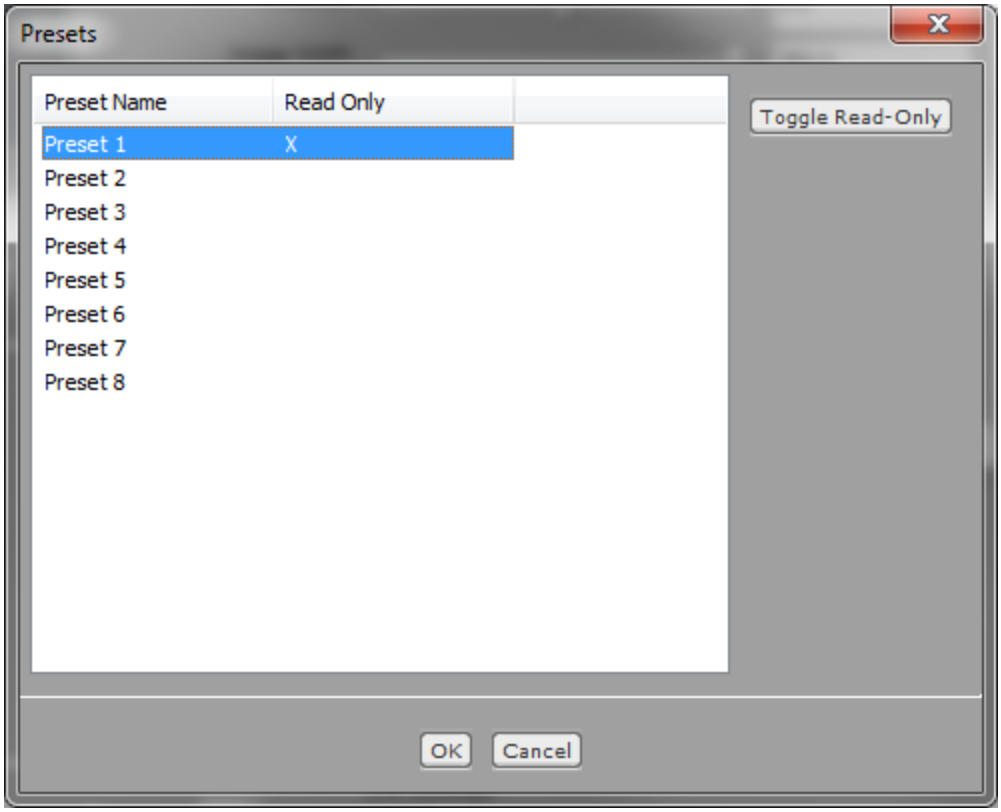
***Marking Presets Read Only**

Optionally you can use the below procedure to “lock” each preset as you are finished with the associated track (Plogue .9705 and higher).

To mark a Preset Read-Only, press the preset button and select “organize”.



Click on the preset for your track to select it, and then click on Toggle Read-Only”. That “locks” your settings. E.G. for track 1 into Preset 1.



Hit OK and repeat the process with the test of the tracks on your Album.

To reuse the layout for subsequent albums you can remove the presets or un-mark them “Read-Only” and save new settings in them, using the presets dialog.

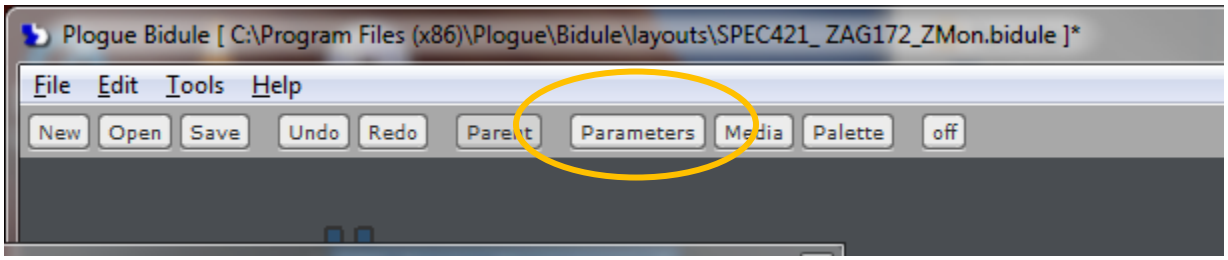
Linking ZAG to your Presets

Notes:

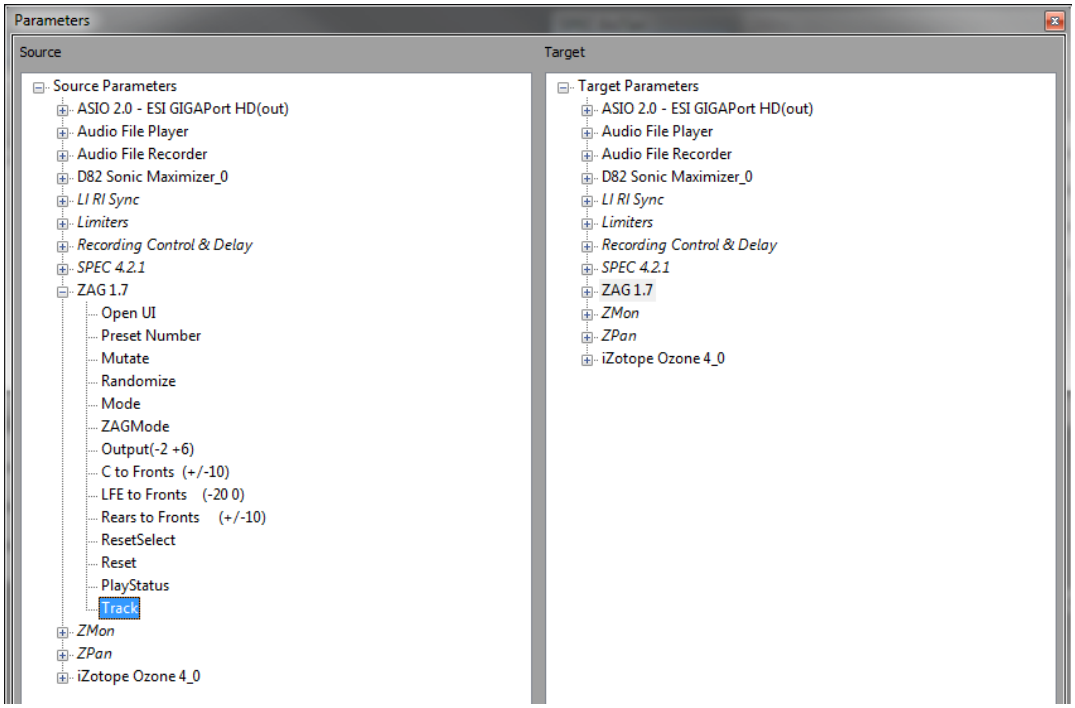
1. You can skip this section if you are using the PTA layout, as it already has the necessary links.
2. This section assumes you are not using the preset manager, thus the described links are directly from ZAG ”track” to each group’s “Preset Number” parameter

For each of the groups that you made presets for (ArcTan, Blend Controls, etc.) you will need to link Zag’s “Track” parameter to the group’s “Preset Number” parameter.

Click on the “Parameters” button at the top of Plogue.

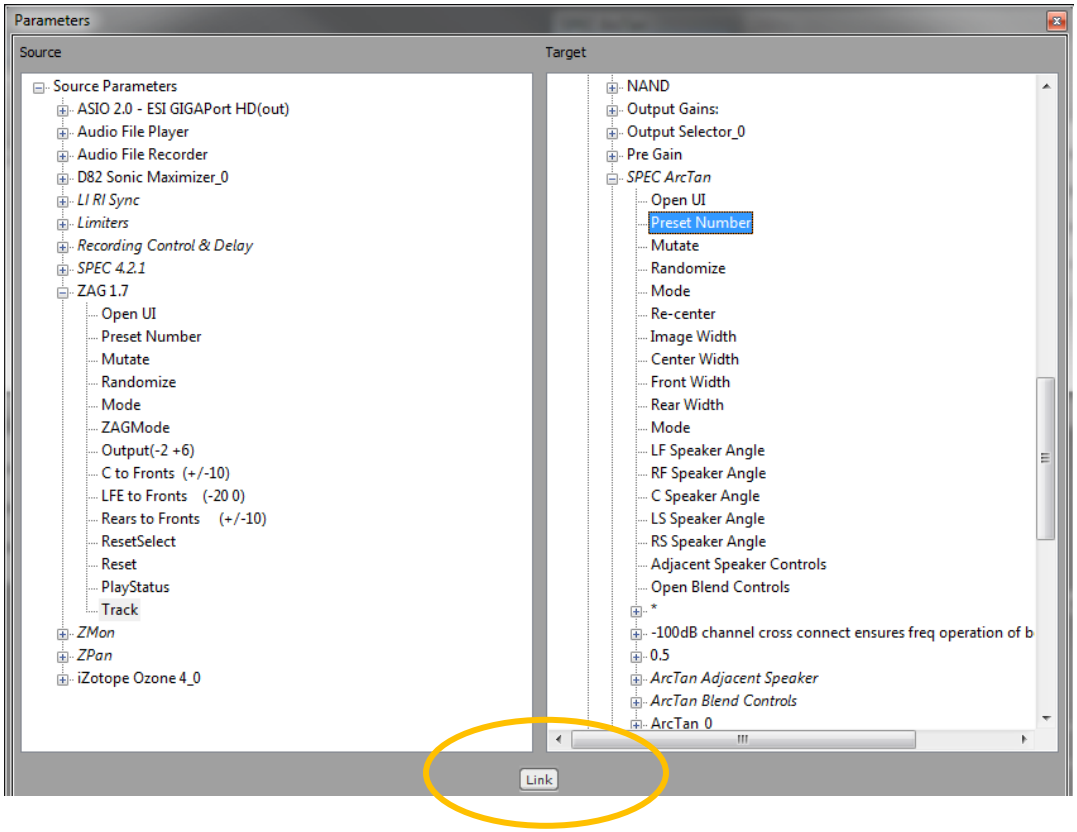


On the “Source” Side of the Parameters dialog, expand “Zag” and select the “Track” Parameter:



On the Target side, expand SPEC and/or any other sections to find the group of controls you made presets for. In the case of ArcTan it would be:

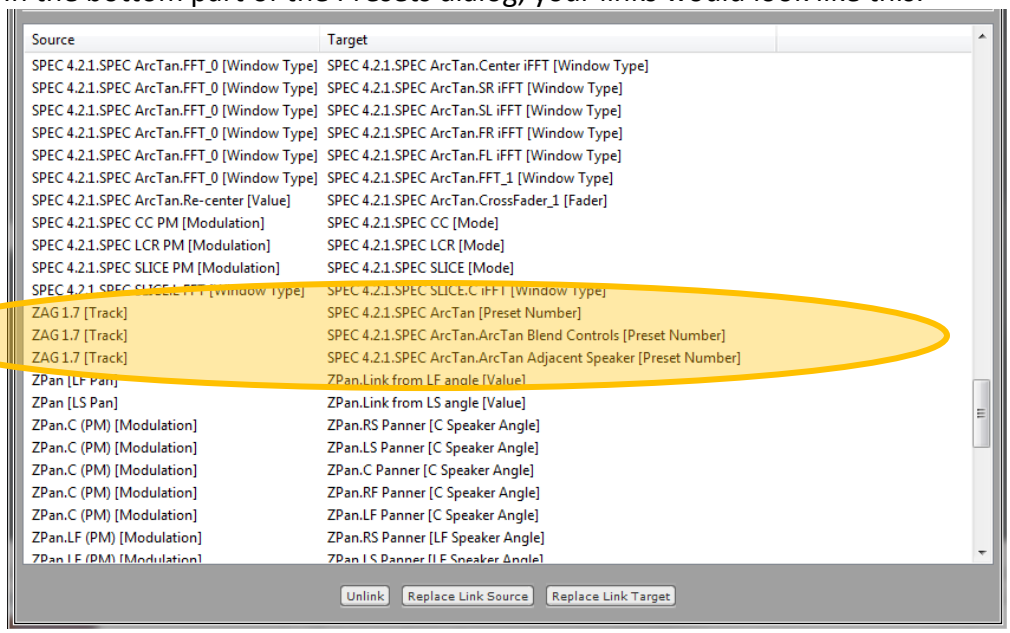
SPEC 4.3 → *SPEC ArcTan*



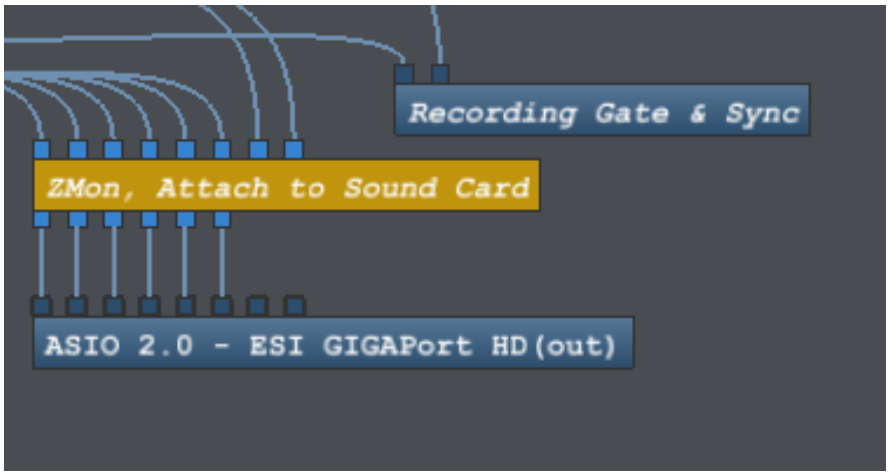
Click on “Preset Number” and click on “Link”.

Repeat the target selection and link steps for any other groups of controls you made presets for.

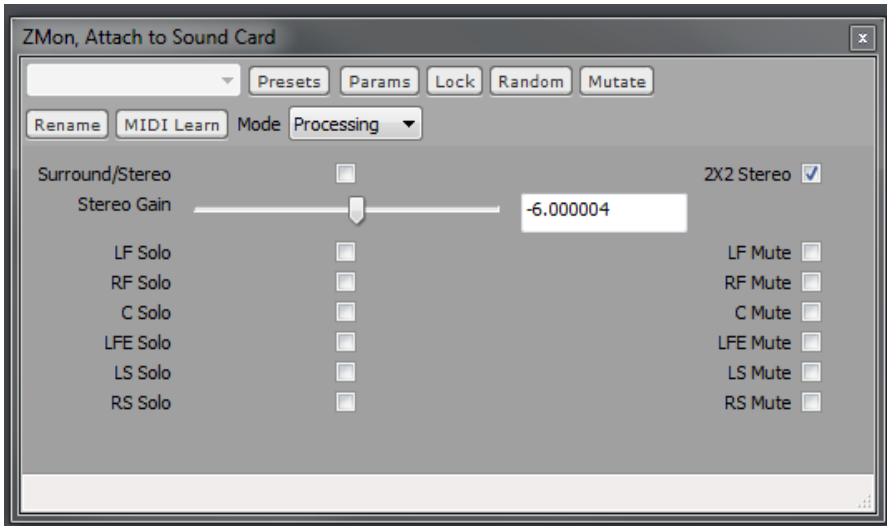
In the bottom part of the Presets dialog, your links would look like this:



ZMon



ZMon is included as an aid to live monitoring of your conversion. It also serves as the connection point in the layout for your sound card (Audio Device):



The Solo and Mute controls work just as the Solo and Mute controls on an audio mixer do. Any channels that are checked “Solo” will play and all others will be muted. For example if you check “C Solo” only the center channel will be heard. If you check “LF Solo” and “RF Solo” only those channels will be heard.

Any Channels that are checked “Mute” will not play. For example checking “C Mute” will play all channels except Center.

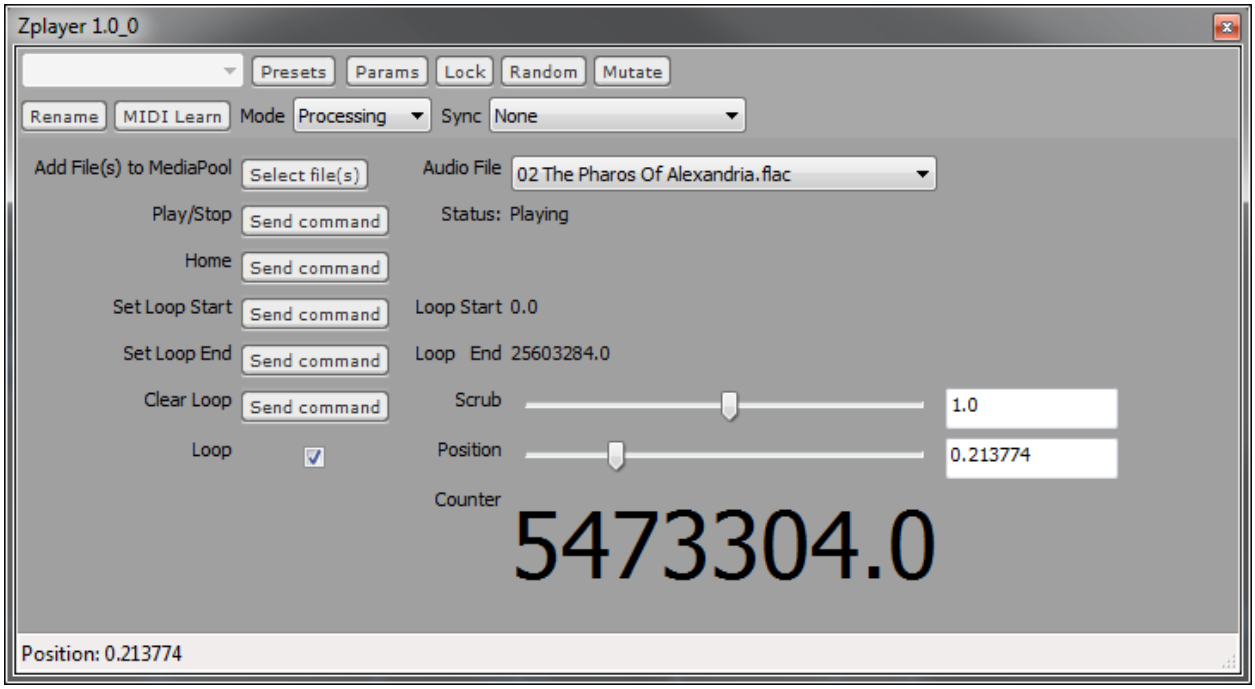
ZMon is also setup to enable quick comparison of your conversion (or certain channels of it) to the original Stereo.

Checking the box labeled “Surround/Stereo” will play the original stereo. Un-checking it will play the surround channels. The “Stereo Gain” slider is included so you can match the volume level of surround to that of the stereo, to make for more accurate “A/B” comparisons.

The 2X2 box sends the original stereo left signal to both front and rear left speakers, and the original right signal to both front and rear right speakers. Un=checking the box sends the original stereo to only the front left and right speakers.

2X2 is similar to playing stereo in a car with front and rear speakers. A few HT (Home Theatre) units also have this setting. Using 2X2 in ZMon also helps with more accurate “A/B” stereo to surround conversions.

ZPlayer 1.0



What is it?

A file player for use during preset adjusting. Included in the “PTA” layout.

Why?

So you can easily jump between tracks, move around within a track, loop on a small section of track (or the whole track), and even listen to details at half speed etc.

All of this is for adjusting settings for per track automation.

Does it take the place of the audio file player?

No, at least not yet. There is still the bug in Plogue's "Basic Audio Player" (at the core of this) that degrades audio quality towards the end of an album sized track.

It needs individual audio files for each track.

Also, this thing requires that all your tracks be in the media pool (RAM) so you probably should have a lot of RAM and a 64 bit OS. But try it on 32bit XP and let us know.

Connecting to Layout (done for you in the PTA layout)

You need to wire this in to the top of SPEC AND the Normalization group (or whatever groups the Audio File Player is wired into in your layout) so ZMon will work correctly to compare surround and stereo.

Instructions/Features

In a windows explorer window, select your individual track files and drag them into plogue's patch bay (the gray background part of plogue). That will load them into the media pool.

Note: You can use "media" button, at the top of plogue, to manage the files in the media pool. The player also has a button to add files to the media pool.

Use the "Audio File" drop down in the player to pick the track you want to play.

Note: If you have a scroll wheel on your mouse (or a scroll ring on a trackball) you can scroll through the tracks one you "focus" on the drop down.

Controls:

Play/Stop: toggles play

Home: Jumps to Loop Start (or Track start if loop is cleared)

Set Loop Start: As you are listening to the track, clicking this will set a start point for the loop function, at the current position in the track. By default the start position of the loop function is the beginning of the track.

Set Loop End: As you are listening to the track, clicking this will set a end point for the loop function, at the current position in the track, and start the loop over at the beginning. By default the Loop end is the end of the track.

Clear Loop: Clears your loop settings back to the Start and end of the track.

Loop: Check box to turn looping on and off. If Loop is unchecked, play will stop at the end of the track or the end of the current loop setting.

Scrub: a -32x to 32x speed control/jog wheel. As soon as you “let go” with the mouse it will spring back to a 1X play speed (Processing must be “On”). Positions close to “1” are fractional speeds (slower than 1X). This lets you move around (forward and backwards) in the track with precision. Works well with scroll wheels (if you have one), while using the wheel you can right click to jump to 1x.

Indicators:

Loop Start: The start of the loop in samples (zero for the beginning of the track)

Loop End: The end of the loop in samples (or track length in samples if loop is cleared)

Position: A relative indicator of where you are in the track. The number is from 0 to 1, 1 being the end of the track. Moving this around with the mouse does nothing, but remember the speed control lets you move around (like a jog wheel)

Counter: Play position in samples.

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Speaker Angle Chart: