EigenD System Release Notes

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1 – Introduction

Release 1.1.24 is the latest Stable release of EigenD. It contains a large number of bug fixes from the last stable release (1.0.14) as well as many significant changes to existing behaviour, all of which is detailed below. It is the end of the line of the 1.1 development releases.

This release will upgrade previous setups from earlier stable and testing releases.

2 – Bugs fixed in this release

A large number of bugs have been fixed since the 1.0.14 release. Therefore we have just included the issues still known with this release – in all other cases we believe the bug to be fixed.

- 1.1.24:

  Fix a problem where the setup of the Browser can get lost.
  Fix problems with polyphonic aftertouch in AU's.

3 – Bugs and known issues in this release

- Switching from Factory Tau to Factory Pico setup occasionally freezes
- EigenD gain structure needs revisiting
- Pico controllers not bound to active instrument when using AU
- Unable to select which channels to use for multichannel audio interface in Browser
- Audio output not saved in user setups
- Playing a recording after the first take sometimes glitches
- Pitch bend oddity when set to 72 semitones

4 – Changes and Improvements

Changes since 1.0 release series

The 1.1 release series introduces some new features and improvements to the 1.0 stable series:

- **New EigenD User Interface**

    There have been a number of improvements to the EigenD user interface since the 1.0 release series.

    The EigenD drop down menu found in the 1.0 release series has been replaced by a graphical window for loading your EigenD setups:
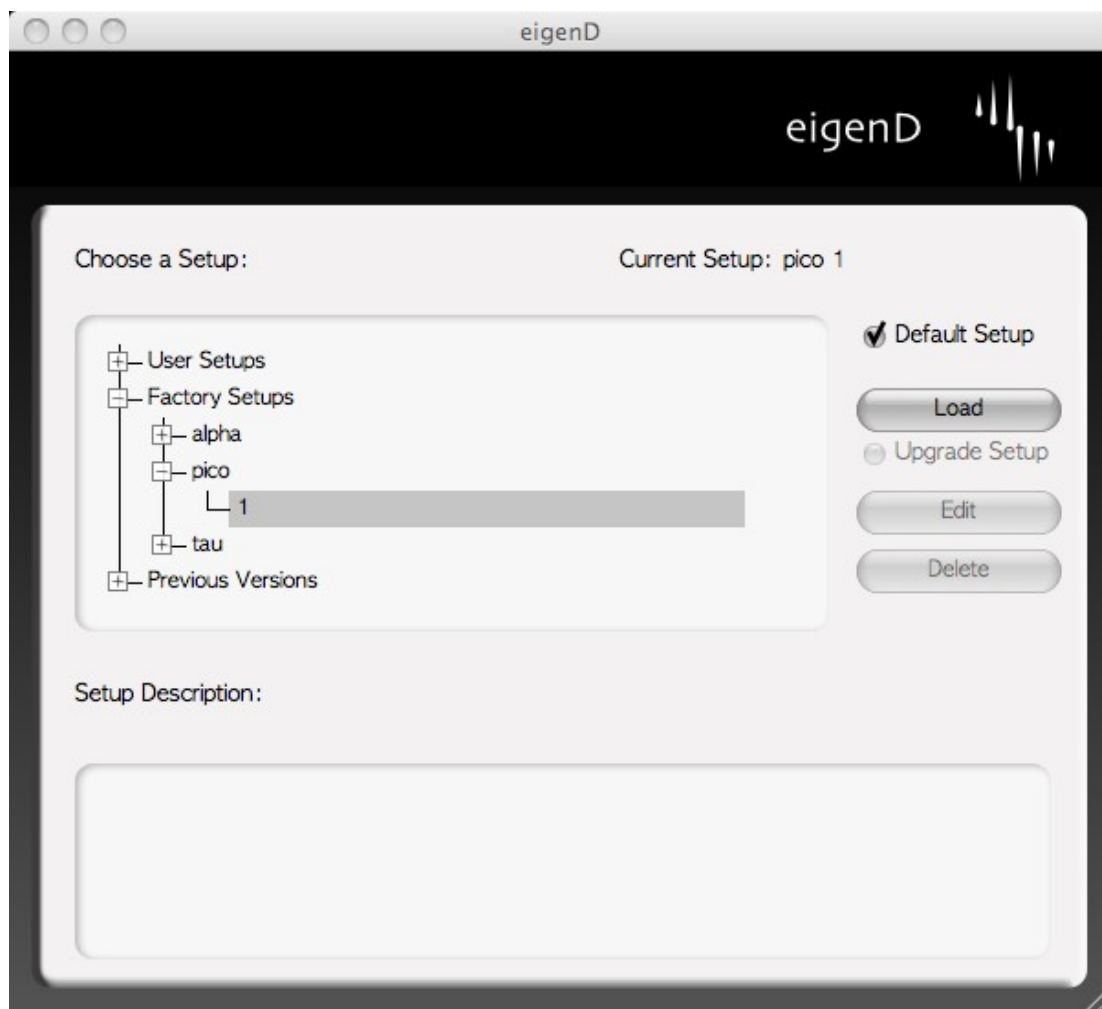
    To load an EigenD setup, select the desired setup from the setup tree and click 'Load'. A separate progress window will appear temporarily while the setup loads. Once it reaches 100% it will disappear and EigenD is ready.

    If you would like that setup to load automatically the next time you start EigenD, click the 'Default Setup' option on the right hand side of the Load window (above).

To open the EigenBrowser and EigenCommander applications, you now need to select 'Run EigenBrowser/EigenCommander' from the EigenD 'Tools' menu.

Each of the currently running Audio Unit/VST windows can be accessed through the 'Window' menu, as well as the 'System Usage Meter' and the 'Load Window'. Loading and Saving Setups, Reporting a Bug and finding out 'About eigenD' are all located under the 'File' menu.
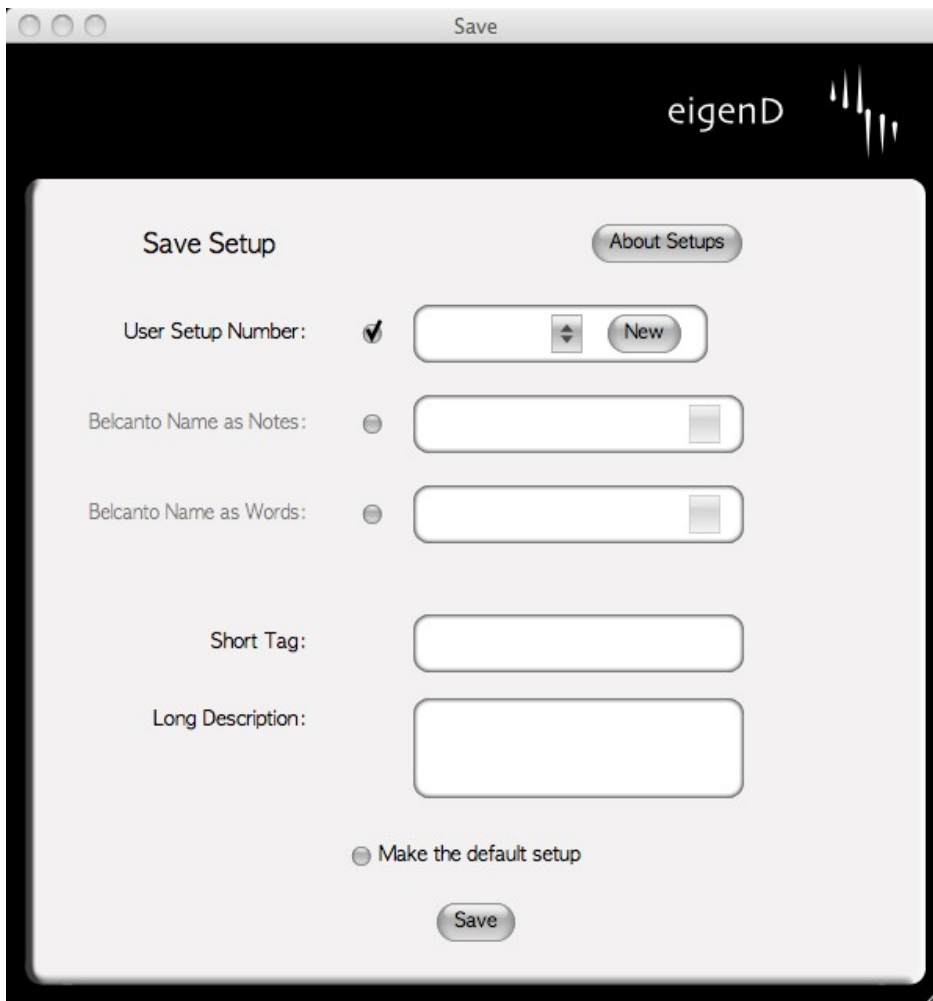
To upgrade your User Setups from previous versions of EigenD to include new fixes and improvements, there are two methods. You can either select then from the 'User Setup' subheading (you will see in the Setup Description which versions they have been upgraded from) and click Load, or select a setup from the 'Previous Versions' subheading (these setups are not upgraded automatically) and click the 'Upgrade Setup' option shown in the above diagram.

You can also now Edit the name and Delete your User Setups using the 'Edit' and 'Delete' buttons (shown above).

Saving Setups
In the revamp of the EigenD user interface, you can now configure the name for your EigenD user setups.

To display the Save dialogue, select 'Save' from the File menu or press 'cmd-S':

To save a User setup, you have a number of options. In order to allow the loading and saving of User Setups using the Belcanto language, only names which have associated Belcanto words can be used for EigenD setups. Therefore you can add tags and descriptions to help describe each of your user setups. The 'short tag' is contained within the filename and will be displayed in parentheses in the Load window next to the setup name.

The longer description will appear in the 'Setup Description' box shown in the Load window diagram above.

To save a new user setup in the form 'User X', click on the 'New' button in the 'User Setup number' field in the diagram above. This will generate a new User Setup number.

If you would like to save a new user setup with a unique Belcanto name (using words or 'notes'), type your desired name into the 'Belcanto Name as Words/Notes' field above. Please be aware that this will only accept valid Belcanto words.

If you would like to save over an old user setup of the form 'user X', select your desired setup name from the drop down menu in the 'User Setup Number' field above. If you would like to save over and old user setup with a Belcanto name, select the desired setup name from the drop down menu in the 'Belcanto Name as Words/Notes' field. Once ready, click 'Save' – a dialogue box confirming the success of the saving process will appear once complete. If you need more information, click on the 'About Setups' button in the 'Save Setup' dialogue above.

- **New AU/VST host**

  Since the 1.0 series we have significantly changed the Audio Unit host which will now also host VSTs, and support Cocoa Audio Units.

  Changes to existing AU/VST scanning behaviour

  We have made some significant changes to the Audio Unit/VST validation process:

  - The scan now takes place out of process so it cannot crash EigenD itself.
  - The scanning is done during installation, and also at startup time if no ~/Library/Eigenlabs/Plugins/plugins_cache exists.
 - The plug-in scanner can now also be started manually from the 'Tools' menu.

  The scan dialog allows you to perform a full scan, which rescans everything, or a quick scan, which will skip any plug-ins that are in the current 'plugins_cache' or 'bad_plugins' lists. When doing a quick scan you can choose to rescan 'bad plug-ins' by selecting them in the table.

  Each plug-in to be scanned is opened in a separate process. If it does not open within 10 seconds, or if it crashes, it will be marked as a 'bad plugin'. (Note that if a plug-in chooses to put up a modal dialogue during initialisation, the dialogue will have to be dismissed before the 10 second timeout, otherwise the plugin will be marked as bad).

When the scan is complete, a dialogue appears showing the list of 'bad plugins'.

The Audio Unit parameter routing window has also been changed. To display the Audio Unit parameter window, click on the 'Configure' button on the top left hand corner of your AU Window.

This will now display the new window:
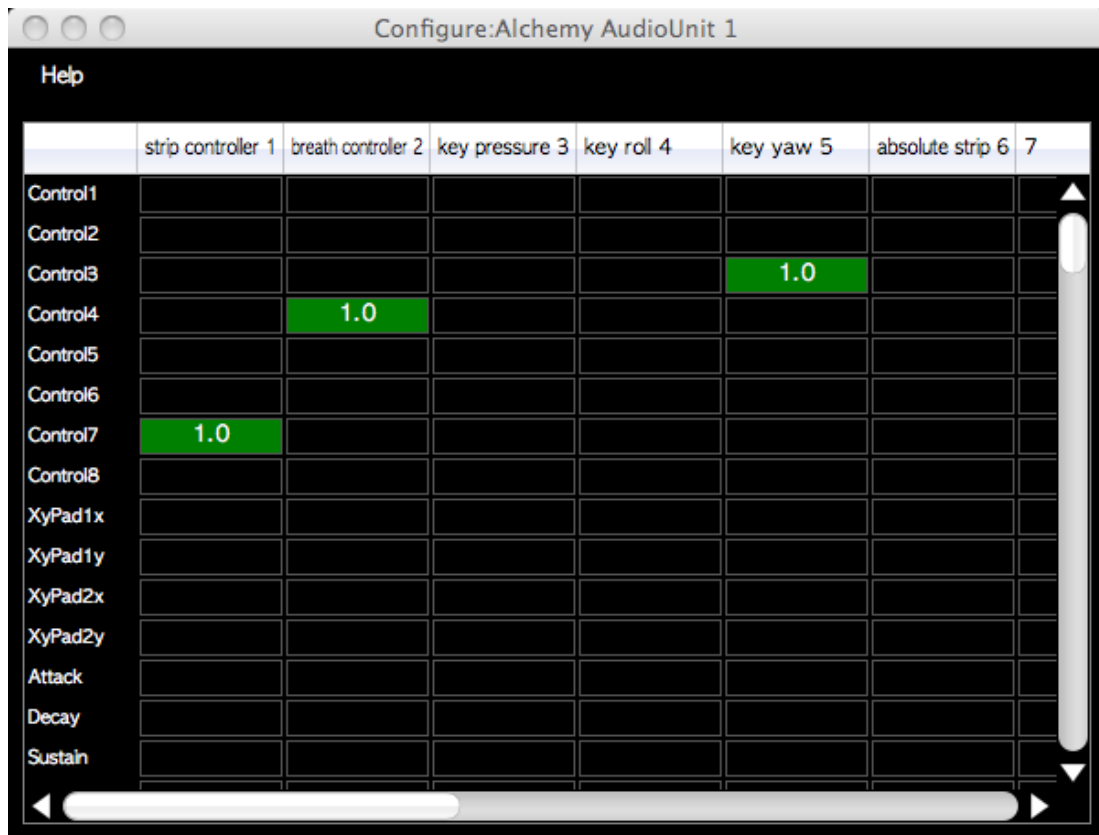
The principal of control over the parameters is the same: you have a table with the EigenD Audio Unit parameter numbers in the row at the top, and the plug-in's input parameters in a column on the left hand side.

Instead of a 'tick box' mechanism to toggle control on and off as in the previous version, you now have a higher degree of control over the way that EigenD uses the plug-in's parameter information. You will see in the diagram above contains three numbers '1.0' for parameters 1, 2 and 5. This number tells EigenD to route the EigenD controller to the desired plug-in parameter, and to scale it by the specified number – in this case 1. This gives you more options for your expression information – e.g. if you set the number within the box to a negative number, you will invert your control signal.

You can turn on parameter routing by clicking within the desired cell – the value can then be adjusted. Drag your mouse cursor up to make a fine positive adjustment, down for a fine negative adjustment, left for a coarse negative adjustment and right for a coarse positive adjustment. A single click within a cell turns off routing for that particular parameter. Other than that described above, you should see no other differences from the old Audio Unit host.

- **Improved cello model.** The following changes have been made to the cello model in order to improve its sound and playability:

   1. Monophonic note transitions: When playing in mono mode, the previous cello model would transition between a note being held and a new note by sliding between the two pitches. This modelled sliding the finger on the string for every note transition. To improve playability, this has been replaced with a model of stopping the string with a finger at the new note position giving a smooth but rapid note transition.
   2. Strip control bowing speed: the finger movement speed needed to attain a note from bowing has been reduced so that a longer stroke can be achieved for legato style bowing.
   3. Improved sound and playability from the addition of multiple string models: models of individual strings are now included so that note pitches are matched to models of the strings that normally produce those notes on a cello. This improves the harmonics of the notes and hence the bowing sound produced. It also allows Helmholtz oscillations to be achieved more readily so that a smooth note tone is easier to achieve over a wider range. This improves playability by reducing non-Helmholtz artefacts such as 'double slipping', which could lead to an unpleasant second harmonic dominating the sound in the previous model.
   4. String decay when the string is released by the bow: when holding the keys and releasing the strip controller after a stroke, the release of the bow from the string is now simulated giving a more natural sounding string decay. The string is damped when a key is released. This can also be achieved when stopping blowing when bowing with the breath controller. Note: the effect is less prominent with the breath controller as it has a physically softer release response.
   5. Body response sound: the balance of the string and body response sound has been improved. The long cello body impulse response has also been filtered of recording noise which previously gave an unnatural ringing in the response tail.
   6. Noisy artefacts in the attack of the notes have been reduced, particularly in the lower octaves.

- **Scripting support.**

   There is now a script browser, which allows the user to select and execute both factory and user defined script files, which may have an arbitrary effect on the system.

   In the pico setups, there is a new key 12 in the instrument and FX control mode which places the browser in script mode.

   In Alpha Setups 1, 2 and 3, there is a new key 1 in the 'Pedal Calibration' Advanced control mode (please refer to page 13 of the Alpha Quick Reference Guide for more details.

   To run a script, select the script with the scroll keys or mouse. A description will be displayed. Select the script again to run it.

   Some scripts have been supplied which remap the keyboard in various ways, and which change the pitch bend range to various values.

- **Transposition up/down**

  You can now change the interval that the octave up/down keys on the Pico transpose by, using the new scripting mechanism.

  Bring up the script browser in the EigenBrowser by pressing key 16 in the Instrument/FX Control mode, and navigate to the 'Octave key transposition' folder.

  You will now see a list of scripts, labelled from 'minor 2nd' (one semitone) through to 'Two Octaves', executable via the above method, which will then allow you to adjust the interval by which the 'octave keys' transpose by.

  Please note: the tonic of your scale will not change when you use this functionality – you will have to reset your octave keys (using the 'reset' script) for this to return to normal.

- **MIDI input**

  We have introduced a MIDI input since the 1.0 release series. So far this has only had limited testing, and is still a work in progress. This introduces the following features:

  MIDI input configuration within factory setups

  If you have external hardware MIDI devices (such as a MIDI pedal board), you can now use this to control various aspects of the EigenD software.

  In Pico Factory Setup 1, within the Instrument/FX control mode, there a new control – below the MIDI output port browse key there is now a MIDI input port browse key, which will display a list of MIDI devices as per the MIDI output port browse view.

  In the Alpha Factory Setups, within the Advanced MIDI Out 1 control mode there is a new MIDI input browse key, which will display a list of MIDI devices as per the MIDI output port browse view. This is located on the key to the right of the MIDI output port browse key.

  Once you have selected the desired device from the Browser, you will need to configure your hardware MIDI device to produce MIDI note number information. The following table describes the list of actions that are triggered by corresponding MIDI note numbers:

Action	MIDI note no.
Load setup 'user 1'	12
Load setup 'user 2'	13
Load setup 'user 3'	14
Load setup 'user 4'	15
Load setup 'user 5'	16
Load setup 'user 6'	17
Load setup 'user 7'	18
Load setup 'user 8'	19

Action	MIDI Note no.
Load setup 'user 9'	20
Load setup 'user 10'	21
Metronome start/stop	59
Set tonic to C	60
Set tonic to C#	61
Set tonic to D	62
Set tonic to D#	63
Set tonic to E	64
Set tonic to F	65
Set tonic to F#	66
Set tonic to G	67
Set tonic to G#	68
Set tonic to A	69
Set tonic to A#	70
Set tonic to B	71
Set scale to major	72
Set scale to harmonic minor	73
Set scale to melodic minor	74
Set scale to chromatic	75
Set scale to blues	76
Set scale to pentatonic major	77
Set scale to diminished	78
Set scale to whole tone	79

In both the Pico and all the Alpha Factory Setups, the actions referred to by the above table apply to ALL the keygroups (i.e. normal behaviour for Factory Pico 1 and Factory Alpha 1, and acts in the same way as the *Global Scale and Tonic controls* in Factory Alpha 2 & 3 - please refer to page 11 of your Alpha Quick Reference Guide for more information.)

You can change the scale that is set by the MIDI note number in the same way that you change the scale for the Scale Controls in the Pico and Alpha Factory Setups (please consult the relevant pages of your Quick Reference Guide for more information).

- **MIDI clock sync**

  The EigenD metronome can be synced to an input MIDI clock allowing other MIDI applications and devices to control the playback and tempo of EigenD.

  To sync the metronome to a MIDI clock, the MIDI input port must first be set to the port that the MIDI clock source is using. See 'MIDI input configuration within factory setups' above. Note: if using the IAC Driver on both the input and output MIDI ports to connect EigenD to other applications, then currently the input and output ports must use different IAC buses.

  To activate MIDI clock sync, first ensure the metronome is stopped. In Pico Factory 1 setup, the key to activate MIDI sync is now included below the MIDI input port browse key in the MIDI control kgroup of the Instrument/FX control mode. In Alpha Factory setups, the activation key is located in Advanced MIDI Out 1 control mode on the key below the MIDI input port browse key.

  After activating MIDI clock sync, the metronome must be started in the normal way to arm the metronome to respond to clock sync. As soon as the metronome receives a clock sync signal then EigenD will begin playback. When the clock source stops playback, then EigenD will also stop. The MIDI clock sync state can be viewed by browsing the metronome.

  Stopping the metronome will cause EigenD to stop independently of the clock source. If the metronome is stopped then restarted whilst a clock source is running, then the MIDI clock sync is rearmed and will start when the clock source next issues a start signal. Deactivating MIDI clock sync whilst the metronome is running will cause the metronome to continue free running at the last tempo determined by the clock source. If the MIDI clock sync is then reactivated, it will be rearmed and will start when the clock source next issues a start signal.

  The MIDI clock sync can compensate for the delay that arises in sending the MIDI clock signals through system. This can be used to ensure that the metronome is tightly in sync with the clock source in terms of the average system delay. Note that small amounts of system delay variation may exist in the MIDI clock signal around the average delay.

  The current delay compensation setting in milliseconds is shown as the 'MIDI clock latency' when browsing the metronome. This can be adjusted in the Pico Factory 1 setup using the key below the MIDI clock sync activation key. In the Alpha Factory setups, it can be adjusted with the key located in Advanced MIDI Out 1 control mode below the MIDI clock sync activation key.

- **MIDI virtual source and destination**

  MIDI inputs and outputs now create virtual MIDI endpoints visible to other MIDI software running at the same time as EigenD. These virtual endpoints are created in addition to the ports than can be routed to the sources and destinations listed when

browsing the EigenD MIDI ports. A destination will be created for each MIDI input/output port, named 'Eigenlabs 1, Eigenlabs 2' etc.

The Factory Pico Setup has one MIDI input and one MIDI output, and the Factory Alpha Setups have one MIDI input and two MIDI outputs. These can be used to route MIDI into and out of EigenD directly by selecting these from the list of available endpoints in other MIDI software running at the same time as EigenD. Note: the EigenD endpoints do not appear when browsing the MIDI ports using EigenD as it is invalid to connect EigenD directly to itself.

- **Belcanto Interpreter input keygroup**

  In EigenD 1.1. series, scripts have been included which connect the Eigenharp keyboard to the Belcanto Interpreter in all the Factory Setups. There are two factory scripts – one for Pico Setup 1 and one for the Alpha Setups. Once the script has run (see above instructions for more details), the Interpreter will be found where the Scheduler Control mode was previously connected in Factory Pico Setup 1, and in the Alpha setups there is a new mode situated in the top left hand corner of the keyboard (underneath the breath pipe) when you press the main mode key.

  When you input Belcanto, your Belcanto 'notes' will appear in a new section of the Commander called the 'staff view' (a five line musical staff). Where you would normally play the first eight notes of the scale on both the Pico and the Alpha, you will find the first eight Belcanto notes appear in the staff view underneath (numbered 1 to 8). You will also notice that under each Belcanto word in the Commander's dictionary view, there is a corresponding sequence of notes. To type a Belcanto word, you need to press the keys that correspond to the note sequence shown in the dictionary, but play a 'louder note' (i.e. tap the key harder) to terminate the word (this lets the Belcanto interpreter know that you have finished a word).

  Further documentation about EigenD Agents and Belcanto can be found at our documentation wiki (http://www.eigenlabs.com/wiki/)

Changes and improvements in the 1.1 series:

Keyboard axis window parameters

The EigenD Keyboard Agents have two new nouns:

131 8832 8833
  roll   axis   window

and

131 8832 8833
 yaw   axis   window

The new 'axis window' is used to control how much of the movement of the Eigenharp keys is used for the roll and yaw signals. The axis window parameter is set as a value between 0 and 1 using the following Belcanto commands:

 117 11 5 63 8833 23 11 67
keyboard 1   hey all   window   to   1   set

 117 11 5 63 8833 23 22 33 18 67
keyboard 1   hey roll   window   to   0   .   8   set

 117 11 5 63 8833 23 22 67
keyboard 1   hey roll   window   to   0   set

For example, if you set the axis to 0.5, then only half of the keys total movement is used, and the outer half is ignored. This has the effect of getting all the roll/yaw range without having to move the key as far.

MIDI rate throttling

Due to the high data rate produced by the Eigenharp, we have added the ability to throttle the EigenD MIDI output data rate for use with external hardware MIDI devices via Belcanto scripts.

There are scripts provided to throttle and 'un throttle' MIDI output 1 and 2 – the script for MIDI output 1 can be used with all the Factory Setups (Alpha, Pico and Tau) and the script for MIDI output 2 is for use with the Alpha and Tau Setups only.

The script which throttles the MIDI output applies a one message per ten millisecond rate limit to the specified MIDI output instrument – this should throttle the output sufficiently for use with a standard MIDI cable.

The scripts will be available under 'Factory Scripts   MIDI Output'.

The MIDI rate throttling has also been removed from the Audio Unit/VST instrument host.