Cantabile 2.0

User Guide

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1 Introducing Cantabile

Welcome to Cantabile!

Cantabile is a simple to use host for virtual music instruments and audio effects with an emphasis on real-time performance and use in live performance situations.

Editions

Cantabile comes in two editions:

Cantabile Solo	Intended for home hobbyists and casual users who need a more flexibility, including unlimited plugins and racks, preset morph and randomize tools, MIDI filters, MIDI controller assignments and set lists.
Cantabile Performer	Designed specifically with live performance in mind, Performer adds features like sub-sessions, MIDI Clock, MIDI routing tables and triggers.

This manual covers all three editions. Features not applicable to particular editions are appropriately marked.

x64 Editions

Cantabile is available as x86 and x64 versions.

x86	This is the standard 32-bit version of Cantabile
x64	The 64-bit version requires a 64-bit operating system (eg: Vista x64) and compatible x64 plugins.

By default Cantabile x64 will not load standard x86 (32-bit) plugins, though this can be done with jBridge – see http://www.cantabilesoftware.com/jbridge .

The term x64 should not be confused with 64-bit audio which is a different sound format and supported by both x86 and x64 versions of Cantabile.

If you're not sure about any of the above, use the x86 version.

Trial Versions

Trial versions of Cantabile are fully functional for 30 days after which a license must be purchased.

Registration

If you have purchased a license for Cantabile, you would also have received an email containing your registration details and instructions on how to download the software.

The first time you run the software you will be asked to enter these registration details. Wherever possible use copy/paste to enter these details.

Installation

To install Cantabile, simply run the downloaded setup program. You will be prompted for some basic details and the software will be automatically installed.

Cantabile also supports "xcopy deployment" where you can simply copy the executable file to another machine or location and it will run successfully. Cantabile is not dependant on any other DLL files or other files - other than those included in the operating system itself. If deploying Cantabile in this way, file associations can be created and removed using the appropriate buttons in General Options.

Compatibility with Cantabile 1.2

Cantabile 2.0 will upgrade and load session files, quick sessions and most settings from Cantabile 1.2.

Files created by Cantabile 2.0 are cannot be loaded by Cantabile 1.2. If Cantabile opens a session file from 1.2 you will be prompted before it is overwritten by the new Cantabile 2.0 session file.

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- Cantabile (the software product) and this User Guide are Copyright © 2006-2009 Topten Software. All Rights Reserved
- VST Plugin Interface Technology by Steinberg Media Technologies GbmH
- ASIO Interface Technology by Steinberg Soft- und Hardware GbmH

2 Getting Started

Introduction to Computer Based Music

If you're new to the world of computer based music this sections explains a few of the basic concepts you'll need to understand to get the most of Cantabile.

If you're already familiar with computer music you can skip this section.

MIDI vs Audio

In computer music, there are two main ways of representing musical information:

Audio	Audio data is a digital representation of the actual sound waves that make up sound. WAV and MP3 files are typical ways to store audio data. Computer software can be used to process audio data to apply effects such as reverb, echo etc...
MIDI	MIDI is standard way of recording the notes that make a piece of music. MIDI doesn't necessarily define the sound of each note so a MIDI file can be played back with a different instrument to which it was recorded. MIDI is not limited to notes – it can also be used to represent other controls such as damper pedals, modulation wheel data and more.

Think of audio as similar to storing music as a CD whereas MIDI is more like sheet music.

Synthesis, Virtual Instruments and Audio Effects

Sound synthesis is the process of taking musical notes (typically represented as MIDI data) and converting it into an digital sound. ie: the process of converting MIDI to audio.

A virtual instrument is a piece of computer software that performs this process. For example, a virtual piano accepts MIDI notes as input and generates the sound of a piano playing those notes.

An audio effect is a piece of software that applies effects to an incoming audio signal. This could be anything from simply making it louder of softer, to widening the stereo width or applying sophisticated reverb effects (eg: recreating the sound of a large cathedral).

Virtual Instrument	MIDI In → Audio Out
Audio Effect	Audio In → Audio Out

In general it is not possible to accurately convert from audio to MIDI (though there are some programs that can do this reasonably well).

Plug-ins and Hosts

Computer music software typically falls into one of two main categories – plugins and hosts.

A host is the main program that a user uses to create their music and provides the framework for routing audio and MIDI between external devices and loadable modules called plugins.

A plugin is a software module that is loaded by a host to perform a specific function. Plugins fall into two main categories – instruments and effects (as described above). Other plugin types include MIDI effects (which generate MIDI), surround sound processors and analysers.

Cantabile is a host application that is designed for real-time performance. This means it's designed for connecting a MIDI keyboard, microphones and other devices and processing them in real-time.

Cantabile does not include any plugins and as such you'll need to acquire these separately. Free and commercial plugins are available from many different software developers. There are a number of different plugin formats available, though Cantabile only supports the most popular – VST. VST (short for Virtual Studio Technology) is a standard defined by Steinberg.

A good source of information on available plugins is KVR Audio – http://www.kvraudio.com .

Audio Drivers

An audio driver is a piece of software that knows how to communicate with a sound card. Cantabile uses audio drivers to allow it to work with many different types of sound cards. In order to use Cantabile you will need a compatible audio driver.

One of the most important features of a good audio driver and sound card is the ability to deliver low-latency audio. Latency is a term used to describe the time delay between the computer generating a sound and the sound being heard. It also describes the delay between receiving a sound and that sound being delivered to the computer software. Latency is measured in milliseconds and ideally you will want a latency of no more than about 10ms.

Cantabile supports two different audio driver standards:

ASIO	ASIO, short for Audio Stream Input/Output is a standard specified by Steinberg. ASIO generally offers very low latency and is the preferred type of audio driver.
DirectSound	DirectSound is a Microsoft technology designed primarily for use in games. Although DirectSound can work well with Cantabile it should generally be considered less stable than ASIO.

If your sound card came with an ASIO driver you should use that driver – particularly if it is a professional quality sound card. If your sound card did not come with an ASIO driver a good option is the excellent generic ASIO driver ASIO4ALL available from http://www.asio4all.com.

In addition to these standard audio driver types, Cantabile also includes a null audio driver. The null audio driver doesn't produce any sounds but allows the audio engine to run as if a sound card was attached. This is mostly useful for using Cantabile as a MIDI only processor.

Bringing it All Together

So to bring all this together, Cantabile is a host application for VST plugins. It accepts incoming MIDI and audio data and can route it to one or more VST plugins. The audio and MIDI generated by these plugins can then be routed to speakers and other external MIDI devices.

Typical uses of Cantabile include:

- Playing virtual instruments by connecting a MIDI keyboard to your computer, routing the incoming MIDI to a virtual instrument and sending the generated sounds to a set of speakers.
- Real-time audio processing by connecting a microphone to your computer, routing the incoming audio to an audio effect and then sending the output of that to a set of speakers.

In addition to this basic routing capability, Cantabile can also:

- Record audio and MIDI streams to files.
- Playback audio and MIDI streams from files.
- Process MIDI in special ways such as changing the velocity with which notes are played to better suit your playing style (MIDI filters)
- Control plugin settings remotely from a MIDI device (MIDI Controller Assignments).
- Process multiple plugins in series - route the output of one plugin to the input of another. Eg: a MIDI generating plugin connected to a virtual instrument, in turn connected to an audio effect etc...
- Process multiple plugins in parallel – process incoming audio on one rack and load a virtual instrument on another, or perhaps two separate instruments.
- Control timing and synchronisation
- Manage plugin presets
- Lots more...

Don't be too daunted if you didn't follow all of the above. Install Cantabile, download some plugins and just start playing – you'll soon get the idea.

Starting Cantabile

To start Cantabile, simply click the short cut that the installation program would have created in your Windows Start Menu.

You can also run Cantabile in an "alternate configuration". Alternate configurations maintains a completely separate set of settings. This can be useful for diagnosing problems, or if you need run Cantabile against two different sets of devices. The installation program would have created one additional configuration named "Alt Config" in your start menu. You can create as many custom configurations as you like (see Alternate Configurations).

Configuring Cantabile

Before Cantabile can run correctly, it needs to have various settings configured. To help with this the first time Cantabile is run, the Quick Configure dialog is displayed where you'll be asked to select an audio driver, one or more MIDI devices and the location of your VST plug-ins folder:
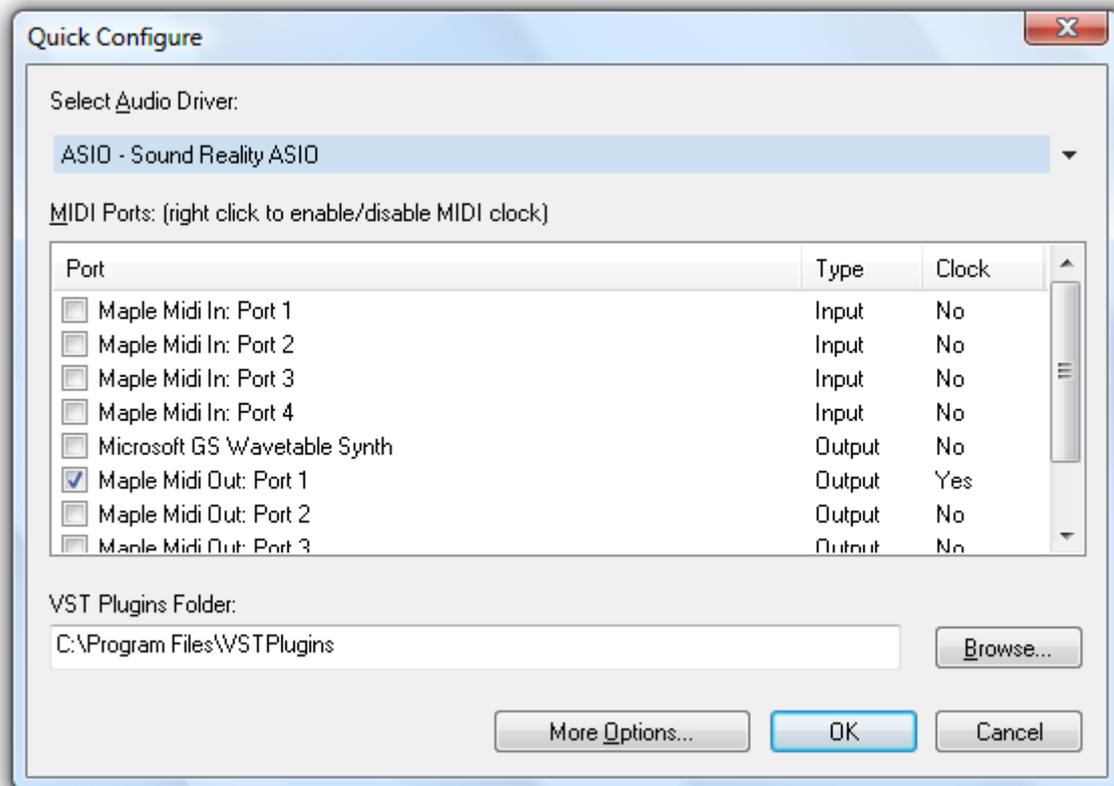
The Quick Configure dialog

Selecting an Audio Driver

When selecting an audio driver, choose the ASIO driver that matches the sound card of your computer. If your sound card doesn't have an ASIO driver you might consider using ASIO4ALL (a free ASIO driver that works with most computers available from http://www.asio4all.com).

DirectSound driver support is included for compatibility; however ASIO is the preferred driver model.

The Null Audio driver is a built in driver that emulates a sound card so Cantabile can run correctly, but doesn't produce any sound. It is useful primarily when working with MIDI only.

Selecting MIDI Devices

Place check marks next to any MIDI input/output devices you wish to use.

When choosing MIDI devices in other parts of Cantabile, only those selected will be shown. By selecting only the devices you will actually be using, you can avoid cluttering these menus with unneeded choices.

In Cantabile Performer, you will also have the option to select which MIDI devices will send and receive MIDI clock. You can enable MIDI clock for a device by right clicking on the device or by double clicking in the **Clock** column.

Specifying VST Plug-in Folders

To use VST plug-ins, Cantabile needs to know where you have these installed on your computer. Either manually type the location of this folder, or use the **Browse** button to locate the folder.

If you don't have any plug-ins installed, you may leave this field blank for now. For a comprehensive list of free and commercial plug-ins please visit http://www.kvraudio.com.

More Options

Cantabile has many more options and settings. Click the **More Options** button to adjust these settings.

Getting Back to Quick Configure

All of the settings in the Quick Configure dialog are also available from Cantabile's Options window; however you can re-show the Quick Configure dialog by either:

- Holding **Ctrl+Alt+Shift** while Cantabile is starting.
- Running Cantabile with the /clean command line argument.

Ready

Once you've configured all the above settings press the **OK** button.

Cantabile will scan your plug-ins folder, start the audio driver and MIDI devices and prepare a new empty session for you to start working with.

You're now ready to start using Cantabile.

Playing Virtual Instruments

Cantabile allows real-time playing of virtual instruments from an external MIDI device.

Before continuing you must have at least one VST instrument plugin installed on your computer.

To play a virtual instrument:

- On Cantabile's main screen, make sure the panel **Racks and Plugins** is expanded and click **New Plugin** button.
- Select the **Instruments** category on the left and locate and click on the name of a plugin on the right.
- The plugin will be loaded and its settings displayed. You can close this window for now.
- You should be able to now play the instrument from either an external keyboard, or with the onscreen keyboard.
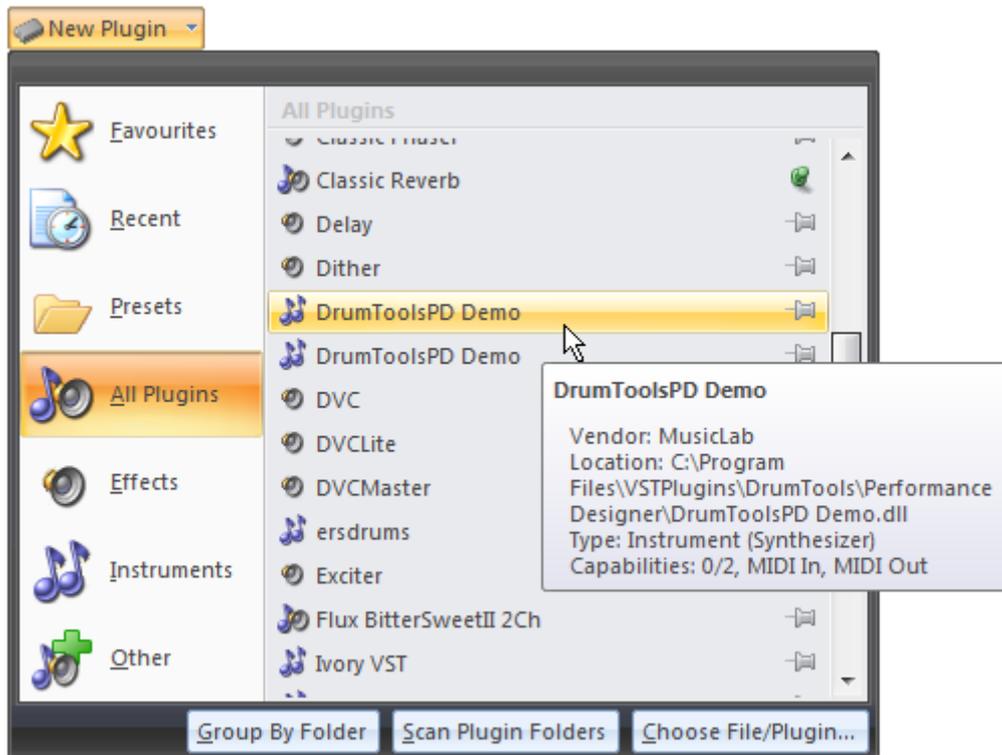
Selecting a plugin with Cantabile's plugin selector

If you hear no sound, check the following:

- When playing an external keyboard, check that the same keys on the on-screen keyboard light up. If not, there is a problem with your MIDI configuration.
- If the on-screen keys light up, check whether the output level meter on the main screen is indicating any audio output. If it is then there is a problem with your audio configuration.
- Next you should check the settings of the plugin itself. Click the **Edit** button in the plugin slot to display the plugins user interface. Check the plugin's settings. Some plugins require sample libraries or presets to be loaded before they produce any sound.
- Finally, check the output level setting on Cantabile's main screen and Window's volume settings.

Audio Effects

Similarly to playing virtual instruments, Cantabile can also process audio signals in real-time.

For example you can connect a microphone to your computer and use Cantabile process the incoming audio using a reverb or other effect plugin and send the output back to a set of speakers in real time.

The steps for this are essentially the same as for a virtual instrument except:

- Instead of loading an instrument plugin, load an audio effect plugin.
- Make sure audio input is enabled but selecting the **Input** check box in the master levels panel.

Enabling Audio Input

- Connect the rack's input to audio input by clicking the **Input Connect** button on the rack slot:
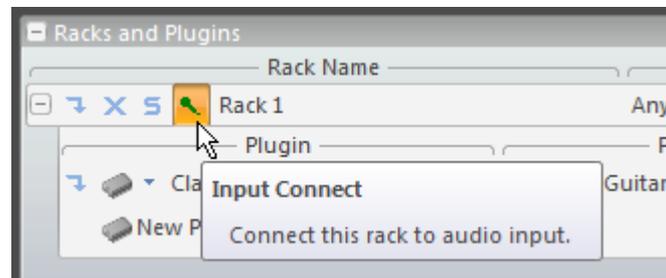
Connecting a rack to audio input

Be careful when using audio input not to create feedback loops where the incoming sound is processed, and sent to output where it's picked up again as audio input. Typically this will produce a loud screeching or whistling noise but can be reduced by lowering input or output levels, disabling input or simply moving microphones and pickups away from speakers. This can also happen with some sound cards that return output signals as input. Refer to your sound cards documentation for information how to disable this.

If audio processing doesn't appear to be working:

- Check the audio input level meter on Cantabile's main screen. This meter will light up when Cantabile is receiving audio input. If it doesn't check your audio connections and audio driver settings.
- Check the audio output level meter. This meter will indicate audio output from the loaded plugin. If this this meter isn't showing any audio activity, check the settings of the loaded plugin.
- Finally, check the output level setting on Cantabile main screen and Window's volume settings.

Master Levels

The **Master Levels** group on the **Home** tab can be used to control the master input and output gains. You can also enable or disable input/output and view the current output levels.

Master Levels group on the Home tab

Recording

Cantabile supports recording audio and MIDI files and both recorders can be controlled from the **Record** tab.

To Record MIDI Input:

- Ensure MIDI input is working correctly.
- Switch to the **Record** tab (using the mouse or press **Alt+R**).
- Click the **Auto Record** button in **MIDI Recorder** group.
- Start playing the MIDI device you want to record from.
- Cantabile should automatically start recording when you start playing.
- Recordings are shown in the recording panel (see below).

Recording audio is nearly identical to recording MIDI - simply click the other **Auto Record** button in the **Audio Recorder** group.

Instead of recording audio or MIDI input, you may want to record output (ie: the signals coming out of Cantabile as opposed to those being received). To select whether to record input or output, click the buttons on the record tab titled **Record Input** and/or **Record Output**.

Managing Recordings

All recordings you make will appear in the Recordings list:
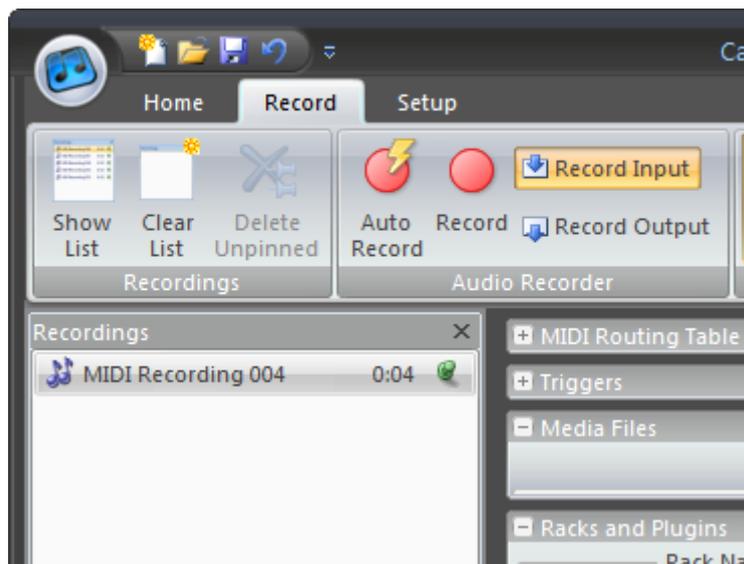
The Record tab and Recordings List

Pinned records will be kept while unpinned recording will be deleted when the session is closed. You can select whether to automatically pin all new recordings (optimistic recording), or only those you select (pessimistic recording) in [Recordings List Options](#).

You can also delete, rename or explore recording files by right-clicking the recording.

Playing Media Files

Cantabile supports the playback of audio and MIDI media files. To load a file for playback:

- Expand the **Media Files** panel
- Click the **New Media File** button
- Select the **Open...** command to browse for a media file.
- Press the file's **Play** button to start playback.
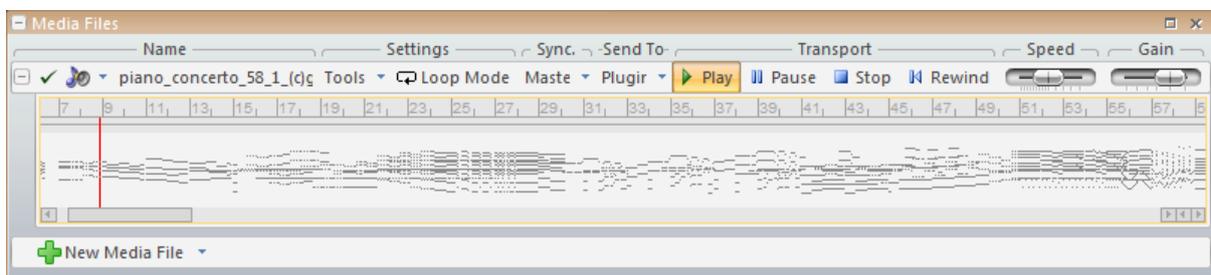
Playing a MIDI file

Some notes about playing media files:

- You can load multiple media files at once and trigger them either individually or together.
- The **Send To** drop down for each media file specifies where the output of the media file is directed. By default, each media file is directed to the main input of the racks/plugins.
- Media files can be looped by selecting a play range (by dragging on the visual representation of the loaded file).

Saving and Loading Sessions

Once you've configured Cantabile you can save that state to a session file. Session files store all of Cantabile's settings except for global options and settings.

To save a session file:

- From the Application Menu (**Alt+F**), select the **Save** command (or just press **Ctrl+S**)
- Enter a filename for the session.
- Press **OK** to save the file.

To load a session file:

- From the Application Menu, select the **Open** command (or press **Ctrl+O**)
- Locate and select the session file to load.
- Press **OK** to load it.

Cantabile also keeps a list of recently used session files in the list on the right side of the Application Menu. You can "pin" favourite entries here to prevent them from being pushed off the bottom of the list.

Cantabile's Main Window
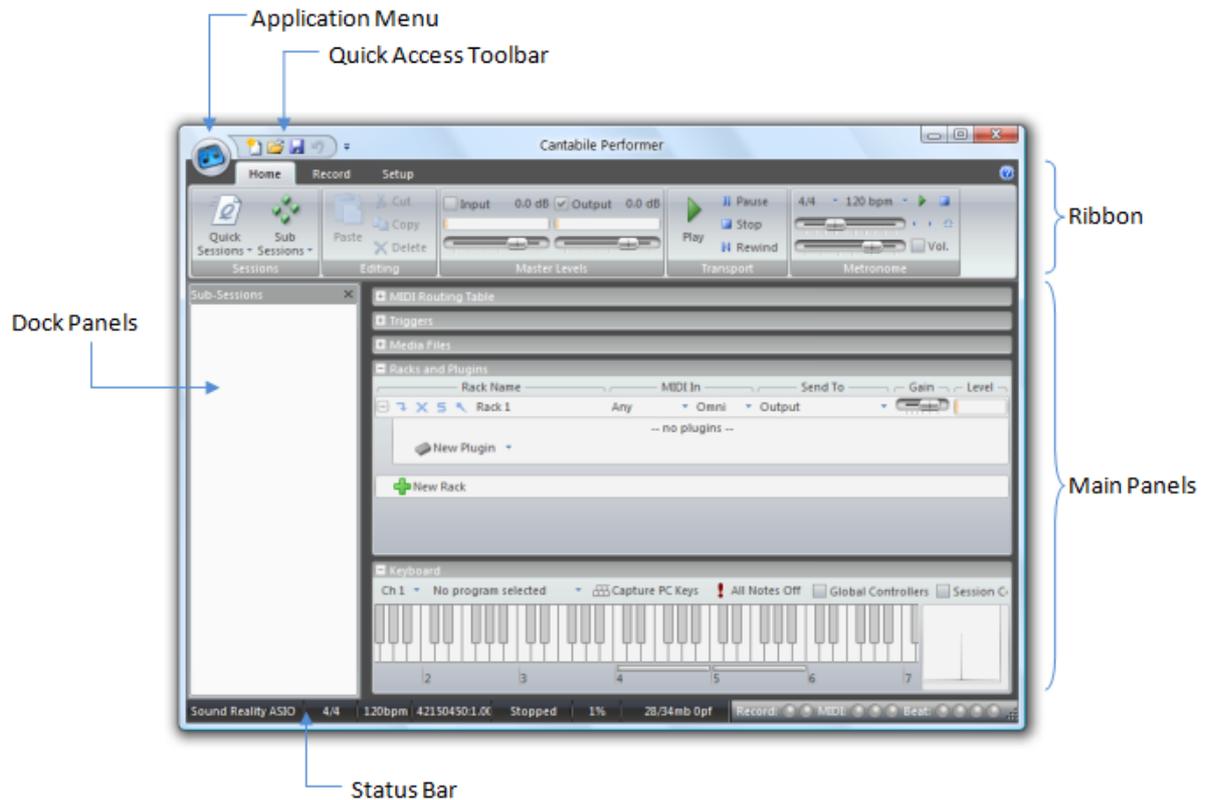
Cantabile's Main Window

The Application Menu

The Application Menu is displayed by clicking the round button in the top left corner of the main window. The Application menu is similar to the File menu in most applications and contains commands for creating, saving and loading session files, setting options and exiting the program.

The application menu can be accessed through the keyboard by pressing **Alt+F**.

The Ribbon

The ribbon is the main toolbar at the top of the main window. The ribbon consists of several tabs, each with a different set of commands:

Home	Most common commands and settings. (**Alt+H**)
Record	Commands for controlling the audio and MIDI recorders. (**Alt+R**)
Setup	Commands related to setting up Cantabile or a session. (**Alt+S**)

To save screen space, the ribbon can be minimized to just show the tabs. To minimize or restore the ribbon, double click on one of the tabs.

Besides clicking on the tabs, you can also switch between tabs using the mouse wheel while the cursor is over the ribbon.

Quick Access Toolbar

The Quick Access Toolbar is the small toolbar typically displayed just to the right of the Application Button in the title bar area.

The Quick Access Toolbar contains commands that are often used and can it be customized to suit your working style.

To add a command to the ribbon:

- Right click on any toolbar command and select **Add to Quick Access Toolbar**
- Click the drop down arrow to the right of the Quick Access Toolbar to select additional commands.

To remove a command from the ribbon:

- Right click on the command in the Quick Access Toolbar and select **Remove from Quick Access Toolbar**.

To re-order commands on the Quick Access Toolbar:

- From the Application menu select **Cantabile Options**
- Switch to the Customize page.
- Click the command to be moved in the right hand list.
- Use the Up/Down buttons to move the item up or down.

The Quick Access Toolbar can also be positioned below the ribbon. This is especially useful if you have many commands and not enough room in the title bar to display them all. To move the Quick Access Toolbar, click the drop down button to its right and select **Show Below the Ribbon**.

Main Panels

Most of the main window is comprised of several panels that can be expanded or collapsed as required. Depending on which edition of Cantabile you're using you may have the following panels:

MIDI Routing Table	Defines routings between MIDI devices
Triggers	Defines actions to execute on certain events (typically used to configure external MIDI devices for a session)
Media Files	MIDI and audio file players.
Racks and Plugins	Plugins organised into racks.
Keyboard	An onscreen piano style keyboard and several controllers for testing plugins with.

Most of these panels can be:

- Resized by dragging the divider between them.
- Maximized by clicking square box icon in its top right corner.
- Hidden by clicking the cross icon in its top right corner.
- Hidden or shown by clicking the **Show/Hide Panels** drop down button on the far right of the **Home** tab.

Status Bar

The status bar appears at the bottom of the main window and can be configured to show a wide range of indicators. To customize the status bar, right click on it and select the elements to be displayed.

Most of the status bar indicators are self-explanatory except perhaps the following:

- The memory indicator shows memory usage, displayed in the format x/y (n) where x is physical memory used, y is virtual memory allocated and n is the number of page faults in the previous 1 second. For optimal performance, x and y should be almost equal (or x > y) and n should normally be 0.
- The record indicators glow green if auto record is enabled and red when recording. The first indicator is the audio recorder, the second the MIDI recorder.
- The MIDI indicators glow green when MIDI connectivity is detected (eg: active sense or MIDI clock) and red when MIDI data activity is detected. The first indicator represents MIDI-in activity, the second internal MIDI activity (eg: a MIDI file playing) and the third indicates MIDI-out activity.

Dock Panels

Cantabile has two dock panels that appear to the left of the main panels.

Sub-sessions *	A list of all sub-sessions for the current session.
Recordings	A list of recordings made during this session.

* Cantabile Performer Only

These panels can be shown by associated commands on the ribbon toolbars, or by pressing **Ctrl+1** for the sub-session list and **Ctrl+2** for the recordings list. To hide a dock panel, click its close icon or press **Shift+Escape** while it has keyboard focus.

Keyboard Control

Cantabile can be driven completely by the PC keyboard which many users will find faster than using the mouse. Note the following about using Cantabile with the keyboard:

- The ribbon and most commands can be accessed by pressing the **Alt** key followed by a series of letters. To learn these letters, press and hold the **Alt** key. After a short period a set of key tips will appear showing the available keystrokes. Once you've learned the keystrokes, you don't need to wait for the key tips and you can simply key ahead.
- Moving around within the main panels and dock panels is typically done with the arrow keys.
- To move focus between panels, using **Ctrl+Tab** and **Ctrl+Shift+Tab**
- Buttons and drop downs can be activated with the **Enter** key. Note that although most applications activate buttons with the spacebar, in Cantabile the spacebar is used to start/stop the master transport.
- Many commands also have **Ctrl** key shortcuts. To discover these, simply hover over the command and the short-cut key (if available) will be shown in the tooltip.

As a final note on using the keyboard, don't forget that if the on-screen keyboard's capture feature is enabled, most shortcut keys won't work as they'll be controlling the on-screen keyboard instead.

General Editing Tasks

This section describes common editing features that can be used when working with Plugins, Racks, Media Files, Triggers and MIDI Routing Tables.

Creating New Items

To create a new item click the **New Item** button that appears near the bottom of each panel. Depending on the type of item it will be either created immediately or a popup will be displayed where additional options are available.

For plugins, the **New Plugin** button is contained within the parent rack, which must be expanded to be visible.

Plugins and Media Files can be replaced using the **Replace** button near the start of the slot.

Deleting Items

To delete an item:

- Select the item to be deleted by navigating to it with the keyboard, or by clicking on its name.
- Press the **Delete** key, or click the **Delete** command on the **Home** tab.

Note:

- Deleting a rack will also delete all contained plugins
- Most delete operations can be undone, though in some cases routings between deleted items may not be restored correctly.

Renaming Items

Although not necessary for Cantabile to function correctly, renaming items to give them more meaningful names is a convenient way to make your sessions more understandable.

To rename an item:

- Select the item to be renamed by navigating to it with the keyboard, or by clicking on its name.
- Press the **F2** key, or right click on the item's name and select **Rename**,
- Enter a new name for the item
- Press **OK**.

Using the Clipboard

Most items can be manipulated using the clipboard.

To cut or copy an item:

- Select the item to be cut or copied by navigating to it with the keyboard, or by clicking on its name.
- To copy the item, press **Ctrl+C**.
- To cut the item, press **Ctrl+X**.

Pasted items are always inserted before the currently selected item. To paste an item at the end, select the **New Item** button at the bottom of the list.

- Select the item to paste before.
- Press **Ctrl+V**.

Note: clipboard commands are also available from the **Home** tab and by right clicking on items.

Using Drag/Drop

Items can be rearranged and duplicated using drag drop:

To change the order of items:

- Click on the name of the item to be moved.
- Hold the mouse button on while dragging up or down to choose a new position for the item.

By holding the **Ctrl** key while dragging you can create a copy of the item at the new location.

Undo and Redo

Many operations can be Undone (and then redone):

- To undo the last operation, press **Ctrl+Z**
- To redo the last undone operation, press **Ctrl+Y**

Note, that only Cantabile related operations can be undone. For example, changes made to a plugin's own settings are not stored in the undo buffer.

The Undo and Redo commands are also available on Quick Access Bar.

3 Working with Plugins

Understanding Racks and Plugins

Cantabile supports loading multiple plugins through a simple rack approach (as opposed to a completely free-form wiring method). This approach provides a flexible yet easy to use mechanism for connecting plugins.

A rack is simply an ordered list of plugins where each plugin is connected to the one after. The rack's input is connected to the input of the first plugin and the output of the last plugin becomes the rack's output.

The input of each rack can optionally be connected to audio input from the audio driver. Similarly, each rack can be optionally configured to response to a specific MIDI device/channel.

The output of each rack can be routed to either your external hardware (sound card output or MIDI output device) or to another rack.

The following example shows two racks routed to the input of a third.
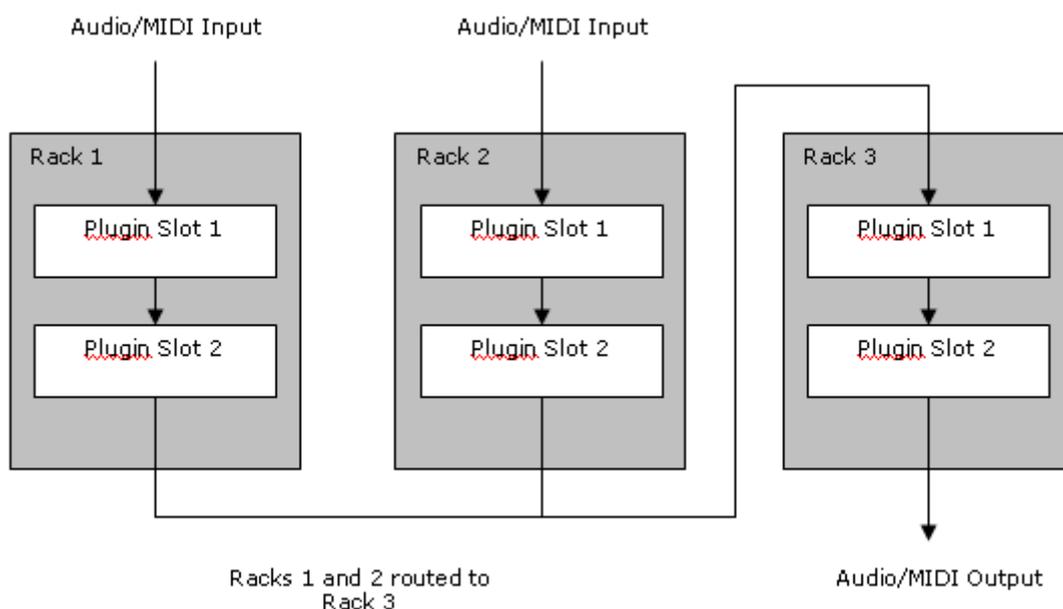
Rack Wiring Diagram

Within each rach, each plugin slot supports a wet/dry mixer and a MIDI pass-through setting:
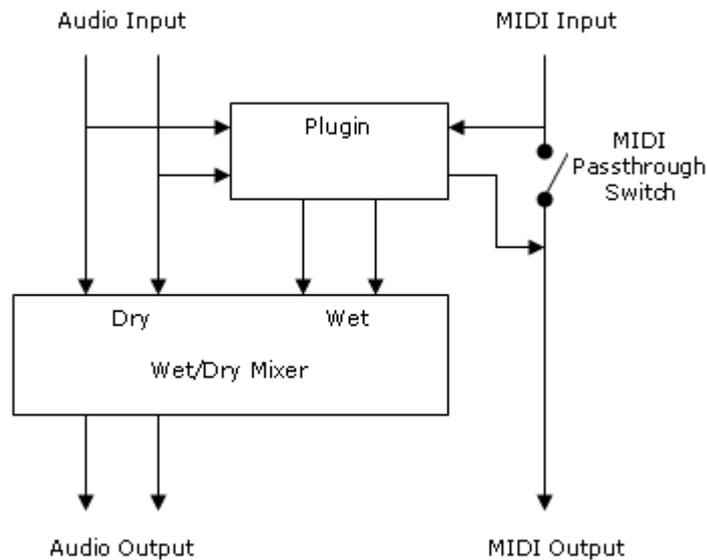
Plugin Wiring Diagram

Dry and Wet Mix Levels

The dry mix level of a plugin determine how much of unprocessed incoming audio signal should be passed through to the next plugin.

The wet mix level determines the amount of output signal from the plugin that should be passed through to the next plugin.

The wet and dry mix levels can be used to determine the volume of an instrument or amount of effect to be applied in the overall output.

MIDI Pass Through

By default only MIDI generated by a plugin will be passed to the next plugin. When the MIDI pass through setting is enabled, both incoming events and events generated by the plugin are passed to the next plugin.

This setting can be used in combination with a plugin's MIDI filters to create multi-timbral instruments on a single rack.

Audio Master Bus

Rather than providing direct pin to pin connections between plugins, Cantabile has a concept of a master bus that plugins are connected through.

The input and output pins of each plugin are connected to the master bus. Cantabile supports multiple N-N connections between a plugin and the master bus allowing simple but flexible configuration of audio channel assignments.

To adjust the audio channels of a plugin, from the plugin slot's **Tools** drop down menu select **Audio Channels**.

To set the format of the master bus, from the **Setup** tab select **Configure Master Bus**.

Partial Sends

Cantabile Performer also supports partial sends. A partial send is typically used to send part of the output signal of a rack to an effects rack. Partial sends only applies to the audio signal (not MIDI) and peels off a percentage of the rack's output, while leaving the direct signal unaltered.

You may configure up to two partial sends for each rack. Each partial send can be routed to any other rack - so long as this wouldn't cause a circular routing.
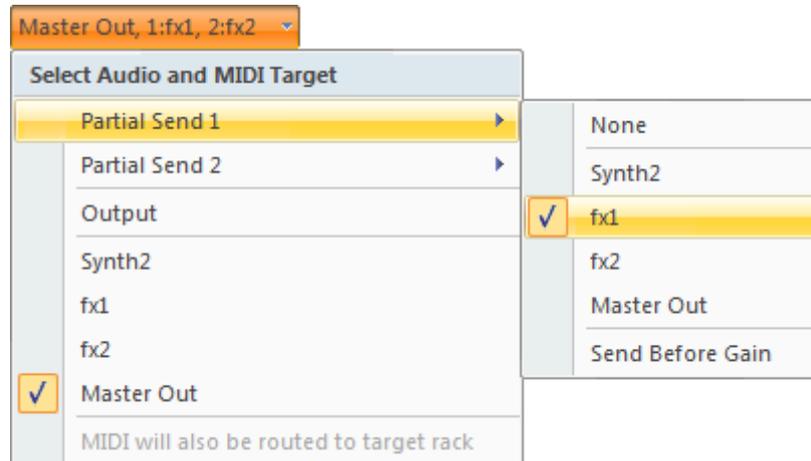
Configuring Partial Sends in Cantabile Performer

Each partial send can be configured to be taken either before or after the rack's output gain is applied. When the option **Send Before Gain** is selected, adjusting the rack's gain doesn't affect the sent signal.

Plugins and Racks Panel

Plugins and racks are created and edited using the Plugins and Racks panel which is one of the expandable panels on Cantabile's main window. To use this panel, make sure it is visible and expanded (see Main Panels)

Rack Settings

Each rack is headed by a set of controls for the rack as a whole:

Record MIDI Input

Input Connect

Solo

Mute

Bypass

Rack Expand/Collapse

Partial Send Amounts

Rack Expand Button	Clicking this button expands or collapses the rack's list of plugins. You can also use **Ctrl+Left** and **Ctrl+Right** to expand and collapse the rack.
Rack Bypass Button	When bypassed, all plugins in a rack are suspended from processing and all audio and MIDI input to the rack is passed directly to the rack's output.
Rack Mute Button	When muted, all plugins are suspended and any incoming audio or MIDI is discarded.
Rack Solo Button	Clicking the **Solo** button for a rack effectively mutes all other racks. You can solo multiple racks by holding the **Ctrl** key while clicking the **Solo** button.
Input Connect Button	Clicking this option connects the input of this rack to audio input from your sound card.
Record Incoming MIDI	When selected, enables recording of incoming MIDI events. Requires the MIDI recorder be configured to record Racks and Plugins.
Rack Name	A name describing the rack. By default Cantabile assigns rack names similar such as "Rack 1", "Rack 2" etc...
	You can rename a rack by selecting the rack and pressing **F2**, or by right clicking the rack's name and selecting the **Rename** command.
MIDI-In Device and Channel Number	The MIDI device and channel number that this rack responds to.
	Note that this setting can be overridden by the MIDI Routing Table where any MIDI events explicitly routed to rack are accepted by the rack regardless of this setting.
Split/Transpose	Specifies a sub-session controllable keyboard range and/or transpose amount for this rack.
	See Rack Split and Transpose.
Send To	This setting determines where to send the output of this rack.
	Racks can be routed to either **Output** (ie: the sound card) or to another rack. When routed to output, there is an additional set of options that allow routing of MIDI events to a specific MIDI output device.
	In Performer, this menu is also used to configure up to two Partial Sends.
Partial Send Amounts *	Adjusts the send amount percentage for each of the partial sends.
Gain	The output level gain for this rack.
Level Meter	Shows the output level of this rack.

* Cantabile Performer Only

Plugin Settings

Within each rack you can create a chain of plugins. Each plugin slot has the following controls:

Replace Plug-in

Suspend

Bypass

In-place Edit

MIDI Pass-through
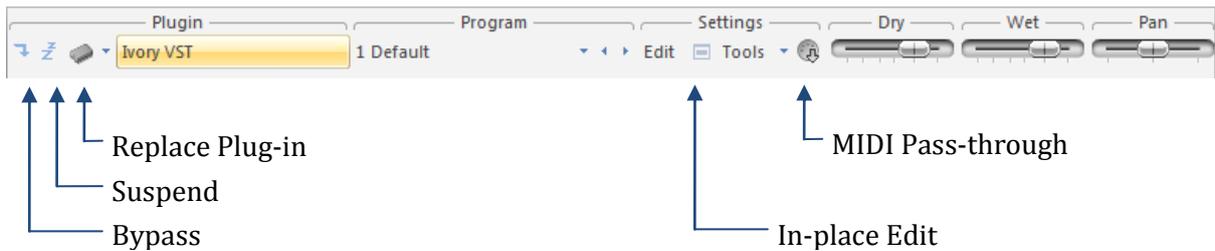
Bypass Button	When a plugin is bypassed, all incoming audio and MIDI data is passed through to the next plugin (or the rack's output if the plugin is the last in the rack).
	The plugin is left running however, allowing still sounding notes and effects to sound out. This option is also useful for situations for slow starting plugins that need to be resumed quickly.
Suspend Button	A suspended plugin is similar to a bypassed button in that all incoming audio and MIDI is passed through.
	When suspended however, the plugin is no longer processed causing still sounding notes and effects to be cut off. When suspended however processing load is saved.
Replace Plugin Drop Down	Clicking this button allows selecting a new plugin to replace the existing plugin in this slot.
Plugin Name	The name of the plugin in this slot.
	By default, plugins are named according to the type of plugin they contain. You can rename plugin slots to provide a more descriptive name by selecting the plugin and pressing **F2**, or right clicking the plugin's name and selecting the **Rename** command.
Program	Most plugins support more than one program. A program is a predefined set of settings that control the plugin's sound and behaviour.
	The program selector drop down can be used to select a program or you can use the next/previous buttons to move through the set of programs.
	When the plugin slot is active, the **N** and **P** keys can also be used to move to the next and previous programs.
Edit Button	The edit button displays the plugin custom user interface if it has one (most plugins do), or Cantabile's built in plugin editor otherwise.
Inplace Plugin Editor	Displays the plugin's user interface within Cantabile's main window (in the Plugin View panel)
Tools →Plugin's Editor	Displays the plugin's custom user interface (if supported).
Tools →Built-in Editor	Displays Cantabile's built in parameter editor for the plugin.
Tools →Save Plugin Selector Preset	Saves the plugin's current preset or bank to the **Presets** group in the plugin selector.
Tools →Program Organiser	Displays the program organiser which can be used to manage the plugin's program bank.
Tools →Sub-Session Behaviour	Allows specifying which plugin attributes are controlled by sub-sessions.

Tools →Import Program or Bank	Loads a bank (fxb) or preset (fxp) file into the plugin.
Tools →Export Bank	Saves the plugin as a bank (fxb) file
Tools →Export Program	Saves the current program as a preset (fxp) file
Tools →Audio Channels	Assigns audio channels between the plugin and the session's master bus. See [Audio Channel Assignments](#).
Tools →MIDI Filters	Defines MIDI filters to manipulate incoming MIDI events for this plugin
Tools →MIDI Pass Through	When selected, passes incoming MIDI to this plugin and to the next plugin. When cleared, only MIDI events generated by the plugin are passed to the next plugin. Use this option to layer multiple VST instruments in the same rack, or to pass controller events to a series of plugins.
Tools →Suppress MIDI Program Changes	When selected, MIDI Program Changes are not passed to the plugin. This option is useful when playing MIDI files that have program change events that are inadvertently resetting the program loaded by a plugin.
Tools →Record MIDI Output	When selected, causes MIDI generated by this plugin to be passed to the MIDI recorder. Requires the MIDI recorder be configured to record Racks and Plugins.
Wet/dry mix and gain sliders	Controls the wet and dry mix levels of this plugin. See [Wet/Dry Mix Settings](#).
Pan	Controls the left/right panning of mono plugins or the stereo balance of stereo/multi-channel plugins. The panning laws use to pan signals can be controlled via the panning law setting in [Master Bus Configuration](#).

Unloaded Plugins

A plugin can be unloaded without actually deleting it.

When unloaded, Cantabile saves the plugin's entire state, closes the plugin and removes it from memory. If the session is saved while a plugin is unloaded, its saved state is written to the session file.

When an unloaded plugin is reloaded, Cantabile loads the plugin and restores it from the saved state.

To unload a plugin:

1. Right click on its name and select **Unload**.
2. The plugin will be unloaded and appear as a suspended plugin with most controls disabled.

To reload an unloaded plugin:

1. Right click on it again and select **Reload**, or
2. Click its bypass button.

Unloaded plugins are an easy way to completely disable a plugin without actually deleting it. This feature works particularly well in conjunction with sub-session where some sub-sessions have the plugin loaded and some don't.

Unloaded plugins are also used when a session contains a plugin that fails to load. In this case, the state of the plugin is read from the session file and stored as the unloaded state. Re-saving the session will not cause the saved state to be lost and the session can be repaired by installing the missing plugin.

Wet/Dry Mix Settings

The meaning of a plugin slot's wet and dry mix sliders depends on the **Use Wet/Dry Controls** option in [Plugin Options](#).

When the Use Wet/Dry Controls option is enabled (the default) the wet and dry mix levels are controlled separately:

Dry Slider	Controls the amount of dry signal that is passed through the plugin slot. The dry signal is the input to the plugin slot.
Wet Slider	Controls the amount of wet signal that is included in the output of this plugin slot. The wet signal is the output of the plugin itself.

When the option to use wet/dry mix levels is turned off, the behaviour of these sliders changes depending on whether the plugin is an effect or instrument.

For instrument plugins:

Plugin Slider	Controls the gain of the plugin itself (ie: same as wet mix)
Gain Slider	Controls the gain of the plugin slot as a whole. ie: it is a gain that is applied after the plugin gain is applied and mixed.

For other types of plugins:

Plugin Slider	Controls the wet/dry balance
Gain Slider	Controls the overall gain of the plugin slot.

Plugin Selector

The plugin selector is used to insert new plugins, or to replace the plugin in a plugin slot.
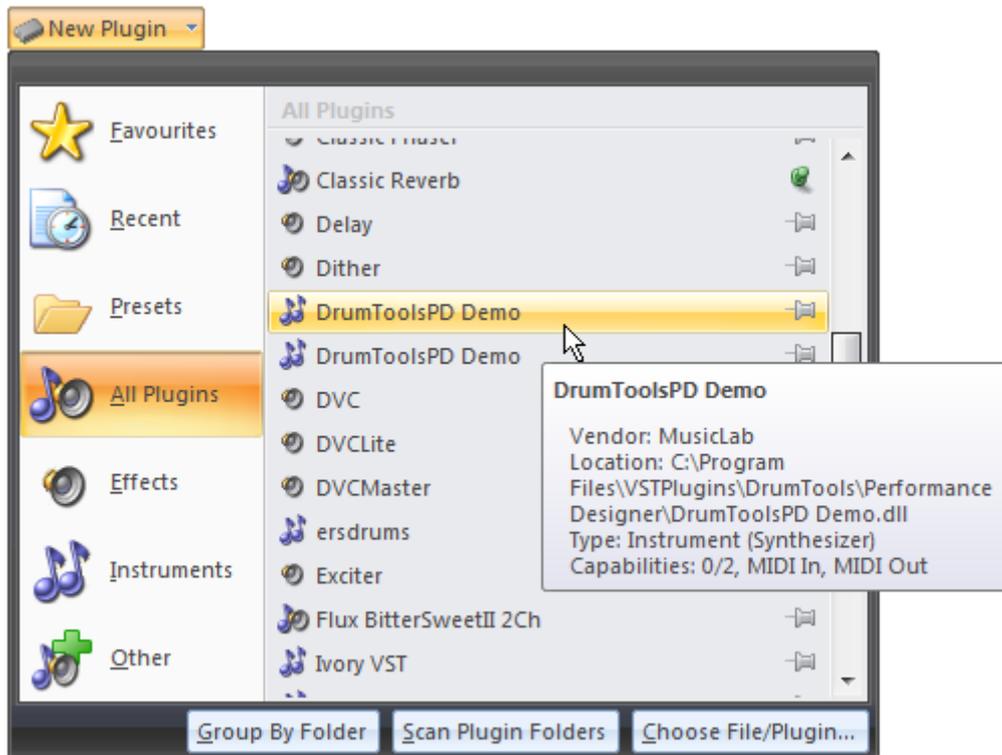
The Plugin Selector

Plugin Groups	Download the left side of the plugin selector are a number of plugin groups. Selecting a group shows the plugins belonging to that group in the list on the right hand side.
Favourites Group	Shows all plugins that have been "pinned" as favourites.
	Each plugin in the list has a pin icon. By clicking the pin icon you can control which plugins appear in the favourites group.
Recent Group	Shows plugins that have been recently used.
Presets Group	Shows all preset (fxp) and bank (fxb) files that have been saved to a special presets folder.
	See Plugin Options.
All Plugins Group	Shows all available plugins.
Instruments, Effects and Other Groups	Shows plugins of a particular plugin type.
Plugin List	The list on the right shows all plugins in the selected plugin group.
Group By Folder	When selected, the entries in the plugin list are displayed in a hierarchical view matching the file system folders containing the plugins.
	When not selected, all plugins are displayed in a single flat list, sorted alphabetically.
Scan Plugin Folders	Press to update the set of plugins by re-scanning your plugin folders.
Choose File/Plugin	Press to browse for a plugin (dll), preset (fxp) or bank (fxb) file.

In-place Plugin Editor

The in-place plugin editor displays a plugin's user-interface within Cantabile's main window - as opposed to display it in a separate popup window.

Only one plugin can be displayed in the in-place editor and it is only supported on plugins that provide a custom user-interface (nearly all plugins).

To display a plugin in-place, simply click the in-place edit button:
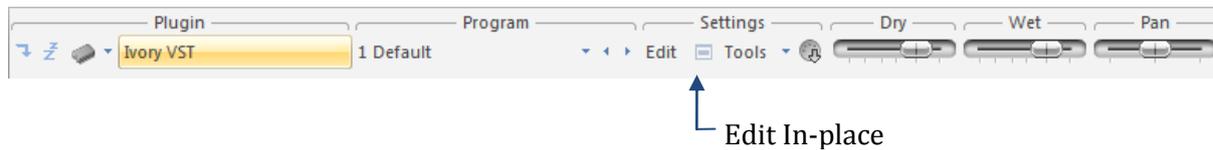
Edit In-place

The plugin will appear in the **Plugin View** panel:
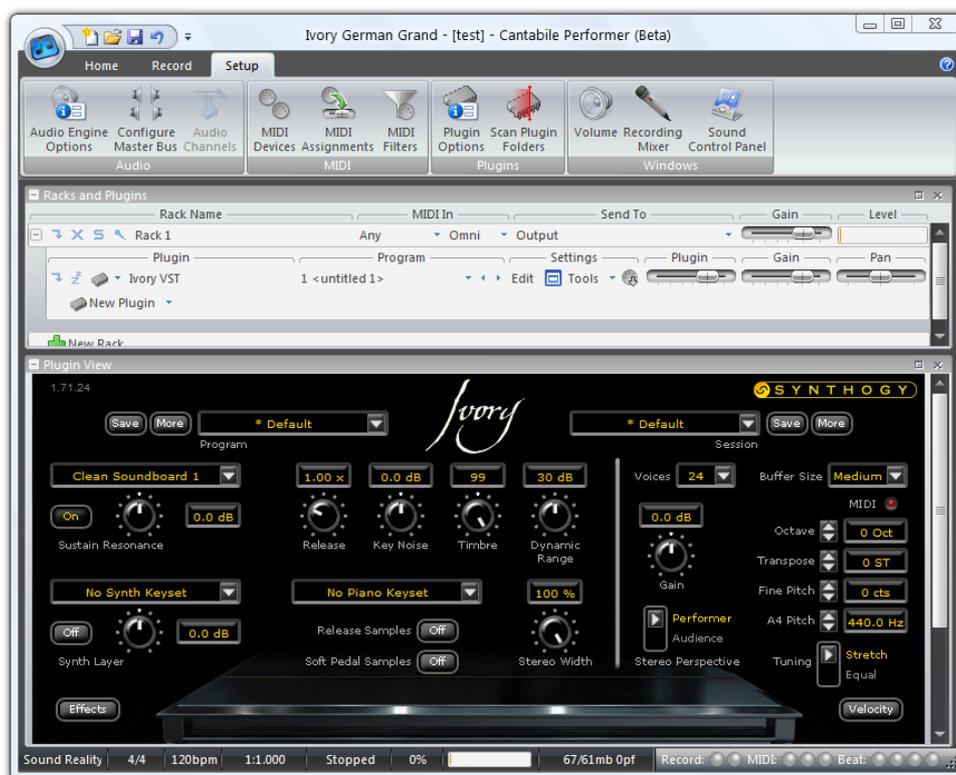
Inplace Plugin Editor

Plugin Editor

The plugin editor displays the user interface of a plugin and various other tools and commands provided by Cantabile.

To display the plugin editor, in the plugin slot click the **Edit** button or double click on the plugin's name.

Most of the plugin editor's functionality can be accessed through its menu and toolbar commands.

The toolbar also has a program selector (shown as 1 <untitled 1>) in the screen shot below that can be used to select different programs.

The Plugin Editor
(with Synthogy Ivory VST loaded)

File Menu

Open Program	Displays a file selector window for loading a program file (.fxp)
Save Program	Saves the current program as a .fxp file.
Save Program As	Saves the current program using a new file name.
Increment and Save	Performs an incremental save of the current program where a counter in the file name is incremented by 1 creating a sequence of files.
Open Bank	Displays a file selector window for loading a program bank file (.fxb).
Save Bank	Saves the entire program bank as a .fxb file.
Save Bank As	Saves the entire program bank using a new file name.
Close	Closes the plugin editor.

Edit Menu

Undo Program Changes	Discards all changes made to the current program since opening the plugin editor.
Undo Bank Changes	Discards all changes made to the program bank since opening the plugin editor.
Restore Session Program/Bank	For plugins loaded from a Cantabile session file, discards changes and reloads the plugin's state from the session file.
Restore Factory Program/Bank	Restores the current program or bank to the plugin's default "factory" state.

Rename Program	Renames the currently selected program.
Toggle Previous Program	Switches between the two previously selected programs.
Previous Program	Selects the previous program.
Next Program	Selects the next program.
Toggle A/B	Swaps the current program for the plugin's "B" state. See A/B Preset Toggling.
Copy A to B	Copies the current program to the plugins "B" state. See A/B Preset Toggling.
Program Organiser	Displays the Program Organiser.
Assign MIDI Controller *	Displays the MIDI Controller Assignments window for assigning MIDI controllers.
Randomize, Randomize Between and Morph Tools	Displays a second toolbar with commands for randomizing and morphing the parameters of the current program. See Morph and Randomize Tools .

* Cantabile Performer and Solo Only

Toolbar Commands

Most of the commands in the toolbars have equivalent commands in the **File** or **Edit** menu and won't be repeated here. The other toolbar commands are:

Morph/Randomize Tools	Similar to the menu commands except this button cycles between the various morph and randomize tools.
Capture Keyboard	Captures or releases the PC keyboard for playing notes.
Rollup Window	Hides the plugin's user interface leaving just Cantabile's toolbars and menus. This is useful for leaving Morph or Randomize tools running in animated mode without taking up too much screen space.

System Menu Commands

The plugin editor also has several window management commands in the system menu (ie: click on the icon in the title bar or press Alt+Space).

Show Toolbars	Select this command to show or hide all of Cantabiles toolbars and menus. You can also use **Alt+Enter** for this command.
Always On Top	Displays this plugin editor window in front of all other windows.
Open on Load	When enabled this plugin editor will be automatically displayed when the session file is loaded.

A/B Preset Toggling

A/B Preset Toggling is a simple system for toggling between two states of a program making quick comparisons easy.

Each plugin type has a secondary "B" state that can be used to store the state of a single program. The B slot can be thought of like the memory button on a typical handheld calculator.

Cantabile provides two commands for working with this B slot.

Copy A to B	Copies the state of the currently selected program to the B slot,
Toggle A/B	Swaps the selected program with the saved B state.

Since the B state is shared across all instances of the same plugin it can be used as a simple way to copy a program from one program to another, or even between two instances of the same plugin.

The content of the B state is discarded when Cantabile is closed.

Program Organiser

The Program Organiser provides tools for managing program banks. To display the program organiser:

- Select **Program Organiser** from the plugin editor's **Edit** menu, or
- Select **Program Organiser** from plugin slot's **Tools** menu (on the main screen).
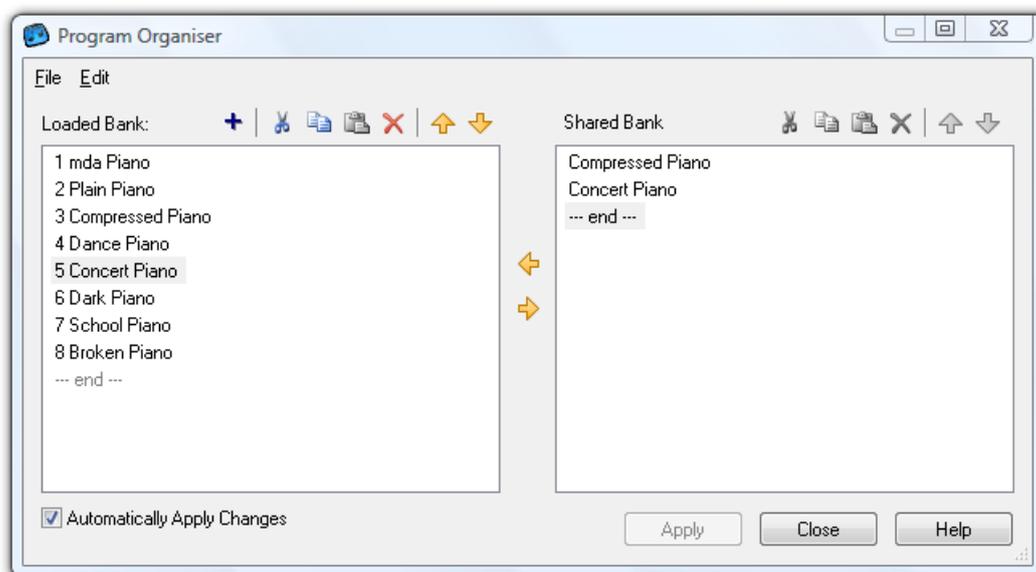
The Program Organiser

Loaded and Shared Banks

The program organiser works with two lists of programs.

Loaded Bank	Shows all programs currently loaded into the plugin.
Shared Bank	A separate store of programs managed by Cantabile that is shared by all instances of the plugin.

The shared program bank serves several purposes.

- It can be used as a convenient temporary storage location for programs while organising a program bank.
- Since it is shared between all instances of a plugin it can be used to move programs from one plugin instance to another, even between different sessions.
- It can be used as storage place for favourite banks - all entries in the shared program bank appear at the bottom of the program selector drop down. This is useful for plugins

that have a limited number of program slots. When a program is loaded in this way it is loaded into and overwrites the currently selected program.

Using the Program Organiser

Using the program organiser is fairly straight forward. Here are a few tips though:

- Clipboard commands provide a familiar way to move programs either within the one bank, or between the two banks.
- Drag/drop can be also be used to re-order or move plugins.
- Holding the control key while dragging within the one list changes the operation from move to copy
- Holding the shift key while dragging between lists changes the operation from a copy to a move.
- Both program lists support multiple selection to simplify moving many programs around.
- Programs can be moved up/down in the list by using the up/down arrow buttons on the associated toolbar, or by using the **Ctrl+Up** and **Ctrl+Down** keys.
- Although most commands have short cut keys defined, please be aware that these will not be available if keyboard capture is enabled.

Automatically Apply Changes

The option **Automatically Apply Changes** causes changes in the loaded programs list to be automatically and instantly applied to the plugin. For most plugins, this is the preferred bahaviour.

Some plugins however can be very slow to switch or load programs (eg: plugins that utse large sample libraries). By turning this option off you can make a many edits to the program bank and apply them when finished.

Note that some operations will still be slow, though in general the program organiser should be much more responsive with these slow plugins.

File Menu

Load Bank	Loads a program bank (.fxb) file.
Save Bank	Saves the current program bank.
Load Program	Loads a program file (.fxp) into the selected program.
Save Program	Saves the selected program as a program file.
Export Programs	Displays tools for exporting either the selected programs or all programs as separate .fxp files.
Import Programs	Displays tools for importing multiple program files into the current bank.
Close	Closes the program organiser.

Edit Menu

The **Edit** menu provides command that operate on which ever program list currently has the focus. For example to copy a plugin from one list to another you should set focus to the first list (by clicking in it for example), select the copy command then set focus to the other list before selecting the paste command.

The toolbar buttons above each list operate in a very similar way to the menu commands except they always work on the associated list.

Rename	Renames the currently selected program.
Cut	Copies the selected programs to the clipboard before deleting them from the list.
Copy	Copies the selected programs to the clipboard.
Paste Insert	Pastes the contents of the clipboard before the selected program.
Paste Replace	Pastes the contents of the clipboard over the selected programs.
Paste Fill	Pastes a single program into all selected program slots. (applies to the loaded bank only)
Insert Empty Program	Inserts a blank program entry before the selected program.
Delete	Deletes the selected programs and shuffles all following programs up.
Clear	Resets all the parameters of the selected programs to 0 and renames them to <empty> .
Sort Alphabetically	Sorts the selected programs alphabetically. Note you must select which programs to sort before this command becomes available.
Select All	Selects all the items in the list.

Morph and Randomize Tools

Cantabile provides several tools for randomizing and morphing the state of the current program. These tools are presented as a second toolbar that appears just below the plugin editor's main toolbar.

To access these tools, choose the appropriate command from the plugin editors **Edit** menu, or click the **Morph/Randomize Tools** button to cycle between the different tools.
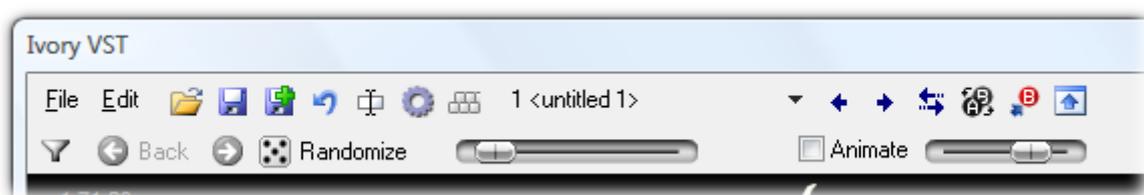
Morph and Randomize Tools

These tools can be configured to manipulate all of a plugins parameters or only a subset. To select the parameters that are modified, click the **Select Parameters** button (the first button on the second toolbar). This will display a list of all available parameters that can be used to select which parameters are affected.
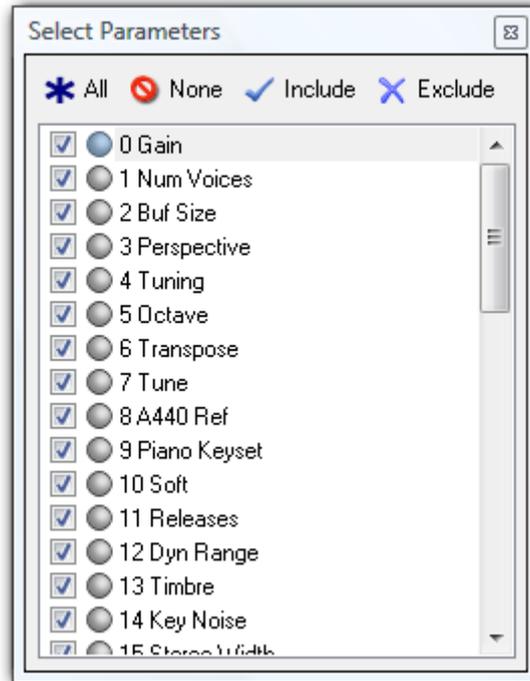
Selecting parameters to be morphed/randomized

This window also supports learning which parameters modify. Click either the Include or Exclude button and then move the control that should be included or excluded. Also note the indicator next to each parameters name lights up when that parameter is being moved in the plugin editor. This helps to locate which parameter corresponds to a particular control.

These tools can be used either manually, or in animation mode. When **Animate** is selected the tools run automatically and the slider next to the animate check box can be used to control the animation speed. For example you might set one of the randomize tools to randomize every 5 seconds. You can then play notes continuously until you hear a sound you like.

Randomize Tools

The Randomize Tool randomly modifies all selected parameters. The amount of randomization is controlled by the amount slider (to the right of the randomize button) and ranges from 0 to 100%.

Randomize Tools

If you hear a sound you like but miss it because you have animate turned on, or you accidentally press **Randomize** again, you can use the **Back** button to return to previous randomizations. Similarly the **Next** button moves forward in the list.

Randomize Between Tools

The Randomize Between tool is similar to the Randomize tool except instead of modifying parameters by a certain amount, it randomly selects values between two captured limits.

Randomize Between Tools

To use the Randomize between tool:

- Select the program you want to randomize. This will act as one end of the randomization limit.
- Display the Randomize Between tools.
- From the **To Program** drop down select a second program to define the other randomization limit.
- Click the **Randomize** button. All selected parameters will be randomized between the values of each defined limit.

Alternatively you can manually define the limits:

- Select the program you want to randomize.
- Move the plugin's settings to define one end of the randomization limit.
- Click the **Capture Start Parameters** button (to the right of the Randomize button).
- Move the plugin's settings to define the other randomization limit.
- Click the **Capture End Parameters** button.
- Click the **Randomize** button.

Selecting a program from the **To Program** drop down is effectively the same as switching to another program, pressing the **Capture End Parameters** button and switching back to the original program.

The result of the Randomize Between tool is not the same as randomly selecting a position with the Morph tools. The morph tools move all parameters in a synchronised manner whereas the Randomize Between tool randomly selects values for each parameter.

Morph Tools

The Morph tools smoothly change parameters from one set of values to another.

Morph Tools

Using the Morph tools is similar to using the Randomize Between tools in that you must first define the start and end values for the morph operation. Do this in exactly the same way as described for the Randomize Between tool. That is, either use the **To Program** drop down to select the end parameters or manually define the start end values using the **Capture Start/End Parameters** buttons.

Once the start and end parameters have been captured, simply move the slider the morph the parameters from one set of values to the other.

4   Recording

Cantabile Performer and Solo Only

Cantabile has the ability to record audio and MIDI files.

Recording is controlled through the **Record** tab (**Alt+R**):

The Record Ribbon Tab

Or by the **Record** button drop down on the **Home** tab (**Alt+H+R**):
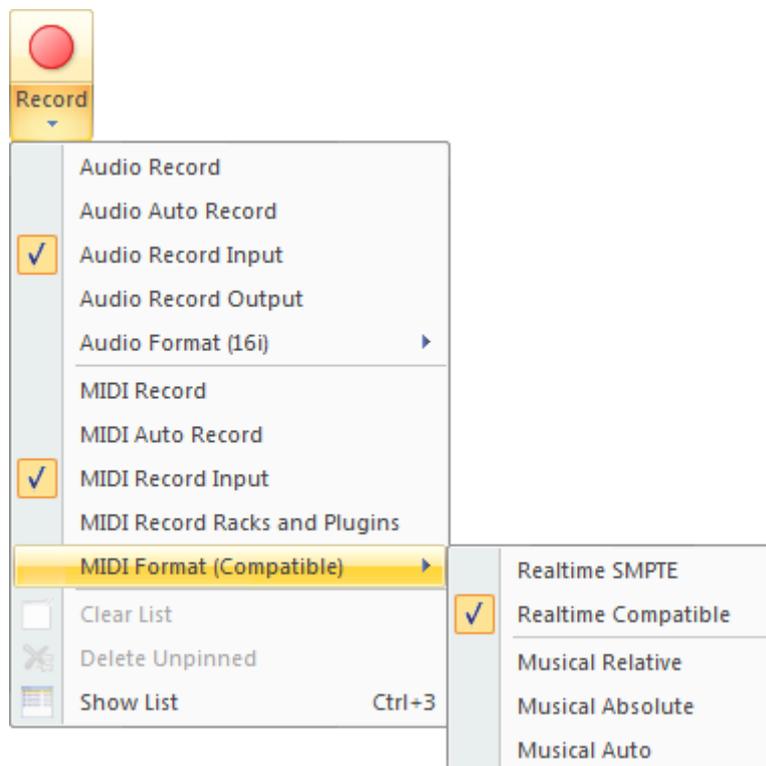
The Record Button

When using the record button, click the top half of the button starts or stops recording while clicking the bottom half displays the drop down menu.

Input vs Output

The recorders can be used to record either input or output:

MIDI Input	All incoming MIDI events from external MIDI devices and the on-screen keyboard.
MIDI Racks and Plugins	Records the MIDI input arriving at any rack that has the Record MIDI Input option selected.
	Also records and plugin slots that have the record MIDI Output option selected.
Audio Input	All input audio received from the audio driver.
Audio Output	All audio output by the audio driver.

Both recorders also support simultaneously recording from both input and output.

Manual Recording

To manually control the recorders:

- Switch to the **Record** tab.
- Ensure the correct **Record Input** and **Record Output** options are selected.
- Click **Record** to start recording.
- Click **Record** again to stop recording.

Manual recording can also be controlled by clicking the top half of the **Record** button on the **Home** tab. Click this button to start recording using whichever recorder is enabled through the Record Input/Record Output options. If both recorders are enabled, both will start recording.

To stop any recording, click this button again.

Automatic Recording

Cantabile can also automatically start and stop recording:

- Switch to the **Record** tab.
- Ensure the correct **Record Input** and **Record Output** options are selected.
- Click **Auto Record** button to enable automatic recording.
- Click **Auto Record** again to disable automatic recording.

Recording will start it detects MIDI activity or audio signals above a certain threshold. Recording stops when a certain period of inactivity or silence elapses. Very small recordings are automatically discarded.

Settings for the timeouts and audio thresholds are available in MIDI Recorder Options.

Status Bar Indicators

The status bar has two indicators to show the state of each recorder:

Record Status Indicators

The left indicator shows the state of the audio recorder, while the right indicator shows the state of the MIDI recorder. (You can hover over the indicators for tool tips showing which is which).

The meaning of indicators is as follows:

Off (Grey)	The recorder is off.
Green	Armed for auto record
Red	Recording

Recordings List

The recordings list appears as a dock panel on the left side of the main window and maintains a list of all recordings made. Each recording shows the name of the recording file, its duration (in seconds) and whether it's an audio or MIDI file (by the icon).

To show the recordings list, press **Ctrl+2** or select **Show List** from the **Record** tab.

The Recordings List

Various commands for working with recordings are available by right clicking on a recording:

External Tools	Custom external tool commands can be configured for audio and MIDI files (eg: editors, players etc...). See External Tools.
Delete	Deletes the recorded file and removes the entry from the list.
Delete Unpinned	Deletes all unpinned files and removes them from the list.
Clear List	Removes everything from the list without deleting any files.
Rename	Renames a file.
Pin All	Pins all recordings in the list.

Unpin All	Unpins all recordings in the list.
Toggle Pins	Pins all unpinned recordings and unpins all pinned recordings.
Explore	Launches Windows Explorer with the recording selected.
Open	Loads the recorded file into Cantabile for playback.

Loading Recordings for Playback

You can easily load a recording for playback by right clicking the recording in the recording list and selected **Open**.

Alternatively, to have the last recording always loaded see [Automatically Loading Recordings](#).

MIDI Recorder Formats

The MIDI recorder can make recordings that are encoding in either real-time format or musical time format.

In real-time encoding events are time stamped in milliseconds and don't require the master transport to be playing.

In musical (or synchronised) encoding recorded files are encoded in musical time (ie: bars, beats, sub-beats) and as such require to the master transport to be playing in order to provide a time base.

The following record modes are available:

Realtime SMPTE	Encodes the MIDI file in SMPTE time code format with millisecond accuracy. This is the correct format for non-musical time encoding however it is not widely support by MIDI players
Realtime Compatible	Encodes the file at 120 bpm 4/4 time with 500 ticks per beat. This gives millisecond accurate recording in a format that is compatible with all MIDI players.
Musical Relative	Encodes the file using a synchronised musical time format that matches the time signature, tempo and play position of the master transport. The recording starts from the beginning of the current bar. For example, if the first event to be recorded occurs when the master transport is at bar 40, beat 2, the first recorded event will be time stamped at beat 2 in the first bar.
Musical Absolute	This format is the same as Musical Relative except the recording's origin is set to 0. Using the above example, the first event would be at bar 40, beat 2 (with 39 bars of silence before it)
Musical Auto	Operates in Musical Absolute when a media file is the master transport. Operates in Musical Relative when the metronome is the master transport. This mode is intended to avoid accidentally recording large sections of silence when the metronome is left running and multiple recordings are made.

Since the musical encoding modes require a playing transport they can also be thought of as synchronised recording and the following also applies:

- If the master transport is not playing when recording starts, it is automatically started.
- If the transport was automatically started when recording started, it will also be automatically stopped when recording stops.
- It the transport is stopped manually, recording is also stopped.
- Media files don't stop playing at their end if recording is in progress.

These recording modes are also affected by looped playback:

- If the master media file loops in relative recording mode, recording continues.
- If the master media file loops in absolute recording mode, recording stops.

The MIDI recorder format can be set using the **Record** button dropdown on the **Home** tab, or the format drop-down in the **MIDI Recorder** section of the **Record** tab.

Audio Recorder Formats

Audio recordings can be made in one of several formats 16-Bit Integer, 24-Bit Integer, 32-Bit Integer, 32-Bit Floating Point and 64/32-Bit Floating Point.

When 64/32Bit is selected recordings will be made in 64-bit if the master bus is configured for 64-bit audio, otherwise 32-bit. See 64 Bit Audio

The audio recorder format can be set using the **Record** button dropdown on the **Home** tab, or the format drop-down in the **Audio Recorder** section of the **Record** tab.

Pinned and Unpinned Recordings

Each recording in the list can be pinned or unpinned. A pinned recording won't be automatically deleted by Cantabile, whereas an unpinned recording will.

Unpinned recordings are deleted automatically when the session is closed, or Cantabile is shutdown. They can also be explicitly deleted with the **Delete Unpinned** command (in the **Record** tab).

By default, all recordings are pinned causing all recordings to be kept (ie: optimistic recording).

Pessimistic recording – where everything is unpinned by default is also possible, see **Pin All New Recordings** in Recordings List Options.

Recording Options

The audio and MIDI recorders both have options that control where the recorded files are saved to, filename formatting and auto record timeouts. See MIDI Recorder Options and Audio Recorder Options.

The recording list also has options that control optimistic vs pessimistic recording, when to delete unpinned recordings and how many unpinned recording to keep before automatically deleting them. See Recordings List Options.

5 Playback

Cantabile Performer and Solo Only

Cantabile supports loading multiple MIDI and audio files.   Each can be played individually or they can be synchronised to each other, the metronome or an external MIDI clock.

Media files can be triggered using Cantabile's user interface or triggered remotely using MIDI Controller Assignments.

Media files can be routed to specific racks for additional processing, directly to output or in the case of MIDI files to all racks where each MIDI event is routed according to each rack's MIDI channel setting.

Media Files Panel

Media files are loaded and edited using the **Media Files** panel which is one of the expandable panels on Cantabile's main window. To use this panel, make sure it is visible and expanded (see Main Panels)

To load a media file:

- Click the **New Media Player** button.
- Either browse for a file, or choose from the list of recently used media files.

Group Selector

Replace Media File

Loaded

Expand/Collapse

Visual Representation
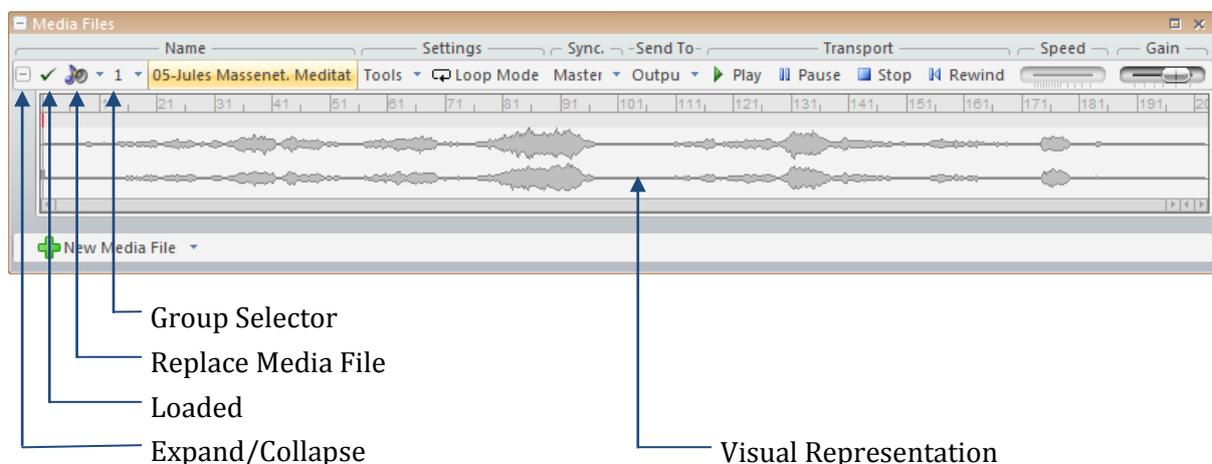
For each media file, the following settings and commands are available:

|	
Expand/Collapse	Expands or collapses the Visual Representation part of the media player.
Loaded	Used to load/unload media files without actually deleting them from the session.
Replace Media File	Replaces this media file with another.
Group Selector	Sets the group number for this media file. See Media File Groups
Name	The filename of the media file. To discover the full path of the file, select **Information...** from the file's **Tools** drop down.
Tools →Loop Mode	When loop mode is enabled, the file plays in an endless loop over the play range. If no play range is defined, the entire file is looped.
Tools →Follow Play Position	When enabled the Visual Representation will automatically scroll to keep the current play position in view.
Tools →Auto-load New Audio/MIDI Recordings	When selected this media player will automatically load any new recordings of the same type. ie: an audio player will automatically load the latest audio recording, a MIDI player will automatically load new MIDI recordings.
Tools →Lock Play Range	When the play range is locked, you must explicitly set the play range using the **Set Play Range** command. When the play range is not locked, selecting a range in the visual representation also sets the play range.
Tools →Set Play Range	Sets the play range to the current selection.
Tools →Clear Play Range	Clears the play range, effectively setting the play range to the entire file.
Tools →Show All	Scales the visual representation to show to the entire file.
Tools →Zoom to Selection	Scales the visual representation to show the currently selected range.
Tools →Show Track List	For MIDI files, shows a list of tracks and allows suppressing tracks and routing tracks to different destinations. See Track List (MIDI Files)
Tools →Audio Channels	For audio files, shows the dialog where channels in an audio file can be connected to channels on the master bus. See Audio Channel Assignments.
Tools →Delete File	Deletes the media file from disk and removes the media player.
Tools →Rename	Renames the media file.
Tools →Explore	Launches Windows Explorer and selects the media file.
Tools →Information	Displays information about the loaded media file.
Synchronisation Mode	Displays a drop down menu with synchronisation options for the media file. See Media File Synchronisation.
Send To	Specifies where the media file is routed to.
Play/Pause/Stop/Rewind	Transport controls for the media file.
Speed Slider	For MIDI files, allows controlling the playback speed of the file.

Gain	For audio files, applies an audio gain/attenuation to the output of the media player.
	For MIDI files, adjusts the velocity of all notes in the file.

Automatically Loading Recordings

To have new audio and/or MIDI recordings automatically loaded for playback, select **Auto-load -> Audio Recordings** or **Auto-load -> MIDI recordings** from the **New Media File** drop down. This will create a new media file player (initially empty) that will automatically load the latest audio or MIDI recording.
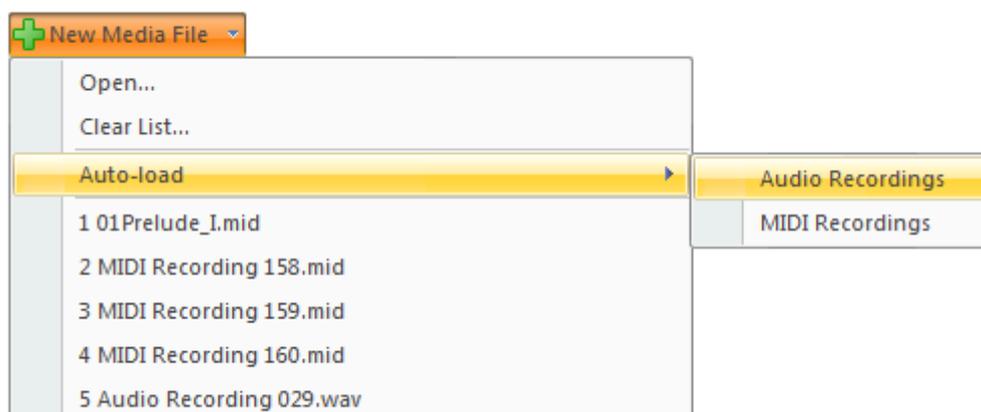
Creating a media player to load new recordings

You can enable or disable this auto-load functionality for an existing media player by selecting or clearing the **Auto-load New Audio/MIDI Recodings** option in the player's **Tools** drop-down.

Media File Groups

Cantabile Performer Only

Media files can be grouped into one of ten groups (numbered from 0 to 9).

Each group has two flags that control the behaviour of the group:

Exclusive Load	When selected only one media file can be loaded and all others are automatically unloaded.
Exclusive Play	When selected only one media file in the group can play and all others are automatically stopped.

Groups are mostly used in association with MIDI Controller Assignments which allow a controller to be assigned to play/stop or pause all the loaded files in the group. Controller assignments can also be used to load the first/next/previous file in the group.

For example, suppose you have a set of media files, each which is used in a different song. Rather than assign a MIDI controller to play each one, you can put all these media files in an

exclusive group, use sub-sessions to load a different one for each song and use the one MIDI controller button to play the group – resulting in just the loaded file in that group being played.

To do this:

1. Load the media file for each song.
2. Set all the media files to belong to a single group (say group 1) by clicking the group selector drop-down and selecting the group number
3. Make the group exclusive by clicking the same drop down and ensuring the **Exclusive** option is checked.
4. All of the media files should now be unloaded except one.
5. You activate a different media file by clicking it's load button – the currently loaded one will be unloaded and the new one loaded.
6. Now create a sub-session for each song and load a different song in each.
7. Open MIDI Controller Assignments.
8. Press the MIDI button you want to use to play the group – it should be displayed in the **Controller** field.
9. From the **Assign To** drop down choose **Transport – Play Media Group**.
10. From the **Group** field, choose the group number you used in step 2 above.
11. Press the MIDI button again to confirm it starts playback of the loaded file in the group.

Some other notes on using Media Player Groups:

- By using a non-exclusive group you can control multiple media files from one button (eg: play an audio and MIDI file at the same time).
- You can create assignments for Group Play, Pause, Stop, toggle Play/Stop and toggle Play/Pause.
- You can also create a MIDI controller assignment to all groups – select **(All)** in the **Group** field. This is especially useful for the stop media group assignment as it allows all media file players to be stopped from a single button.
- By default group 0 is non-exclusive and all other groups are exclusive.
- By creating global controller assignments for the group commands, you can avoid having to create the same set of assignments in each session.

Track List (MIDI Files)

For MIDI Files, you can control where events for each track are routed to in one of two ways:

- Select the **Track List** command from a MIDI file's **Tools** drop down menu. From here you can select whether a track should be routed to the loaded VST, the internal MIDI mapper or an external MIDI device.
- For tracks mapped to the internal MIDI mapper, events matching the selected channel in the rack's panel, will be routed to the VST and all other events will be sent to enabled MIDI output ports.

You can also use the Track List to Solo and Mute tracks.

Note that any changes made in the track list are saved with the session file.

Visual Representation View

The visual representation shows a microscore of the notes for a MIDI file, or audio waveform for audio files.

You can zoom and scroll this view using the scrollbar and zoom buttons, or with the following keys:

Left/Right	Scroll left/right
Ctrl + Left/Right	Zoom out/in
A	Show entire file
Z	Zoom to the selected range

Note that clicking in the visual representation area when it doesn't have focus, doesn't cause the selection to change – this allows easily moving focus without altering the current view.

Moving the Current Play Position

To change the current play position, click in the small band at the top of the visual representation at the position you want to move to.

Play Ranges and Selection

The visual representation display has two selection types - the Selection and the Play Range.

The Play Range is indicated by a dotted range in the small band at the top of the display. The sequencer plays from the start of the play range to the end and then stops. If Loop Mode is enabled, the range is played in a endless loop.

The Selection is indicated by a band across the main display area and can be used to select a region to zoom to.

When the **Lock Play Range** button is pressed, the current selection is disconnected from the Play Range and allows zooming and scrolling without affecting the play range.

6 Timing and Synchronisation

Cantabile Performer and Solo Only

Cantabile supports several timing and synchronisation modes as well as the ability to synchronise to an external MIDI clock and/or to send MIDI clock events.

Synchronisation Modes

When working with timing and synchronisation each item can be in one of three synchronisation modes:

Master	The master is the item which defines Cantabile's concept of time, including controlling of other synchronised items and timing information reported to plugins.
	There must always be one master object.
Synchronised	A synchronised item matches its timing to that of the master.
Unsynchronised	An unsynchronised item uses its own internal timing.

Synchronisable Objects

The synchronisation modes apply to these items:

The Metronome	The metronome can run in any of the three modes.
	When there are no loaded media files, the metronome automatically becomes the master.
MIDI Media Files	MIDI files support all three synchronisation modes.
Audio Media Files	Audio media files fully support master and unsynchronised modes.
	Synchronised mode is limited to starting and stopping in-sync with the master – time stretching of audio files is not supported.
Plugins	Plugins are always synchronised to the master, though many have their own options to control synchronisation with the host.

Transport Controls

Transport controls are the play, pause and stop buttons used to control the playback state of an object. The metronome and each media file have their own set of transport controls.
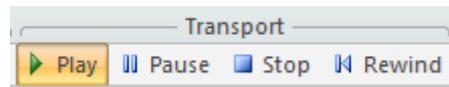
Transport controls for a media file

The master transport controls which control whichever object happens to be the master.

Master Transport Controls

All transport controls can be used either directly through Cantabile's user interface, or through MIDI controller assignments.

The follow keys can be used to control the master transport:

Space	Play/Stop
Ctrl+Space	Pause/Resume
W	Rewind

Metronome

The metronome appears in the **Home** tab of the main window and can be used as the master transport to provide timing information, or in can be synchronised to play metronome sounds in sync with a media file.

The Metronome

Synchronisation options for the metronome are found in the tempo drop down:
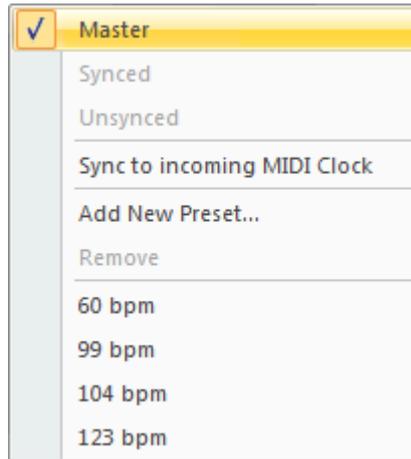
Tempo and Synchronisation Options for the Metronome

To make the metronome the master, select **Master**. When another item is the master, use the **Synced** and **Unsynced** options in this menu to control whether the metronome is synchronised or not.

The ability to have the metronome unsynchronised is useful when switching often between listening to a media file and using the metronome to practice against.

Specifying Metronome Audio Channel Assignments

By default, the metronome is configured to send sounds to the left, right and center channels. To change the audio channel assignments for the metronome:

1. From the **Setup** tab, select the **Audio Channels** command (or press Ctrl+A)
2. In the drop down **Show Channel Assignments For**, select **Metronome**.
3. Make the required assignments (see [Audio Channel Assignments](#)).

Media File Synchronisation

To set the synchronisation mode for a media file, use the drop down menu in the column named **Sync.**
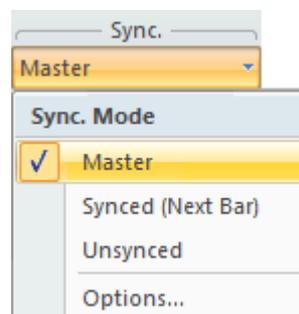
Setting the synchronisation mode of a media file

Media files also have additional options that control synchronisation:
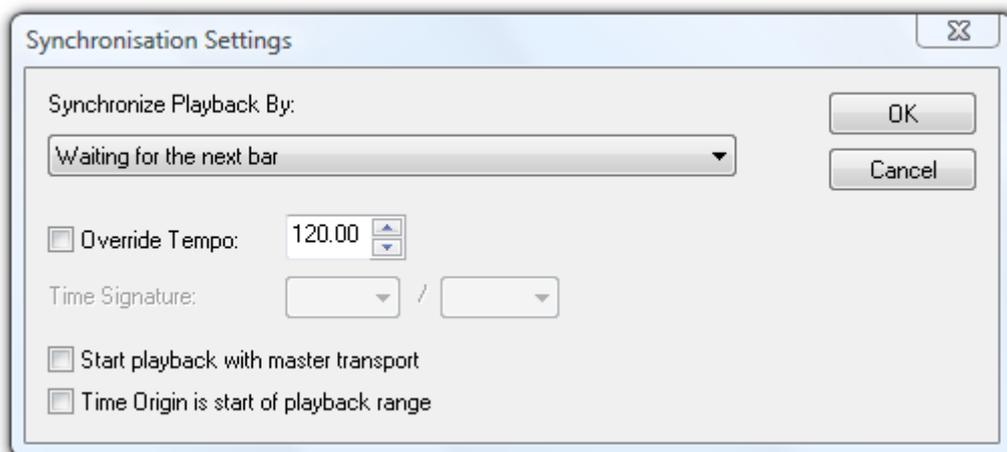
Synchronisation Settings for a Media Player

Synchronise Playback By	This option controls how this file is synchronised against the master transport.
	There are options to synchronise at the next beat, the next bar, to continuously track the play position of the master and other less common options.
Tempo/Override Tempo	For MIDI files, overrides the file's own tempo with a fixed tempo.
	For audio files, specifies the tempo of the file so other files can be synchronised to it.
Time Signature	For audio files, specifies the time signature of the file so other files can be synchronised to it.
Start Playback with Master	Causes the file to start playback at the same time as the master transport.
Time Origin is Start of Play Range	Causes the time origin of the file to be located on the start of the current play range (as opposed to the start of the file).

MIDI Clock

Cantabile has the ability to send and receive MIDI clock events.

Before using this feature you must enable MIDI clock for the MIDI devices you intend to send and receive these MIDI events from/to. See [MIDI Devices](#) for more information on how to do this.

Synchronising Cantabile to an External Device

Once you've enabled MIDI clock for one or more devices, you can synchronise Cantabile to incoming MIDI clock events by:

- Make the metronome the master transport.
- Select **Synchronise to Incoming MIDI Clock** in the metronome's tempo drop down.

When synchronised in this way, Cantabile's master transport controls become disabled as transport will now be controlled by the device sending the MIDI clock events.

Please note that the terms "master" and "slave" can be somewhat confusing in this context. Although the metronome is the master as far as plugins and media files are concerned (ie: internally to Cantabile) externally Cantabile is the slave to the MIDI clock source.

Synchronising External Devices to Cantabile

Cantabile can also send MIDI clock events. To do this, simply enable MIDI clock for the devices that you want to send these events too. See MIDI Devices for more information on how to do this.

7 Session Management

Session Files

In Cantabile, session files are used to store the configured state of Cantabile. Working with session files is very similar to working with documents in most other Windows applications.

Cantabile session files have a ".cantabile" file extension.

To open or save session files use Cantabile's Application Menu, which is accessible by clicking the round Cantabile icon in the top left corner, or by pressing **Alt+F**.
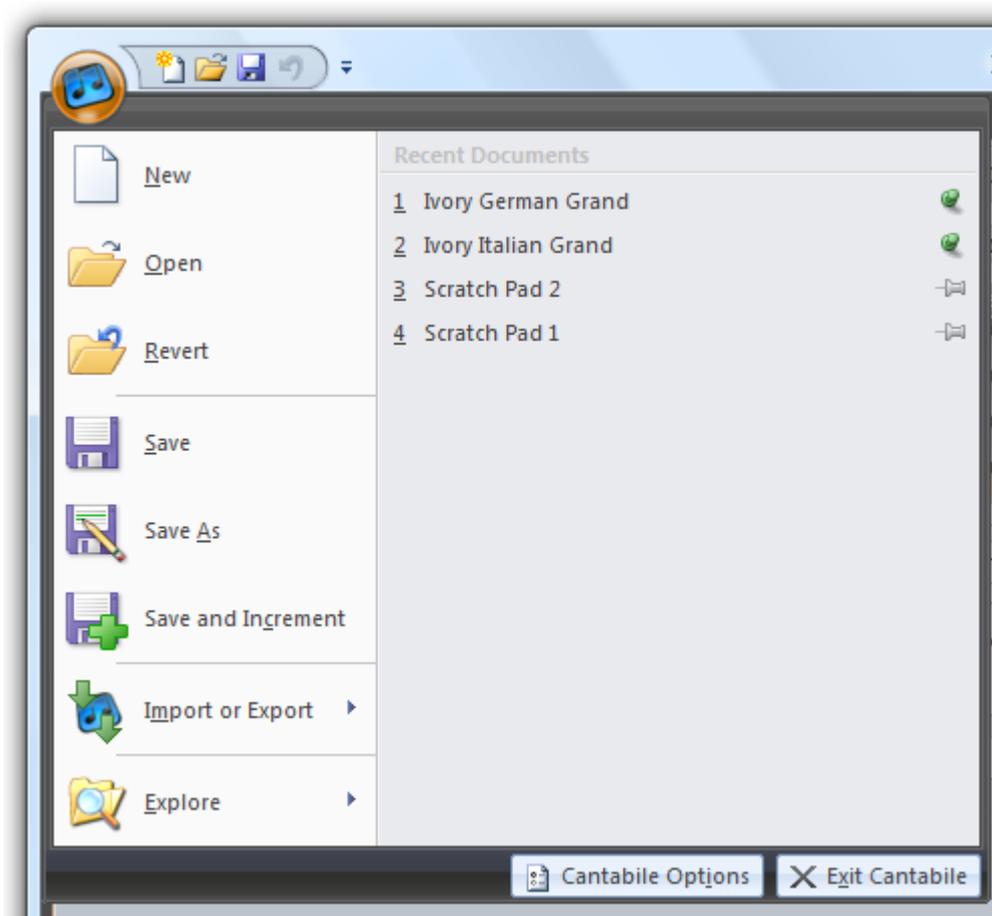
The Application Menu

The following commands are available for working with session files:

New	Creates a new session file.
Open	Opens an existing session file.
Revert	Discards all changes to the current session and reloads it.
Save	Saves the current session.
Save As	Saves the current session under a new file name.
Save and Increment	Increments a counter in the current session's file name and saves the session. (See Incremental Saving below)

Sessions can also be loaded by:

- Selecting a recently used session from the list on the right side of the application menu.
- Double clicking the file in Windows Explorer.
- Using Set Lists.

Pinning Recently Uses Sessions

Normally when the recently used session file list fills up, sessions that haven't been loaded for some time get pushed off the bottom of the list. If you have a favourite session that you want to ensure always remains in the recent set list, you can pin it.

To pin or unpin a recently used file, simply click the pin icon to its right. You can also press the right arrow key while focus is on a list entry to move focus to the pin.

In the screen shot above notice that the first two entries have been pinned.

The Default Session

Cantabile supports setting the default state of new session files. To do this:

- Create a new session.
- Configure the session to the desired default state. For example, open the panels that you use most often, set your preferred speaker arrangement etc...
- In General Options, locate the **Default Session** section
- Click **Set**

The **Reset** button restores the default session to a completely empty session.

Incremental Saving

Incremental saving is where each successive time a file is saved a counter in the file name is increased and a new file created.

Cantabile supports two incremental save modes:

- Save then Increment or
- Increment then Save

The incremental save mode can be set in General Options.

Sub-Sessions

Cantabile Performer Only

Sub-sessions are named states within a session. Each sub-session stores various properties of each item in the session and can re-apply those settings when the sub-session is loaded.

Typical uses for sub-sessions include:

- Enable/bypass/load/unload different sets of plugins,
- Loading different presets into a plugin,
- Enabling and disabling MIDI routing entries, or triggers,
- Different tempo and transport synchronisation options.

A sub-session does not store a different set of items. For example every sub-session has the same set of plugins – it's just that some might be disabled in one sub-session, enabled in another and have a different preset loaded in another.

Working with Sub-Sessions

Sub-sessions can be managed through the **Sub Sessions** popup on the main window:
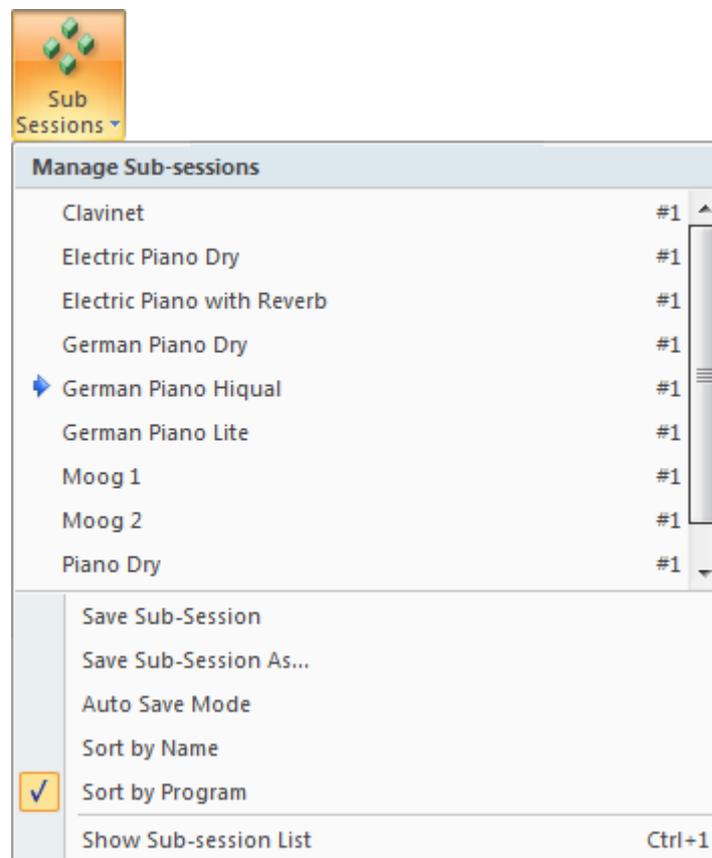
Sub-session Commands

To create a new sub-session:

- Configure the session to a particular state that you would like to be able to recall.
- From the **Sub-Sessions** drop down select **Save Sub-Session As...**
- Enter a name for the sub-session and optionally enter a MIDI program number to be used for loading this sub-session.
- Press **OK**

A sub-session can be loaded in a number of ways:

- Select it from the list in the sub-session drop-down menu,
- Double click it in The Sub-Session Dock Panel,
- Use MIDI Controller Assignments.
- Use Set Lists.

To update a previously saved sub-session:

- Load the sub-session to be updated
- Make the required changes
- Use the **Save Sub-session** command to update it.

Sub-sessions can also be automatically updated by enabling the **Auto Save Mode** in the sub-session drop down menu. When auto save is enabled, changes to sub-sessions are automatically saved to the loaded sub-session when a new sub-session is loaded.

The active sub-session is indicated by a blue arrow next to its name and is also displayed in the Cantabile's main window title bar.

The Sub-Session Dock Panel

Sub-sessions can also be managed through the sub-session dock panel.

To show the dock panel, press **Ctrl+1** or select the **Show Sub-Session List** command.
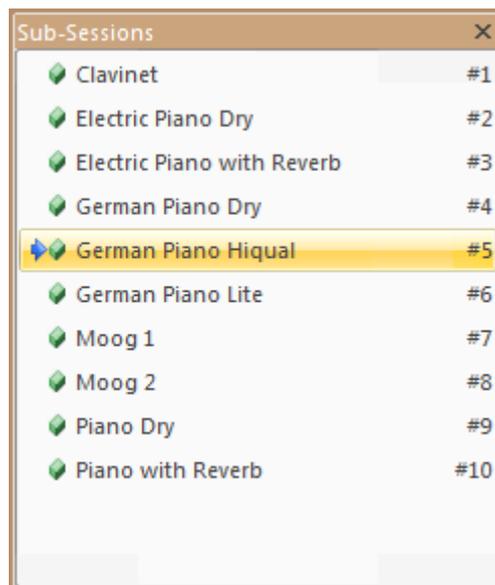
The Sub-session Dock Panel List

The sub-session list shows all sub-sessions and provides the following commands in the right-click context menu:

Load	Loads the selected sub-session
Delete	Deletes the selected sub-session
Rename	Allows renaming the sub-session
Set Program Number	Displays a window where a new program number for the sub-session can be entered.

Increment/Decrement Program Number	Provides a quick way to adjust the program number of a sub-session by 1. Even quicker is to use the **N** and **P** keys.
Sort by Name	Sorts the sub-session list alphabetically by name.
Sort by Program	Sorts the sub-session list numerically by program number.

The sub-session list doesn't have a concept of sequence or performance order. To define the order in which sub-sessions should be loaded use Set Lists.

Sub-session Item Behaviour

Often you will want to control which attributes of an item are to be controlled by sub-sessions.

To control which attributes are controlled by sub-sessions, use Sub-Session Behaviour settings.

The right click context menu of most sub-session controllable items has a sub-menu **Sub-session Behaviour**. In this sub-menu you can select which attributes of the item will be affected by sub-sessions.
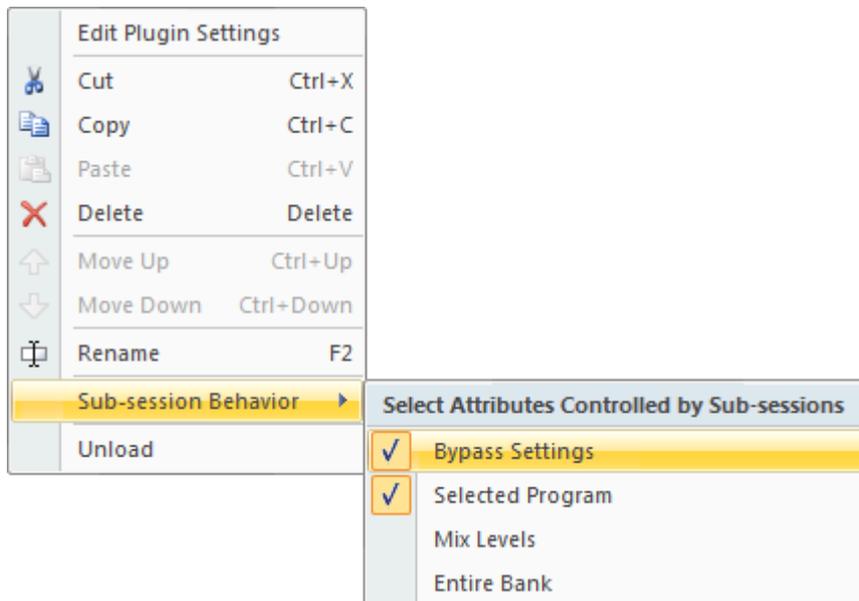
Controlling the Sub-session behaviour of a plugin

In the above screen shot, the plugin's bypass settings and selected program will be controlled by sub-sessions where as its mix levels and the entire saved bank state will not.

Note that in general all attributes are saved with a sub-session but only selected attributes are reapplied when the sub-session is loaded. The one exception to this is the **Entire Bank** attribute for plugins. Since this has the potential of using large amounts of memory, this attribute must be selected at the time the sub-session is saved in order for it to work.

Controllable Attributes

The following describes the attributes that can be controlled by sub-sessions:

Plugin

- Bypass, Suspend and Loaded State

- Selected Program
- Mix Levels
- Entire Bank

Rack

- Bypass Setting
- Input Connect Setting
- Mix Levels
- MIDI Source and Channel
- Keyboard Range
- Transpose
- Partial Send 1 Amount
- Partial Send 2 Amount

Metronome

- Time Signature
- Tempo
- Master Flag

Media Players

- Master Flag
- Loaded Flag

MIDI Routing Entry

- Enabled State

Trigger

- Enabled State

Set Lists

A set list is a set of previously saved session files that provides a convenient way to group and order songs for a particular performance. Each entry in a set list typically represents a song in a performance and defines the session and sub-session to be used.

Commands are available to load the first, next and previous songs. These commands can be invoked through Cantabile's user interface or by [MIDI Controller Assignments](#).

Set Lists are saved in files with ".cantabilelist" file extension.

Note for users of Cantabile 1.2: Set lists replace and enhance the functionality provided by Quick Sessions.

Creating and Editing Set Lists

Set lists are edited is a separate popup window:
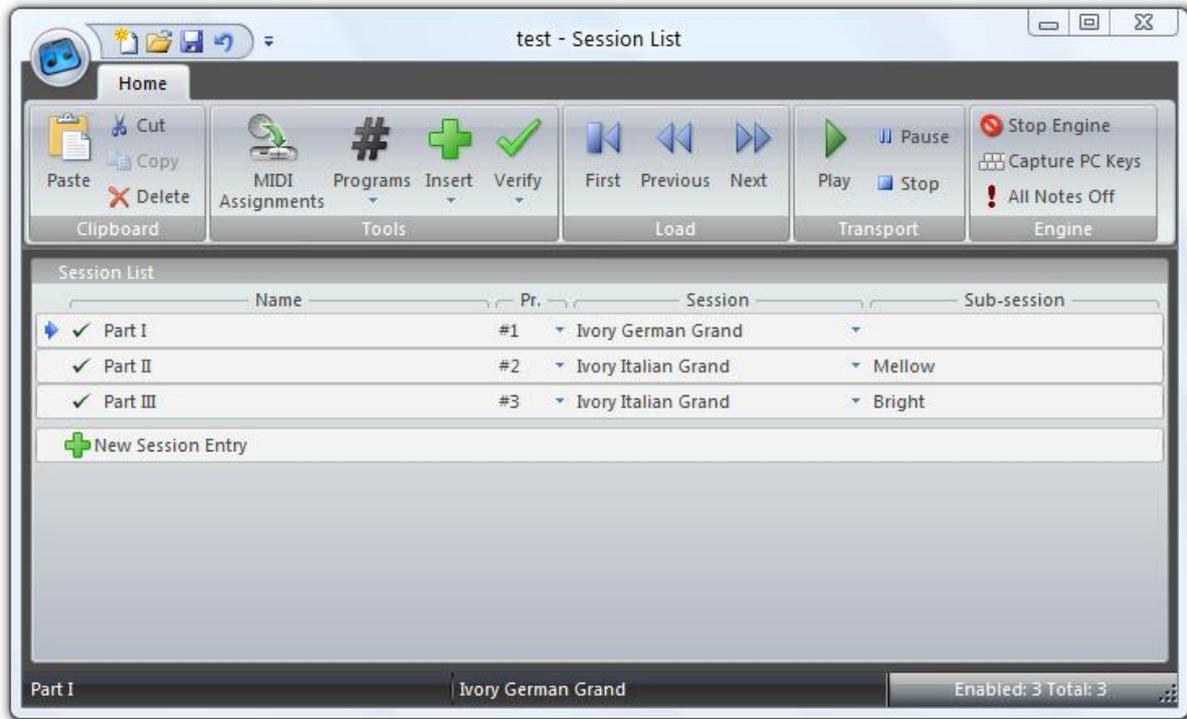
The Set List Editor

Using the set list editor is similar to using Cantabile's main window and has the same commands for opening, saving and creating new set lists.

Each set list entry (ie: song) has the following settings:

Last Loaded Song	The last loaded song is indicated by a right pointing blue arrow.
	Clicking this button causes the entry to be loaded.
Enabled Checkmark	When checked the song is marked as enabled.
	Disabled songs are skipped when using the load first, load next and load previous commands.
	Disabled songs are useful say you've decided not to perform a particular piece but you want to leave the entries for use at a later date.
	You can manually load disabled songs by clicking the Last Loaded Indicator for that entry.
Name	A descriptive name for the song. Typically the name of a song to be performed or some other information useful to the performer.
Program Number	By giving a song a program number you can load that entry using a MIDI program change event (requires configuring an assignment [MIDI Controller Assignments](#))
Session	The session file to load for this song
Sub-session *	The sub-session to load for this song

* Cantabile Performer Only

Note that in Cantabile Performer, each song can use a different session file, a single session file with different sub-sessions, or a combination of both. Loading a song that uses the same session file as the currently loaded song will simply trigger a sub-session switch allowing for fast song loading.

Set List Commands

In the set list ribbon you'll find these other useful commands for working with set lists:

Programs – Reassign All	Reassigns the program number of all songs, starting at 1
Programs – Reassign All (Skip disabled)	Same as above except skips disabled songs
Programs – Auto Reassign Mode	When enabled, causes program numbers to be automatically re-assigned whenever the list is changed. Will skip disabled songs if that command was the last reassign command used.
Programs →Resort by Program Number	Resorts the entire set list by program number.
Insert →New Blank Slot	Inserts a new song entry before the currently selected song.
Insert →Current Session/Sub-session	Inserts the currently loaded session into the set list.
Insert →All sub-session from current session	Inserts all sub-sessions from the currently loaded session into the set list.
Verify →Find Missing	Locates songs that specify a session or sub-session that can't be found.
Verify →Delete Missing	Deletes songs that specify a session or sub-session that can't be found.
Verify →Disable Missing	Disables all songs that specify a session or sub-session that can't be found and enables all other entries.
Verify →Disable All	Disables all songs.
Verify →Enable All	Enables all songs.

Set List Dock Panel

In addition to the set list editor window, the set list is also available through the set list drop down menu on the **Home** tab and in the set list dock panel.

To show the set list dock panel, from the set list drop down select **Show Set List**.

The set list dock panel can only be used for selecting songs from a set list – use the set list editor window to make changes to the set list.

Delayed Session Loading

Delayed session loading is a feature where instead of instantly loading the next or previous session, Cantabile displays a small window indicating the name of the session that is about to be loaded. If no further load next/previous commands are received in the next 2 seconds, the session is loaded.

The purpose of delayed loading is to allow fast navigation through a list of sessions without having to wait for each to load as the next button is repeatedly pressed. With delayed session loading you can continuously press next/previous until you find the session you want then have it load.

For the next/previous commands on Cantabile's toolbars, delayed loading is the default, but can disabled by a setting in Set Lists Options.

For MIDI controller assignments to these commands, there are two sets of assignments available - one delayed and one instant.

Chapter 7 - Session Management

8 Working with Audio

Audio Channel Assignments

The audio channels dialog displays a list of channel assignments between the output pins of one object and the input pins of another. Each assignment is referred to as an audio channel.

- To assign audio channels for a plugin select **Audio Channels** from the plugin's **Tools** drop down.
- To assign audio channels for an audio media file, select **Audio Channels** from the media file's **Tools** drop down.
- To assign audio channels for the audio driver, in Audio Engine Options click **Assign Audio Channels.**
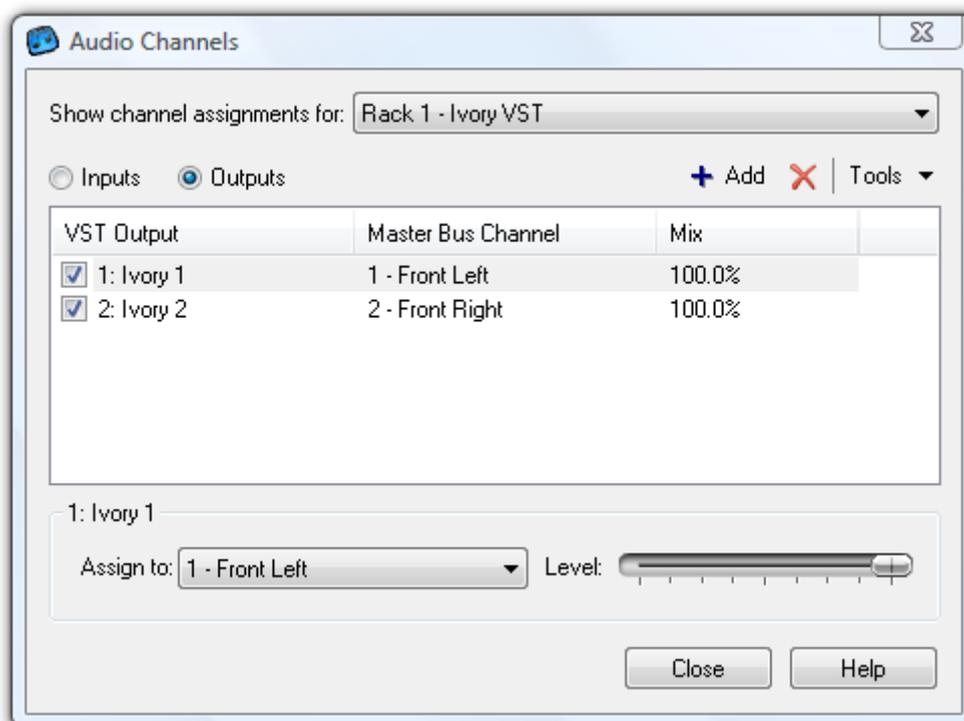
Assigning Audio Channels

The following settings are available:

Show channel assignments for	Display a list of all objects that support audio channel assignments. Select the object that you want to edit.
Inputs/Outputs	Select whether you want to edit the input assignments or output assignments of the object. For example an audio effect plugin supports audio channel assignments from the master bus to the plugin's inputs and from the plugins outputs back to the master bus.
Source Pin Column	Displays a list of all inputs or outputs of the object being edited. Items with a check mark are connected. (shown as VST Output in above screen shot)
Target Pin Column	Displays what this channel is connected to, or blank if not connected. (shown as Master Bus Channel in above screen shot)
Mix Column	Shows by how much this channel is attenuated
Assign To Combo Box	Changes the target pin of the selected channel.
Level	Changes the attenuation level of this pin.
Add Button	Creates a new audio channel for the selected source pin. For example to assign a second channel from a plugin's output pin, select the output pin and click the Add button. A new row will be created that allows defining a second channel.
Delete Button	Deletes the currently selected audio channel assignment.
Tools →Connect All Command	Connects all source pins to all target pins in order.
Tools →Disconnect All Command	Deletes all audio channel assignments.
Tools →Swap Stereo Perspective	Swaps all audio channel assignments from left to right (may not work with some custom speaker arrangements).

Master Bus Configuration

The Master Bus Configuration defines the format of the master audio bus including the number and type of audio channels, 32 vs 64 bit audio and panning laws.
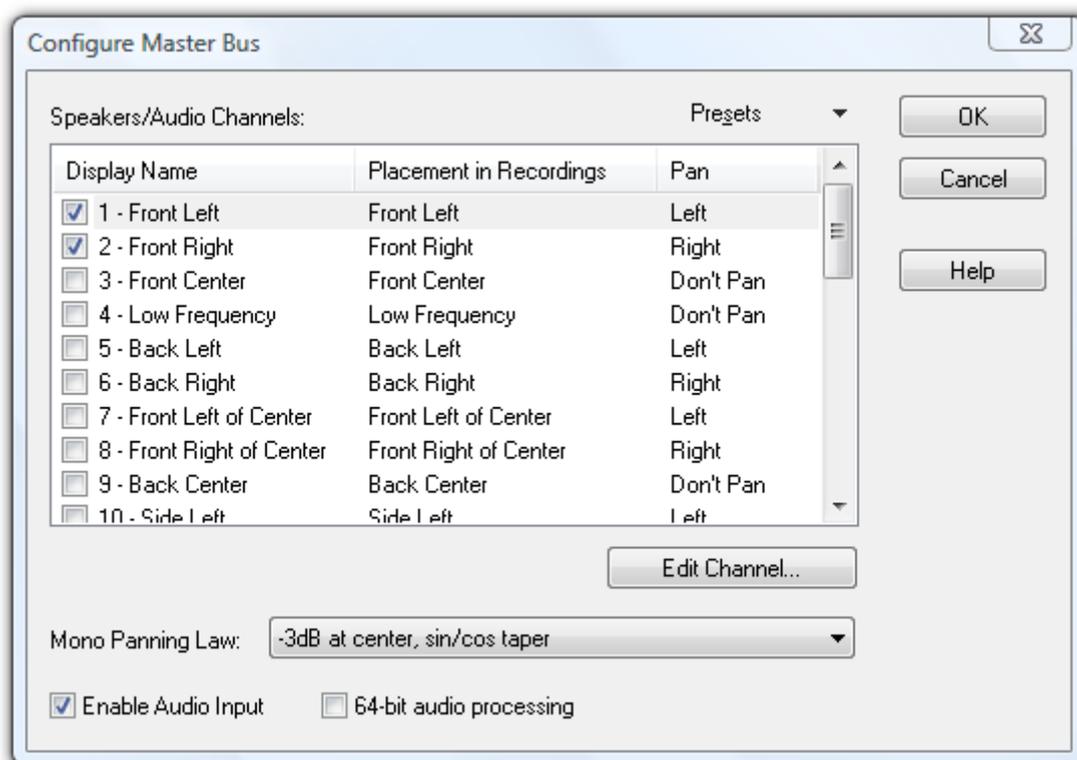
Master Bus Configuration

The master bus configuration saved with a session file.

Editing the Master Bus Configuration

To display Configure Master Bus dialog from the **Setup** toolbar, select **Configure Master Bus**.

The following settings are available:

Presets	Displays a drop down list of predefined speaker arrangements.
Channel List	The channel list displays information about the currently configured audio channels.
Display Name Column	The display name for the channel. The check box is used to enable or disable the channel.
Placement in Recordings Column	Displays how this channel should be identified in wave file recordings, unplaced if this channel doesn't represent a specific speaker, or unrecorded for auxiliary channels that shouldn't be recorded.
Pan Column	Displays how this channel is affected by panning.
Edit Channel Button	Displays settings for the selected audio channel.
Mono Panning Law	Controls how mono plugins are panned. Stereo and multi-channel plugins use a left/right balance rather than a panning law.
Enable Audio Input	Some session files don't require audio input from the sound card. You can save some processing overhead by disabling audio input.
64-bit Audio Processing	Select this option to enable 64 Bit Audio processing.

Standard Speaker Arrangements

Cantabile included pre-defined presets for severl standard speaker arrangements. To use a standard speaker arrangement:

1. Click the **Presets** drop down at the top right of the channel list.
2. Select the speaker arrangement you want to use.

Custom Speaker Arrangements

In addition to standard speaker arrangements, you can define your own speaker arrangements:

1. Configure the speaker arrangement by selecting appropriate channels and configuring them by pressing the **Edit Channel** button
2. Select **Save** from the **Preset** drop down menu
3. Enter a name for the preset
4. Press **OK**

To delete an unwanted speaker arrangement:

1. Load the custom preset using the Presets drop down menu.
2. Select Delete from the Presets drop down menu.

Presets are saved in Cantabile's global settings however each session file that uses a preset also saves a copy of the preset definition.

64 Bit Audio

Cantabile supports 64-bit audio processing which is a higher precision sound format. Enable enable 64-bit audio, select the option in Master Bus Configuration.

Please note that plugins only support 32 bit processing which negates any benefit in using 64-bit audio.

To save unnecessary processing overhead, this option should only be selected when using plugins that support 64-bit audio. When selected, plugins that only support 32-bit audio will be marked with an asterisk next to the plugin's name on Cantabile's main window.

64-bit audio is not to be confused with the x64 edition of Cantabile. Cantabile x64 is a different build of Cantabile to be used on 64-bit operating systems such as Vista x64 and requires x64 compatible plugins. In contrast, 64-bit audio is a different sound representation format and is supported in both the x86 and x64 versions of Cantabile.

9 Working with MIDI

Keyboard Splits and Transposition

Cantabile Performer and Solo Only

This section describes several ways of creating keyboard splits and transposing notes. A keyboard split is where one section of the keyboard plays one instrument, while another section plays a different instrument.

In Cantabile there are various ways of doing this.

Rack Split and Transpose

The Rack Split and Transpose settings are the quickest and easiest ways of creating keyboard splits.

Each rack has the following settings that can be used to create splits and transpose notes:

Keyboard Range	Specifies a range of notes that will be accepted by the rack. All notes outside this range are discarded.
Transpose Amount	Specifies how much to transpose all incoming notes and is applied after the keyboard range is checked. Notes that are transposed outside the range 0-127 are discarded. The transpose amount is indicated in the form <octaves>.<semitones>. For example +1.2 means transpose up 1 octave and 2 semitones.

Both of these settings are applied before the rack's MIDI Filters.

Unlike other methods for setting up keyboard splits and transposition, these settings are controllable by Sub-Sessions. This allows individual racks to each have different settings for each sub-session.

These settings also intelligently handle being changed while notes are being played so as to prevent stuck notes.

For example, if the transpose setting is changed while a note is held, the off event for that note will automatically have the old transpose setting applied (thus preventing the note from becoming stuck).

The same principle applies for changing keyboard ranges. If the keyboard range is changed while a note is being played, the off event for that note is still accepted even if the new range would normally cause it to be discarded.
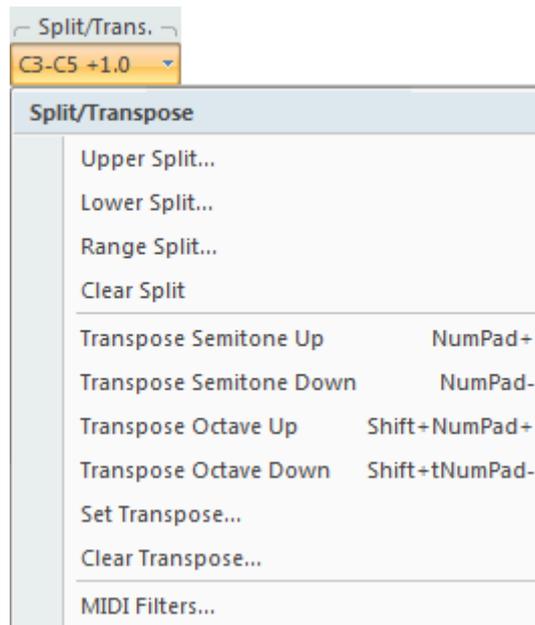
Rack Split/Transpose Dropdown

The following commands are available from the Split/Transpose dropdown:

Upper Split	Creates a keyboard split so that this rack only accepts notes from the upper part of the keyboard.
	After selecting this command you will be prompted to play the first (lowest) note of the keyboard range.
Lower Split	Creates a keyboard split so that this rack only accepts notes from the lower part of the keyboard.
	After selecting this command you will be prompted to play the last (highest) note of the keyboard range.
Range Split	Creates a keyboard split covering an arbitrary range of the keyboard.
	After selecting this command you will be prompted to play the note at each end of the desired range.
Clear Split	Clears an existing keyboard split, resetting to accept the entire keyboard.
Learn Transpose	Sets the transpose setting by learning from played notes.
	After selecting this command you will be prompted to play two notes and the interval will be calculated and set.
Set Transpose	Displays a window where a new transpose setting can be manually entered. This method also allows updating all other racks with the same old setting to the same new setting.
Clear Transpose	Clears the transpose setting.
MIDI Filters	Displays the [MIDI Filters](#) for this rack.

Using MIDI Filters

To create a keyboard split using MIDI filters:

1. Load the instruments you want to play into two different racks (say Rack 1 and Rack2)

2. Give each rack a different MIDI channel number. Eg: Rack 1 = Channel 1, Rack 2 = Channel 2
3. Open MIDI Filters
4. In the combo box at the top of the window, choose the point in the MIDI processing path where you'd like the split to be made. Typically you would choose **Session Input** to have the split apply to just the current session.
5. Click the **Add** drop down button and select the Keyboard Split MIDI filter item.
6. For the **Split Point** setting, enter the first note of the upper range.
7. Specify the MIDI channel for the upper and lower halves and optional and transpose amount.

Using the MIDI Routing Table:

To create keyboard splits using the MIDI routing table:

1. Load each instrument into a different rack, but in this case it is not necessary to specify channel numbers.
2. In the MIDI Routing Table create a new routing entry.
3. Select the source device (or just select **Any**) and optionally the source channel.
4. Click the conditions drop down and select **Conditions**.
5. Specify an upper and lower keyboard range for the instrument.
6. Press **OK** to close the conditions window.
7. For the MIDI routing's target setting, select the rack the first instrument.
8. Create another similar routing entry for the second and subsequent instruments.

MIDI Filters

MIDI filters are simple translations that can be applied to incoming or outgoing MIDI events.
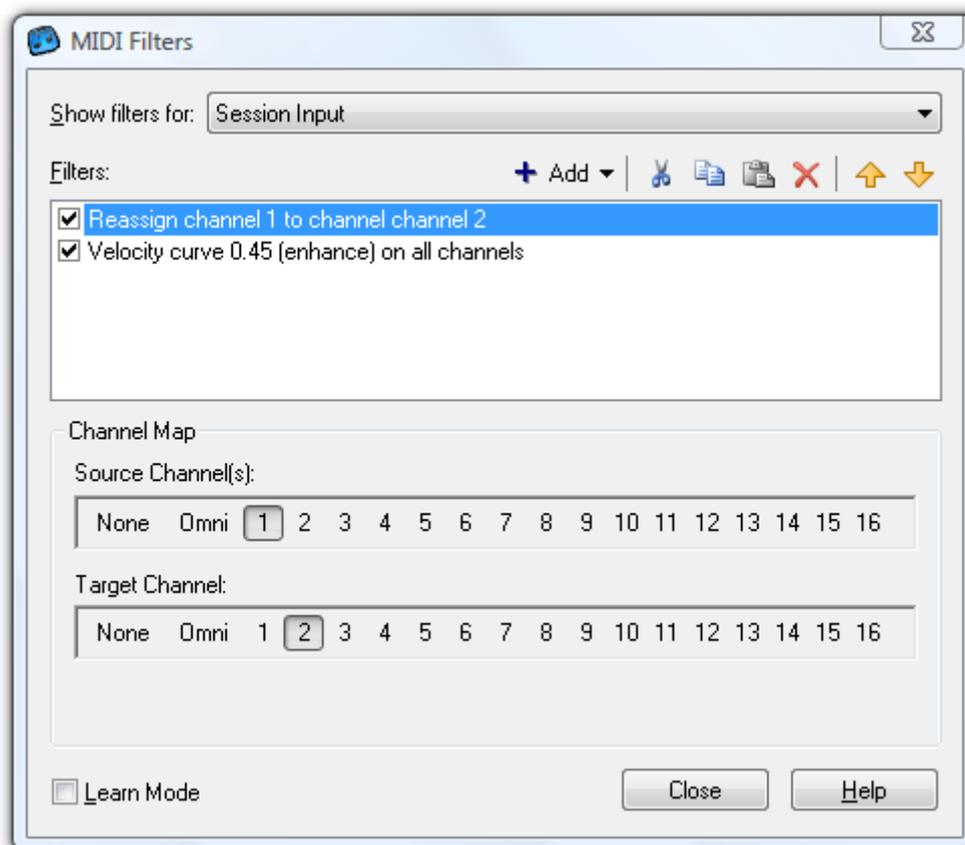
MIDI Filters

MIDI filters can be applied at various points in Cantabile's MIDI processing:

- MIDI input ports
- MIDI output ports
- Global Input
- Session Input
- Input to a rack
- Input to a plugin
- On a MIDI routing entry

Filters for MIDI input and output ports and the Global Input filters are saved in the registry and therefore apply to all sessions.

Other MIDI filters are saved in session files and apply only to that session.

MIDI Filter Items

Each MIDI filter consists of a series of filter items, each of which applies a specific type of manipulation. Each filter can contain as many filter items as you need.

Cantabile processes MIDI filters items in the order they are displayed in the MIDI filter editor.

Filter items are available to perform the following translations:

Channel Map	Assigns all MIDI events from one or more MIDI channels to one or more other channels.
Channel Select	Selects MIDI events from one or more channels and suppresses all other events.
Controller Map	Assigns all MIDI events for one MIDI controller to another.
Controller Latch	Transforms an incoming MIDI controller button press to a sequencer of controller values.
Controller to Program Map	Maps a MIDI controller event to a MIDI program change event. Can also map CC button presses to next/previous program.
Transpose	Transposes a range of notes up or down by a specified interval, and optionally change the channel of those notes.
Velocity Curve	Manipulates the velocity values of note on, off and after-touch events.
Velocity Gate	Allows rejecting notes outside a velocity range or remapping notes within a velocity range.
Pitch Based Velocity Ramp	Adjust the velocity of notes according to their pitch. Useful for adjusting instruments that get too loud or too quite at one end of the keyboard.
VST Parameter	Assigns a MIDI controller to a parameter of a VST plugin. (This filter is many included for compatibility and MIDI Controller Assignments should now be used).
Note to Controller	Emulates a MIDI controller using note events.
Keyboard Split	Performs a keyboard split, changing all notes below the split point to one MIDI channel and notes above to another channel. Can also perform separate transpositions for the upper and lower keyboard ranges.
Keyboard Range	Allows rejecting notes outside a keyboard range, or remapping notes within a keyboard range.
Suppress Events	Suppress one or more MIDI event types
Button Bank	Generates MIDI controller, program change or NRPN/RPN events using two banks of push button controllers.

Editing MIDI Filters

To create or edit MIDI filters:

- From the **Setup** tab, select **MIDI Filters**.
- From the **Show Filters For** drop down, select the MIDI port or plugin that you want to edit the filter for.
- To create a new filter item click the **Add** button (or press the **Insert** key) and select the type of filter to be added.
- To delete a filter item, select the item to be deleted and press the **Delete** key.
- The top half of the dialog shows plain English descriptions of what each MIDI filter will do.

- The bottom half of the dialog shows the settings for the currently selected filter item.
- When you've finished editing the filter, press **Close** to dismiss the dialog.

Other tips for editing filters:

- You can use the clipboard functions (cut/copy/paste) to move or duplicate items.
- The up/down arrows on the tool bar can be used to quickly re-order items.
- You can select multiple items at once for clipboard, delete and re-order operations.
- Filter items can be enabled and disabled by clicking the check mark next to it in the list.
- You don't need to close the filter dialog to test the changes made. Changes are applied in real-time for easy testing.

Using Learn Mode

To simplify setting up filters, Cantabile supports Learn Mode where it can setup properties of a filter item to match incoming MIDI events. To use Learn Mode:

- Select the filter item to be edited.
- Select the **Learn Mode** check box.
- Select the property to be learnt.
- Move the controller or play the note whose property is to be set.
- The property will be updated to match the most recent MIDI event.

Learn mode can be used to set:

- The channel mask (Apply to Channels)
- Key range (note) properties
- Controller numbers
- Controller values
- VST parameter numbers (by moving the parameter in the VST's editor)

Channel Map

The Channel Map filter item assigns all MIDI events from one or more MIDI channels to one or more other channels. It supports the following settings:

Source Channels	The channel or channels to be remapped.
Target Channels	The new channel or channels.

Note: you can select multiple channels by holding the Control key while clicking the channel numbers.

Channel Select

The channel select item is a simple way to filter out all MIDI events except those on one (or more) channels.   It supports the following settings:

Source Channel(s)	The channel or channels to be selected

Note: you can select multiple source channels by holding the Control key while clicking the channel numbers.

Controller Map

The Controller Map filter item assigns all MIDI events for one MIDI controller to another MIDI controller. It supports the following settings:

Apply to Channels	The MIDI channels this filter should be applied to.
Source Controller	The controller to be reassigned.
Target Controller	The new controller.

Controller Latch

Transforms an incoming MIDI controller button or pedal press to a sequencer of controller values.

Apply to Channels	The MIDI channels this filter should be applied to.
Source Controller	The controller number of the source button/pedal.
Target Controller	The controller number of events generated by this filter. Can be the same as the source controller.
Target Values	A sequence of controller values. On each press of the source controller button/pedal the next value in the sequencer will be generated as a new controller event.

This filter is intended for cycling through VST parameters that have discrete values rather than continuous controller values. Eg: this could be used to assign a push button to toggle a VST parameter on/off.

Controller to Program Change

Maps a MIDI controller event to a MIDI program change event and/or maps controller button presses to next/previous program.

Apply to Channels	The MIDI channels this filter should be applied to.
Select Program Controller	The controller number to be mapped directly to a MIDI program change. The controller's value becomes the program number sent.
Next Program Controller	The controller number of a button to select the next program.
Previous Program Controller	The controller number of a button to select the previous program.
New Channel	New channel number for the generated program change events.
Copy Event	When cleared, incoming matching controller events are suppressed and new program change events generated.
	When cleared, the incoming controller events are passed through unaltered while still generating program change events.

Transpose

The Transpose filter item transposes a range of notes up or down by a specified interval, and optionally changes the channel of those notes. It supports the following settings:

Apply to Channels	The MIDI channels this filter should be applied to.
Key Range	The range of notes to be transposed.
Transpose	The interval to transpose notes by.
Change Channel	Optional setting to also change the MIDI channel number of transposed notes.

Notes outside the specified key range are not transposed, nor is their channel changed.

The ability to change channel is useful for creating keyboard splits, although this is now better covered by the new [Keyboard Split](#) filter item.

Velocity Curve

The Velocity Curve filter item manipulates the velocity values of note on, off and aftertouch events. It supports the following settings:

Apply to Channels	The MIDI channels this filter should be applied to.
Minimum Input Value	The input value that should be mapped to the minimum output value.
Maximum Input Value	The input value that should be mapped to the maximum output value.
Minimum Output Value	The minimum output value
Maximum Output Value	The maximum output value
Curve	Controls the shape of the translation curve
Expand/Compress	Uses a curve that either increases or decreases all note velocities.
Enhance	Uses a curve that enhances the response of the keyboard.

The graph can be used to visualize the type of translation being applied to note velocities. The X-Axis represents the input values, the Y-Axis represents the output values.

Velocity Gate

The velocity gate filter can be used to remap notes according to their velocity. This can be used for example to play one instrument with soft notes and another with loud notes.

The keyboard range filter can be used to either remap notes to a new MIDI channel, or to simply suppress notes outside the specified velocity range.

Apply to Channels	The MIDI channels this filter should be applied to.
Velocity Range	Specifies the velocity range to remap.
New Channel	Specifies a new channel number for all notes matching the specified keyboard range.
Velocity Delta	Specifies how much to adjust the velocity of remapped notes by.
Notes Only	When selected, only remaps note events.
	When cleared, all other events are also remapped.
Suppress out of range notes	When selected all notes outside the specified velocity range are suppressed.
	When cleared, notes outside the specified velocity range are passed through the filter unaltered.
Passthrough Original Events	When cleared, notes that are remapped are modified and subsequent filter items only see the modified event.
	When selected, notes that are remapped generate a new event and the original event is passed to the next filter item unaltered.

Keyboard Range

The keyboard range filter is similar to the keyboard split filter except instead of creating a single split above/below one point on the keyboard it allows an arbitrary range on the keyboard to be selected.

The keyboard range filter can be used to either remap a range of the keyboard to a new MIDI channel, or to simply suppress notes outside the specified range.

Apply to Channels	The MIDI channels this filter should be applied to.
Key Range	Specifies the first and last note in the range.
New Channel	Specifies a new channel number for all notes matching the specified keyboard range.
Transpose	The interval to transpose notes in the keyboard range by.
Notes Only	When selected, only remaps note events.
	When cleared, all other events are also remapped.
Suppress out of range notes	When selected all notes outside the specified range are suppressed.
	When cleared, notes outside the specified range are passed through the filter unaltered.
Passthrough Original Events	When cleared, notes that are remapped are modified and subsequent filter items only see the modified event.
	When selected, notes that are remapped generate a new event and the original event is passed to the next filter item unaltered.

VST Parameter

The VST Parameter filter item assigns a MIDI controller to a parameter of a VST plugin. It supports the following settings:

Apply to Channels	The MIDI channels this filter should be applied to.
Source Controller	The MIDI controller to be used to control the parameter
Range (Source)	Range of values for the source controller. Values outside this range will be clamped to the specified range.
Target Parameter	The parameter of the VST plugin to be manipulated by the MIDI controller.
Range (Target)	Range of parameter values for the target parameter.

Keyboard Split

The keyboard split item splits incoming MIDI events into two separate MIDI channels. Is supports the following settings:

Apply to Channels	The MIDI channels this filter should be applied to.
Split Point	The first note of the upper keyboard range.
Notes Only	When selected, only MIDI note events are routed.
	When cleared (the default), MIDI controllers and other events are duplicated and send to both target channels.

Lower Channel	The new channel for notes below the split point.
Upper Channel	The new channel for notes above the split point.
Lower Transpose	The interval to transpose notes in the lower range by.
Upper Transpose	The interval to transpose notes in the upper range by.

Pitch Based Velocity Ramp

The Pitch Based Velocity Ramp adjusts the velocity of notes according to their pitch.

This filter is useful for adjusting instruments that get too loud or too quite at different parts of the keyboard.

Apply to Channels	The MIDI channels this filter should be applied to.
Key Range	Specifies the first and last note of the range of notes whose velocities are to be adjusted
Adjust Velocity By	Specifies a percentage to adjust the velocity of notes by.
	The first value specifies the velocity adjustment at the low end of the key range.
	The second value specifies the velocity adjustment at the high end of the key range.
	Notes within the range will be adjusted by a percentage calculated by linearly interpolating these two values.
Also Adjust Notes Above/Below	Specifies whether notes outside the specified key range should be adjusted or left.
	When selected notes below the keyboard range are scaled by the low velocity adjustment and similarly for notes above the keyboard range.
	These options are useful if you want to create a sequence of pitched velocity ramps for different key ranges.

Note to Controller Assignment

The Note to Controller Assignment filter item emulates a MIDI controller using note events.

This filter can emulate either a single variable controller - where a range of notes represents the value of the controller, or a set of button controllers - where each note represents one controller in a series of on/off controllers.

It supports the following settings:

Apply to Channels	The MIDI channels this filter should be applied to.
Emulation Mode	Whether to emulate a single variable controller or a range of button controllers.
Condition	The number of a controller whose value must be pressed (>=64) for the emulation to take effect. (see explanation below).
Key Range	The range of notes used to emulate the controller or controllers.
Target Controller	The controller number to emulate.

Channel	The channel to send controller events on (or **Same** to use the same channel as the source note events).
Min Value (when emulating a variable controller)	The minimum value of the emulated controller - mapped to the lowest note in the key range
Max Value (when emulating a variable controller)	The maximum value of the emulated controller - mapped to the highest note in the key range.
Released (when emulating button controllers)	The value of the controller when the note is released - typically 0.
Pressed (when emulating button controllers)	The value of the controller when the note is pressed - typically 127.

The condition controller can be used to enable/disable controller emulation using another controller.

For example you might define a range of notes to act as a series on/off buttons but only want them to take effect when a real MIDI controller button is pressed, or a pedal maybe. To do this, set the **Condition** property to the controller number of the button/pedal that enables the emulation. The condition controller must take on a value of 64 or greater when pressed for this feature to work.

Suppress Events

The suppress events item can be used to suppress certain MIDI event types.

It supports the following settings:

Apply to Channels	The MIDI channels this filter should be applied to.
Notes	When selected, all note on/off events are suppressed.
Aftertouch	Suppresses aftertouch events.
Program Change	Suppresses program change.
Channel Pressure	Suppresses channel pressure events.
Pitch Bend	Suppressed pitch bend events.
Controllers	Suppresses one or more controllers. Multiple controllers can be specified eg: 1,2,10-30,45

Button Bank

The Button Bank item allows mapping two ranges of button controllers onto some other MIDI event.

Say you have two banks of button controllers that you'd like to translate to say a program change event. The button bank controller allows this by combining the button presses from one bank with the button presses from the other (using configurable add/multipliers operations) then sends the desired event.

It supports the following settings:

Apply to Channels	The MIDI channels this filter should be applied to.
Bank A Controllers	The range of button controllers for bank A
Bank A Base	Base value for bank A
Bank A Multiplier	Multiplier for bank A

Bank B Controllers	The range of button controllers for bank B
Bank B Base	Base value for bank B
Bank B Multiplier	Multiplier for bank B
Send Event	The event to send. Choose from • Bank Select + Program Change, • Program Change • Bank Select • Controller • Registered Parameter (Coarse) • Registered Parameter (Fine) • Non-registered Parameter (Coarse) • Non-registered Parameter (Find)
Controller	Specifies the controller or RPN/NRPN parameter number to send.

For example, assume you have 20 MIDI push buttons - the first set of 10 on MIDI controllers 80-89 and the second set on controllers 90-99. When you press a button in bank A, the filter simply remembers which one you pressed. When you press a button in bank B, the filter generates a program change event. The program number it generates is calculated by this formula:

```
(IndexOfButtonA + BankABase) * BankAMultiplier +
  (IndexOfButtonB + BankBBase) * BankBMultipler
```

So say you pressed button 81 then button 93 that would be:

```
(1 + 0) * 10 + (3 + 0) * 1 = 13
```

In other words, you're using bank A as the tens column, bank B as the units and you've got a really quick way to access 100 program changes from 20 buttons.

Other notes:

- Each bank is optional so you can use it for a single button bank
- If the controller range for a bank only has a single controller, it uses the controller value rather than its index. This allows other manipulations of controllers to be created.
- It's not limited to generating program changes - it can also generate Bank Select+Program Change, Program Change, Bank Select, another Controller, and coarse or fine RPN and NRPN events.
- The button controllers don't need to be in order. eg: 10-14,20,8 is a valid definition for 7 buttons.

MIDI Controller Assignments

MIDI Controller Assignments allow controlling VST parameters and most Cantabile settings using an external MIDI controller. Assignments can be made for controller change events, program change events, note events and RPN/NRPN events.

To edit controller assignments, select **MIDI Assignments** from the **Setup** ribbon tab.
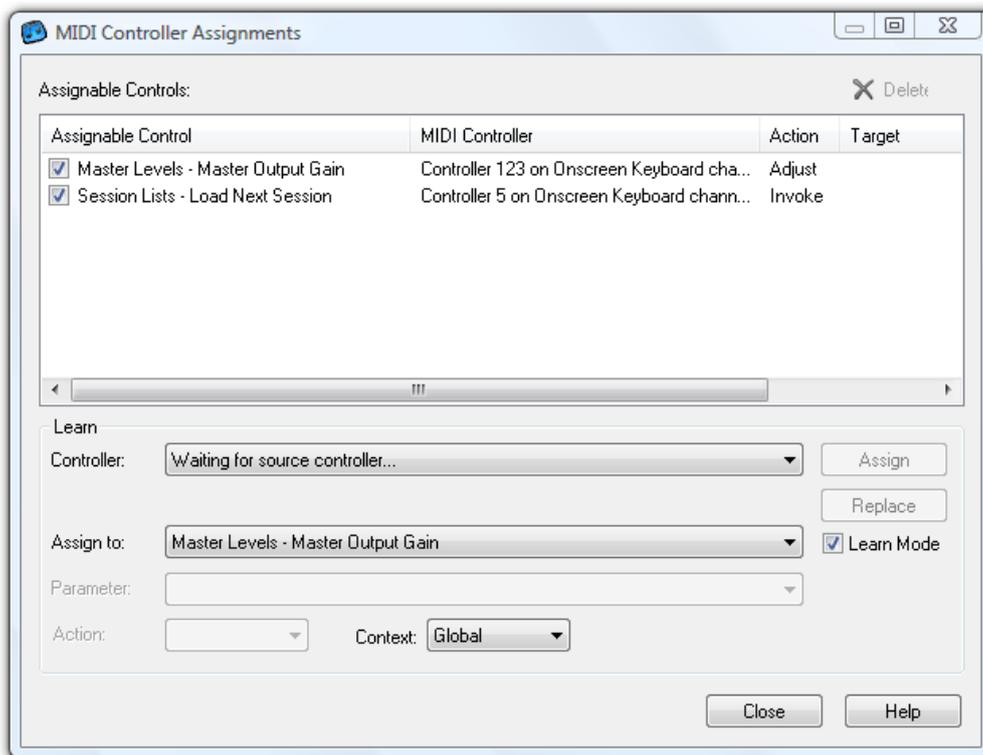
MIDI Controller Assignments

Session vs Global Assignments

Controller assignments fall into one of two categories:

- Global assignments are saved globally and apply to all sessions.
- Session assignments are saved in a session file and apply only to that session.

Some assignable items only make sense as session assignments (eg: assignments to a plugin), where as other assignments can be created either globally or at the session level (eg: master gain level). When an assignment can be created at either level, the **Context** drop down will become enabled and allow choosing the type of assignment.

On/Off/Toggle and Latch Actions Items

Assignable items that are on/off items can be controlled in one of four ways depending on the type of external MIDI device. Typically these are physical buttons.

When assigning buttons to these items a combo box will appear where you can select the action to take when the button is pressed.

On	When the MIDI controller is pressed the item is turned on.
Off	When the MIDI controller is pressed the item is turned off.
Toggle	When pressed the item is toggle on/off.
Latch	When pressed the item is turned on, when released the item is turned off.

Most MIDI controllers allow buttons to be configured to work in latch mode or momentary action (ie: press on, release off) mode. Refer to the documentation of your controller for more information.

Rack and Plugin Controls

When assigning to a rack or plugin control a combo box will appear letting you select which rack or plugin to control - either a specific one or the active one.

Editing Controller Assignments

Creating an Assignment

To assign an external MIDI controller:

1. Select the item to be controlled from the **Assign To** drop down. Alternatively if learn mode is enabled, move the Cantabile or plugin control to be assigned to select it. eg: while the MIDI controller assignments dialog is displayed, switch back to Cantabile's main window and move the master output slider. On switching back to the controller assignments window, that item will be selected in the list.
2. Move the physical MIDI controller to be assigned. The name of the device and controller number should appear in the **Controller** drop down. Cantabile selects the most recent recognised event however you can select another event from this list.
3. If the controller is already assigned to something else, this information will be displayed.
4. When the desired assignment is displayed, press **Assign** to create the assignment, or **Replace** to replace an existing assignment.

Deleting an Assignment

To remove an unwanted controller assignment:

- Select the assignment in the list
- Press the **Delete** button in the top right corner of the window, or press the **Delete** key on your PC keyboard.

Learn Mode

Normally, moving a plugin parameter or assignable Cantabile control will cause that item to be selected in the list of assignable items.

This can be undesirable however when using plugins that constantly send parameter change events, causing the list to become unusable.

In this case, clear the **Learn Mode** check box to disable this behaviour. You will need to manually select items in the list in this case.

Temporarily Enabling and Disabling Assignments

Sometimes in can be convenient to temporarily disable a controller assignment. The check box in the list next to the name of the assignable item can be used for this purpose.
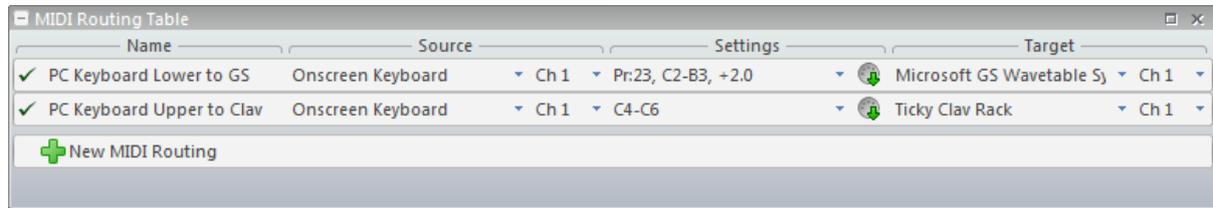

MIDI Routing Table

Cantabile Performer Only

The MIDI routing table let's you route MIDI events from a specific input device to a specific output device or rack.

MIDI Routine Table Panel

MIDI routings are edited using the MIDI routing table panel which is one of the expandable panels on Cantabile's main window. To use this panel, make sure it is visible and expanded (see [Main Panels](#))

MIDI Routing Table

Each entry in the MIDI routing table has the following settings:

Enabled Checkmark	Controls whether this routing is enabled or not.
Name	A descriptive name for the routing. This setting is optional but should be used to describe what the routing does.
Source Device	The source MIDI device to route from. Presently, only MIDI input ports and the on-screen keyboard are available.
Source Channel	Select which MIDI channel(s) this routing applies to.
Settings	Various settings including conditional program number, keyboard range and transpose.
Pass Through	Determines whether processing of MIDI events stops if routed by this entry. Normally when a MIDI event is routed, the processing of the event stops and no further entries are checked. When this option is selected, processing continues at the next routing entry regardless of whether this entry routed it.
Target Device	Select either a MIDI output port or a plugin rack.
Target Channel	Choose to either leave the channel number unaltered or remap events to a specific channel.

Settings

Each routing entry has various conditions that allow finer grain control over whether the routing takes place.

To edit these settings, use the drop down menu in the settings column:

Upper Split	Creates a keyboard split so that this routing only routes notes from the upper part of the keyboard. After selecting this command you will be prompted to play the first (lowest) note of the keyboard range.
Lower Split	Creates a keyboard split so that this routing only routes notes from the lower part of the keyboard. After selecting this command you will be prompted to play the last (highest) note of the keyboard range.

Range Split	Creates a keyboard split covering an arbitrary range of the keyboard.
	After selecting this command you will be prompted to play the note at each end of the desired range.
Clear Split	Clears an existing keyboard split, resetting to accept the entire keyboard.
Learn Transpose	Sets the transpose setting by learning from played notes.
	After selecting this command you will be prompted to play two notes and the interval will be calculated and set.
Set Transpose	Displays a window where a new transpose setting can be manually entered. This method also allows updating all other racks with the same old setting to the same new setting.
Clear Transpose	Clears the transpose setting.
Set Program Number	Cantabile will monitor the most recent program change event from each device and only route events if the program number matches this setting.
	This makes it possible for different program numbers to cause routing to different targets.
Clear Program Number	Clears the program number for this entry.
MIDI Filters	Displays the MIDI Filters for this routing.
Pass Through	Controls the pass through setting for this entry.

Filters

Each MIDI routing entry can have MIDI filters defined that can be used to manipulate MIDI events. The filters for a MIDI routing entry are only processed for events that are being routed. Non matching events are not processed by the filter.

See MIDI Filters.

### Sub-session Control

The enabled state of each MIDI routing can be controlled through sub-sessions.

When a sub-session is saved the enabled state of each MIDI routing entry is also saved. That state is then restored when the sub-session is loaded.

To prevent an entry from being affected by sub-sessions, right click on the entry's name and use the **Sub-session Behaviour** sub-menu to disable it.
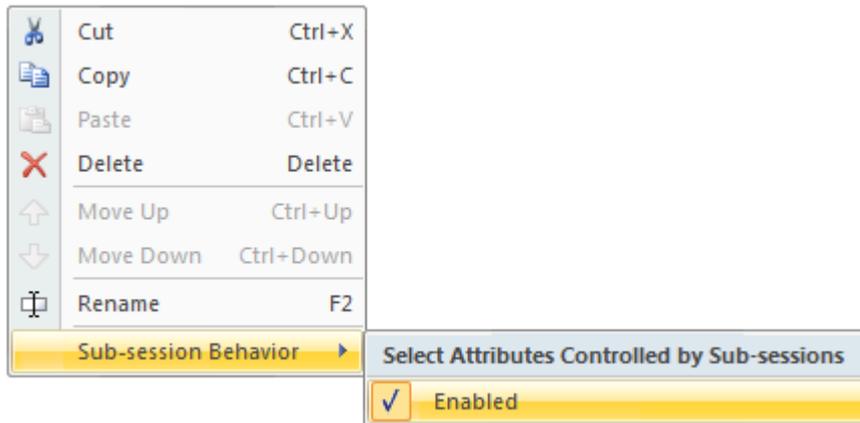
Enabling sub-session support for a MIDI routing entry.

Triggers

Cantabile Performer Only

Triggers are a mechanism that can be used to perform actions in response to certain events.

Primarily they're intended to be used as a way of sending MIDI configuration events to external devices when a session or sub-session is loaded, but they can also be used for other purposes.

Triggers Panel

Triggers are edited using the Triggers panel which is one of the expandable panels on Cantabile's main window. To use this panel, make sure it is visible and expanded (see Main Panels)
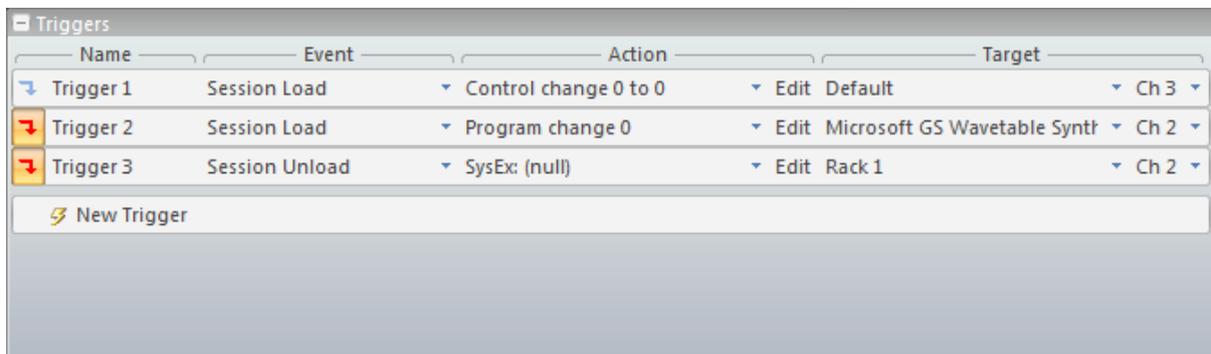
Configuring Triggers

Each trigger has the following properties:

Enabled Checkmark	Controls whether this trigger is enabled or not.
Name	A descriptive name for this trigger. This setting is optional but should be used to describe what the trigger does.
Event	Select the event that causes this trigger to execute. See Event Types.
Action	Select the action to execute when the event occurs. See Actions.

Target Device/Channel	For actions that generate MIDI events, these settings control the destination for those events.

Event Types

Triggers can be configured to execute on the following events:

Session Load	Executes whenever this session is loaded
Session Unload	Executes whenever this session is unloaded
Sub-session Load	Executes when a sub-session with this trigger enabled is loaded. Also executes when the containing session is loaded.
Sub-session Unload	Executes when a sub-session with this trigger enabled is loaded. Also executes when the containing session is unloaded.
Transport Play	Executes when the master transport enters Play mode.
Transport Pause	Executes when the master transport is paused.
Transport Resume	Executes when the master transport is resumed by pause.
Transport Stop	Executes when the master transport is stopped.
Custom Event	Custom events allow invoking a trigger from an external MIDI Controller.
	Select a custom event number for the trigger and the assign an external controller to that custom event number using MIDI Controller Assignments.

Actions

Each trigger can execute one of the following actions.

- Send MIDI Controller Change
- Send MIDI Program Change
- Send MIDI Note On/Off
- Send MIDI System Exclusive Event
- Execute External Program or Script

These actions are self explanatory.

Delays

Sometimes it will be necessary to set delays between triggers. For example, some hardware modules expect delays between certain MIDI events. To support this, each trigger has a pre and post delay setting.

To set these delays, from the **Action** drop down menu, select the **Set Delays** command. Delay values are specified in milliseconds (ie: 1000ms = 1 second).

Sub-session Control

The enabled state of each trigger entry can be controlled through sub-sessions.

When a sub-session is saved the enabled state of each trigger is also saved. That state is then restored when the sub-session is loaded.

To prevent an entry from being affected by sub-sessions, right click on the entry's name and use the Sub-session Behaviour sub-menu to disable it.
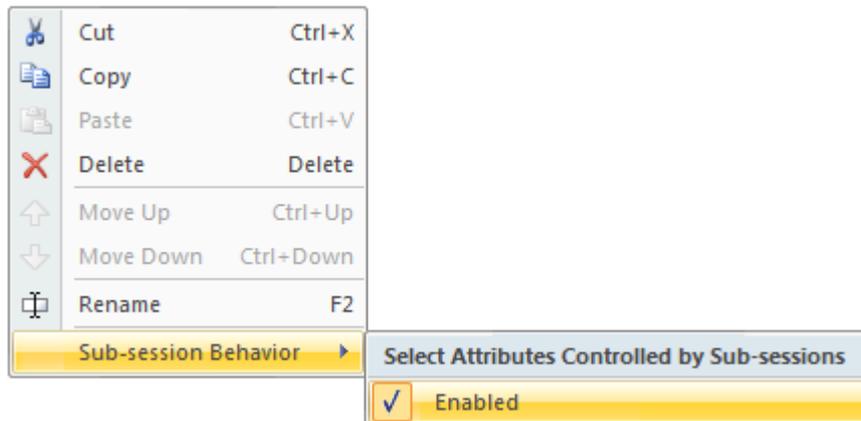
Enabling sub-session support for a trigger.

MIDI Loop-back

MIDI loop-back provides the ability to treat the output of a trigger, MIDI routing entry, media file or rack as MIDI input. This is most often used to route the output of a MIDI plugin to a MIDI controller assignment, or the output of a media player through the MIDI routing table.

There are 4 MIDI loop-back devices named Loop-back 1 through 4. To use these loop-back devices, simply set the output target of the rack, trigger, routing entry or media file to the desired loopback device.
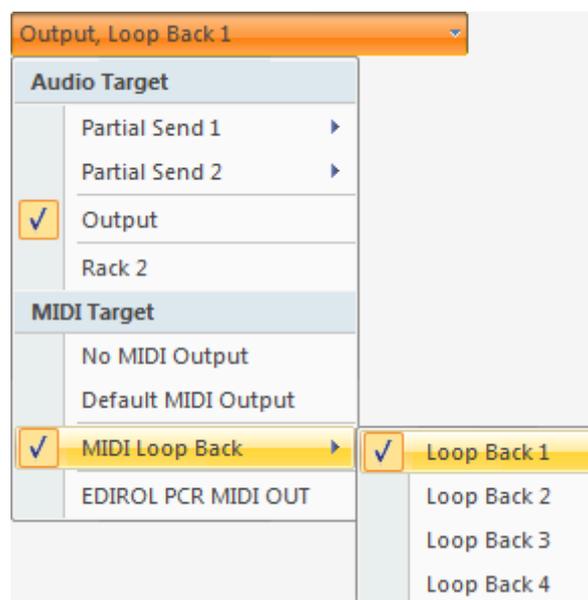
Routing the output of rack to a loop-back device

You can then use the looped back MIDI in MIDI Controller Assignments and the MIDI Routing Table.

Please note that when using MIDI loop-back, care must be taken to avoid infinite feedback loops - where the output of an item fed through a loopback device arrives back to the same original item causing additional MIDI events to be generated.

To help prevent this, loop-back devices automatically suppress events if they detect such a situation – however there are cases where this cannot be determined. Also, as a measure to prevent these feedback loops, a rack can't be configured accept input from a loop-back device (there's no reason to need to do this anyway).

Setting a rack to accept MIDI from all input devices will not cause the rack to receive MIDI from a loop-back device.

Constant Latency MIDI

By default, Cantabile schedules incoming real-time MIDI events for the very start of the next audio buffer cycle.   The idea behind this is to reduce latency and play notes as soon as possible after they're played.

Unfortunately this behaviour changes the timing of events since all events received during the previous audio buffer all get scheduled for the first sample of the next audio buffer.

Generally this is not an issue with small audio buffers. With longer audio buffers however, this can cause problems where rapid successions of notes (eg: guitar strumming) don't sound natural. Worse, if a note on and off event are both received during the same audio cycle, the note may be missed completely, or mishandled by a plugin.

To resolve this Cantabile has an option **Constant Latency Real-time MIDI** (see Audio Engine Options). When selected, this option causes Cantabile to schedule events for the same position in the next audio buffer as they were played in the current audio buffer.

For example, if a note is played half way through the currently sounding audio buffer, then it is scheduled for half way through the next buffer.

By default the constant latency option is turned off but should be enabled when using audio buffers larger than about 10 milliseconds.

10 Onscreen Keyboard

While not particularly useful for playing music, the on-screen keyboard is convenient for testing the sound of the loaded plugins.

The on-screen keyboard is one of the expandable panels on Cantabile's main window. To use this panel, make sure it is visible and expanded (see Main Panels).

Onscreen Keyboard Panel

Playing the Keyboard with the Mouse

When played with the mouse, the keyboard is velocity sensitive. Clicking a key closer to the bottom results in louder sounds than clicking near the top of the key.

Playing the Keyboard with the Computer's Keyboard

The keyboard can also be played using the computer keyboard.

The Z key on the computer keyboard corresponds C note of the highlighted octave, with notes arranged similarly to a piano keyboard - ie: Key S=Note C#, Key X=Note D, Key D=Note D# etc... A second octave of notes continues starting with the Q key.

The selected octave is indicated by the highlighted range. It can be changed using the corresponding function key on the computer keyboard. Eg: F3 selects the octave commencing on C3.

When played using the computer keyboard, the velocity used is the last velocity played using the mouse.

You can also select two separate octaves for the upper and lower PC keyboard ranges. To set the octave for the lower range (starting on Z) hold the Control key while pressing a function key. Eg: Ctrl+F2 sets the lower octave to commence on C2. To set the upper octave use the Shift key. Eg: Shift F6 sets the upper octave to commence on C6.

X-Y Controller

The X-Y controller is a simple 2 dimensional on-screen device that can act as two MIDI controllers. By default the X-Y controller is configured to act as a pitch bend and modulation wheel though this can be edited.

Tips for using the X-Y controller:

- Clicking anywhere within the main area of the X-Y controller moves both controllers by tracking the horizontal and vertical movement of the mouse.
- It's not necessary to correctly position the mouse within this area before clicking as Cantabile will automatically move the cursor to the current controller position.
- Clicking in one of the bars at the right/bottom of the X-Y controller moves just that controller.
- When the X-Y controller has input focus (after clicking in it), the mouse wheel can be used to move an axis that doesn't have snap back option turned on. If neither axis is configured for snap back, the Y-Axis takes precedence.
- Right clicking on the X-Y controller displays the axis configurations settings.

Holding Keys

Keys can be held by playing them while pressing the **Control** key. For example pressing **Control+Z+C+B** will play a C-Major chord and hold it.

To release held notes, click them again while holding the **Control** key.

You can also release all held notes at once by pressing the **A** key.

PC Keyboard Capture

Normally, playing the on-screen keyboard with the PC keyboard is only supported when the on-screen keyboard has focus (or is active).

When **Keyboard Capture** is activated, the on-screen keyboard can be played using the PC keyboard even when the on-screen keyboard doesn't have input focus.

To toggle keyboard capturing on/off press the **F12** key, or select the **Capture Keyboard** command on keyboard's toolbar.

If you find other areas of Cantabile unreponsive to keyboard short cuts, check you don't have keyboard capture turned on.

Panic Button

To send MIDI note off events for every note on every channel click the **All Notes Off** button.

This feature, commonly referred to as a Panic Button is useful for releasing stuck MIDI notes - where a synthesizer has received a note on event but for some reason didn't receive a matching note-off event.

Other Keys

The keyboard also responds to the following computer keyboard keys:

Function keys	Change the selected octave.
Shift	Activates the sustain (damper) pedal controller.
Control	When held while playing a note, holds the note, or if the note is already held, releases it.
A	Releases all held notes.

Channel Selector

Above the on-screen keyboard are two drop down menus, the first of which is the channel selector.

The channel selector allows selection of which channel the keyboard transmits MIDI data on. Select any channel from 1-16.

By convention, channel 10 is typically used for percussive instruments that are not pitch sensitive, while all other channels are used for pitch based instruments. Playing notes on channel 10 to an external MIDI synthesiser will often result in percussive instruments being played (eg: drums etc...)

The on-screen keyboard is connected to the same MIDI input bus as all other MIDI input devices. The device and channel selectors on each rack can be used to control routing of events from the on-screen keyboard.

Program Selector

The program selector allows sending of MIDI program change messages.

When a program is selected from the program selector, Cantabile sends a MIDI program change message to the selected channel.

For convenience, the program selector displays the last program change message send. Note however that it is possible for this to become invalid, if the target device receives a program change event from another source (eg: a MIDI sequencer).

When using General MIDI program names, Cantabile displays General MIDI drum kit names for Channel 10, and normal General MIDI program names for all other channels.

To disable the use of General MIDI program names, use the setting in [Keyboard Options](#).

This version of Cantabile does not support sending MIDI bank select messages from the on-screen keyboard

Custom Controllers

The keyboard panel also has two sets of custom controllers:

Global Controllers	Saved globally and available in all sessions.

Session Controllers   Saved with the session file.

Each set of controllers consists of four push buttons and four sliders.

To show the custom controllers, click the appropriate checkbox on the keyboard's toolbar. When checked, an extra toolbar will appear showing the additional controllers. To configure a controller, right click on it and select **Customize**. A dialog will appear where the MIDI Controller number and various other settings can be specified.

Miscellaneous

Don't forget that in order use the computer keyboard the on-screen keyboard must have focus (indicated by the octave range indicator displayed in the highlight color, rather than greyed out). Alternatively, it must be captured.

11 Other Features

Large Status Display

Cantabile Performer Only

In a live performance situation it can be desirable to display certain information in a large, clearly readable format. To support this Cantabile has a Large Status Panel.

Show the Large Status Panel by selecting it from the **Show/Hide Panels** drop-down.

Cantabile's Large Status Display

To configure the display:

- Right click on the display to select the pieces of information that are displayed.
- To change the font size of a display element, click on it to select it and then use the Page Up/Down keys to increase or decrease the font size.
- To clear the selection from an element, press the Escape key.

Offline Renderer

Cantabile Performer and Solo Only

Cantabile's offline renderer can be used to process a MIDI or audio file through a set of racks and plugins and save the results are to a wave file. This rendering process is done offline – ie: not in real-time.

The main advantages of offline rendering are:

- When using plugins that can process faster than real-time, the rendering can be done more quickly.

- When using plugins that can work in higher quality but more CPU intensive modes, those modes can be used to renderer high quality sounds without the problem of audio drop outs.

Note that the offline renderer is not compatible with most hardware based plugins and other plugins that don't handle faster than real-time processing.

Using the Offline Renderer

To use the offline renderer:

1. Load the MIDI or Audio media file that you want to render.
2. Set the media file synchronisation options so that it is the master transport. See Timing and Synchronisation.
3. Optionally set the play range if you only want to render a portion of the file.
4. From the application menu's **Import/Export** sub-menu, select **Offline Render**.
5. Check and adjust any settings as required (see below).
6. Press **OK** to start the render process.
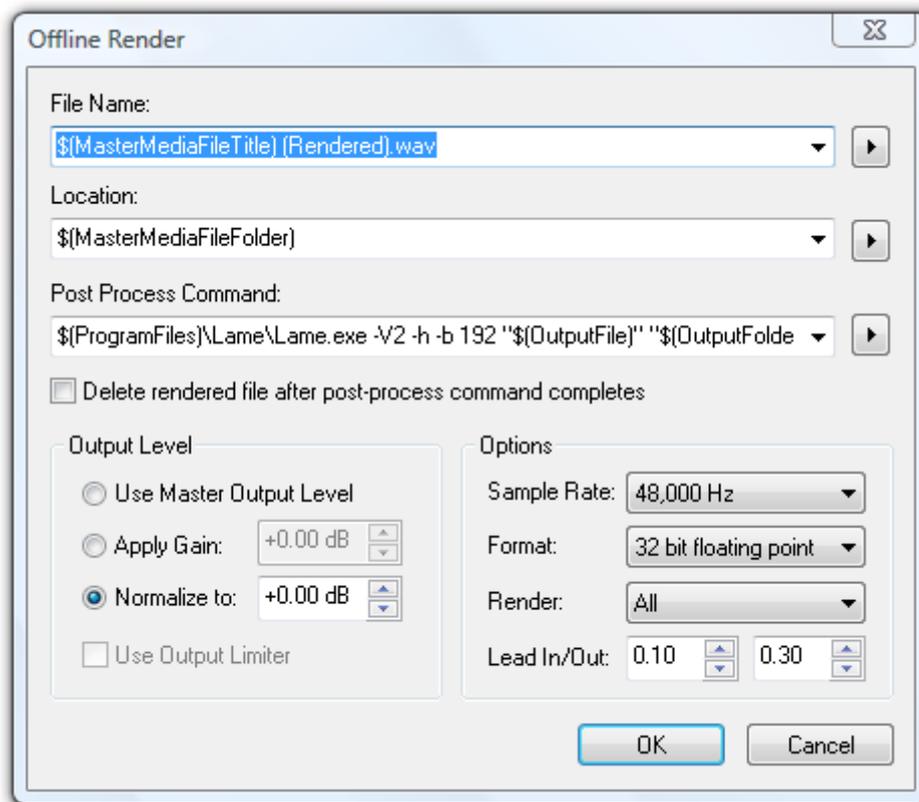
Offline Render Settings

Settings

The following settings control the offline render process:

File Name	The name of the wave file to be rendered to (excluding the folder name).
Location	The folder where the file should be saved.

Post Process Command	A command to be executed once the render process has completed.
	(Typically used to compress the rendered wave file to mp3 or similar format.)
Delete Rendered File	When selected, the rendered output file will be deleted once the post process command completes.
	(Use this if the post process command produces a final output file and the intermediate wave file is no longer needed).
Output Level – Use Master Output Level	Applies a gain to the output file equivalent to the current master output level on Cantabile's main window.
Output Level – Apply Gain	Applies a specific gain to the output file.
Output Level – Normalize To	When selected, the render process performs two passes:
	1. Renders the file to a floating point format and calculates the maximum peak level of the file.
	2. Applies a gain level to ensure the maximum peak matches the specified level and converts the file to the final output format.
	Processing the first pass in floating point format ensures there is no loss of quality due to applying the gain after format conversion.
Use Output Limiter	When selected, an output limiting algorithm is used to ensure peak levels are not exceeded.
	Generally not recommended as normalizing the output will generally produce better results.
Sample Rate	Specifies the sample rate of the generated file.
Format	Specifies the sample format of the generated file.
Render	Specifies which part of the file to render.
	Choose from All, Selection, 10 second preview or 30 second preview.
Lead In/Out	Specify a period (in seconds) of silence to be added to the start and end of the generated file.
	The lead-out time is especially useful to ensure all sounding notes and effects completely finish before the end of the file.

External Tools

Cantabile supports custom commands that can be used to launch external applications and utilities.

Configuring external tools is done in the External Tool page of the options dialog. See External Tools.

External Tool Menus

External tools can be configured to appear in three different menu locations:

Home Tab	Tools configured with this option appear in the **Tools** drop down on the main window Home tab.
MIDI Files	Specifies a command that applies to MIDI files.
	Tools configured in this way appear in the right click context menu of MIDI media files and MIDI files in the recordings list.
Audio Files	Specifies a command that applies to audio files.
	Tools configured in this way appear in the right click context menu of MIDI media files and MIDI files in the recordings list.

The MIDI and Audio file tools can be used to setup external editors for these file types. The variable $(SelectedMediaFile) should be used as a placeholder for the filename of the file that was clicked on.

Engine Start/Stop

By default, Cantabile's audio engine starts automatically. You can use the **Stop Engine** command however to stop all processing of audio, MIDI and loaded plugins.

Stopping the engine can be useful in these situations:

- The stability of the system seems to be suffering and you want to close and re-open all hardware devices.
- You need to run another application that needs access to the devices that are currently in use but you don't want to close Cantabile.

The engine is automatically stopped and restarted when displaying Options and the Master Bus Configuration window.

You can also remotely invoke a restart of the audio engine through MIDI Controller Assignments.

Alternate Configurations

Cantabile supports alternate configurations, where each configuration stores a separate set of global settings including audio driver, VST directories, MIDI configuration etc...

Multiple configurations are useful for:

- Running multiple instances of Cantabile with different audio configurations.
- Supporting different VST directories - eg: a "test" configuration for testing new plugins and a "production" configuration for trusted plugins.
- Different MIDI configurations.
- Any other situation that requires quickly switching between different configurations.

To specify which configuration to load, use a command line argument in the following form:

```
cantabile20.exe /config:[i]<configname>[/i]
```

For example, to launch Cantabile with a configuration named "Test Environment" use the following command line:

```
cantabile20.exe /config:"Test Environment"
```

If no configuration is specified, the default unnamed configuration is used.

When Cantabile is installed, it automatically creates two short cuts to launch Cantabile - one for the default configuration and one for an alternate configuration.

Although using multiple configurations allows multiple instances of Cantabile to be run simultaneously, for this to work successfully you would normally need to configure each to use different audio drivers and MIDI devices. Typically these devices can only be used by one application at a time.

System Tray Icon

Cantabile's system tray icon can be used to control a limited set of functionality without having to activate Cantabile's main window.

By default the tray icon is disabled but can be enabled in [General Options](#).
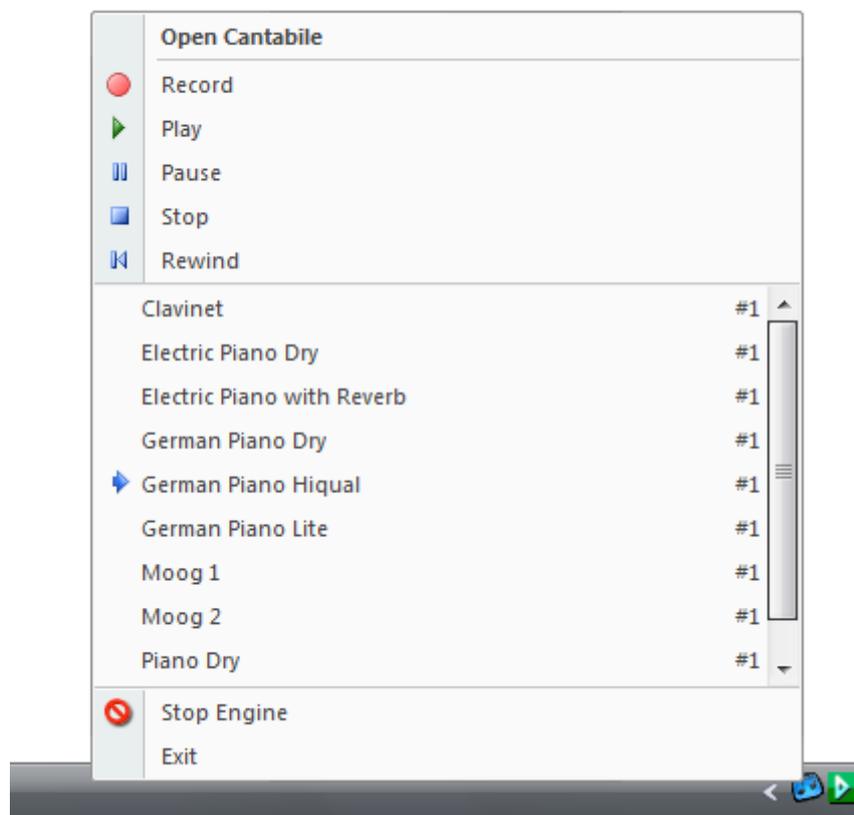
Cantabile's System Tray Icon

Multiple Processor Support

On multi-core and multi-processor machines Cantabile supports processing racks in parallel making best use of the extra processing power of these machines.

Cantabile's multi-processor support works by processing each rack in parallel when possible.

Since not all plugins are completely compatible with this feature, Cantabile can be configured to run in one of three modes (see Audio Engine Options).

Disabled	Turns off all support for multi-core processors for best compatibility.
Enabled (Compatibility Mode)	Enables multi-processor support but prevents instances of the same plugin type being processed simultaneously.
Enabled (Aggressive)	Enables full multi-processor support.

Disabled mode can be used if a plugin proves to be completely incompatible with the multi-processor support. Generally this mode shouldn't be needed but may be useful for diagnostics reasons (particularly for plugin developers).

Compatibility Mode provides significant performance increases when running most multi-rack sessions and is the recommended mode for most situations. In this mode racks are processed in parallel but processing will stall if two or more plugins of the same type need to be processed at the same time – in which case they will be processed one after the other.

Aggressive Mode is suitable when running many racks with the same plugins on each rack. In this mode the plugins being used must be compatible. Many plugins are compatible with this mode, but those that aren't can cause undesirable effects ranging from noise to crashing the entire application.

When a session contains no duplicate plugins Compatibility Mode and Aggressive Mode are effectively equivalent.

Advanced Configuration of Plugin Processing

Advanced users and plugin developers who are interested in having finer control over the multi-threaded processing of plugins can edit the Compatibility.ini file which is in the same directory as the Cantabile executable file.

Refer to the file for more information.

12 Diagnostics and Troubleshooting

Understanding Cantabile's Load Meter

The load meter in Cantabile is often misunderstood. This section attempts to explain its meaning.

The most important thing to remember about the load meter is that it is *not* a measure of CPU load – although occasional they can be related.

Rather, the load meter displays the amount of *time* taken to process each audio cycle as a ratio of the total available time. For example, if the audio buffer is configured to be 8 milliseconds and audio processing of each buffer is taking 4 milliseconds then the load is 50%.

This is not the same as CPU load as the CPU will almost certainly be busy doing other things besides just processing real-time audio.

Furthermore, on multi-core machines the relationship between CPU and time becomes more complex. A dual core machine can for example do twice as much work (CPU load) in the same time as a single core machine.

Cantabile displays load as a time calculation since for real-time audio this is the most important factor – if audio processing doesn't complete in *time* there's a drop out.

By measuring load using time, the load meter can also highlight situations where audio processing is being pre-empted by other higher priority processes (such as Deferred Procedure Call (DPC) Spikes). In this situation the audio processing takes longer, but doesn't use CPU load – since that load is being attributed to another process.

Note however that there is a *relationship* between CPU load and the load meter. If a plugin is more computationally intensive it will increase the time taken to process each audio cycle and therefore increase the load meter reading.

There is no direct relationship between the number displayed by Cantabile's load meter and the number displayed in Windows' Task Manager.

Choosing an Appropriate Buffer Size

Selecting an appropriate buffer size for the audio driver is essential to getting a good balance between audio latency and reducing audio drop outs.

Audio latency is the amount of time between a note being played (or audio input arriving) and sound being produced. There are many factors that can affect latency including hardware latency (delays introduced by midi hardware or the sound card itself) and software latency due to the way digital audio is processed.

Audio dropouts are clicks, pops and other undesirable artefacts due to the software not being able to supply audio data quickly enough for the sound card.

There are many excellent online references explaining audio latency, audio dropouts and buffer size selection. The generally accepted approach to achieving a good balance however is simply trial and error:

- If you're getting audio drop outs you need to either increase the buffer size or adjust the settings of the plugin you're using to be less demanding on the system.
- If you're getting unacceptable latency (you play a note and it doesn't make a sound until a noticeable period later, or audio effects are noticeably delayed) you need to reduce the buffer size.
- If you can't find a suitable balance you probably need to upgrade your hardware.

Cantabile's load meter is useful in determining load.

- If you find the buffer utilization is always close to zero, you should be able to reduce the buffer size (and therefore reduce latency) without causing audio dropouts.
- If the buffer utilization is close to 100%, then you're getting close to audio drop outs and you should probably increase the buffer size or change settings in the plugin to reduce load.

Deferred Procedure Call (DPC) Spikes

If you're encountering occasional random load spikes you should consider the possibility of DPC latency issues.

Deferred Procedure Calls (DPCs) are pieces of code implemented by system level drivers that run at a higher priority than most other applications. A badly written or badly behaving driver can cause a delay long enough to prevent audio applications from running smoothly.

To check whether you're encountering DPC related issues, consider using the DPC Latency Check utility available from http://www.thesycon.de/deu/latency_check.shtml . You'll also find there a better explanation of this problem and suggestions on how to find the cause of problems.

Technical Support

Support for Cantabile is available from:

Support Forum	http://www.kvraudio.com/forum/viewforum.php?f=136
Release Notes	http://www.cantabilesoftware.com/support/releasenotes.php
Email Support	contact@cantabilesoftware.com

13 Options

This section explains all of Cantabile's options.

The options window can be opened by clicking the button labelled **Cantabile Options** at the bottom of the application menu. Alternatively, press Alt+FI

General Options

The general options page contains options affecting general usage of Cantabile:

Color Theme	Select a color theme for Cantabile's main window.
Show Tray Icon	Displays an icon in the Windows system tray that can be used to control a limited set of actions.
Minimize to Tray	When the tray icon option is enabled this option causes Cantabile to be hidden when minimized. To re-show Cantabile, double click the icon in the system tray.
Expand Media Players By Default	Controls whether newly loaded media files are expanded to show the file's visual representation.
Double-click to Rack or Media Player Name to Expand/Contract	When selected, double clicking on the name of a media file or rack expands the item. Clear this option to prevent this behaviour.
Save peak information for audio files	When selected, Cantabile will save peak information for loaded audio files. The saves having to re-scan those files the next time they're opened. This peak information is used for drawing the visual waveform representation of audio files.
Save with audio file when possible	Saves the peak information for audio files in the same location as the audio file itself. When this option is not selected, the peak information is saved in a temporary folder.
Clean Up	Deletes all saved peak information from the temporary folder. (This does not delete peak files saved in the same folder as the audio files).
Use Fast Session Switching	When enabled, Cantabile will attempt to re-use plugins from the previous session when loading a new session. This can improve load times for sessions but uses more memory during the session load.

Display Progress while loading session files	Darkens the main area of Cantabile's main window and displays a message indicating the progress of loading session files.
	Turn this option of if you use fast loading sessions to avoid the flickering to black between each session.
Prompt for filename on first incremental program save	When enabled, a file save dialog will be displayed the first time the incremental save command is used on a plugin.
	When disabled, a filename is automatically determined based on the plugin name.
	To manually override this behaviour, use the Save Program As command to set the current filename, before using the incremental save command for subsequent saves.
Save Modified Sessions	Determines whether modified sessions are automatically saved, discarded or prompted to be saved.
Associate Button	Creates file type associations in the system registry so that supported file types can be loaded by double clicking them in Windows Explorer.
Unassociate Button	Removes file type associations.
Set Default Session	Saves a copy of the current session to be used for the default state when creating new session files.
Reset Default Session	Restores the default session to its factory (empty) state.

Startup/Shutdown Options

The startup/shutdown Options page contains options affecting starting and closing Cantabile:

Load this Session	Specifies a specific session file to load every time Cantabile is started.
Use Current	Sets the file to use for the **Load this Session** option to the currently loaded session file
Browse	Browses for the file to be used for the **Load this Session** option.
Start New Session	Specifies that a new session should be created when Cantabile is started.
Reload Last Session	Reloads the previously last used session when Cantabile is started.
Prompt to Reload Last Session	Prompts before reloading the previously last used session.
Scan VST Folders on Startup	When selected, Cantabile will scan the VST plugin folders on start up.
	When clears, Cantabile will use information cached from the previous scan making startup faster, but you'll need to manually scan the plugin folders when you install or remove plugins.

AutoRun when Windows Starts	When selected, causes Cantabile to be automatically started when Windows starts and is logged on.
AutoRun Minimized	Causes Cantabile to be shown minimized when the AutoRun option is selected.
Reload Last Set List *	Reloads the last loaded set list when Cantabile loads.
And Load First Entry *	Loads the first entry in the set list when Cantabile loads.
Prompt before Exiting	When selected causes Cantabile to prompt for confirmation before exiting.
	This option is useful when using slow loading VST's as it saves from accidentally exiting the program and having to reload.
Escape Key Exits	When selected, pressing the **Escape** key when Cantabile's main window is active causes the program to shutdown.

Audio Engine Options

The audio engine options page contains settings affecting Cantabile's audio engine.

Select Audio Driver	Displays a drop down menu allowing selection of the audio driver. Cantabile supports three types of audio drivers – ASIO, DirectSound and the Null Audio Driver.
	In general, you should use ASIO drivers whenever possible.
Sample Rate	Allows selection of one of the sample rates supported by the audio driver.
Sample Rate Slider	Sets the buffer size (in samples) to be used.
	Only available when a DirectSound or the Null Audio driver is selected. For ASIO drivers, use the driver's control panel to change the buffer size.
Control Panel Button	Displays the control panel application for the selected ASIO audio driver.
Assign Audio Channels	Displays a [Audio Channel Assignments](#) window where master bus channels can be assigned to physical driver channels.
Automatically Stop Recording when Selecting a new Plugin or Program	When selected, changing a plugin's current program or loading a new plugin causes both the audio and MIDI recorders to stop immediately.
Resend Program Changes when Starting or Resuming Play	When selected, Cantabile determine the current program for each MIDI channel for the current play position and resends MIDI program change events to ensure all target devices have the correct program selected.
	Disable this option to leave program selection to the currently selected program. This can be useful when manually selecting programs.
	Program changes can also be disabled on a per-plugin basis. See [Plugin Settings](#).

Constant Latency Real-time MIDI	When selected Cantabile introduces small delays to real-time MIDI events to ensure a constant latency between the each event being received and the sound for that being generated by a plugin.
	When cleared, MIDI events are forwarded as quickly as possible giving an overall lower latency at the expense of timing accuracy.
	See [Constant Latency MIDI](#) for more information.
Enable Output Limiter	Select this option to enable Cantabile's output limiter.
	When selected, audio samples with an amplitude below the threshold are output unaltered.
	Samples above the threshold however are soft saturated, to not exceed the maximum possible output level.
	Use the output limiter to avoid hard clipping and distortion that can occur when audio levels exceed peak levels.
	There is a small performance overhead in using the output limiter. If you don't need this option, turning it off can save some processing time.
Multi-processor Support	Selects which multi-processor/multi-core mode the audio engine runs in.
	See [Multiple Processor Support](#).
Sample Rate Conversion Quality	Specifies the quality level of sample rate conversion when playing audio files with a sample rate different to the current audio driver.

MIDI Devices Options

The MIDI devices page allows selecting which MIDI devices are enabled and other settings related to these devices, including MIDI clock settings:

MIDI Ports	Lists all MIDI input and output devices.
Port Name Column	Place a checkmark next to the MIDI ports to be enabled
	Only select the devices you're actually using to save cluttering the menus used for selecting MIDI devices and to save some processing load.
Type	Indicates if the MIDI port is an input or output port.
Clock *	Indicates if Cantabile should send MIDI clock to an output port, or receive MIDI clock from an input port.
Default Output Device	Specifies which MIDI output device MIDI is routed to by default.
Default Sequencer Device	Specifies which MIDI device MIDI media files should be routed to by default.
Pass-through Device	Specifies a device that all incoming MIDI is passed through to.
Unhandled Pass-through Device	Specifies a device that MIDI events not handled by any rack should be passed through to.

* Cantabile Performer Only

Plugin Options

The Plugin Options page contains settings relating VST plugins:

VST Plugin Folders	Enter the path of one or more folders containing VST plugin modules. Separate multiple paths with a semicolon (;) character.
	The plugins found in these folders will be displayed in the [Plugin Selector](#).
	Cantabile also uses the plugins in these folders when locating the plugin associated with a particular preset or bank (fxp/fxb) file.
Add Button	Displays the browse for folder window for locating plugin folders. The selected folder is appended to the VST Plugin Folders setting.
Include/Exclude Button	Displays a list of plugins that should be explicitly included or excluded.
	Excluded plugins are typically those plugins that encountered problems during plugin scanning.
	Included plugins are those that were browsed for using the Plugin Selector's **Choose File** button.
Full Scan	Discards all cached plugin information and scans the plugin folders again.
Presets and Banks Folder	Any program bank (fxb) or preset (fxp) files saved to this folder will automatically appear in the [Plugin Selector](#) **Presets** category.
	If you create sub-folders in the program bank folder, the plugin selector will duplicate this hierarchy (if the **Group by Folder** option is selected in the plugin selector).
Browse Button	Displays a browse for folder dialog for setting the Presets and Banks folder.
Explore Button	Launches Windows Explorer and selects the presets and banks folder.
Default to Plugin Folder When Saving Presets and Banks	When selected all file dialogs for VST presets and banks default to the directory of the associated plugin.
	Can be used to simplify preset management when you like keep presets and banks with the plugin they apply to.
Include Plugin Name in Default File Name when Saving Presets	Select this option to include the name of the plugin in the default filename Cantabile uses when saving program .fxp files.
	If you save all programs to a single folder this can be helpful in keeping track which plugins a program file belongs to.
	If you normally save programs to a folder specific to the plugin, this information is probably redundant and you might prefer to turn this option off.

Single Column Program Selector	Switches the program selector in the main window plugin slots between single column and multiple column modes.
Use Wet/Dry Controls	When selected the mixer control in each plugin slot act as separate wet and dry gain sliders.
	When cleared, the first slider controls the wet/dry balance and the second controls the overall gain of the plugin slot.
Automatically Open Plugin Editor when Loading Plugins	When enabled, causes the plugin editor's user interface to be displayed immediately when a plugin is loaded is loaded.
Include uncategorized plugins in Effects group	Normally all uncategorized plugins are shown in plugin selector's Other group. This option causes those plugins to also be shown in the Effects group.
VST Knob Mode	Some plugins support various modes for knob controls - linear, circular and circular relative. This option controls that behaviour. Not all plugins support this feature.
Default Plugin Selector Category	Determines the default plugin group displayed in the plugin selector each time it is opened.

Recordings List Options

The recordings list page has settings affecting the recording list panel including pessimistic vs optimistic recording and how the recording list is saved:

Pin All New Recordings	When selected, all new recordings are automatically pinned to prevent deletion (optimistic recording).
	When cleared, recordings are not pinned those to be kept must be manually pinned (pessimistic recording).
Automatically Show the Recordings List on New Recording	When selected, starting a new recording will cause the recordings list panel to be automatically shown.
Save the list of recordings with the session	Saves the contents of the recording list with the session.
Prompt before deleting pinned recordings	When selected, Cantabile will prompt if you attempt to delete a pinned recording.
Automatically Delete Unpinned Recordings	When selected, any unpinned recordings will be automatically deleted when the session is closed, a new session opened or Cantabile is shut down.
Only Keep N unpinned MIDI recordings	Controls how many unpinned MIDI recordings are kept.
	When a new recording is started and there are more than N unpinned recording, the oldest one is deleted.
Only keep N unpinned Audio recordings	Same as above but for audio recordings.

MIDI Recorder Options

The MIDI recorder options page contains settings that affect the MIDI recorder.

Save Recordings To	Specifies the folder where MIDI recordings will be saved.
Browse Button	Displays a browse for folder dialog that can be used to set the **Save Recordings To** folder.
Filename Format	Specifies the filename format for recording files.
	The filename format can contain placeholder variables to allow recorded files to be date and time stamped, or incremented by a counter. Click the right pointing arrow to display a menu of available variables.
	Note that if you use backslash characters in the filename format, Cantabile will automatically create sub-folders and group your recordings accordingly.
	For example if the format string was $(mmm) wk$(wwm)\$(dy) Recording $(###) the recorded files would be named like this: Mar wk02\Sun Recording 007.mid where Mar wk02 is a subfolder of the **Save Recordings To** folder.
Counter	Specifies the next value to be used by the $(###) counter variables in the filename format string.
Split Recordings After	Specifies the amount of time (in seconds) of silence required before a recording automatically ends.
	Cantabile considers MIDI silence to be when all notes are released and the three standard piano pedal controllers are released.
Discard Recordings Less Than	Specifies the minimum length a recording must be in order for it to be saved. Automatic recordings less than this amount of time are discarded.
Add Lead-in	Specifies the amount of lead-in time added to the start of recorded MIDI files.
	Only used for real-time MIDI recording.
Add Lead-out	Specifies the amount of lead-out time added to the end of recorded MIDI files.
	Only used for real-time MIDI recording. For musical time recording, the recording ends at the end of the current measure (bar).

Audio Recorder Options

The audio recorder options page contains settings that affect the audio recorder.

Save Recordings To	Specifies the folder where audio recordings will be saved to.
Browse Button	Displays a browse dialog that can be used to set **the Save Recordings** To folder.

Filename Format	Specifies the filename format for recording files.
	The filename format can contain placeholder variables to allow recorded files to be date and time stamped, or incremented by a counter. Click the right pointing arrow to display a menu of available variables.
	Note that if you use backslash characters in the filename format, Cantabile will automatically create sub-folders and group your recordings accordingly.
	For example if the format string was $(mmm) wk$(wwm)\$(dy) Recording $(###) the recorded files would be named like this: Mar wk02\Sun Recording 007.mid where Mar wk02 is a subfolder of the **Save Recordings To** folder.
Counter	Specifies the next value to be used by the $(###) counter placeholders in the filename format string.
Split Recordings After	Specifies the amount of time (in seconds) of silence required before a recording automatically ends.
	Cantabile considers audio silence to be when the audio level is less than the the Noise Threshold setting (see below).
Discard Recordings Less Than	Specifies the minimum length a recording must be in order for it to be saved. Automatic recordings less than this amount of time are discarded.
Add Lead-in	Specifies the amount of lead-in time added to the start of recorded audio files.
Add Lead-out	Specifies the amount of lead-out time added to the end of recorded audio files.
Noise Threshold	Specifies the audio noise level. Audio levels less than this value are considered to be silence as far as the automatic recorder is concerned. ie: levels above this value trigger the commencement of audio recording.

Set Lists Options

The Set Lists Options page contains settings that affect working with set lists.

Search for Missing Sessions in these Folders	Specifies one or more folders that should be searched for session files that can't be located. Multiple folders can be specified by separating each with a semi colon.
	Set lists store session file names relative to the session file itself. This option should only be needed in the rare cases where session files are in a different location to the set list file.
Add	Browses for folders to add to the above search path.
Automatically load the first entry when loading set lists	Causes the first set list entry to be automatically loaded when a set list is opened. This option may be overridden by the equivalent setting in start-up options.
Wrap from Last to First	When selected, attempting to move to the next session at the end of the list causes the first entry to be loaded.

Wrap from First to Last	When selected, attempting to move to the previous session at the start of the list causes the last entry to be loaded.
Use Delayed Session Loading	When selected, delays the loading of sessions with the next, previous or first commands.
	This option only affects the commands within Cantabile itself. For MIDI assignments, there are separate assignments for delayed vs instant loads.
	See Delayed Session Loading.
Save Modified Sessions	Controls whether sessions are automatically saved, discarded or prompted when using set list commands to load a new session.
Save Modified Set Lists	Controls whether changes to the loaded set list are automatically saved, discard or prompted.

Metronome Options

The metronome options page controls the sounds used by the metronome.

Measure Sounds	Select the sound to play for the first beat of every measure (bar).
	Choose one of the built in sounds or press the **Browse** button to choose an external file.
Measure Volume	Adjusts the volume at which this sound is played.
Beat Sound	Select the sound to play for beats other than the first beat in the measure.
Beat Volume	Adjusts the volume at which this sound is played.
Play this Sound on Measure and Beat	Normally the **Beat Sound** is played on all beats except the first. Select this option to have the beat sounds also played on the first beat of each measure.
Test	Select this option to turn the metronome on or off for testing.

Keyboard Options

The keyboard options page controls the layout and usage of the on-screen keyboard , X-Y controller and PC Keyboard capture mode.

PC Keyboard Layout	This option controls which keys on your PC keyboard can be used for playing notes. Choose from one of two options:
	• Two octaves starting on **Z** and **Q**
	• One octave starting on **A**
	When the two octave option is selected, the **A** key can be used to release all held notes. When the single octave option is selected, the **Q** key can be used to release all held notes.
Capture Mode	Adjusts the scope of the keyboard capture feature. Choose from:
	• Main Window Only
	• All Application Windows
	• System Wide

X-Y Controller Placement	Select whether the on-screen X-Y controller should be displayed to the left or right of the on-screen keyboard, or hidden.
Let F12 Capture Keyboard from Other Applications	When selected, pressing **F12** will capture the PC keyboard to the on-screen keyboard even when Cantabile is not the active application. Only works when **Capture Mode** is set to system wide.
Temporarily disable capture when focus is on an edit control	When selected, the keyboard capture will be automatically temporarily released if focus is in an edit control or a combo text control. This features only works for controls in the Cantabile process – not other applications.
Use General MIDI names in Program Selector	Select this option if you want to display General MIDI program names in the program selector of the on-screen keyboard. When using General MIDI program names, Cantabile displays General MIDI drum kit names for Channel 10, and normal General MIDI program names for all other channels.
X-Axis	Configures the operation of the X-axis of the onscreen X-Y controller. Select which controller and the snap back mode for the X-axis.
Y-Axis	Configures the operation of the Y-axis of the onscreen X-Y controller. Select which controller and the snap back mode for the Y-axis.
Restore Pitch Bend/Modulation Buttons	Restores the default behaviour of the associated axis.

External Tools

The external tools page allows configuring a set of external tools that can be launched from other locations in Cantabile. See External Tools.

Tool List	Displays a list of custom tools.
New Button	Creates a new custom tool entry.
Duplicate	Creates a copy of the selected tool entry.
Delete	Deletes the selected tool entry.
Up/Down Arrows	Re-orders the selected tool entry.
Menu Text	The text to be displayed on the menu command for this tool.
Command	The command line to be executed when this tool is selected.
Arguments	Command line arguments to the tool.
Initial Dir	The initial directory for the tool.
Menus – Home Tab	Specifies that this tool be included in the **Tools** drop down on **Home** tab.
Menus – MIDI Files	Specifies that this tool be included in the right-click context menu for MIDI media files and recordings.

Menus – Audio Files	Specifies that this tool be included in the right-click context menu for audio media files and recordings.
Prompt for Confirmation before Executing	Displays a confirmation dialog before executing the command. Useful for destructive commands or to view the resolved variables in a command line for diagnostic purposes.
Automatically Run on Startup	Provides a convenient way to launch other applications when Cantabile starts.

Customize

The customize page can be used to customize the Quick Access Toolbar.

Choose Commands From	Select a group of commands to show.
Left List	Displays a list of available commands that can be added to the Quick Access Toolbar.
Add Button	Adds the selected command to the Quick Access Toolbar.
Remove Button	Removes the selected command from the Quick Access Toolbar.
Reset Button	Resets the Quick Access Toolbar to its default state.
Right List	Displays commands currently on the Quick Access Toolbar.
Up/Down Buttons	Re-orders the commands in the Quick Access Toolbar.
Show Quick Access Toolbar below the Ribbon	Controls the position of the Quick Access Toolbar – either above or below the ribbon.

Resources

The resources page contains information about Cantabile, tools for checking for updates, links to support email and websites and diagnostic and troubleshooting options.

Check for Updates	Contacts the Topten Software update check server to determine if a newer version of Cantabile is available.
Automatic	When selected, Cantabile will automatically check for updates once a day.
About	Displays additional information about Cantabile.
Go Online	Takes you to the cantabilesoftware.com website.
Contact Us	Sends an email to Topten Software.
Diagnostics	Displays options for diagnosing problems.