

# **CSC SHOW CONTROL v3.4**

**By CTR Electronics**

*Theatre and Live Sound Control Software*

**USER GUIDE**

<http://www.ctrelectronics.co.uk/>

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### Legal

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# Introduction

## Overview

CSC is a Theatrical and Live Sound Control software system for Windows XP/Vista/7/8/10.

It has been developed to aid the needs of theatre sound designers, engineers and operators, and anyone who requires some degree of playback and control functionality for a live production.

CSC has built in capability for the simultaneous playback of multiple wave files and automated fading, the sending of standard MIDI messages, MIDI Show Control support (1.0 spec), MIDI Machine Control support, Serial, Telnet and OSC network commands, as well as Ethernet tracking and backup facilities.

Shows can be edited offline on a laptop and transferred to a main computer system with ease saving valuable production time “in the space”.

Written by theatre professionals, CSC presents the designer and operator alike – a person usually forgotten with other such software - with tools that are *really* needed in today’s technologically changing theatrical world, and helps to solve many of the long term problems which have hindered control applications in the past.

## The Workspace

All show design in CSC is performed within the modular workspace.

The workspace can be configured to show as many modules as are required for the show, and the visibility and placement of these is stored within the show file. If a module is used for programming, but then removed from the workspace, then data within the module is still executed, the windows are merely hidden from view.

The most important part of CSC is the cuelist and the use of individual cues to build up a show.

## About Cues

In CSC, a “cue” is a point in time. For any cue, any number of events can occur, and they all have the one common factor that groups them together: they all happen at the same point in time and can all be fired from a single button push. No 2 or more cues can ever be executed at exactly the same point in time.

A cue can actually be thought of as a “workspace memory”, so a list of 5 individual cues will be giving the user 5 individual memories, each one

remembering the settings of each module within the workspace. On recall of the cue, any data within each module is also executed or transmitted.

A cue is shown to consist of a number, a description and a link element. Within CSC, all cues have a unique cue number. This number defines the order of which cues are drawn in the cuelist and recalled, and enables them to be uniquely identified so they may be linked to from other cues. There is a “default header cue” of cue number 0.00 which is always present and cannot be removed. This is the “home” state for the show, and defines the starting point of any show. Return to this point can be achieved at any time by selecting “Restart show” from the *Cue* menu, or by clicking the toolbar icon.

Cues are added sequentially and CSC will attempt to intelligently suggest the next cue number: by default a value of 1.00 is added from the previous cue, or the nearest next whole number is taken if there is a gap in the cuelist. This can be changed to any valid number within the range of bounding cues if required. There is a two decimal place depth to cues, therefore between 1.00 and 2.00, up to 99 additional cues could theoretically be inserted. Note therefore, that trying to insert a cue between 3.00 and 4.00 will give possible valid values of 2.01 – 3.99, but values such as 2.99 and 4.01 will be rejected.

# Section 1

## Menu Options

## File

**New Show:** Creates a new show. This clears the cuelist and resets everything in the workspace along with all port mappings such as MIDI and audio devices.

**New Cuelist:** Creates a new cuelist, without resetting everything in the workspace. Leaves MIDI mappings, port mappings and workspace window layout untouched.

**Open Show:** Open a CSC show file into the workspace. By default CSC will look for version 3 files with extension `.csc3`, but version 2 show files can be imported by adjusting the file browser filter to show `.csc` files. This will replace the currently loaded show.

**Save Show:** Saves the current show to disk as a `.csc3` file. If the show has not yet been saved, will prompt for a filename.

**Save Show As:** Save the current show to disk under a new name.

**Enable Per-Session Auto-Save Backup:** When checked, CSC will regularly auto-save the current show to disk, with a file extension `.cscbak`. This file is identical to the main show file, and in the event of a power loss or accidental data deletion, this file can be renamed `.csc` and loaded as the last backed up show file. The file is backed up every 5 minutes. By default this option is not checked, as CSC tries to keep disk activity to a minimum during run time, so should be enabled at the start of every “tech” time or period of unstable power supply. This option is disabled by default every time CSC is restarted to prevent accidental enabling during show conditions.

**Export Show to New Folder:** Allows the user to choose or create a New Folder to copy into all media files used in the show, along with a copy of the show file, for exporting a show to a new computer, or for backup purposes. The dialogue will also ask if you wish to reload the show from this new folder. This is useful if a show has been pieced together with wave files from many places and allows one single folder to be created with all the show data present.

\*It should be noted that for best results this should be run after a clean restart of CSC since files recently played can sometimes remain locked in the OS, resulting in a copy error. For more in depth export options see *Media Manager*.

**Validate Show Integrity:** Scans the show for every referenced media file and checks its location and integrity. An integrity check is performed automatically every time a show is loaded into CSC. Note that the integrity check ensures the wave file header is correct and represents a valid wave file, but does not check every data block for corrupt data, so to be sure files should be fully previewed after moving or hard disk failures. For more information see *Importing/Exporting a show*.

**Print Cue Sheet to Printer:** Prints the cuelist to a connected printer showing all cues, descriptions and link elements.



**Print Cue Sheet to Text File:** If a printer is not available, a text file of the cuelist can be created and printed or emailed from another location.

**Close Show:** Close the workspace and put away the current show.

**Recent File List:** Displays the last 4 loaded or saved shows.

**Quit:** Exits the Program.

## Cue

**Add Cue:** Displays the *Add/Edit Cue* dialogue to enter a new cue at the **end** of the cuelist. See *Add/Edit Cue* for more information.

**Edit Cue:** Allows the selected cue to be edited. Performs the same action as double-clicking on a cue but can be used when no mouse is available.

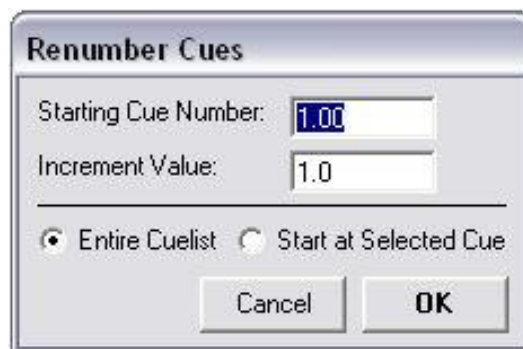
**Insert Cue:** Displays the *Add/Edit Cue* dialogue to enter a new cue **after** the currently selected cue. See *Add/Edit Cue* for more information.

**Delete Cue:** Delete the selected cue from the cuelist. Confirmation is required.

**Cue Management:** Contains options to alter the sequence of cues in the cuelist. See *Cue Management* for more information.

**Cuelist Operations:** Allows advanced operations to be performed on the cuelist entries.

*Renumber Cues:*



Allows cues within the show to be renumbered. The dialogue presents various options to specify what number to start the new cuelist at, what increment value to use, and where to start renumbering within the cuelist – useful to move a bunch of cues such as MD trigger cues to a region of the cuelist out of the way of the main section of the show, such as cue 500.00 onwards.

*Replicate MIDI PC:* Once a show has been programmed, Mixing Desk Program Change data may be attached to certain cues only. During a rehearsal it may

be convenient to jump to any cue and know the desk is in the correct state. Using this option replicates all previous MIDI PC data for the specified mixing desk channel throughout the cuelist. Use this option with care however, as these additional MIDI PC values cannot be removed from cues after this operation.

Offset MIDI PC:



Allows Mixing Desk MIDI PC data to be offset throughout the cuelist.

This can be used when trying to keep the internal memory of a mixing desk in sequential order and allowing CSC to reflect these changes – adding a cue on the desk will change all following cues by one PC value and every PC entry on CSC from that point on will be 1 out. This dialogue can be used to resolve that issue.

The module scans for any MIDI PC data present in any part of the entered cue range, and if the channel and port matches that set up in the MIDI Channel Setup for the Mixing Desk Display (see *MIDI Channel Setup*) will add or subtract an amount to the Program Change Value.

**Go! Next Cue:** Will send the next cue in the cuelist after the current cue stack position as shown in the top left corner of the cuelist window and shown by a “>” in the cuelist (or highlighted if “*Highlight next Cue*” option is checked in the *Settings* window), unless a standby cue, shown by a “!”, is active.

**Send Prev Cue:** As cues are fired, CSC remembers the order in which they were fired, so if it is necessary to revert to a previous cue this is possible, even after a standby cue was called.

**Go! Selected Cue:** Fire the selected cue and set the cuelist stack position to this cue. If the “Highlight Next Cue” option is selected the next cue will automatically be selected and this command effectively becomes a “Go” button. In this way it is possible to set up CSC as a “click and fire” system.

**Send Current Cue:** Send the highlighted cue without affecting the cue stack position. This is the same as triggering cues using the “Data Only” option found in some of the triggering modules.

**GO! Next Act:** When the cuelist has been divided into acts, sending this command will jump forwards in the cuelist to the first cue in the next act.

**Standby Cue:** Set the highlighted cue into standby mode. This will be the next cue to fire, irrespective of cue stack position. A “!” next to the cue indicates standby mode.

**Goto Cue:** Displays the *Goto Cue* dialogue to select and jump to any cue in the cuelist by typing in the cue number.

**Top of Show:** Stop all current activity and reset the cue stack position to 0.00.

## View

Click on any of the menu entries to display the module. When visible, a module has a tick by its menu entry. See following chapter for detailed information of each module.

**Cuelist Columns:** Choose which columns to display in the cuelist. Available options include Cue Number, Link To, Link Time, Page Number (as specified in the edit cue window), and Memory State. Memory state is the value of any Mixer MIDI PC (i.e. a MIDI Program Change command entered on the port and channel specified in the *MIDI Channel Setup* window) attached to the MIDI Control module of that cue. It can be used to visually scan through the list and ascertain where the last mixer state change was and what value it recalled.

**Expanded Cue List View:** Toggle the cuelist between Normal mode and Expanded View showing all elements of each cue. See *Cuelist* for more details.

## Audio

Click on any of the menu entries to display the module. When visible, a module has a tick by its menu entry. See the following chapter for detailed information of each module.

**Pause All WavPlayers:** Pause all currently playing WavPlayers.

**Resume All WavPlayers:** Resume playback of all WavPlayers currently in pause mode.

**Stop All WavPlayers:** Stop playback of all currently playing WavPlayers.

**Complete Active Fades:** Forces any active fades to their final resting value. Useful during rehearsals to reduce time when waiting for long fades to reach their destination and check they hit the correct level. WavPlayer Only.

***Fade And Stop All Audio:*** Forces a natural sounding fadeout over all players and stops any currently playing audio at the end of the fade. WavPlayer Only.

## MIDI

Click on any of the menu entries to display the module. When visible, a module has a tick by its menu entry.

***Full Note Off Cycle:*** Some older MIDI equipment doesn't fully respond to the All Notes Off Control Change message, so this option will send a Note Off value to every note on every channel on both ports. Should only be used if *All Notes Off* fails as this command may take some time to execute.

***Reset Controllers:*** Send a MIDI Reset Controllers message (Control Change 121) to all enabled MIDI Output Ports.

***All Notes Off:*** Send an MIDI All Notes Off message (Control Change 123) to all enabled MIDI Output Ports.

## Comms

Click on any of the menu entries to display the module. When visible, a module has a tick by its menu entry.

## Tools

***Stop Current Action:*** Stop the current cue action. This is broken down into a hierarchical system:

1. Stop timed auto-link
2. Stop Audio Fade
3. Stop Audio Playback

Note this is the same as hitting the <ESC> key whilst the cuelist is in focus.

***Force Network File Update:*** Sends a message to all Slave Computers to reload the show file. See *Networking* for more information

***Update Remote List:*** Forces a sync on a connected iOS device running tRemote.

***Start Internal Timer:*** When the MIDI Timecode window is set to INT (Internal Timer), this starts the timer running.

***Stop Internal Timer:*** Stops the internal timer running.

**System Audio Level:** Presents a master level control through which all WavPlayers and all outputs are controlled.

**Operations Log:** See *Operations Log*.

**Lock System:** Locks the system and prevents gameport buttons firing the cue list. Can be used in areas where the computer isn't secure from accidental or unauthorized use, such as auditoriums at interval time. The lock requires the correct passcode to be entered to resume normal operation. The default passcode is blank, ie. "", and this should be changed using the *Set Lock Passcode* window.

**Set Lock Passcode:** Allows a new passcode to be entered which will exit the *System Locked* dialogue.

**Settings:** Display the Settings Window to make show and application changes.

## Window

**Tile Vertically:** Arrange the windows in the workspace by tiling in a vertical fashion.

**Tile Horizontally:** Arrange the windows in the workspace by tiling in a horizontal fashion.

**Cascade:** Arrange the windows in the workspace by cascading one on top of the other.

**Close All:** Close all open windows in the workspace.

**Window List:** Show all currently open windows in the workspace.

## Help

**About:** Display information about the current version of CSC including build version, date and .csc3 show file format.

## Toolbar Options



**New Show:** Create New Show

**Open Show:** Open Existing Show from disk

**Save Show:** Save Current Show to disk.

**Print Cuelist:** Print cuelist to attached Printer

**Cuelist:** Show the Cuelist

**MIDI Command:** Show MIDI Command Module

**Comments:** Show Comments Window

**WavPlayer:** Show WavPlayer Module

**Messaging:** Show Network Chat and Messaging Module

**Timeline:** Show WavPlayer data in a timeline view for selected cue

**Live Mixer:** Show Live Mixer Module

**Settings:** Show Settings Dialogue

**Record:** Record New MIDI Sequence

**Pause:** Pause all WavPlayers

**Resume:** Resume all Paused WavPlayers

**Stop:** Stop all WavPlayers

**Complete Active Fades:** Force all fades to their final resting place

**Fade All:** Fade Out all WavPlayers over a natural 12 sec period

**Reset:** Reset Cuelist to Top

**GO Selected:** GO Current selected cue

**NEXT:** Go Next Cue

**Stop:** Stop current action (in hierarchical flow model)

**All Notes Off:** Send an All Notes Off MIDI Command to both ports.

**Disable Triggers:** Disable Incoming MIDI triggers from firing cues

**Mute:** Mutes Audio System

**Network:** Show Current Network Status (Online/Offline to remote computer).

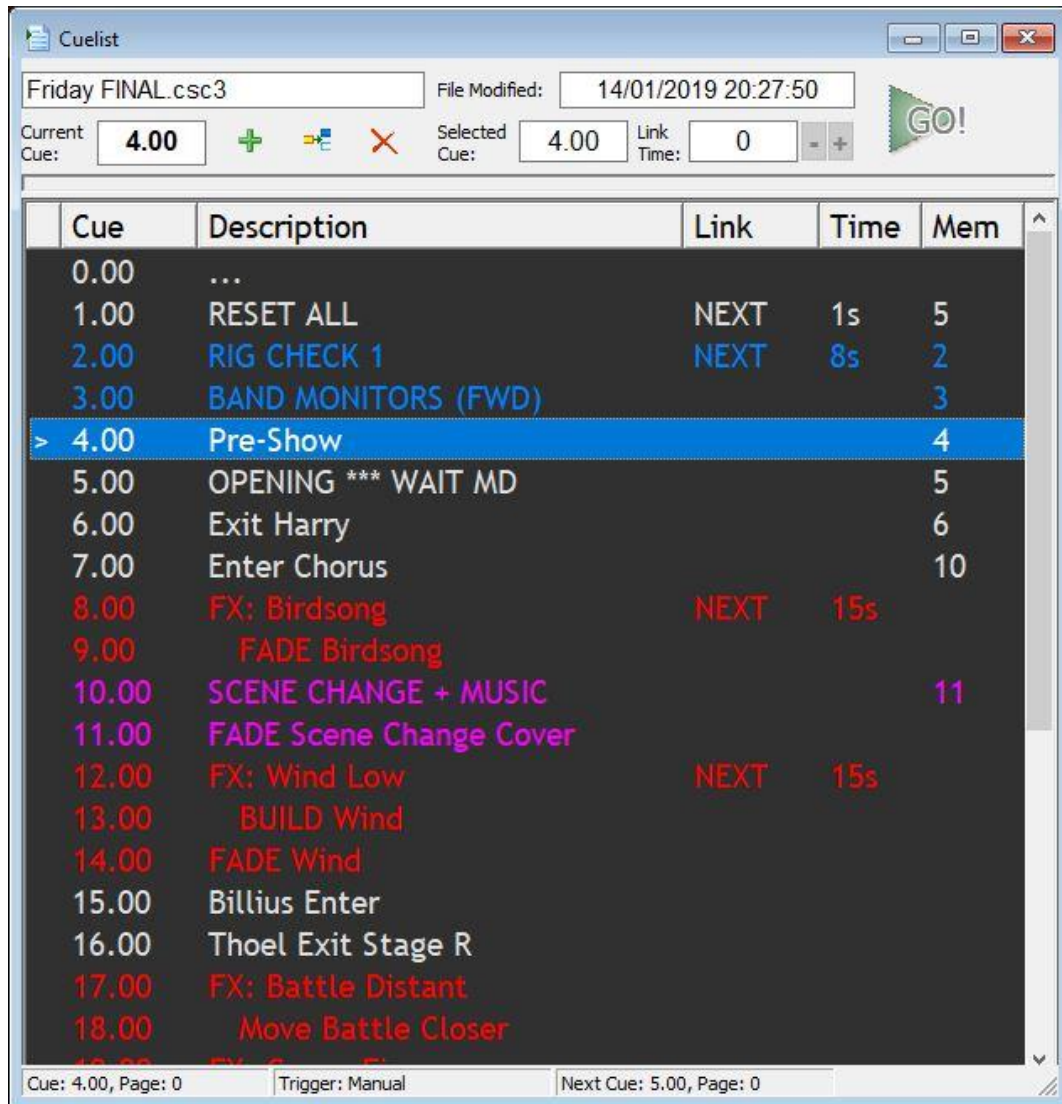
**Remote:** Show Current tRemote Network Status (Online/Offline to remote iDevice)

# Section 2

## Workspace Modules

## The Cuelist Window

This is main control window of the program. It is here that the show is built up and the show running order defined.



The top area of the cuelist window shows the current show filename and when the show was last saved.

Immediately below this can be found the current cue position. This shows the current cue stack position and where the user currently is within the running order of the show. The ">" mark on the left hand side of the cuelist itself is tied to this value.

Next to the current cue are the three cuelist operators: **Add, Insert, Delete**.

Current selected cue, link time details and real-time adjust as well as a shortcut GO button are also located here.



**Add:** This will present the user with a dialogue box to enter a brand new cue at the end of the current list of cues. See *Add/Edit dialogue*.

**Insert:** This will present the user with a dialogue box to enter a brand new cue after the currently highlighted cue. CSC will prompt the user with a suggested insert number, although this can be changed to be anywhere between the new cues boundary cues. When there is insufficient space to insert a cue, this operation will be disallowed, and some cue renumbering may be required before an insert operation can be carried out.

**Delete:** This will delete the currently selected cue. Note also that any module data entered for that cue will also be deleted.

The **selected cue** box shows the cue currently highlighted in the cuelist. Note that during show running time, this will be the same as the entry in the **current cue** box unless *Highlight Next Cue* is enabled.

Note also that the highlight position can be changed to either show the current cue, or to highlight the next cue. This is a matter of personal preference but it can be largely assumed that if CSC is being used to control a lot of desk states and equipment memory states, the “current cue” is the best choice of highlighting. For shows that are mainly sound effect based, it is useful to highlight the effect about to be triggered. This preference is altered in the *Settings* dialogue.

**Link Time** shows details of any automatic links entered for that cue. A value of 0s means there is no autolink enabled for this cue. During activation of an autolink, this entry will count back from the total link to 0 to indicate progress of the link. A progress bar directly between this and the actual cue listview shows this same status in a graphical form. This link time can also be shown in big size in the *Time Display* module.

Link Times can be edited during run time. This is particularly useful during rehearsals when link times can be extended “on the fly” without the need to rerun the same section over and over again to get the link time perfect. During an active link, the +/- buttons will be highlighted and these can be used to alter the current link time in 1 sec steps.

Any cue can be edited by double clicking on it – this will bring the user back to the edit dialogue to make any alterations to the cue.

A single click on any cue will update the workspace to show the memory contents for that cue to enable any of the modules to be edited. Note that any changes to the modules are stored within the cue automatically, no “save cue” operation is needed.

**GO:** Fire the currently highlighted cue. Note that this will not auto-advance the cuelist marker so if using this as the preferred cuelist transport method then the option ‘Highlight Next Cue’ should be enabled in *Settings* dialogue.

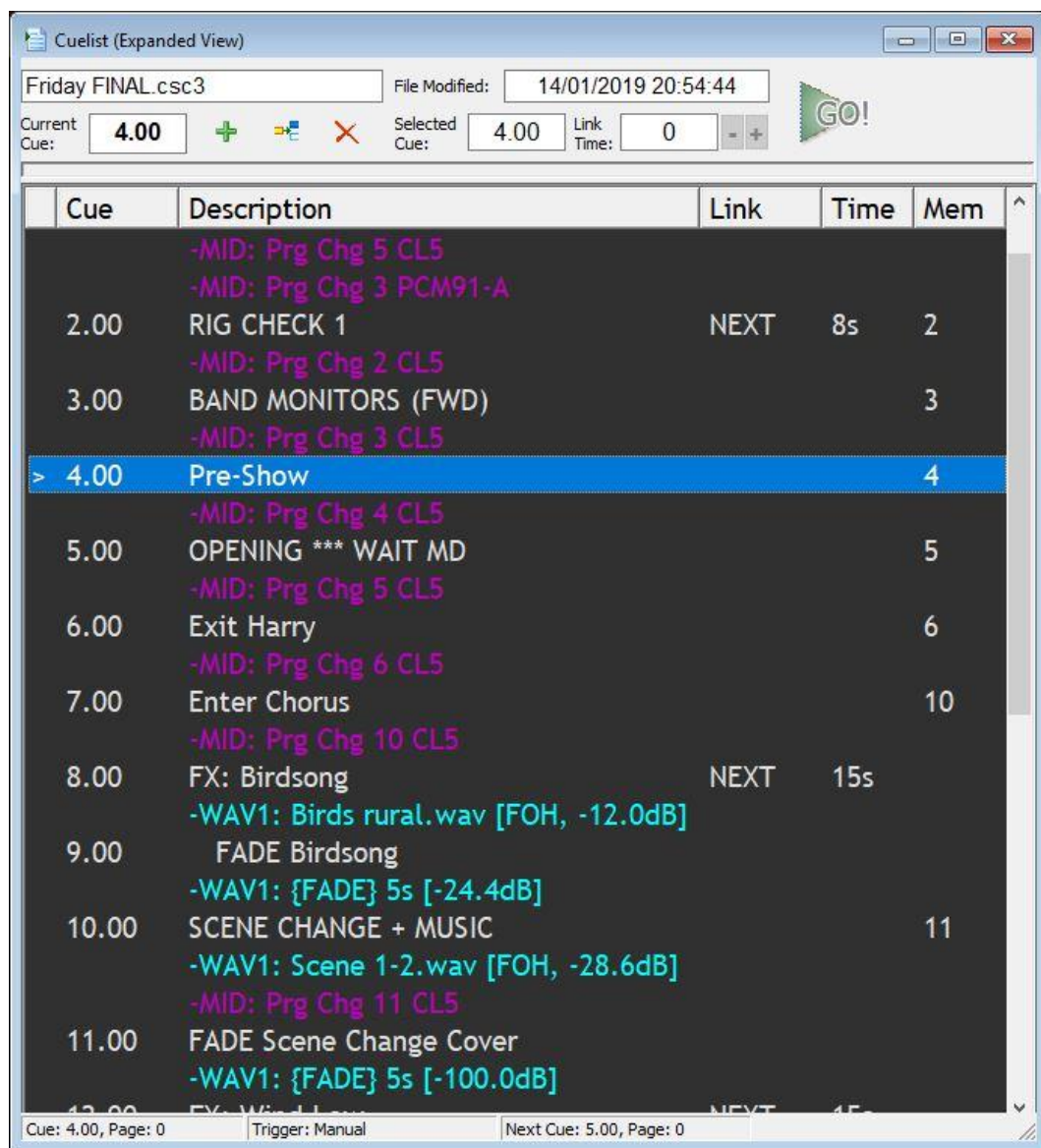
The cuelist data can be displayed in two modes: **Normal** and **Expanded View**.

When in Normal view, the cuelist will show each cue defined within the show, and associated with each, just cue-specific information: The **cue number**, a text **description** of the cue, and a **link** element. Additionally a **page** number reference and a mixer **memory** state can also be shown.

When in Expanded view, each cue is broken down to show each event in each module linked to each cue for analyzing a show and showing a detailed view of exactly what is happening in a running sequence.

Note that in Expanded view, any custom cue colours are overridden to make way for the predefined CSC event colours, and all cues are displayed in System font, dependent on current theme.

Switch between these two modes either by navigating to *View -> Expanded Cue List View*, or by clicking on any of the column headers in the cuelist view.



Cue	Description	Link	Time	Mem
2.00	-MID: Prg Chg 5 CL5 -MID: Prg Chg 3 PCM91-A RIG CHECK 1	NEXT	8s	2
3.00	-MID: Prg Chg 2 CL5 BAND MONITORS (FWD)			3
> 4.00	-MID: Prg Chg 3 CL5 Pre-Show			4
5.00	-MID: Prg Chg 4 CL5 OPENING *** WAIT MD			5
6.00	-MID: Prg Chg 5 CL5 Exit Harry			6
7.00	-MID: Prg Chg 6 CL5 Enter Chorus			10
8.00	-MID: Prg Chg 10 CL5 FX: Birdsong	NEXT	15s	
9.00	-WAV1: Birds rural.wav [FOH, -12.0dB] FADE Birdsong			
10.00	-WAV1: {FADE} 5s [-24.4dB] SCENE CHANGE + MUSIC			11
11.00	-WAV1: Scene 1-2.wav [FOH, -28.6dB] -MID: Prg Chg 11 CL5 FADE Scene Change Cover			

Navigating through the cuelist for editing the workspace can be achieved by using the mouse and a left click, or keyboard cursor keys.

In order to fire cues within the cuelist, any of the functions within the *cue* menu can be used, the transport bar buttons, the cuelist GO button, or even a simple **<SPACEBAR>** push (assuming the cuelist is the active window).

There are a variety of methods available for executing cues in a non-sequential order or for jumping to a particular place within the cuelist (see *Cue Menu*), but it is worth noting that highlighting a cue (single click) and then pressing **<F8>**, or right clicking on the cue and selecting **Standby Cue** will set the cue into standby mode. At this point, a “!” is positioned next to the cue in question, indicating it is in standby mode.

This means that this will be the next cue to fire on receipt of a GO command, regardless of the cue stack position.

## Add/Edit Cue

Editing or creation of any cue in the cuelist is performed using the *Add/Edit Cue* dialogue.

The screenshot shows the 'Add/Edit Cue' dialog box with the following fields and options:

- Cue Number:** 28.00
- Page:** 0
- Link:**
  - Link time (secs): 0
  - Link to Cue: (empty)
- MIDI Trigger:**
  - ☒ No Trigger
  - ☐ Timecode:
  - ☐ Note On: H: 00, M: 00, S: 00, F: 00
  - ☐ Prg Chg: 1
  - ☐ Data Only
  -
- Act Membership:** Act 1
- Change Description:** Telephone Ring
- Jump Over GO!:** ☐
- Jump Over Back:** ☐
- Buttons:** Cancel, OK

**Cue Number:** Shows the cue number of the cue being edited or created. When adding a new cue, CSC will suggest a new cue number which is after the last cue in the cuelist. The cue number cannot be changed to a value lower than this, but can be increased if necessary, up to 990.

When inserting a new cue, CSC will suggest a value for the cue between the ranges of the bounding cues. This number can be changed to any value within this range.

If the entered cue number is out of range, CSC will revert to the suggested cue number.

Cue numbers can be changed after the cue has been added, but the new value must lie in within the boundaries of its neighbouring cues.

**Page:** Enter a page number for the cue. This is for reference only, and appears at the bottom of the cuelist in the status box and also in the notes window. It can also be shown as a cuelist column to visually see when the next cue will happen.

**Act:** Any cue can be assigned to an Act. An Act is a group of cues which can be moved together within a show using the *Act Rearrangement* window. Any Acts already added to the show are shown in the dropdown list, whilst new Act names can be added by typing the name in this box.

**Change Description:** Enter a user-friendly description for this cue to be displayed in the cuelist.

**Cue Colour:** Select a colour for the Cue Description to be shown in the cuelist. This is only shown when in normal mode, since other colours have meaning in the expanded cuelist view mode.

**Jump Over GO!:** A cue can be temporarily removed from sequential operation without removing from the list by ticking this checkbox. The cue is shown greyed out in the cuelist. This cue will still be fired by autolinks and triggers.

***Jump Over Back:*** Check this to prevent the cue from being fired during a *Cue Back* operation. Useful to step back in a show and jump over multiple linked cues, returning to a root cue position.

## **Cue Linking**

***Link Time:*** Specify an auto-link time in secs, to 0.01s resolution, to the cue specified in the *Link to Cue* box. If this is left blank, or set to 0, no auto-link is enabled. Link times can also be entered in m:s format by placing an “m” after the minutes, ie. For 5 minutes 20 seconds, enter “5m20”. This is internally translated to 320s and will be displayed as such in the cuelist.

***Link to Cue:*** Specify a cue to link to when the next **Go** command is fired. If an auto-link time is entered for the cue, this specifies the cue to jump to after the auto-link. If no cue is entered here and auto-link is used, the auto-link will fire the next cue in the cuelist, and “Next” will appear in the link column in the cuelist.

## **Triggers**

***No Trigger:*** This cue is fired by a manual button press

***Note On:*** This cue is fired by either a manual button press or when the specified MIDI Note On value is received at the MIDI Input. Only one cue in the cuelist can be mapped to a unique Note On value, with any velocity from 1-127. Note On velocities of 0 are ignored since some equipment treats velocity 0 to be a Note Off.

***MIDI PC:*** This cue is fired by either a manual button press or when the specified MIDI Program Change is received at the MIDI Input. This range can be shown as either 0-127 or 1-128 by altering the *Cue Trigger PC 0-127* setting in the MIDI Control Mapping dialogue. Only one cue in the cuelist can be mapped to a unique Program Change value.

***Timecode:*** This cue is fired by either a manual button press or when the specified MIDI Timecode is received at the MIDI Input. Ensure that any time setting here fits within the bounds of the frame rate of the MTC source.

Only one cue in the cuelist can be mapped to a unique Timecode. See Appendix for more information on Timecode.

The MIDI Timecode source can also be altered to pick up from an internal timer or the system clock, so in this way the timecode trigger could be used to fire a cue at a particular time of day, or after a desired time has elapsed on the internal timer. The “frames” entry box then doubles up as “hundredths” when using the timer mode.

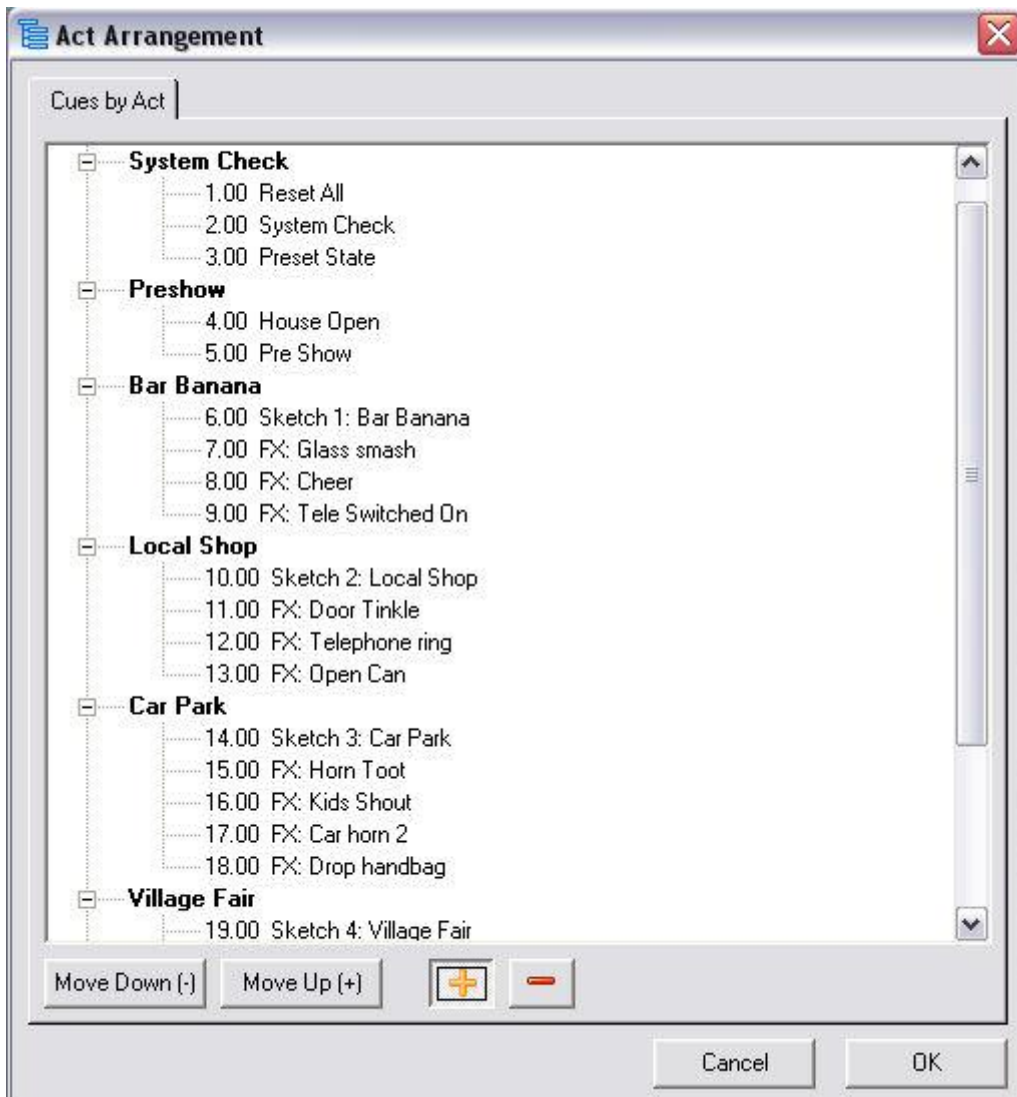
***Data Only:*** If this checkbox is ticked, only the data in the cue modules will be sent, without affecting the cuelist position or auto-link states. This is only available for externally triggered cues.

Note also that any links associated with the cue are **not** executed during “Data Only” cues.

**Capture:** Begins listening to the active MIDI input and assigns the next received Program Change or Note On message to be the trigger command for this cue. Ensure a MIDI port is set up in MIDI Control Mapping before using this feature.

## Cue Management

This module allows groups of cues to be moved around the cuelist based upon their *Act Assignment* in the cue edit window. This is useful for shows based upon many small acts or sketches, such as a revue or comedy show, whose order is changed on a regular basis.



Any individual act node can be double clicked, or its expand (“+”) symbol clicked on to show the cues which are part of the act.

**Move Down:** Move the selected act down the list.

**Move Up:** Move the selected act up the list.

**+**: Expand all act nodes to show all cues belonging to each act

**-**: Collapse all act nodes to hide all cues.

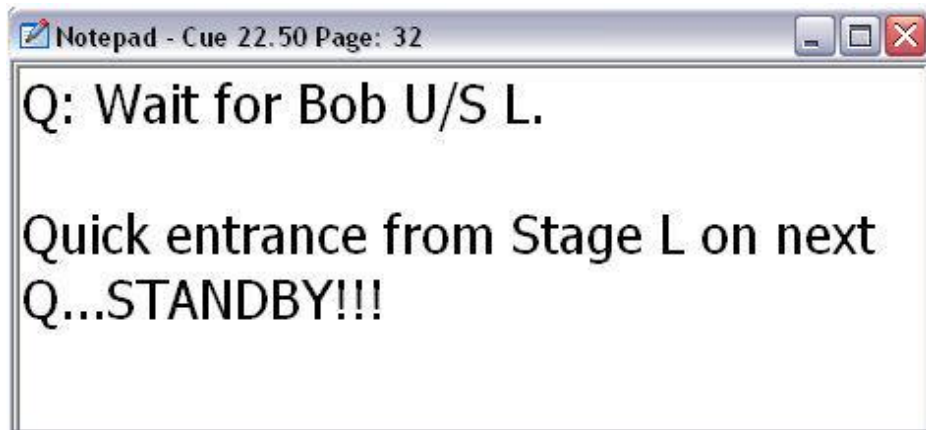
Selecting OK will rearrange the show based on the new act order. Cues which form part of an act are arranged in numerical order, lowest cue number first.

Care should be taken when using this module for 2 reasons:

1. All existing cue numbers are rewritten to form the new show based on the new act order, with new cue numbers starting at 1.00
2. Any link elements must be carefully checked after a show rearrangement. Whilst this will be successful in most cases, since link pointers refer to actual cue ID entries and not cue numbers, links between old acts may no longer be valid. It may be more successful to omit "link to" entries for cues and just base cues on the "Next" method.



## Notepad



A simple jotting pad enabling notes to be remembered on a cue by cue basis.

Notes are automatically saved to the selected cue as they are typed, and recalled once the cue is selected in the cuelist or recalled as part of a cue sequence.

The font size and background colour of the window are customizable in the **Settings** window, and the notepad is resizable to fit the screen by dragging the edges of the window.

When "Highlight Next Cue" is selected, this window will show notes associated with the next cue.

## Hot Cues



The Hot Cues window provides a simple and fast way to jump to certain cues within the cuelist. The window shows “pages” of instant buttons, and there are 5 such pages, each containing 20 buttons. Each button can be programmed to fire a certain cue, and can be styled as necessary to help quick location. Buttons could be programmed in such a way as to enable jumping to certain points within the cuelist for rehearsal periods, providing quick access to audio playback for instant audio effects or even for creating global transport options such as Stopping or Fading all Players.

If a touch screen system is employed, and the window is maximized, it is possible to run an entire show from this one module alone.

Buttons can be programmed to force a jump in cuelist stack position, or to fire “invisibly” in data only mode to leave the stack position as is.

Drag any cue from the cuelist onto a button to assign a button.  
Left clicking on a button will fire any programmed cue.

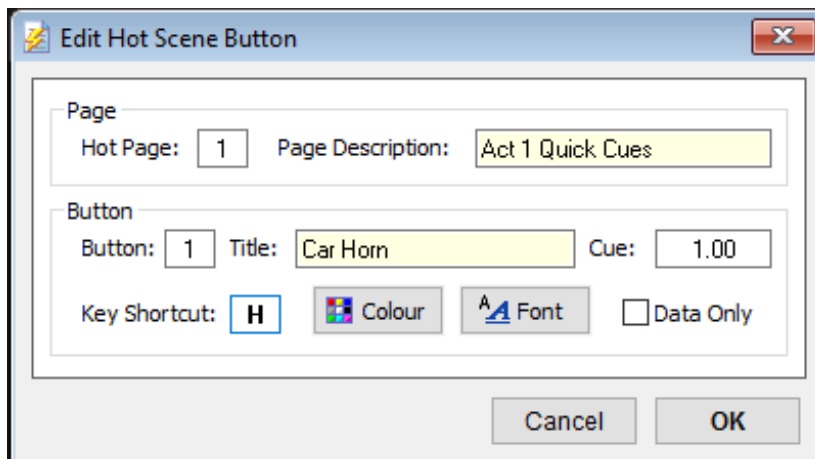
Right clicking will bring up the hot scene menu allowing a change in current page, delete the selected button or enter the button programming dialogue. Pages can also be changed using the *System Commands* module.

**Show Static Buttons:** Divide the Hot Cues window into 2 sections, allowing a dynamic page of buttons which can be changed by system commands, as well as a statically defined page. Useful for having a standard set of commands on screen at all times, whilst allowing pages to move with the show.

**Split Page Vertically:** Split the Hot Cues window between static and dynamic pages either vertically or horizontally.

**Select Static Page:** Select the page to remain on the screen.

The programming dialogue allows all properties of the button to be set.



**Title:** Enter a description to be displayed on the button.

**Cue:** The target cue for the button

**Colour:** Select the background colour of the button

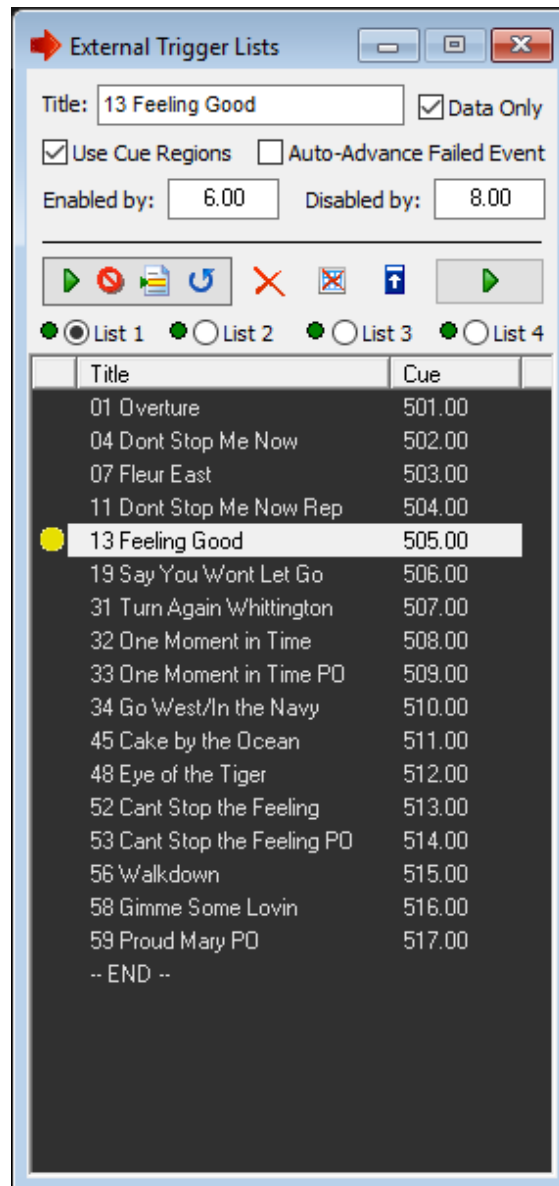
**Font:** Set the Font Style for the button Description

**Keyboard Shortcut:** A unique key on the keyboard to instantly fire the button whenever the Hot Scene window or main Cuelist has focus.

**Data Only:** If checked, the button will “invisibly” fire the cue. In this mode, the cue stack position is unaltered, meaning this button can be pressed at any point and will not affect the shows position at any time. It should be noted that if this mode is used to fire instant audio, care should be taken to ensure that the player triggered will not stop any currently playing audio. Note also that in this mode, cue links are not executed.

The **Description** of the Hot page can be changed by entering a new description at the top of this dialogue.

## External Trigger Lists



The External Trigger Lists module provides a powerful way to interface CSC to external events and environments. 4 lists of event entries can be created – these can be fired by MIDI or gameport actions, and can recall or fire cues in the main cuelist. A nominated list can also be synced for remote inspection and interaction with the iOS application “tRemote”.

Each event entry can also be assigned a “valid” region within the main cuelist to disable a trigger from happening until the correct point is reached in the show cuelist, or to provide tracking between these lists and the main cuelist.

Add events to the trigger list by dragging and dropping cues from the main cuelist into the desired position within the list.

**Toolbox:** This toolbox contains special commands which can be dragged into the triggerlist at the desired position. Their actions are:

**GO:** Perform a general “GO!” command on the cuelist, irrespective of cue position.

**STOP:** Send a “STOP” command to the system, following the hierarchical stop process.

**LOOP:** Return the standby point (yellow or red dot) and highlighted entry to the top of the list, or to the previous marker, to loop a section of the list. Loops can be broken by using the auto-advance option or by using the *System Command* module to advance to a new marker.

**MARK:** Set a marker in the list to jump to. Useful if setting up loop regions within the same list to be triggered from the same button or MIDI source. Markers can be jumped to by using the *System Command* module.

**Title:** Enter a user-friendly description for the event entry in the list. By default, this is taken from the name of the cue.

**Data Only:** Send only the data in the target cue and retain the current cue stack position.

**Use Cue Regions:** An event can be locked so that it can only be triggered when the main cuelist is within the bounds specified by the Enabled and Disabled Cue number boxes. When a selected event is outside its allowed region in the main cuelist a red dot will appear next to it, if it is within its region a yellow dot will appear next to it.

This can be useful if, for example, a prop with an integrated button (e.g. a doorbell or telephone set) is being used to trigger a sound effect, but there is a worry that the prop might be dropped during scene setting backstage and therefore trigger the sound effect early. In this way, the prop can control nothing until the main cuelist reaches the correct point, by which time the prop is in place, and the integrated button is ready in standby position.

Drag a cue from the main cuelist into the enabled and disabled boxes to assign regions to an event.

**Auto Advance failed entry:** If an event entry has been locked to cue regions, there is the possibility of the main cuelist moving past the disabled point, and therefore the entire list being locked. By selecting this option the list will automatically move on if the main cuelist reaches the disabled point, and the entry hasn't been fired.

This can be useful, for example, if there is a live gunshot on stage, and a pre-recorded sound set to fire on a button connected to the computer. If the real gunshot happens, the entry is never fired, and as the main cuelist progresses, the trigger list also progresses to the next entry, as if the backup gunshot had been fired.

**Enabled:** Specify the beginning cue number of the cue region, the point at which the event entry will trigger. When enabled, the entry will show a yellow dot next to it.

**Disabled:** Specify the end cue number of the cue region, when the selected entry can no longer be fired. A red dot will appear next to the entry when it is disabled.

**Insert:** Add the event to the event list at the highlighted point.

**Delete:** Delete the selected event.

**Apply:** Double click any event to edit its data. When finished, click apply to save the new data.

**Top of All lists:** Reset all 4 trigger lists to the top.

**Fire:** Perform a manual fire on the currently visible list.

**List Select:** Select which list to view or edit in the list window. A green dot next to each list shows when a list has been fired.

The External Trigger Lists module can be used in conjunction with the *System Command* module to set specific standby points in the lists and jump through the lists.

## System Command



This module allows many of the toolbar and menu options, and actions which could otherwise be performed with mouse clicks in the workspace to be automated and integrated into the cuelist.

**Reset Main Cuelist:** Reset the Main cuelist to the default header cue ("0.00"). Performs the same action as "Top of Show".

**Reset Trigger Lists:** Reset all 4 trigger lists to the top event and standby all lists.

**GO! Trigger List:** Send a GO command to the selected trigger list. Ensure a trigger list number is entered in the first data entry box.

**Stop All Audio Players:** Stops all currently playing WavPlayers.

**Pause All Audio Players:** Pauses all currently playing WavPlayers.

**Resume All Audio Players:** Resumes playback of any Paused WavPlayers.

**Fade Out All Audio:** Fade out to -100dB any currently playing WavPlayers. Enter the time duration for this to happen in the first data entry box (seconds).

**Mute Audio:** Toggles the system Mute command.

**Un-Mute Audio:** Toggles the system Mute command.

**Disable Incoming MIDI Triggers:** Prevents incoming MIDI commands to trigger cues.

**Enable Incoming MIDI Triggers:** Re-enables incoming MIDI commands allowing them to trigger cues.

**Set Timecode Source MTC:** Sets the MIDI Timecode window to accept incoming MTC as the clock source. (See MIDI Timecode)

**Set Timecode Source INT:** Sets the MIDI Timecode window to accept the Internal Timer as the clock source. (See MIDI Timecode)

**Set Timecode Source CLK:** Sets the MIDI Timecode windows to accept the system clock as the clock source. (See MIDI Timecode).

**Set Internal Time Position:** Set the internal timer to the specified time. Enter an hour (0-23), min (0-59), sec (0-59) and hundredths (0-99) in the first 4 data entry boxes.

**Start Internal Timer:** Starts the internal timer running when MIDI Timecode is set to Source INT.

**Stop Internal Timer:** Stops the internal timer running.

**Disable Gameport Control:** Prevents Gameport buttons interacting with system.

**Enable Gameport Control:** Re-enables Gameport buttons to interact with the system.

**Lock System:** Forces a system lock, same as CTRL+L, and brings up the system lock Modal Window. No further actions can be taken in the system until this is cleared.

**Go to Hot Cues Page:** Force the hot scene window to a specified page. Page number should be entered in the first data entry box.

**Advance Trigger List Marker:** Move the specified trigger list to the specified marker. Markers are counted sequentially from the top of the list down.

**Write Show Operations Log:** Switch on the option to write all show operations to the operations log. By default this is switched off. Can be used to time show performances and generate show reports.

**Save Show Operations Log:** Show the Save Show Operations log file window. Show name and date are entered as a default data.

**Insert Operations Log Data:** Insert a custom string into the show operations log. Type required string in the string entry data box. Can be used the insert "Interval" and "Start of Show" entry points.

**Stop Everything:** Send a Stop All Command to the System.



**Stop Cuelist Autolink:** Sometimes it is necessary to split the operation of a stop button so that it only affects certain parts of the system – for example, in a show with Orchestra triggered click tracks, it may be desirable to have a stop button for the operator which only stops certain WavPlayers relating to sound effects and leaving the Click Track players unaffected. A “stop” button can be modelled on a triggerlist button, but this would still leave any links in the cuelist running.

**Stop MIDI Sequences:** Stop playback of any currently active MIDI sequences.

**Pre-Buffer Available Players:** Whilst the audio playback engine in CSC is written to be as responsive as possible and acceptable for nearly all applications, there may be times when a faster audio playback response is required (or when using the software on a machine with a slower hard drive) – such as Click Track triggering in the middle of a song where the next track needs to start exactly on the beat.

Use this option to pre-load all WavPlayers for the specified cue. CSC will open each audio file into the player and pause it ready for playback. The cue can be fired in the usual manner, then only difference being that because the file is already loaded and opened, response is near instantaneous.

Note this function will not stop an already active player so will only have an effect on currently inactive players.

With a modern machine utilizing SSD hard drive technology there is little to no need to use this function.

**Start Players from Timeline Position:** Begin playback of audio files in a specified cue number from Min:Sec:Hun into the cue as it appears on the timeline view. Useful for splitting large playback content into smaller sections, eg. For rehearsal points and could be combined with Hot Scene buttons.

**Start Timeline Playback if Visible:** Begin the playback function of the timeline if open. This allows rehearsal points to be set up and triggered remotely by assigning this functionality to a remote event such as MIDI/External trigger list combination.

**Disable External Trigger Cue Regions:** Disable the restrictive locking of trigger entries between the entered cues. This could allow for trigger entries to be checked pre-show for example.

**Enable External Trigger Cue Regions:** Re-enable the locking of trigger entries to ensure they can only be fired between the entered cue numbers.

**Enable WavPlayer:** Programmatically enable a disabled WavPlayer for a specified cue. This may be useful for enabling or disabling different versions of an audio file within a cue for example.

**Disable WavPlayer:** Programmatically disable a WavPlayer for a specified cue.

## Time Display



A clock to show the computer's system time or current link time in the show workspace.

The clock can be resized by dragging the edges of the window.

Right click in the clock menu to bring up the clock source selection menu. Set to Link Time to show in big numbers the current countdown time in the main cuelist.



## Clock Triggers

The clock triggers window allows automated cuelist triggers based on the system clock time. This can be useful for pre-show announcements or events which can be guaranteed to occur at a certain time every day. Note also that multiple sets of times can be entered to deal with matinee and evening shows as CSC will search for the next approaching trigger at startup.



Times can be added to the list and a corresponding **GO** or **STOP** action attached to each time.

The module will search for the next trigger time and place it in standby mode, waiting for the system time to occur. This will be displayed in Red.

**Add Trigger:** Adds the entered hour, minute and action to the trigger list.

**Remove Trigger:** Removes the selected trigger from the list.

**STANDBY +:** Advances the trigger list to the next system time and sets it to standby

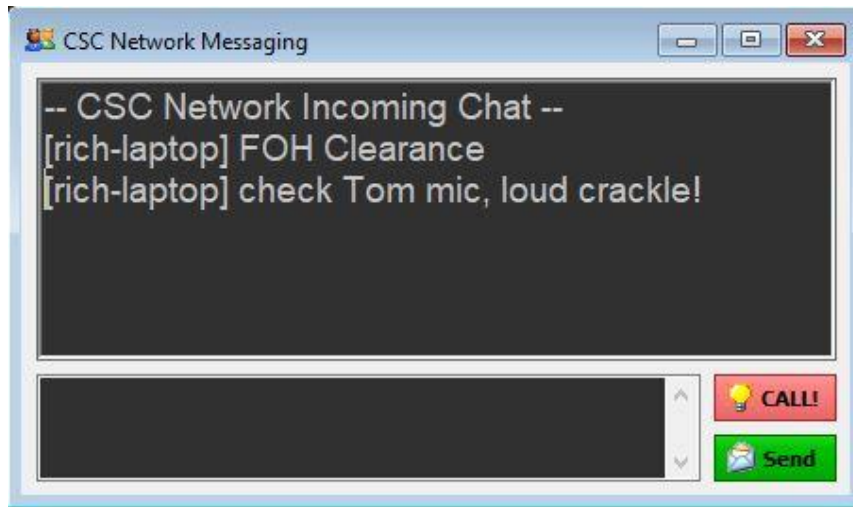
**STANDBY -:** Standby the previous entry in the trigger list.

**STOP:** Takes the trigger list out of standby mode, and stops checking system clock changes until a new trigger is put into standby.

**FIND:** Scans the trigger list to find the next trigger in time order and sets it into standby mode.

Note also that cues can be time-controlled by using the Timecode window set to System Clock mode and entering the time in the cue timecode edit window.

## Messaging



As a component of CSC LAN, network chat is possible between all computers running CSC or the CSC network chat client. A call/flash signal can also be generated to gain the attention of operators. This could be used for FOH/Backstage communication between Stage Managers, Radio Operators and FOH technicians to warn of problems or microphone swaps in situations where normal voice communication is not possible.

It can be part of the CSC workspace and so removes the need for switching between CSC and another application for messaging purposes.

**Incoming Messages:** Shows the most recent incoming messages, prefixed by the name of the machine sending the message.

**Outgoing Message:** Type an outgoing message here to send to the entire network.

**CALL!:** Will flash the background colour of the window to be used as an alert message or to gain the attention of an operator. Could also be used as a primitive cue signal.

**Send:** Will send the message in the outgoing message box to the entire CSC LAN, and this will be displayed on all machines with the chat window open or supported chat clients. Pressing <ENTER> after typing text in the outgoing message box performs the same action.

Note these controls are only available when the CSC LAN is operational.

Check the CTR Electronics website for currently supported network chat clients.

## Transport

This window provides a graphical interface for moving through the cuelist, similar to a traditional tape “transport” control.



**GOTO:** Shows the Goto cue dialogue Window, enabling the user to type in a cue number and quickly fire or standby that cue. For more information see *Cue Operations*.

**PREV:** Returns the cuelist to the previous cue in the cue stack. Note this button performs the same operation as the <BACKSPACE> key, and returns the user to the previously fired cue, and not the cue immediately before the current in the cuelist.

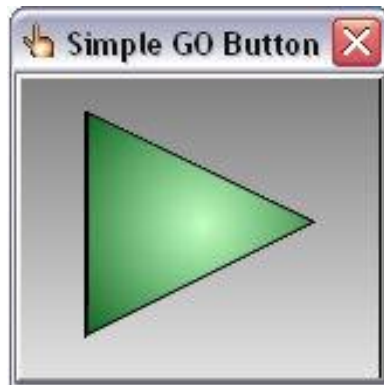
**STOP:** Stops the current action. For more information see *Cue Operations*.

**ACT +:** Jump to the Next Act in the cuelist.

**SEND:** Fires the data saved to the currently selected cue, and moves the cue stack position to this cue. If this cue has already been fired, clicking this button will restart the cue.

**NEXT:** Fires the next cue in sequence in the cuelist.

## Simple GO! Button



As its name suggests, a big button which does little more than fire the currently selected cue.

When opened for the first time, if not already enabled, the system will ask you if you wish to turn on “Highlight Next Cue”.

This allows the cuelist to be used in a click and go manner – that is to say the go button will fire the selected cue, irrespective of cue stack position.

Without this mode switched on, the GO button will repeatedly send the same cue over and over again.

If you wish to change this mode this can be altered at any point by unchecking the ‘Highlight Next Cue’ entry in the *Settings* dialogue.

## WavPlayer

The WavPlayer module is the front-end to control the 64 built-in playback engines. Using this module, files are selected and their attributes are set. All file entry details are stored in the currently selected cue, and corresponding actions are triggered on recall of that cue.



**Player:** Selects the player to be edited or viewed. Note that for multiple simultaneous wave file playback, wave files must be staggered across players since a second **Play** command on Player 1 will replace any previous file playing on Player 1. The players can of course be reused on a cue by cue basis, as long as simultaneously playing files is not required.

**Action:** Select what the player will be doing for the currently selected cue. Possible actions include **Play**, **Stop**, **Fade**, **Pause** and **Resume**.

**Play:** Will play the loaded file on send of current cue.

**Stop:** Will stop all playback on the player, whatever file is currently playing.

**Fade:** Set the player to Fade mode: See Fade Time below.

**Pause:** Pause playback of the current player.

**Resume:** Resume playback of the current player.

**Exit Loop:** Release the player from any currently playing loops

**Group Fade:** Fade the output levels of the player from one defined multi-output group to another group over a linear fade curve. Player level ignored.

**Group X-Fade:** Fade the output levels of the player from one defined multi-output group to another group over a crossfade style curve. The curve shape can be defined in the audio setup and allows the options of the level difference to be 3, 4.5 or 6dB at the fade halfway point. This option should be used for moving sound between speakers smoothly.

**All Fade:** As Group Fade but takes into account the player master level also.

**All X-Fade:** As Group X-Fade but takes into account the player master level also.

**Duck18:** Drop the player current output level by a relative 18dB, irrespective of its current level. The level of the player at the point of sending this action is stored in order to use the Un-Duck command.

**Un-Duck:** Restore the player level to the point before the Duck command was sent.

**Fade (s) In:** When selected action is **Play**, the fade time specifies the time taken for the player output to reach the set fader level from start point of -100dB, and so acts as a Fade-In time. Note that Pan position during this fade-in is unaffected. When the player is set to any one of the **Fade** modes, this value specifies the time taken for the player to change from its current Pan position and Fader level (this may not necessarily be the same as the initial play cue if manual adjustments or the live mixer have been operated) to newly specified Pan and Fader levels. If the new Fader level is set to -100dB, the player will cease playing when the fade finishes, so if this is not desired, set the fader one step above this point, roughly -96dB which still renders the player virtually silent. This value is specified in seconds.

**Fade Out:** Specify a Fade Out time in seconds for the player as the file reaches end of playback. Note this is a file-level dependent fade, so if a fade time of 10 seconds is specified, the player will begin a fade out when the player reaches the last 10 seconds of the file. If the file is less than the value specified, or set to loop, this fade out may not be triggered.

**Play Wait:** Specify the time between firing the cue and the player beginning playback. Enables multiple wave files to be fired from one cue, each with its own offset to create a sequence. This is specified in seconds. The timeline view can also be used to visually adjust this value. See *Timeline View*.

**File Display Window:** Shows the currently loaded wave file (if any) for the selected cue. This window is disabled when the player is not in **Play** mode.

**File Play Time:** Shows the loaded file playback duration. This shows a red background if the file has been altered by cropping the start and end points using the *Wave Display* dialogue. A time is displayed as <m:s> when the player contains a loop.

**Open:** Click this to load a wave file into the selected player for playing on the selected cue. If you are importing a non-WAV format file, you will be prompted for an import location and the conversion process will begin unless these options are explicitly unchecked in the *Media Manager*. You can also import CD tracks by selecting the CD drive as the source, and selecting the track you wish to import, by clicking on the appropriate \*.cda file.

**Wave Display:** Opens the Wave Display Editor window to adjust start, stop, loop and trigger settings.

**Open File in External Editor:** Opens the wave file in an external audio editor as defined in the *Audio Setup* dialogue. A copy of the original file is also made if the option is checked in the Setup.

**Clear:** Clears the currently loaded file or action from the player.

**Fader:** Used to set the playback level of the player for the selected cue. During **Play** mode, this level will be the level at which playback to the selected output



device occurs. During fade modes, this level will be the final level to which the fade resolves: See *Fade Time* below. This fader is marked in dB and has been modelled against a “real” physical fader as used in analogue mixing desks to provide a smooth and useable fade range. The same fader curve is also used during fade modes.

Player dB levels can also be typed directly into the box above the fader.

**Out Type:** Shows the current routing type for the player. Click to show the routing menu to change output type. There are 3 different methods used in CSC to route audio to the soundcard outputs. These are Bus, Mono and Multi.

*Bus* – This option uses a stereo soundcard output as defined by the windows sound system or ASIO pair to route the mono or stereo wave file to.

*Mono* – Similar to Bus, but pans the file to the left or to the right side of the stereo soundcard output. Note if you use a stereo file both channels will be summed together to source that output.

*Multi* – This is by far the most powerful method used to route audio in CSC but can also be more costly in processing time and CPU use. This routing option allows the player to be routed to any of the assigned soundcard outputs in the audio setup window. This option is used in conjunction with the routing mixer to specify the exact levels of the player to each output available, or can be used to quickly route via an already existing saved group. See *Routing Mixer* for more info.

**Patch:** Shows the current output patch for the player. Click to show the routing menu to change the patch.

*Bus:* Shows the stereo outputs as defined in the Audio Setup for the current show.

*Mono:* Shows the mono outputs defined in the current show. These are described in the audio setup window as “Outname L” and “Outname R”.

*Multi:* Shows any routing groups that have been saved to the current show. Routing groups can be selected quickly from this popup menu without having to go into the routing mixer.

**Routing Mixer:** (Speaker symbol) Show the Routing Mixer window. Only available when output type is *Multi*.

**Pan:** Specify a pan position for the selected file to begin playing at, or a new pan position for the sound to move to when action is in **Fade** mode. Possible values range from -100 (fully left) to +100 (fully right). This control has no effect when using the Mono output routing option.

The display **<C>** indicates the normal central position, and the player can be returned to this point at any time by double clicking in the pan display window. Clicking in this window and dragging the move up and down whilst holding the mouse button can also quickly adjust pan position.

**Autofollow:** When ticked, will send a “GO Next” command to the cuelist when the selected player’s file has finished playing, or when a fade completes. Note only one player per cue can have an **Autofollow** assignment to avoid multiple trigger confusion.

**Freesync:** By default CSC will buffer all available files in a cue first before commencing playback. With a large number of files being loaded in a cue this could cause the player response to get slower. Tick this option to allow a player to begin playback without waiting for all other players in the cue.

**Loop All:** Causes the wave file to be looped indefinitely, until the player receives a full-fade, or stop command.

**Disabled:** Prevent playback from this player during cue execution.

**Transport Controls:** Used to play, pause and stop the selected player. These controls are also activated by the cuelist.

**Time Display:** Shows the playback position of any file currently playing on the selected player.

**Progress:** Show the current playback position of the file in a graphical format. Click and drag the bar to move through the file.

**File Playing:** Displays the file currently playing on the selected player. This should not be confused with the file loaded to the current cue as the selected cue may have different information to the current playback state of the player.

## Isolate Operation

All faders in CSC act in real time to make designing a show a much quicker and easier process.

However, sometimes it may be necessary to program a cue without affecting the current output – such as programming a fade, whilst the same player is running a rehearsal cue. In this case, switching the player to isolate mode will enable the fader to be moved and the cue programmed without affecting the current output.

Isolate mode is achieved by right clicking on the fader. When the fader (and pan) controls are isolated from the output, these boxes will be displayed with a yellow background. Clicking again in the same box reverses this mode.

## Routing Mixer



When the WavPlayer routing type is set to *multi*, the option to use the routing mixer is enabled. The routing mixer consists of a channel strip, a routing group memory module and the output faders corresponding to each stereo output installed in the system.

The audio file from the player is routed through the player master fader, and then on to the routing matrix, where there is a fader for each assigned output in the system. Stereo pairs can be linked using the Link button above each set of faders.

**Create Group:** Select this to use the current fader positions and output levels to create a *routing group*. Up to 99 routing groups can be saved per show, and any player can be quickly assigned to a routing group directly within the WavPlayer.

As a routing group can be used many times within a show it is perfect for setting up routing options for sources such as scene change music or on-stage effects, where the same combination of speakers and levels are required time after time.

**Recall Group:** Left clicking on the *Current Group* window will show a popup menu with all the pre-saved groups. Selecting one of these will pre-load the group, but the settings will not become active until this button is clicked. A pending load is indicated by flashing text in the Current Group window.

**Save group:** A group can be edited by moving the faders on a selected group and then clicking *Save Group*. An unsaved group will be indicated by red text in the Current Group window.

By editing a saved routing group, all WavPlayer entries that refer to this group will be updated, so there is no need to edit every cue to reflect the change which makes updating a cuelist for a new venue or change of idea very quick and easy.

**Revert:** When the routing mixer is first loaded or changes are made the previous state of the mixer is stored. Clicking Revert will cancel any changes and revert back to this state.

**Rename:** Rename the Selected Routing Group. Note the names of all routing groups must be unique.

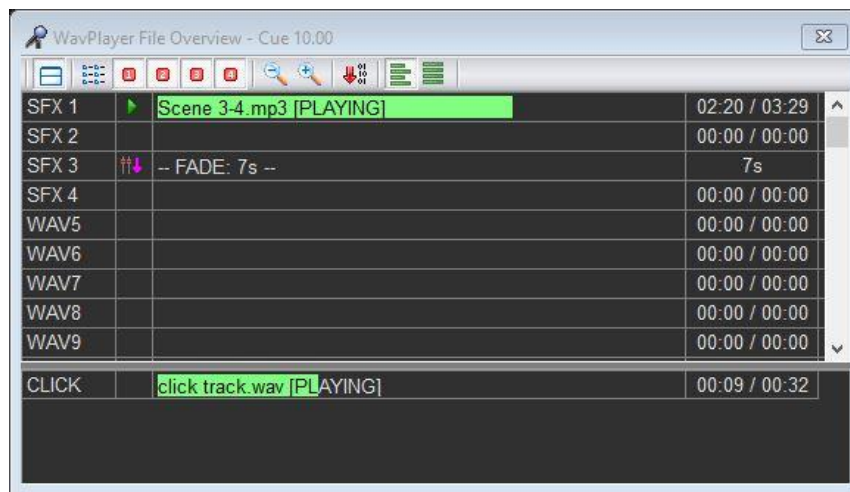
**Delete:** Delete the selected routing group. Ensure no cues are using this group before deleting! If they were the WavPlayer entries will revert to <No Group> and a copy of the levels from the group will be saved.

**Nom Levels:** This will move all faders to their maximum possible output level to ensure a higher signal to noise ratio. All changes are relative so if the highest output fader is set to -8dB, clicking Nom Levels will increase all fader levels by 8dB. At least one output will reach 0dB.

**Reset Faders:** Reset all faders to their -100dB position.

**Channel Strip:** The channel strip contains controls to adjust the level and toggle solo and mute options for the selected player. There is also an option to force an update (“**UP->**”) of the routing mixer if another module has caused changes to the cue and these are not being reflected by the routing mixer.

## WavPlayer File Overview



A simple yet informative visual interface for displaying a graphical overview of the WavPlayers. The module shows the current progress of files across the bank of playback engines, and indicates whether they are Playing, Fading, or Paused. When a player is not currently playing, this module shows the file loaded to each player, or the programmed action for the selected cue.

The module can be split into 'static' and 'dynamic' player entries. Static players will be shown in the top half of the window, whilst dynamic players will appear in the bottom half when they are active. This helps to maximize screen space when a large number of players are used in a show. Assignment of a player as dynamic or static is done in the *Audio Setup -> Player Setup* dialogue.

One or many files can be dropped onto any free player "row" on this window from a Windows Explorer Drag and Drop operation. When multiple files are dropped they will be inserted starting at the dropped row onwards.

When "Use Player Names" is selected in the Player Setup window, the players are shown by their names and not by their number. This can make analysing a show much quicker and easier.

The second column shows a visual indication on any player that has data associated with it for the currently selected cue. This can be helpful to see whether the currently playing file originates on the selected cue or whether there is data on a selected cue which is masked by a playing file. Note that since the player may be playing audio from a previous cue, this icon and the file playing column may not always match each other.

The progress bars remain green when playing normally, and change to yellow if a player is paused. When fading, the file information changes the player text to red and shows the progress of the fade. File position can be changed during playback by clicking on the row to select the player and dragging the bar. If

'Lock Players in Cue' is selected all players part of the same cue will move together, as would be required when jumping through a multitrack sequence.

Selecting any line in the overview list will set the WavPlayer to display that player, or open the WavPlayer if it is not currently visible.

This module can also be used for rearranging files between players. If a file has inadvertently been loaded to Player 1, and then at a later time it is decided this needs to be on another player to allow files to overlap, the player entry can be simply moved using drag and drop onto the new player. Note this action is only available when no files are playing.

Files can also be copied to additional players by holding <ALT> whilst dragging.

**Show Static and Dynamic Grids:** Toggle the window view between showing all 64 players in one grid or dividing the window into 'static' and 'dynamic' grids. Players assigned as dynamic in *Audio Setup* will be excluded from view in the top 'static' grid; instead appearing in the bottom 'dynamic' grid as and when they are actively playing a file.

**Show All Players:** Temporarily toggle the window view to show all players regardless of static or dynamic allocation. This can be useful during programming when players have already been assigned but an overall view is required to make changes.

**Visibility Groups 1-4:** Show or hide players assigned to a visibility group. Players can be assigned to a visibility group in the Audio Setup -> Player Setup dialogue. This can help reduce the number of players shown on the screen at once. It may be desirable to hide some background FX players, for example, as there may not be much need for interaction with these, but a quick toggle of the visibility group will bring them up if needed.

**Window Font Size:** Choose the font size used in the display window, between 8pt and 18pt.

**Show Time Remaining:** Toggle between player progress and time remaining for count-up or count-down views.

**Players Search Independently:** Only the selected player will change position when the green progress bar is dragged left or right.

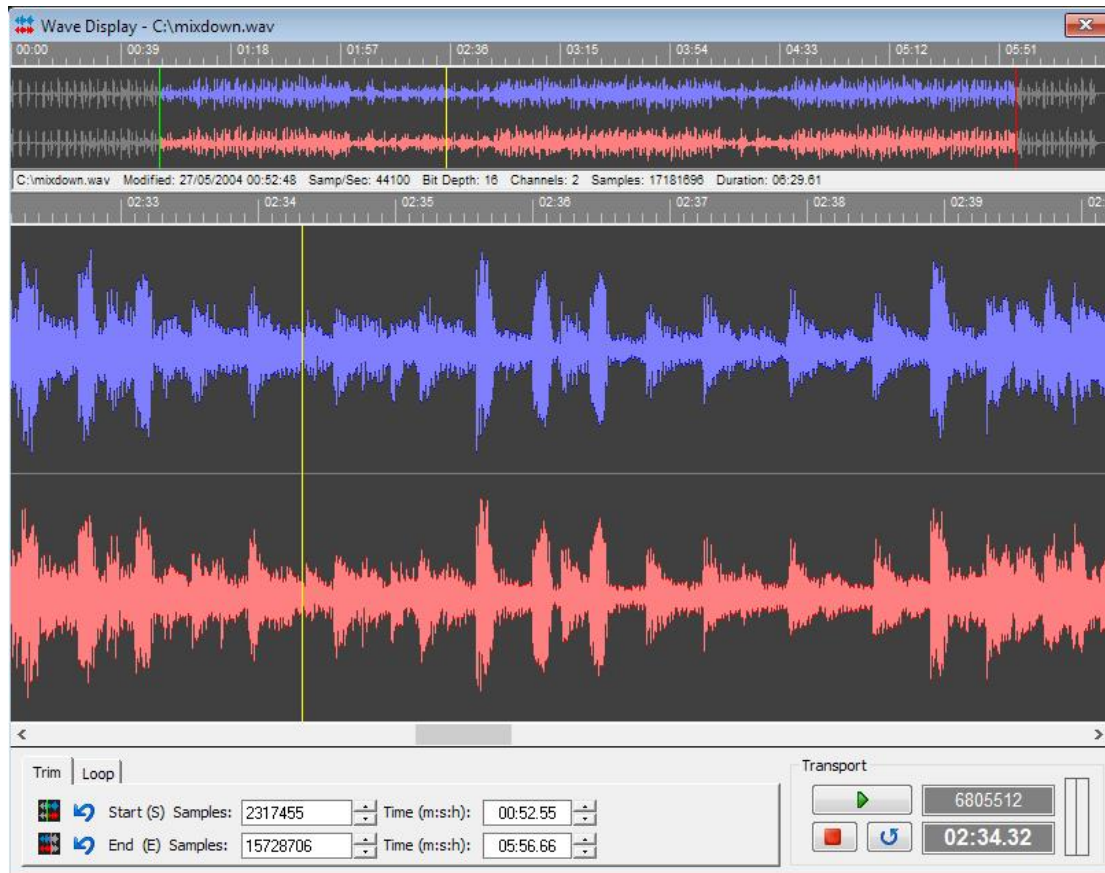
**Lock Players in Cue during Search:** All players that began playback in the same cue as the selected player will change position when any of the green progress bars is dragged left or right. This can be used to adjust the position of multitrack type playback cues.

### **Real-Time Use:**

Right click any player name or number whilst the player is playing and the live control menu is brought up.

This allows the player to be stopped, paused, or faded without affecting any of the other players to make removing accidental playback or live “on-the-fly” mixing possible.

## Wave Display



The Wave Display window enables fine tuning of a wave file to be played. Specific details such as Start, Stop and Loop points can be plotted into the cue to describe the way the file will be played back by the WavPlayer.

The window is split into 4 sections. The top section shows an overview of the entire wave file, including any start, stop and loop points applied to the file. Regions not to be played are shown in grey.

The second section shows details of the wave file itself including filename, modified date, sample count and format as well as duration of the original wave file.

The central section shows a zoomed in section of the wave file. This is the working section of the window and any cursor positioning is done in this window.

The final section includes Trim and Loop adjustment as well as the Transport control.

### Trim

**Start:** Clicking Start will set the WavPlayer's start position to the current cursor position (the yellow vertical line is the cursor). The start position can be set by either clicking on the start button, right clicking on the wave display window and selecting *Set as Start Position* or by pressing the '**S**' button on the keyboard.



The Start position is shown as both samples and time values, as well as being indicated by a green bar on the waveform display. Fine adjustments can be made by clicking the up/down controls next to the value boxes.

**Revert Start:** Cancel any added Start Position and play the file from the beginning.

**End:** Clicking End will set the WavPlayer's end position to the current cursor position. The end position can be set either by clicking on the end button, right clicking on the wave display window and selected *Set as End Position* or by pressing the 'E' key on the keyboard.

The End position is shown as both sample and time values, as well as being indicated by a red bar on the waveform display. Fine adjustments can be made by clicking the up/down controls next to the value boxes.

**Revert End:** Cancel any added End Position and play the file right up to the end.

## **Loop**

**Loop Type:** This offers 3 modes of operation: No Loop, Loop Until Exit, Play Set Times.

*No Loop:* Allow the file to play between the start and end markers with no interruption to playback.

*Loop Until Exit:* Allow a definable region to be created for the player which will loop a section of the wave file indefinitely. The loop can be released by clicking the loop button on the WavPlayer or by sending an *Exit Loop* command from the WavPlayer.

*Play Set Times:* Used in conjunction with the *Plays* box, this will loop a section of the wave file by a set number of times. The *Plays* box will indicate how many times the WavPlayer will play the looped region, i.e. How many times that section will be heard. For example, if a bell sound is looped and the play count is set to 5, the bell will be heard to chime 5 times. This is different from 'number of loops', which would be 4!

**Loop In:** This defines the start of a looped region and is the point at which any looped file will cycle back to on the start of a new loop. This point is set by clicking the loop in button or by pressing 'I' on the keyboard, the loop point will then be set to the current cursor position. It can also be set by right clicking on the waveform and selecting *Set Loop In*.

Note this can only be set once the *Loop Type* has been defined.

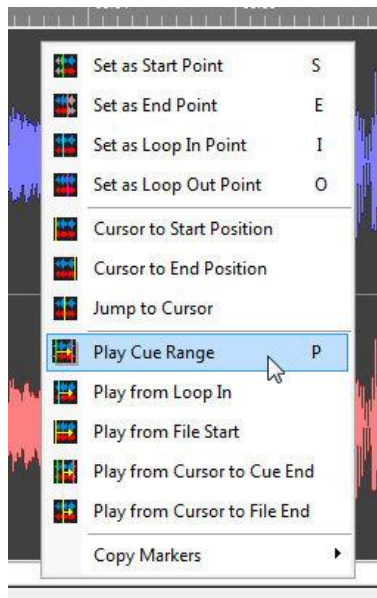
The Loop In point is shown as a blue marker on the waveform.

**Loop Out:** This defines the end of a looped region and is the point at which any looped file will jump back to the defined loop in point. This point is set by clicking the loop out button or by pressing 'O' on the keyboard, the loop point will then be set to the current cursor position. It can also be set by right clicking on the waveform as selecting *Set Loop Out*.

Both Loop In and Loop Out markers can be adjusted using the time adjustment boxes and the up/down controls.

A looped region will also be shown as a white section of waveform in the overview window.

### **Pop-Up Menu:**



Right Clicking anywhere on the Wave Display will show the popup menu with shortcut options available.

**Set as Start Point:** (S) Set the current cursor position as the file start position for the current cue.

**Set as End Point:** (E) Set the current cursor position as the file end position for the current cue.

**Set as Loop In Point:** (I) Set the current cursor position as the Loop-In position of the file for the current cue. Note this will only be active when a loop type has been defined in the loop tab.

**Set as Loop Out Point:** (O) Set the current cursor position as the Loop-Out position of the file for the current cue. Note this will only be active when a loop type has been defined in the loop tab.

**Cursor to Start Position:** Move the cursor to the current cue start position.

**Cursor to End Position:** Move the cursor to the current cue end position.

**Jump to Cursor:** Move the display scrolling view to the current cursor position.

**Play Cue Range:** (P) Play the file as it would be heard in the cue.

**Play from Loop In:** Play the file from the defined Loop-In position.

**Play from File Start:** Play the file from the start, ignoring cue start positions.

**Play from Cursor to Cue End:** Play the file from the cursor position up until the defined cue end position.

**Play from Cursor to File End:** Play the file from the cursor position up until the end of the file, ignoring cue end positions.

**Copy Start Point to All Players in Cue:** Copy the defined start position of the WavPlayer to the other players in the cue. This will only work if the start position is available in the other files (ie. They are long enough). This is useful when working with multi-track files, where a single stem (such as a percussion track) can be used to define the start position for all the other files.

**Copy End Point to All Players in Cue:** Copy the defined end position of the WavPlayer to the other players in the cue. This will only work if the end position is available in the other files (ie. They are long enough).

**Copy Loop Points to All Players in Cue:** Copy the Loop-In and Loop-Out positions from the WavPlayers to the other players in the cue. This will only work if the positions are available in the other files. Useful for creating loops in multi-track cues when a loop can be defined on one file, such as the percussion track, and then applied to the other players to keep the loop in sync.

### **Transport:**

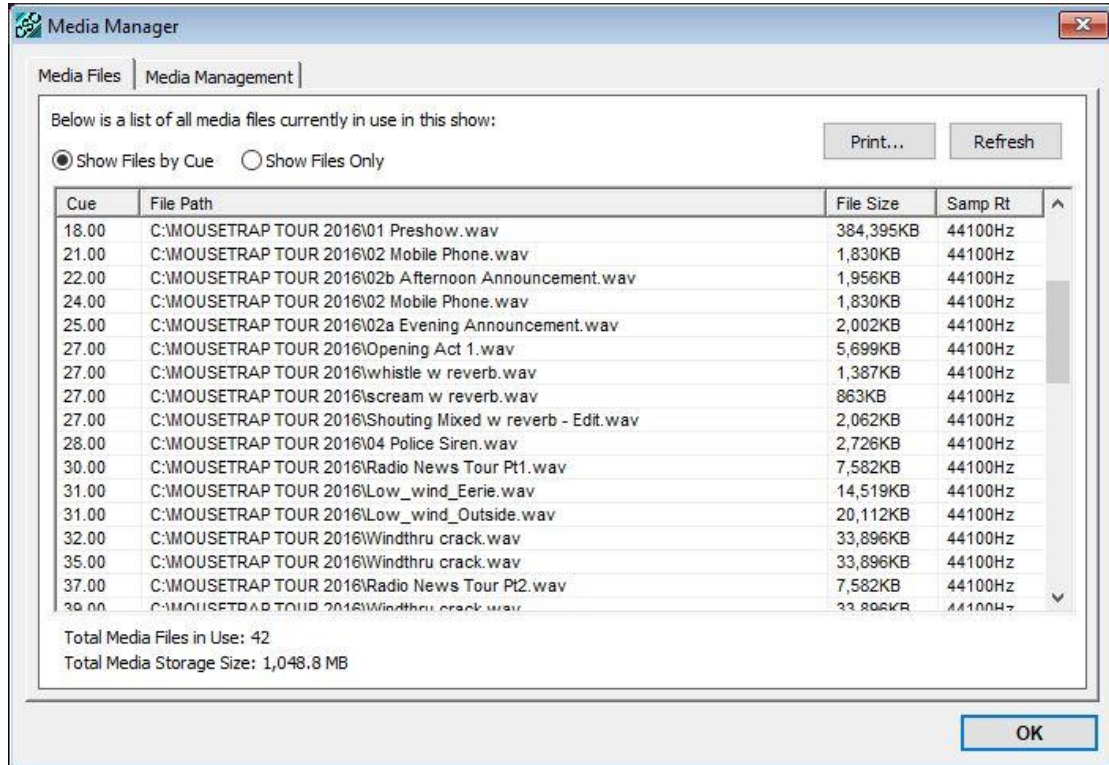
**Play:** Play the file from the current cursor position, irrespective of cue markers. If cue positions are wished to be heard, use the pop-up menu of press 'P' to play the actual cue with markers applied.

**Stop:** Stop playback of the current WavPlayer. Pressing Stop twice will return the cursor to the current Start Position.

**Exit Loop:** When a loop is defined and active, this will be illuminated. Press to allow the file to test exiting a loop.

## Media Manager

This dialogue provides an overview of all media files used throughout the show and also presents the user with options for importing and exporting media files.



**Show Files by Cue:** Scans the cuelist and displays all wave files with reference to their cue.

**Show Files Only:** Scans the cuelist and displays all wave files in use by the show. Unlike the *Show Files by Cue* option, each file will only be displayed once, even if used multiple times, and a true listing of the number of wave files and total media storage size can be obtained.

All files referenced in the cuelist are listed and scanned for file size and sample rate. If the file sample rate doesn't match the audio settings sample rate this will be shown in red. If a file is missing or corrupt this value will be unknown.

**Print:** Print a list to a connected printer showing all wave files in the show, useful for import/export purposes.

**Refresh:** Update the list to reflect recent changes.

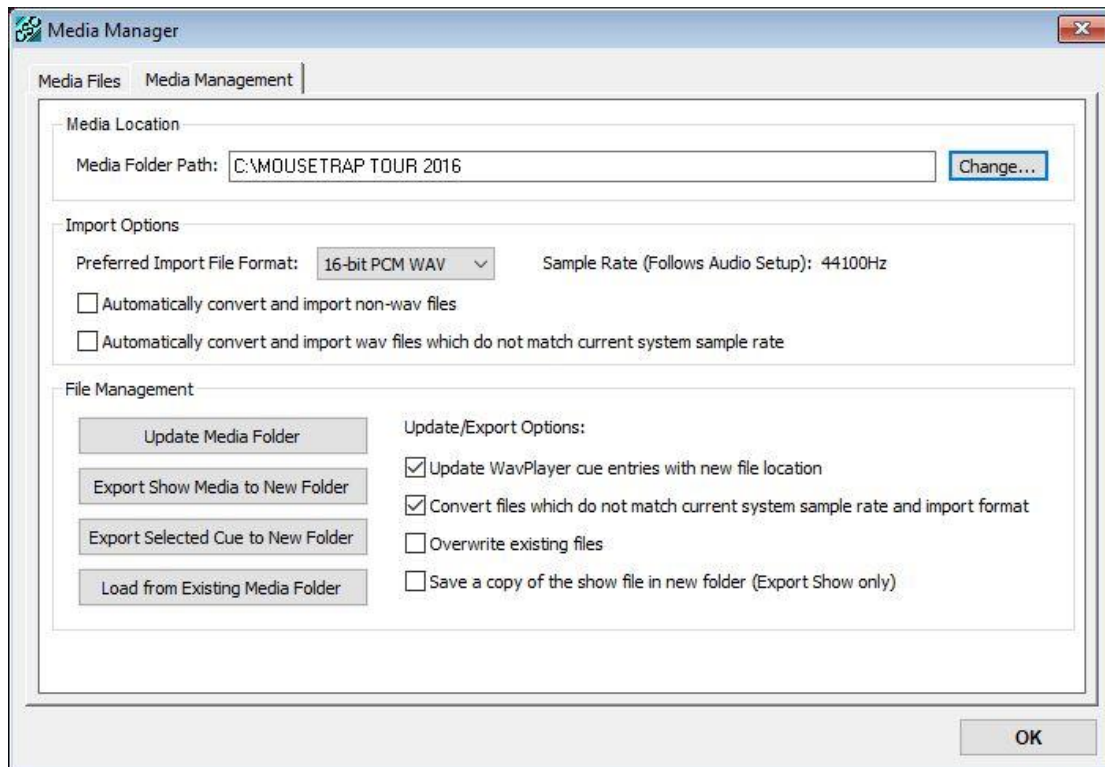
**Total Media Files in Use:** The total number of individual wave files in use in the show.

**Total Media Storage Size:** Total storage size, in MB, of all the wave files, useful for planning an export of backup media.

## **Media Management**

Good filing and file management can be hard to maintain during busy technical and rehearsal periods, and the temptation to quickly add files to a show from whatever source they reside on rather than copy to a specified media folder on the playback machine is high.

CSC provides tools to help regularly clean up the media used within a show, aiming to keep everything in the same place, on the fastest system disk and preferably of the same file format and sample rate.



**Media Folder Path:** CSC can automatically convert and copy a file into a specified media folder when adding to a cue. If this is not set a folder selection dialogue will be shown when adding the first file, and this folder will then be used for any further file imports. The location can be changed here, although this will only change any future file operations and not those already copied.

## **Import Options**

**Preferred Import Format:** Due to their uncompressed nature, WAV files are the chosen format for efficient playback. If desired, CSC can automatically convert an audio file when it is added to a cuelist. Use this dropdown menu to choose the preferred format for the import WAV files. Choose between 16-bit, 24-bit, 32-bit and 32-bit float PCM formats. The audio converter will always use the sample rate defined in the Audio Setup dialogue.

***Automatically Convert and Import Non-WAV file:*** Enable or disable the automatic file conversion system for files which are not WAV files. Enabling this will ensure MP3, MP4, AIFF files etc are copied to the media folder and converted to WAV once added to the cue list. If this option is deselected the files will remain as are, CSC will still attempt to play them assuming the necessary file codecs are installed on the system.

***Automatically Convert Files not Matching the Sample Rate:*** Even if a selected file is of WAV format, it may not be of a sample rate matching the existing files or the system sample rate. Enable this to ensure the files are sample rate converted to the system sample rate and imported automatically.

### **File Management**

***Update Media Folder:*** Analyse the current show file and verify whether all files are located in the specified Media Folder. If any files are located elsewhere these will be copied into the Media Folder, using the options specified below.

***Export Show Media to New Folder:*** Allows the selection or creation of a new media folder and will copy all files used in the show from their current location to the newly chosen folder, using the options specified below.

***Export Selected Cue to New Folder:*** Allows the selection or creation of a new media folder and will copy all media files related to the currently selected cue from their current location to the newly chosen folder, using the options specified below.

***Load from Existing Media Folder:*** Load and re-target all media files to a new location. This will alter the folder path of all files used in the show to the new location. This may be useful when moving a show or moving media to a new drive for example.

***Update WavPlayer Cue Entries with new Location:*** When any of the export operations are performed, enabling this option will update the cue list to change the folder path for each file to the newly created folder. This could be used to move all files used in a show from one location to another for example. Care should be taken to ensure this is not enabled when exporting to a removable drive, when taking backups for example.

***Convert Files which do not match Sample Rate:*** As per import, enabling this will ensure that any update or export operation will verify file format and sample rate and if these do not match the import options will convert during the export process. Can also be used to convert files to a different sample rate in an existing media folder by choosing enabling this and then choosing Update Media Folder.

***Overwrite Existing Files:*** Enable this to overwrite any existing files with the same name in the destination directory. Disabling this will cause new files to have an extension appended to the filename, usually of the type (1) etc. Note that if the source and destination folders for a file are the same overwrite will not be possible.

***Save a Copy of the Show File:*** If a complete show backup is required, the audio files and the show file will be required. Enable this to ensure a copy of the show is saved in the new folder.



## WavPlayer Live Mixer

All of CSC's WavPlayers can be controlled from the WavPlayer Live mixer in real-time. This is useful when a montage of files is being played back, and allows the mix to be fine-tuned easily.



Mixes can be auditioned before levels are saved back to the players respective root cues (or last level change cue – indicated in the “Cue” indicator next to the fader), or linked directly back to the cuelist to save instantly.

The Pan slider will alter the pan/balance of the selected player. Double clicking on the pan position readout will revert the pan position to the centre <C>.

The mixer can be displayed in Narrow or Wide mode. In wide mode, more details of the individual players can be seen, such as parent cue and last level saved. The mode selection buttons in the top left of the mixer window can be used to change the view.



The mixer also features **Solo** and **Mute** buttons for each player, to analyse mixes in detail or quickly remove a file from the output. These controls operate in the same way as traditional mixers, and the Solo mode can be set to “*add-mode*” whereby a solo’d channel will be added to the existing solo signal, or



“*replace*” where each solo button will remove the previous solo selection. These modes are switched by clicking **Add Mode** under the Master **Solo** and **Mute** reset buttons.

Each channel also features a **Fade** button (marked “F”). This will start a natural sounding fade out on the selected player. This is useful for on-the-fly adjustments, correcting accidental playback without affecting any other player or having the harshness of an immediate stop.

The cue number of the last saved level – be this a play or fade action is also shown for each playback channel within the mixer inside the “Cue” indicator next to each channel fader.

**Link:** When this is selected, any changes in fader or pan positions are linked directly to the WavPlayer and saved in the root cue. Without this selected, changes are only reflected in the actual output buffers, and are not saved to the cue until “save” is pressed. This is useful for trying a different mix of audio, without actually committing to it.

**Save:** Saves the current mixer settings back to the root cues of each player.

**Restore:** Restores the mixer’s fader and pan positions back to those saved in the cue.

**Mute Clear:** Removes any Mute selections from all channels.

**Solo Clear:** Removes any solo selections in the mixer and switches the output back to main mix.

**Add Mode:** Toggles between Solo “add” mode and Solo “replace” mode, similar to traditional mixing desks.

It should be noted that all SOLO settings are cleared when the WavMixer window is closed, but any selected MUTE settings remain.

**Create:** Creates and inserts a new cue into the cuelist, after the currently selected cue, and adds fade data to every player currently active. If Link is active, then this should be pressed first, and then new mixer settings can be applied to the new cue (without this, mixer changes would be written back to the last level change cue), or if Link is not active then this button can be pushed at any point in time to ‘snapshot’ the mixer levels into a new cue. The default fade time specified under Audio Settings is applied to all new fade entries. Created cues follow the same numbering rules as the standard Edit dialogue.

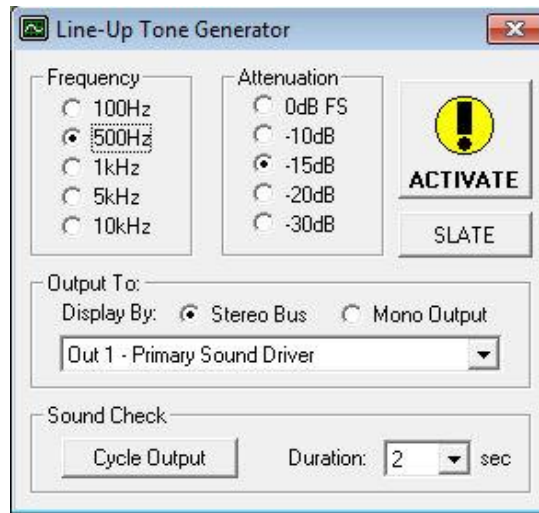
## MIDI Control

The 64 Player Faders, Pan Controls, Mutes and Solos can be controlled by incoming MIDI Control Change messages.

This can be used in conjunction with a MIDI control surface or digital mixing console to have physical real-time control of the mixer to quickly and accurately build a mix.

MIDI control can be set up via the **MIDI Control Mapping** dialogue under the MIDI Menu.

## Tone Generator



This module will generate a test tone sine wave for checking and setting output levels for interfacing with external mixers and equipment. There is a choice of frequencies (100Hz, 500Hz, 1kHz, 5kHz, 10kHz), and a choice of output amplitudes (-30dB FS, -20dB FS, -15dB FS, -10dB FS, 0dB FS).

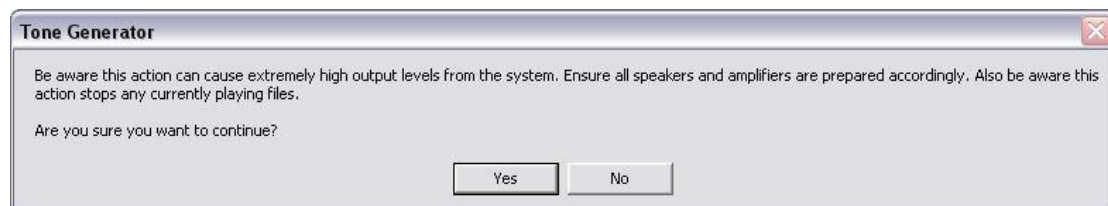
Note the amplitude levels are functions of the operating level of the soundcard and any master mixer levels set on the soundcards own control panel. 0dB FS (Full Scale) will represent the highest level CSC is capable of generating.

The output can be sent to any individual output, or if the **SLATE** option is selected, the tone is routed to all CSC-enabled outputs.

Stereo Bus mode will route the test signal as a stereo pair to the stereo output pair on the soundcard. Mono Output will route to either the left or right output of the soundcard.

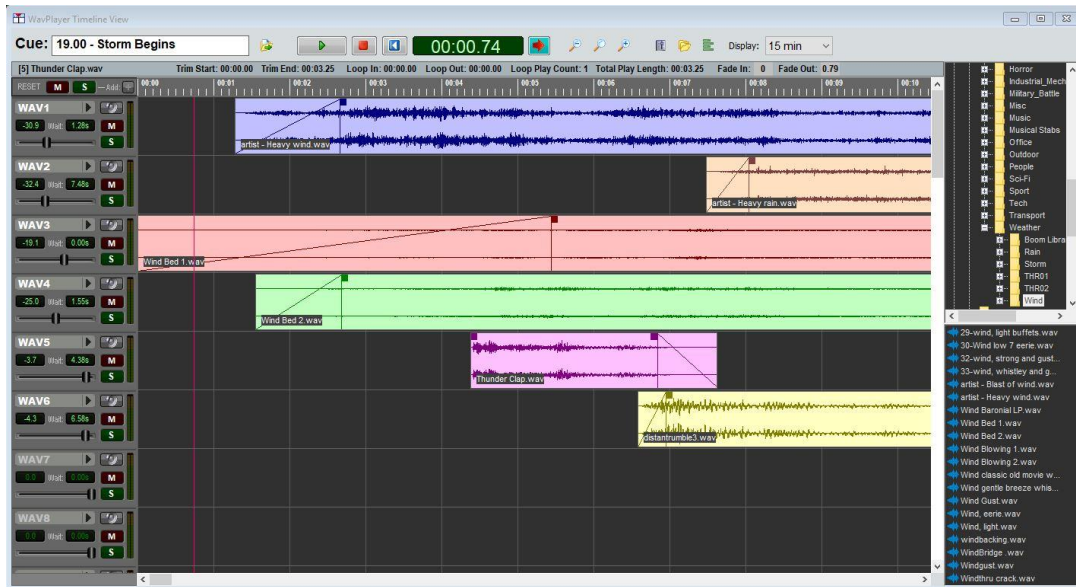
**Soundcheck** mode will cycle the tone between all outputs using the interval specified.

Press **ACTIVATE** to begin the tone generation process and confirm the following dialogue to ensure non-accidental operation of this feature.



## Cue Timeline View

Cue Timeline View gives a unique way to graphically visualize the audio events within a cue. It presents the cue in a sequencer style format, with the 64 WavPlayers represented as 'tracks', and audio events shown as blocks with an overview of their waveform inside.



**Cue:** Shows the name and number of the currently shown cue. The update cue button directly to the right of the description will update the timeline view based on the highlighted cue in the cuelist.

**Play:** Audition the audio in the current cue from the cursor position. Note this is not directly linked to the cuelist, so firing a cue there will not begin timeline playback.

**Stop:** Stop timeline and cue playback.

**Restart:** Return the cursor to the beginning of the cue, ie. 0sec.

**Cue Time Position:** Shows the current cursor and playback position from time 0 of the beginning of the cue.

**Follow Cursor:** Auto-scroll the timeline graphics to follow the playback position.

**Zoom (Vertical):** Enlarges the player 'track panels' to see greater detail within the wave file.

**Show Mixer:** If not already visible on the screen, will show the WavPlayer Live mixer.

**Show File Explorer:** Toggles the file explorer on the right hand side of the timeline layout window. See below for more info.

**Show Timeline Multitrack Adjust:** Toggle the Multitrack Adjust window to perform global operations to all audio files contained within the cue.

**Timeline Windows Edit Range:** Adjust the duration of cue show within the timeline window. This is by default 15mins, but can be extended up to 3 hour to show long content, or select rehearsal points in conjunction with the System Command window. It should be noted there is no guarantee of synchronization of players delayed by large periods of time.

**Info Bar:** Shows information about the currently selected audio event, including Start/End and Loop info, as well as fade in values.

**Reset Mute:** Cancels any active mutes on players within the timeline view. This also toggles all mutes within the Live mixer.

**Reset Solo:** Cancels any active solos and returns the outputs to their normal state.

**Add:** Toggles the Solo Mode between 'addition' and 'auto-cancel'. See *Live mixer* for more details.

**Player "Track Panels":** The left hand side of the view gives access to the players, which are named as per the show naming scheme. A bright white label indicates there is data loaded to the player, whilst a greyed out label indicates an empty player or 'available track'. Clicking the access arrow next to the player name allows change of routing type, and to set whether a player is looped or not.

As per the WavPlayer, the Speaker icon opens up the routing mixer for that player, or if it is already open, updates the routing mixer with details for that player. (M)ute and (S)olo operate as per the Live mixer, muting and solo'ing players respectively. The mute systems between the Live Mixer and timeline are linked and so work together.

The player 'track panel' also shows the current volume of the player in dB, and also the time offset (delay) of the player. This is the same as the 'Wait' time set in the WavPlayer, and changes to either will be reflected in both. This determines where the audio event first appears on the timeline, so for a delay of 5s, the audio event will be drawn graphically starting at the 5s point.

The volume slider allows quick setting of the players volume without having to show the mixer should screen size and space be an issue.

### **Working with cues in the timeline**

The timeline presents a unique way of working with cues. It allows sequences to be built easily without using multiple linked cues or guessing Wait times on Players due to the ability of seeing the waveforms of the files on each player.

The timeline will show by default up to the first 15 minutes from the start of a cue (a player wait time of 54000 seconds). If more time is required between audio events, either toggle the view to show up to 3 hours, although due to each player using an individual wait timer, the synchronization of players is not guaranteed over long periods of time, so it may be desirable to use linked cues or alternative methods of delaying material.

An already built cue with all files inserted can be opened and edited within the timeline, whilst any new cues can be built within the timeline using the file explorer window.

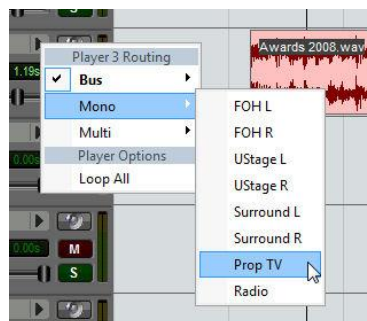
Although tempting to try, it is important to remember that the timeline is not a 'true' sequencer, but a graphical representation of the players, so only one audio event can be added to each player/track.

This event can be manipulated by dragging in either direction on the timeline to increase/decrease the player wait time, and also by dragging the start and end points of the audio event. This will have the same effect as setting the Start/End points within the *Wave Display*. Double clicking on any audio event will open the Wave Display for more precise editing, if required.

The audio file name is always displayed in the top left hand corner of the audio event. Holding the mouse over this label will reveal the full filepath of the audio file rather than just the name.

**Timeline Smart Cursor:** When moving the mouse above an audio event, the cursor will switch between drag mode (a hand icon) when in the lower half of the event, and cursor position mode (standard arrow) when in the top half. This allows events to be moved about, but also set the playback position from within the timeline itself rather than losing the current edit position and clicking on the time ruler along the top.

**Adjusting Volume and Routing:** Quick changes can be made to the output levels and routing from within the timeline. The Arrow Access Menu can be used to select an output routing method for the player, giving the same options as the WavPlayer, and the player level can be set using the volume slider in each track panel. Note that changes to the output routing will only be heard after the next restart of playback.



**Looping:** Loops can be set within the timeline, but only the 'Loop All' option is available. This is because 'Loop Until Exit' requires manual intervention, and as

the timeline is a predrawn display, CSC has no idea at which point the exit will occur, so it is impossible to predict an event which hasn't yet happened!

As a result of this, the Wave Display when toggled from the timeline will not show the loop tab, and any cues which contain LUE information will be excluded from timeline view.

Loop All can be toggled on and off from the Arrow Access Menu, located by the player name:



**Add New Files:** To add new files to a cue, either drag and drop from Windows explorer or ensure the file explorer is toggled on the right hand side of the timeline.

This shows a standard directory structure in the top pane of the window whilst the lower pane shows any files within the folder with the file extension “.wav” with a blue coloured icon (preferred), whilst other audio files CSC may be able to import or play directly are shown with an orange coloured icon.

These files can be dragged directly into an available player on the timeline. If the target player is showing the ‘no drop’ icon, there is probably already an audio event on the player. A player showing a name in a bold font already has an event attached to it, whilst an empty player can be seen as having a greyed out player name. Note that if a non WAV file is dropped onto the timeline, the import options will be offered unless these have been suppressed in *Audio -> Media Management*, and if this is the first time an import has occurred, an import folder location will be requested.

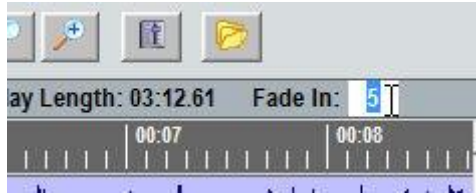
The files will be inserted at the time point they are dropped on to the timeline, unless <SHIFT> is held down whilst dragging and dropping, in which case they will be inserted at time 0. This also sets the player wait time.

Note that as per the Wave Display, CSC will scan the new file and attempt to create a graphical peak overview file (\*.cpf). This file will be written to the same location as the file, so ensure the file is on writeable media, and not a source such as a read-only network drive or CD-ROM as this operation would then fail.

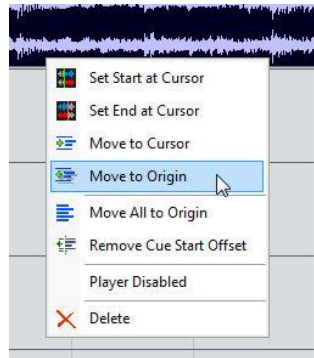
New files will be routed to the first ‘bus’ output, unless an alternative is set in the *Player Routing Defaults* module.

**Adding a Fade In or Fade Out.** The fade-in or fade out time can be set either by dragging the fade handle at either end of the audio clip, or on the clip information bar by entering the time in seconds into the ‘Fade In’ or ‘Fade Out’ box once an audio event has been selected by left clicking it.

Note that *Fade Out* time is the time before the end of the file to begin a fade out to silence.



### **Track Context Menu:**



Right click on any track waveform to see the context menu options.

**Set Start at Cursor:** Crop the selected file's playback start position to the current cursor position.

**Set End at Cursor:** Crop the selected file's playback end position to the current cursor position.

**Move to Cursor:** Move the selected file's timeline start position to the current cursor position.

**Move to Origin:** Move the selected file's timeline start position to 0 sec.

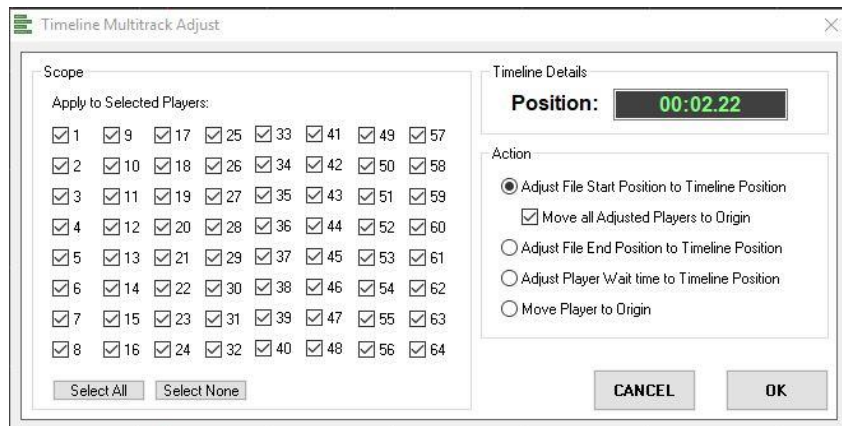
**Move All to Origin:** Move all files in the currently selected cue to start at 0 sec.

**Remove Cue Start Offset:** Move the leftmost file in the currently selected cue to start at 0 sec, and move all other files relatively.

**Player Disabled:** Disable playback of the selected file/player.

**Delete:** Remove the selected file from the player and the current cue.



**Timeline Multitrack Adjust:**

Use this dialog to perform adjustments to player in/out/start points globally across the entire cue.

***Apply to Selected Players:*** Select which players the action should apply to.

***Position:*** Cursor position at the point this dialog was invoked.

***Adjust File Start Position to Timeline Position:*** Crop the selected players start point to the current cursor position. Useful for adjusting the start point of a multi part audio composition/click track.

***Move all Adjusted Players to Origin:*** Also move all players to origin.

***Adjust File End Position to Timeline Position:*** Crop the audio events to end at the current cursor position.

***Adjust Player Wait time to Timeline Position:*** Set the player wait time to the current cursor position, meaning selected audio events will start when cue playback reaches <position>.

***Move Player to Origin:*** Move selected players to the beginning of the timeline.

## Player Level Adjust

Sometimes precise system gain settings or levels are unknown when starting to design a show. If the show contains a large dynamic range of content it can also be quite hard to get the best signal to noise ratio from the equipment whilst simultaneously leaving enough headroom for any potentially loud sound effects which may occur later in a design.

For the cases when a best guess wasn't good enough, it may be necessary to retrospectively adjust all levels within a show, or possibly all levels assigned to a particular output bus. CSC provides 4 dialogues for adjusting levels for a single cue, a single player, a single output bus or bus within a multi.

Care should be taken when using these tools as the results may not always be as expected; for example, lowering all levels of a particular player by 10dB may sound feasible, but unless any associated fade levels are also lowered by 10dB some later cues targeting that player may then be invalid.

All tools allow a requested level change to be entered and analyse all players to be altered. If the requested level change forces any player below -100dB or above 0dB a warning will be shown in red and the requested level change will be limited to the maximum allowed by the player nearest the limit. It is possible to ignore this restriction and force every player to change level as close to the requested level as possible, although this will alter any mix between players.

### Cue Adjust

The screenshot shows the 'WavPlayer Level Adjust' dialog box with the 'Cue Adjust' tab selected. The dialog contains the following elements:

- Adjust the level of every loaded WavPlayer "Play" action in the current cue.**
- Cue:** 27.00
- Change Level by (dB):** 0
- Max Up:** 0
- Max Down:** -85.4
- Players:** 4
- If requested level changes pushes any Player beyond Min/Max level:**
  - ☒ Allow Player to restrict entire cue adjustment
  - ☐ Force Player to Max/Min Bounds (will alter mix)
- Table:**

Player	Level	Target
WAV1	-14.6	-14.6
WAV2	-3.0	-3.0
WAV3	0.0	0.0
WAV4	-3.0	-3.0
- Process** button
- ☒ Do not include fades < -90dB in Max calculations (assume Fade and Stop)
- Close** button

This tool allows adjustment of all players with a 'Play' action in the currently selected cue to be altered. The requested level adjustment can be entered in the **Change Level by (dB)** box. Note that this action can also be performed by simply holding SHIFT whilst moving any player fader in the Live Mixer.

Selecting **Process** will change all levels as shown in the preview window.

### Player Adjust

WavPlayer Level Adjust

Cue Adjust | **Player Adjust** | Bus Adjust | Multi Adjust

Adjust the level of every loaded WavPlayer "Play" or "Fade" action matching the selected WavPlayer within the specified cue range. Multi routing is unaffected.

Player: WAV1 Change Level by (dB): 0

From: 0.00 To: 140.00 ☒ Include Fades

Max Up: 0 Max Down: -62.31 Total: 34

If requested level changes pushes any Player beyond Min/Max level:

☒ Allow Player to restrict global adjustment  
☐ Force Player to Max/Min Bounds (will alter mix)

Cue	Level	Target
5.00 Music Check	0.0	0.0
6.00 CRICKET	-12.0	-12.0
8.00 FOH L	-22.0	-22.0
9.00 FOH R	-22.0	-22.0
10.00 U/S L - Piano	-18.4	-18.4
11.00 Prop Radio	-18.4	-18.4
12.00 U/S R - Siren/Fi...	-21.8	-21.8
13.00 U/S C - Window	-21.4	-21.4
18.00 Q0: Pre-Show M...	-30.2	-30.2
27.00 [Q2] - Overture	-14.6	-14.6

Process

☒ Do not include fades <-90dB in Max calculations (assume Fade and Stop) Close

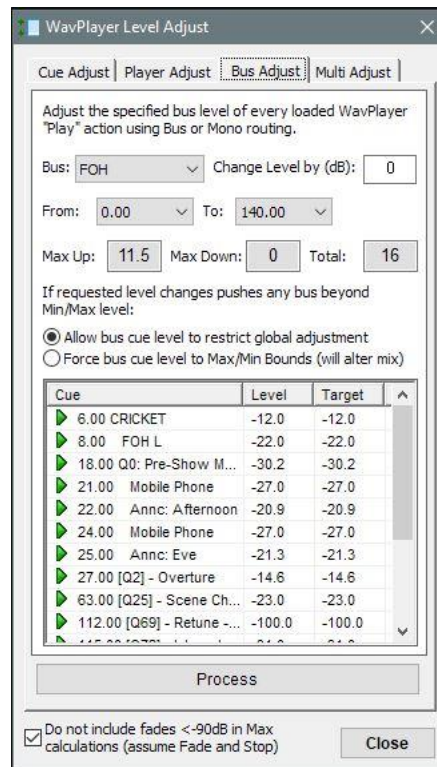
This tool allow the level of every 'Play' and, if also selected, 'Fade' action, of a single player within the specified cue range to be adjusted.

Fade levels below -90dB are excluded by default as these would mostly be "Fade and Stop" types cues, and therefore wouldn't require any level processing, although this behavior can be disabled by unchecking the 'Do not include fade <-90dB' checkbox.

### Bus Adjust

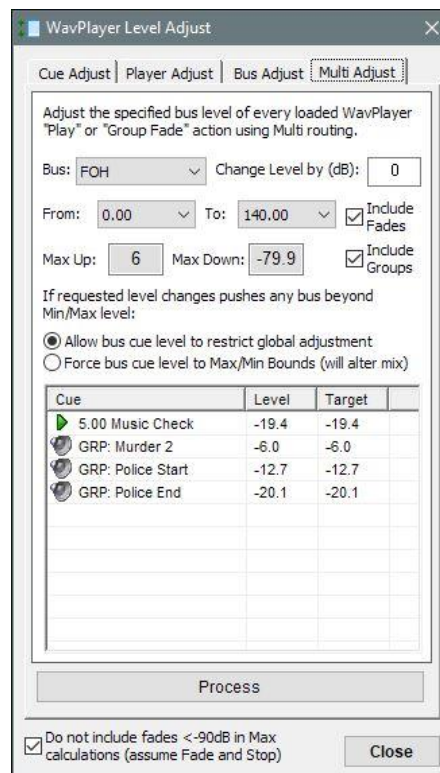
This tool allows the level of any player with a 'Play' action routed to a specific bus using the 'BUS' or 'MONO' routing types, between the specified cue ranges, to be adjusted.

Be careful when using this tool as fades will not be taken into account as they don't reference a specific output bus, so increasing all player levels by 10dB to compensate for a poor signal to noise ratio, for example, will work fine until the first fade command is encountered.



## Multi Adjust

This tool analyses all players with a 'Play' or 'Group Fade' based action using Multi Routing and adjusts accordingly.



Checkboxes are included to specify whether to include processing for 'Fade' actions as well as 'Play' and also whether to include the saved routing groups as well as straight '<No Group>' routings, even if not explicitly used for routing in the specified cue range.

As already mentioned, be extremely careful when using any of the level adjust tools and ensure a backup of the show file is taken before attempting these in case of unexpected results, but with such a range of modification options it may also just solve headroom or signal to noise ratio issues.

## Player Routing Defaults

When using CSC for certain tasks, such as Multi-track playback, it may be desirable to assign certain players to a dedicated output for the entire production. This could ensure that the backing vocals, for example, are always routed to the same soundcard output and therefore to the same desk channel, by default, every time a new cue is added, either via the WavPlayer or the Timeline view. This makes multi-tracks cues very quick to build.

Note that this does not 'lock' a player to a certain output routing type, it simply acts as a template for new cues. The routing can still be freely changed at will, unless "Fixed" is checked. Also, note that any patch changes made to this module will only affect new cues and not those already in the cuelist.

Player Default Routing

Use the table below to specify the default routing behaviour when a file is first attached to a player. This can be changed manually afterwards. If a player is fixed this routing will be used regardless of cue specific routing.

Player	Routing Type	Patch	Fixed
SFX 1	Bus	SFX	<input type="checkbox"/>
SFX 2	Bus	SFX	<input type="checkbox"/>
SFX 3	Bus	SFX	<input type="checkbox"/>
SFX 4	Bus	SFX	<input type="checkbox"/>
SFX 5	Bus	SFX	<input type="checkbox"/>
SFX 6	Bus	SFX	<input type="checkbox"/>
VOX BOYS	Mono	B VOX	<input checked="" type="checkbox"/>
VOX GIRLS	Mono	B VOX	<input checked="" type="checkbox"/>
TRACK	Bus	TRACK	<input checked="" type="checkbox"/>
GTR	Mono	GTR	<input checked="" type="checkbox"/>
CLICK	Mono	CLICK	<input checked="" type="checkbox"/>
PERC	Bus	SFX	<input checked="" type="checkbox"/>
KEYS 1	Bus	KEYS	<input checked="" type="checkbox"/>
KEYS 2	Bus	KEYS	<input checked="" type="checkbox"/>
WAV15	Bus	SFX	<input type="checkbox"/>
WAV16	Bus	SFX	<input type="checkbox"/>
WAV17	Bus	SFX	<input type="checkbox"/>
WAV18	Mono	SFX	<input type="checkbox"/>
WAV19	Bus	SFX	<input type="checkbox"/>
WAV20	Bus	SFX	<input type="checkbox"/>

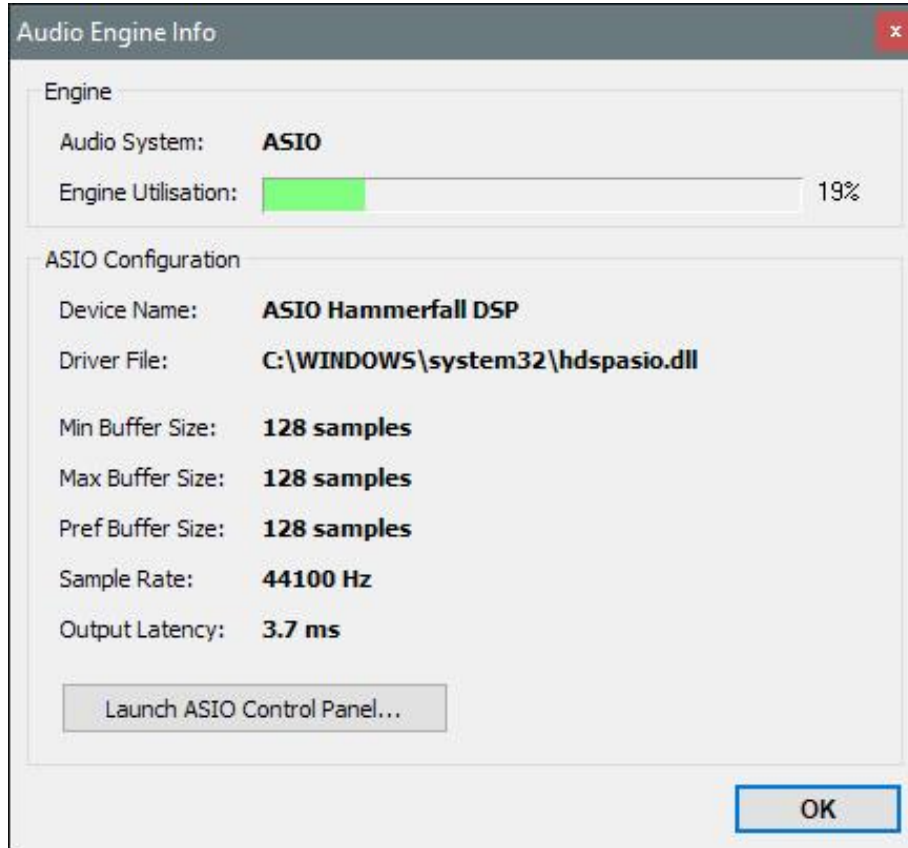
Cancel OK

To make changes to any of the routing options, click in the column next to the player, and select from the drop down menus that appear. The first column allows the Routing Type to be selected (from Bus, Mono and Multi), the second column allows choosing the patch within that routing type. Note that if a multi is selected and then subsequently removed from the show, the routing will default back to 'Bus'.

**Fixed:** Force a player to always use the defined routing here irrespective of that define on the player or timeline.

## Audio Engine Info

This window shows information about the audio engine in use and its current performance.



**Audio System:** Shows the current driver type in use, either Windows Soundsystem or ASIO.

**Engine Utilisation:** Shows the current engine CPU use. This value indicates the time within each buffer update taken to retrieve, process and mix all current files as a percentage of the total buffer length. So for example, if the buffer length is 4ms and CSC is taking 2ms to process each update, the utilization will be 50%. If this value is approaching high values it may be an indication to increase the buffer size of the soundcard, reduce the number of files playing concurrently or locate the media on a faster drive otherwise dropouts or other audible artifacts may begin to be heard.

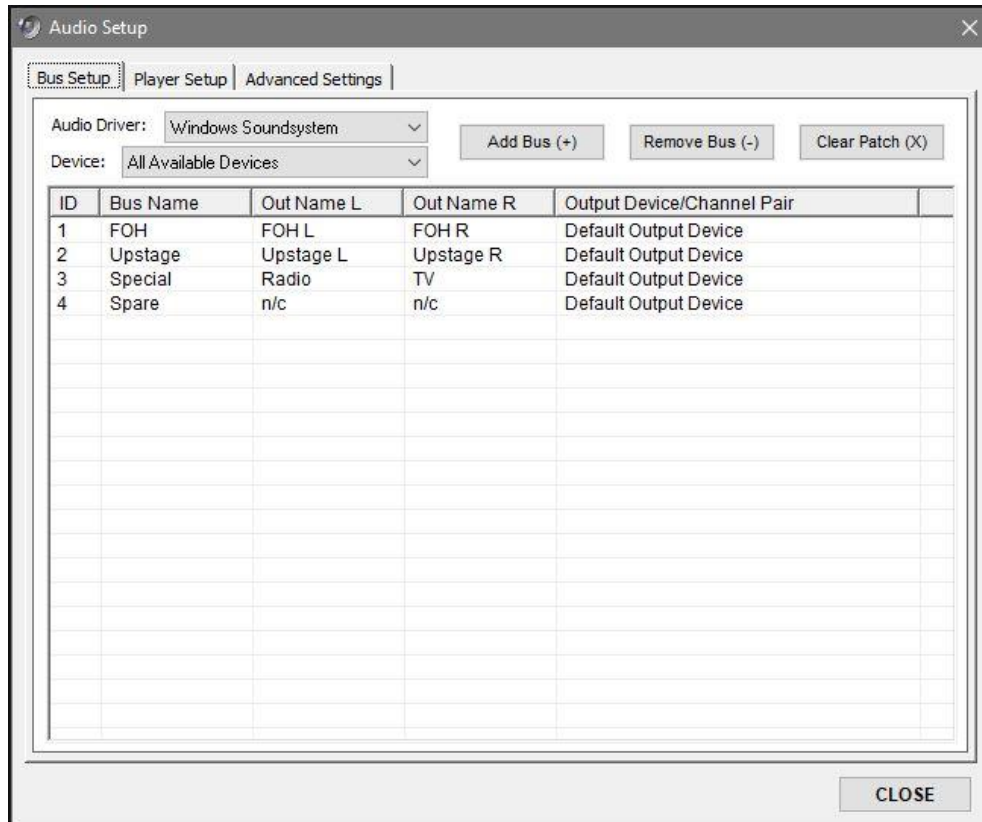
**ASIO Configuration:** Gives details of the current soundcard driver in use when using the ASIO driver type. It is also possible to show the soundcards own driver panel by clicking on the *Launch ASIO Control Panel* button.



## Audio Setup

By default a new show opens in CSC with a single bus routed to the Primary Sound Driver (The one used in Windows as Default device). Up to 32 stereo buses can be defined in CSC, giving a total of 64 outputs. A bus can route to any of the available Windows Sound System compatible output devices or ASIO compliant soundcards installed in the system.

### Bus Setup



**Audio Driver:** Select between Windows Soundsystem and ASIO driver modes. On later versions of Windows the Windows Soundsystem will use WASAPI, but will fall back to the older DirectSound API when this is unavailable. Note that ASIO may be preferential for low latency situations such as Click Track playback, especially when WASAPI is unavailable, but may put higher demands on the computer system depending on selected buffer sizes.

**Device:** Select an ASIO device for CSC to use for output mapping, or select All Available Output Devices when using the Windows Soundsystem option.

**Add Bus:** Create and add a new stereo bus to the current show. The bus will take a default name, although this can be changed by double clicking the bus name column. These names will appear in the Routing Mixer, the cuelist and the popup menu in the WavPlayer when *Bus* output type is selected. The Out Name L and Out Name R columns can also be changed. These names will



appear in the Routing Mixer, the cuelist and the popup menu in the WavPlayer when selecting *Mono* output type.

Clicking in the column *Output Device* will show a popup menu with available output devices available with the current driver/device selection. For Windows Soundsystem these will be named as stereo devices as installed in Windows, and for ASIO these are named as a joined mono pair. Note for some soundcards you may need to enable an option to force the driver to present all available outputs as WASAPI/DirectSound outputs – sometimes only a stereo output is shown, but consult your soundcard manufacturer for more information with regard to this issue.

One or more buses can be mapped to the same output device if required, ie. for working with a show on a laptop computer before transferring to the main computer. In this case, the option “Primary Sound Driver” can be used as in the picture above, whereby all buses will be mapped to the default output as used by the Windows Sound System.

Ensure all buses are mapped to a specific output device or to <No Output> before closing this dialogue.

**Remove Bus:** Remove the selected bus from the bus setup. If a bus removed is currently in use, CSC will attempt to remap all cues currently using that bus.

**Clear Patch:** Remove all buses from show. Use carefully as this will disable all audio.

## **Player Setup**

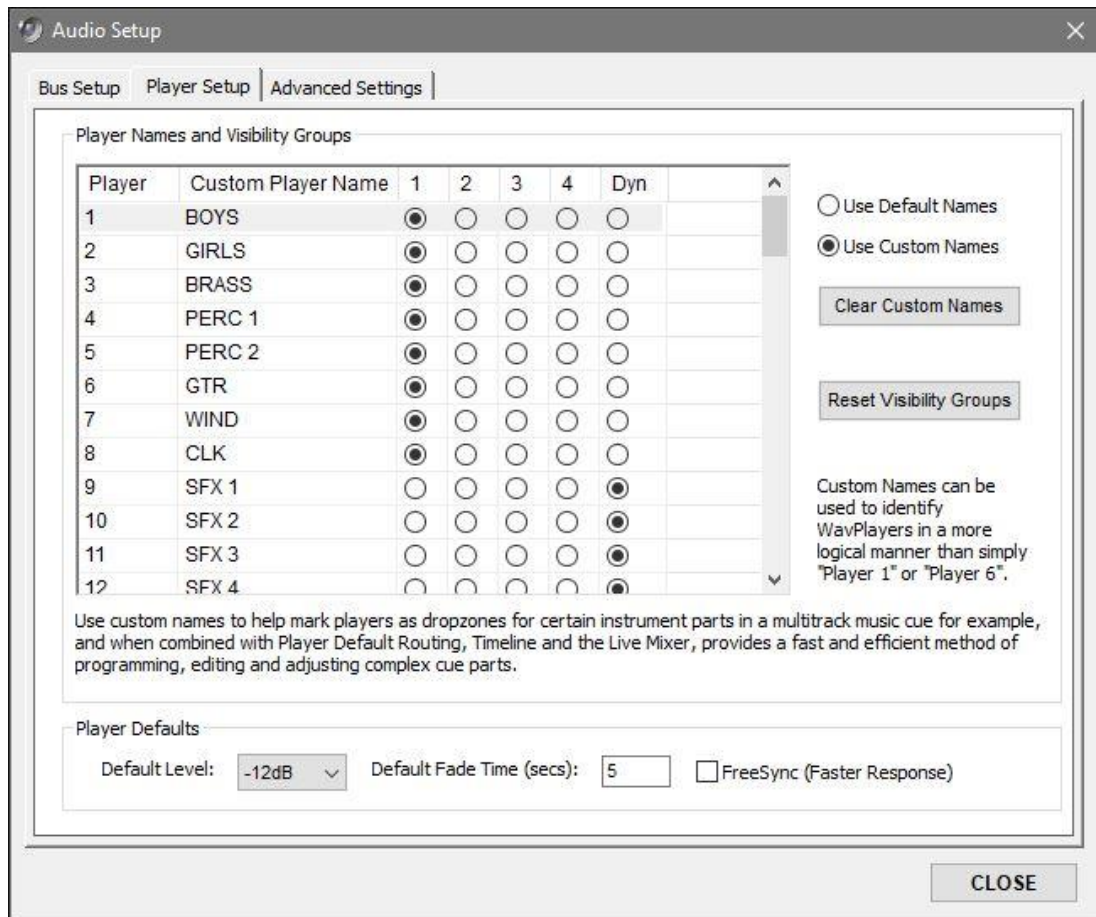
The 64 WavPlayers can be configured in a way such as to make programming and referencing already programmed cues easier to read.

Each player can be given a unique name to easily identify it within the cuelist. This can be especially useful in mixed-mode shows where playback from CSC can include multitrack backing tracks as well as soundscapes and announcements. Players can be marked as to the type of content they will usually have, as in the picture below.

Players can also be assigned to one of 4 *visibility groups* or marked as *dynamic*. This defines how the player is displayed in the *WavPlayer File Overview* Window. See *WavPlayer File Overview* for more information.

**Use Default Names:** Show all player names in the cuelist and overview window as the default WAV1, WAV2, WAV3 etc.

**Use Custom Names:** Show all player names in the cuelist and overview window as the custom names entered in the Player Names grid.



## Player Defaults

**Default Level:** The level a new file opened in a WavPlayer will take as its starting level. Available options include 0dB, -6dB, -12dB, -18dB.

**Default Fade Time:** Set the default time in seconds to apply to a new fade command.

**Freesync:** By default, all WavPlayers in a single cue will sync to each other. If there are many players to be loaded, this may take some time to load from disk unless a preload command has been issued. Setting a player to FreeSync will free it from the player sync and allow it to begin playback immediately, irrespective of other players. Use this checkbox to set the option on as default for all players.

## Advanced Settings

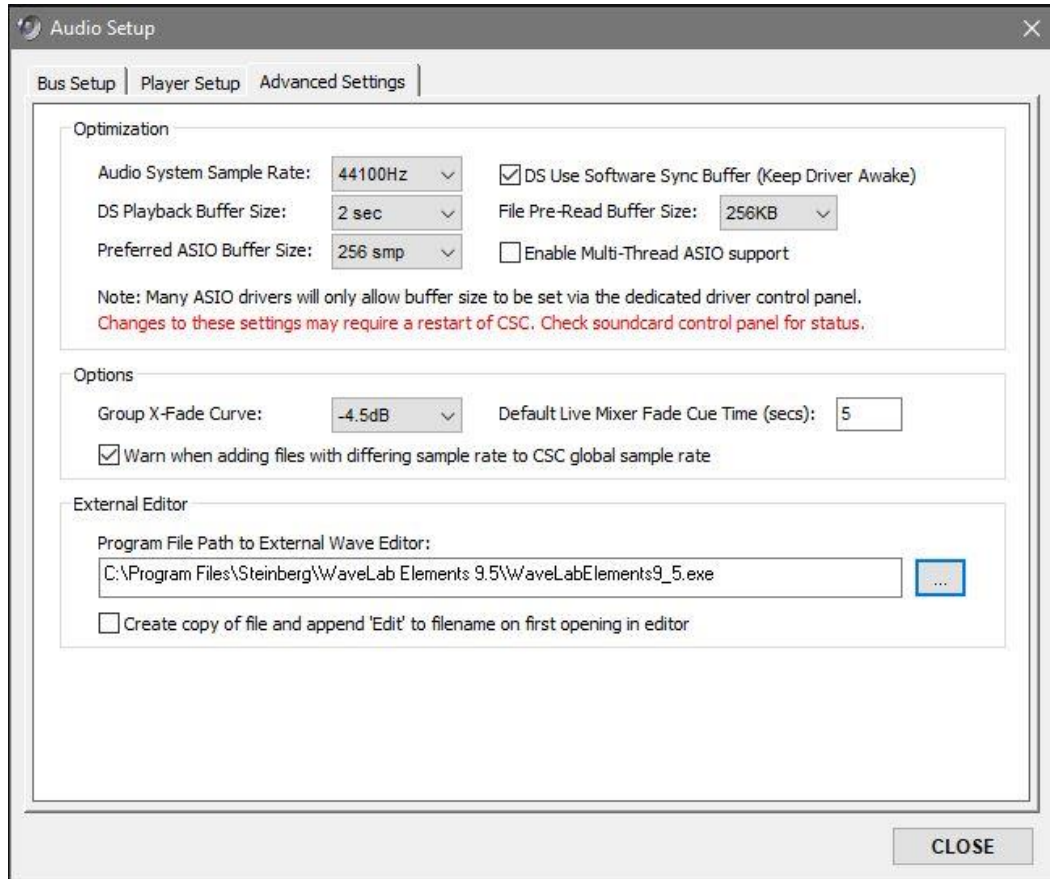
Use these options to customize advanced playback setting for CSCs audio system. Only change these settings if you are sure about what they do!

## Optimization

**DS Use Software Sync Buffer:** In order for CSC to stream audio across multiple WASAPI/DirectSound accessed output devices, it is necessary to run a synchronization buffer to keep the outputs in sync with each other. Some soundcard manufacturers however, provide an option to sync all outputs at a

hardware level, and this may be preferential to using the software based method built in to CSC. If using the soundcard based method, untick this box but be aware playback may not begin until all outputs assigned have an active file playing to them.

If unsure leave this option checked. Ignored for ASIO operation.



**Audio System Sample Rate:** This option sets the sample rate at which the sync buffer will run at, and therefore the sample rate at which the soundcard is first opened at. This should be set to match the wave file sample rate used, or in a digital system, set to match the word clock rate of the system.

**DS Playback Buffer Size:** Use this to set the buffer size of the Windows Soundsystem WavPlayer engines. The bigger the buffer the less disk access the system will require so for a high track count on an old machine a higher buffer size may be desirable. However, in return, the software will use more memory and will take slightly longer to begin initial playback. These differences should be negligible on any modern day system and it is unlikely this setting will need altering. For ASIO, the default driver buffer size is used, and this setting is ignored.

**File Pre-Read Buffer Size:** The amount of data pre-read from the disk ahead of playback. The larger this is the longer the operation will take but will increase stability if a disk is particularly slow, busy, or supplying high track count playback.

**Preferred ASIO Buffer Size:** The ASIO buffer size requested by CSC. Some drivers will only allow buffer size to be set on their specific control panels so this setting may be ignored or invalid.

**Enable Multi-Thread ASIO Support:** When using multiple soundcard outputs it may be beneficial to spread the processing load across multiple threads to increase efficiency as the OS can assign to multiple cores. This should be used with care though as sometimes the sync between threads can mean a slower overall process or actually increase CPU load.

## Routing Groups

**Group X-Fade Curve:** When using the X-Fade options available in the WavPlayer there is a choice of 3 different curve types, 3dB, 4.5dB and 6dB. The refers to the middle point of the fade – any level decreasing will be at the value selected below its initial starting value, and any increasing value will be at the value selected below its final value. Depending on the speaker and amplifier configuration it may be necessary to alter this value to find the smoothest transition between speakers for each setup.

## Options

**Sample Rate Warning:** When checked, CSC will alert the user to a file of sample rate other than the defined system sample rate being added to the show. Attempting to play a file of a higher sample rate than the rest of the show may result in the sound card driver switching to a higher system sample rate with the previous files being played at the wrong pitch. This is dependent on the audio system in use and the sound card driver.

**Default Live Mixer Fade Time:** Set the default fade time (secs) assigned to 'fade' cues created by the Live Mixer.

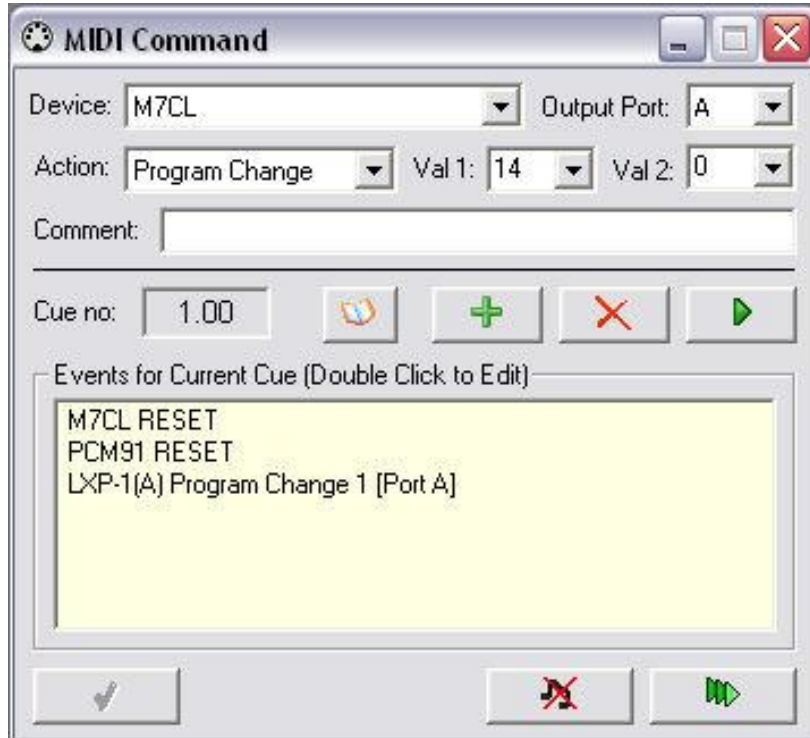
## External Editor

**Program File Path:** Specify the Program File (\*.exe) location of the external editor to be launched when *Edit With External Editor* is clicked in the WavPlayer.

**Create Copy of File:** When checked this will create a copy of the file selected to be opened in the editor, meaning the original file is still intact on the system. The text "- edit" will be added to the filename. The new filename will be updated in the WavPlayer. This will only occur the first time the edit button is clicked.

## MIDI Command

This module generates the standard MIDI messages used to communicate with MIDI ready equipment.



These standard messages include:

(0x80h)	<b>Note Off</b>
(0x90h)	<b>Note On</b>
(0xA0h)	<b>Key Pressure</b>
(0xB0h)	<b>Control Change</b>
(0xC0h)	<b>Program Change</b>
(0xD0h)	<b>Channel Pressure</b>
(0xE0h)	<b>Pitch Bend</b>

Two MIDI output ports are provided in CSC, and both of these are accessible from the MIDI command module.

Up to 16 MIDI events may be added per cue, and these events are shown in the Events List window. Once a complete MIDI event has been defined in the editor, it may be added to the event list by clicking the “+” (Add) button. Events may be removed at any time by selecting them and clicking on the “X” (Delete) button.

**Device:** This dropdown box allows selection of one of the 16 MIDI channels available for each output port. If specific names have been entered in the *MIDI Mapper* window, these names will appear in the drop down list, allowing MIDI

channels to be referred to by Device name. Note the names in the list are also dependent on the setting of the **Port** drop down box.

**Output Port:** Select which output port the MIDI command window should send the specified MIDI Event to.

**Action:** This dropdown box specifies the type of standard MIDI message to be sent as defined above. The most commonly used messages are Note On (e.g. to generate an instance of a sound within a sampler), Note Off (e.g. to stop the sound from a sampler) and Program Change (to recall a particular memory or state in a MIDI capable device with onboard memories).

Note also the setting of this selection box modifies the contents of **Val 1** and **Val 2** data boxes.

**Val 1:** Specify a value for the “data 1” part of the MIDI message. The meaning of data 1 is entirely dependent on the type of MIDI message being sent. For Example, if a Note On is being sent, Val 1 refers to the note number being sent (where 60 usually equals Middle C), whereas when a Program Change message is being sent, Val 1 refers to the memory number being requested. Special care must be taken when entering Program Changes since there are two standards by which Program Changes are addressed, and this is the basis of the “off by one” rule which plagues MIDI control systems. CSC is capable of interfacing with either standard - For more details on this, see the *MIDI Setup*. *Note also that although normal values of this data entry box are 0-127 or 1-128, when entering Program Change values, values far above 128 can be entered. This is to enable specific banks to be selected. See MIDI Setup for more details.*

**Val 2:** Specify a value for the “data 2” part of the MIDI message. Like Val 1, Val 2 is entirely dependent on the type of MIDI message being sent. For example, if a Note On is being sent, Val 2 refers the velocity (strength) of the note requested in Val 1, whereas for a Program Change, Val 2 is not needed and so this option is not available. Note that if this value has not been set when trying to add a Note On, CSC will default this value to 100.

**Comment:** Sometimes it is easier to refer to the event list and see a description of the MIDI message rather than the actual message itself. If text is entered here, the default display of showing the parts of the MIDI message is replaced by the text in this window. For example, a “Channel 1 Program Change 12 [Port A]” message could be shown in the events list as “Desk Change Scene 4” by typing that text into the comments window. This text will also appear in the cuelist expanded view under its parent cue and makes reading the cuelist a lot easier.

If nothing is entered here, the event description will take the full MIDI Message.

**Keyzone Lookup:** When events have been entered into the Keyzone Explorer Window, these can be quickly added to the MIDI Command module by clicking this button and selecting from the keyzone window.

**Add/Remove:** Events are added using the “+” button, and selected events are removed using the “-” button.

## Modifying Events

Once events have been entered they can be edited by double clicking on the event list. This will bring the window into edit mode, and this will not be released until the “tick” (Apply) button at the bottom of the window is clicked, at which time the selected event’s data will be replaced with the data currently in the editor.

Note that events are sent in the order they appear in the events list and so this should be taken into account when messages need to be received by external equipment in a certain order.

## Previewing Events

A single event can be previewed by selecting the event in the lower window and clicking the single play button next to the add/remove buttons. This plays the event listed in the top of the window.

An event can also be auditioned before adding it to the event list by building it in the editor and then clicking preview. When the message is correct, it can be added to the list.

The two remaining buttons at the bottom of the window are used for previewing the entire cue (all events):

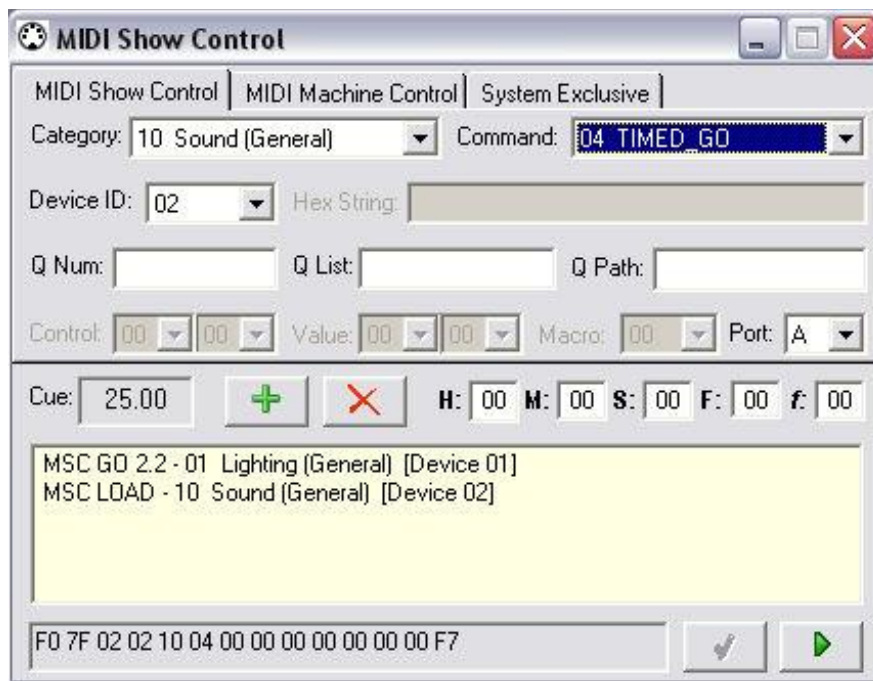
When the Multi-Play symbol is clicked, every event in the current cue is sent to the output port as specified per event.

Hung notes caused by Note On messages with no corresponding Note Off messages can be cleared using the All Notes Off button next to the apply button

Note that removing events from the MIDI list is also possible by right clicking on the event in the cuelist, when in expanded mode, and selecting “**Delete Event**”.

## MIDI Show Control

This module generates a range of extended MIDI commands based on System Exclusive messages. Three tabs are available: an MSC tab which generates System Exclusive messages based upon the MIDI Show Control standard; an MMC tab which generates MIDI Machine Control messages to control devices which respond to “transport” style messages, such as Multi-track recorders and tape machines; and a SysEx tab which allows a non-standard message to be entered.



### MIDI Show Control

The MIDI Show Control protocol was designed to create a standard method of controlling a vast range of MIDI enabled equipment, from Sound and Lighting desks to Pyrotechnics and Projection systems.

MSC messages are able to target certain groups of equipment, and individual devices by assigning each an individual ID. This ID can be anywhere in the range 0 – 7E. All devices can be targeted by using the ID 7F. Once the category of equipment and the ID of the target device are known, the actual command is required.

CSC supports command sets 0-1E. Each of the commands has a different set of subcommands which can be optionally entered. For example, a GO command can be sent to a target device, or a GO command followed by a cue number can be sent, i.e. GO 2.2. Additionally, a cuelist could also be referenced, so the command could be GO 2.2 A, to make the target device GO cue 2.2 in cuelist A.



As each command is selected in the command drop down box, the allowed extra commands are enabled in the window. Check the documentation of the target device to ensure you are sending the required amount of information otherwise the device may refuse to respond.

As an MSC string is built up, the output string is displayed at the bottom of the module in Hex Bytes. This is the data CSC will actually send out, so ensure this is what the target device is expecting. The string can be tested by clicking the “play” button at the bottom right of the window. The message will be sent to the port referred to in the **Port** dropdown box, so ensure this is mapped to a physical MIDI port.

In order to add a command to a cue, define the message using the dropdown boxes and adding any required extra information in the additional fields, and then click the add “+” button. The string will then be entered in the events list for that cue. Note this list is shared between the MSC, MMC and SysEx tabs.

To add more events, build the message and then click add again. To remove an event, select it and click the delete “X” button.

To edit a message already in the events list, double click it in, and make the required changes in the editor. When the edit is complete, click the apply “√” button.

### **MIDI Machine Control**

MMC is a protocol designed to control devices requiring standard “transport” commands, such as Multi-track recorders and tape machines, or anything requiring *Play* and *Stop* style commands to control them.

Like MSC, target devices are assigned an ID from 0 to 7E, with 7F referring to “All Devices” in the MIDI chain. This ID is set in the device and the manufacturer’s documentation should be referred to on exactly how to do this.

The MMC tab enables an action to be selected in the dropdown box, and the target device ID to be entered. The *Locate* command also requires a time position to be entered, enabling devices to be cued to a new location, usually before a *Play* command is sent.

The output string is shown in the box at the bottom of the module and this can be previewed by clicking the *Play* button to ensure the message is correct before adding it to a cue.

Adding, deleting and editing messages can be performed in the same way as MSC messages.

### **System Exclusive**

The SysEx tab allows non-standard messages to be entered to the events list. CSC will not attempt to format these messages into standard commands, and so beginning (0xF0h) and end (0xF7h) status bytes must be inserted correctly to prevent MIDI data errors.

To enter a string, type the required message in Hex format. CSC will group all characters into bytes, with a space between each for easy reading. Invalid Hex characters will also be ignored. Note that if a single character is required, such as 0xAh, this must be inserted as 0x0Ah to complete the byte, otherwise CSC will incorrectly group the bytes together.

To add a message typed in the box, click the add “+” button. To remove the message, select the message and click delete “X”. To edit the message once entered, double click on the message and make the required changes. Once completed, click the apply button.

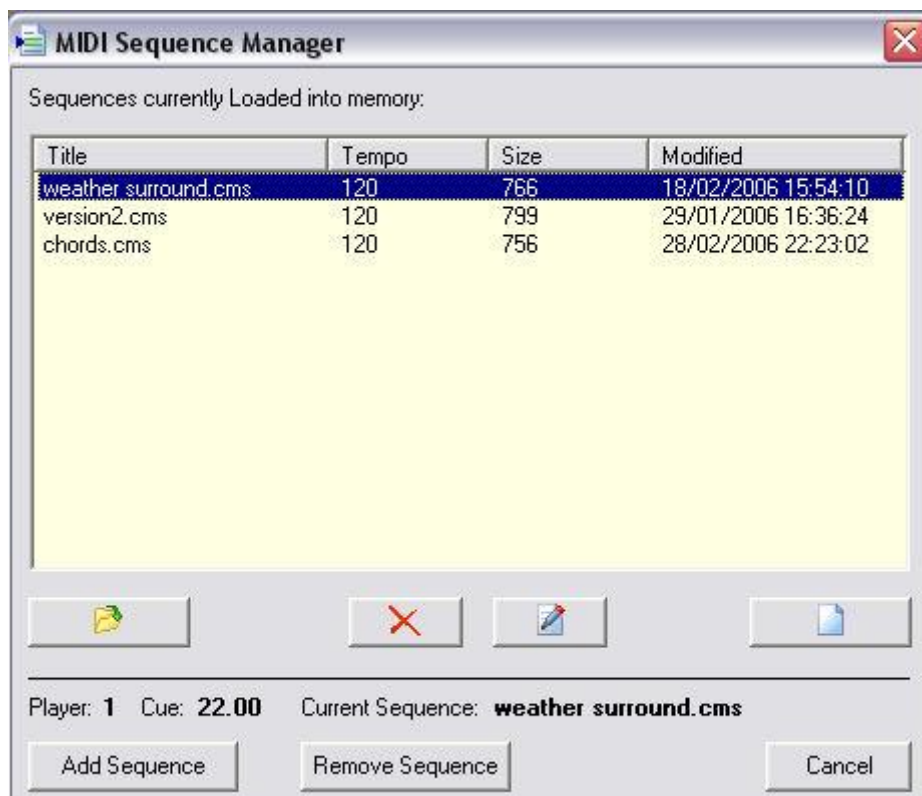
As with the MSC and MMC tabs, to preview the message click the *Play* button with the required message in the SysEx window.

## MIDI Sequence

This module controls the 4 built-in MIDI sequence playback engines. Each player is independent and sequences can be played or stopped on cues by selecting the appropriate action. Note that if 2 consecutive cues have sequences attached to the same player, the second cue will stop the first. Sequences are edited or recorded using the sequence manager, and linked to cues using this module.



**Seq:** Clicking on Seq will display the sequence manager, with additional cue information at the bottom of the dialogue. See *Sequence Manager* for further information.



The details at the bottom of the manager show exactly which cue and which player is about to have a sequence added or removed from it. To add a sequence to the current player, select the required sequence from the list, and

click **Add Sequence** or simply double click on the sequence in the sequence list.

To remove a sequence from a player, follow the same procedure to display the extended sequence manager dialogue and click **Remove Sequence**.

**Loaded Sequence or Action:** This box displays the name of the sequence currently assigned to the player. If *Stop* action is selected, this window will show the “—STOP—” command. This box will turn green when a sequence is running and the name becomes red for easy visual indication of a running sequence.

**Edit:** Once a sequence is assigned to a player, clicking edit allows the sequence to be edited using the Sequence Editor window. Be careful about editing sequences when multiple cues use the same sequence, since a change here can affect all cues which refer to that sequence. This option is not available when no sequence is assigned or when the *Stop* action is selected.

**Action:** Select *Play*, *Stop* or *Loop*. *Play* will allow a sequence to be assigned to a cue using the sequence manager as described above. *Stop* will stop the current playing sequence on that player when the cue is fired. Note this does not send an All Notes Off command since there may be other players playing, so if that action is desired, adding an All Notes Off Control Change message in the MIDI Command window on the same cue may be necessary. *Loop* will repeat the sequence from the beginning at the point at which the last note is sent.

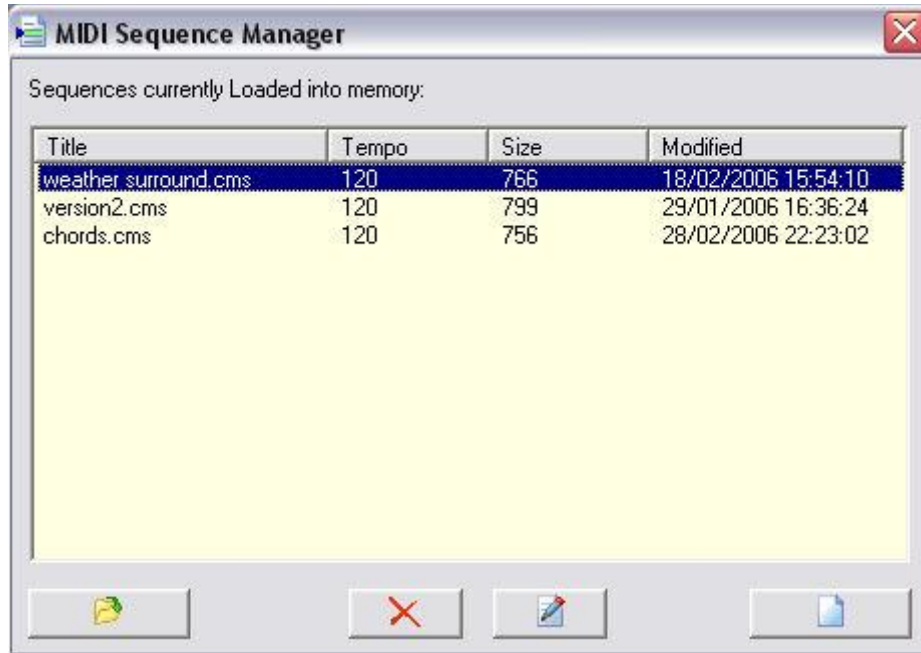
**Port:** Selects the Port to which the MIDI sequence data should be directed. This box is not available when the player is set to *Stop* mode.

**Time Display:** Shows the current running position of a playing sequence in secs. This display will become brighter when a valid sequence is running, and darken down again when nothing is playing or a *Stop* command is selected on the player, to give better visual indication of what is currently playing.

All running sequences can be stopped using the “Stop Current Action” button on the toolbar, or by using the <ESC> key when the cuelist is highlighted.

## MIDI Sequence Manager

The MIDI Sequence Manager is responsible for managing the sequences loaded into memory. From this window, sequences can be added or removed from a show, as well as created or edited.



The Sequence Manager has 2 views, a standard view, and an extended view showing cue information.

Displaying Sequence Manager by selecting *MIDI -> MIDI Sequence Manager* will show the standard view, whilst clicking **Seq** in the Sequence Player window will show the extended view, with information about the selected cue and then sequences linked to it.

MIDI sequences are stored on disk as .cms files. This is a specially arranged file format which stores events sequentially so that they can be streamed, unlike the standard .mid format which is arranged by channel order. Once opened by the sequence manager, these .cms files are copied into the computers memory so they may be accessed instantly.

To Load a sequence into the manager, click the **Open** icon in the bottom left hand corner of the manager window. This will display a standard file dialogue box where the required sequence can be selected. If successfully opened, the manager will display details about the sequence which include the sequence name, the tempo (default 120), the size of the sequence in bytes, and the last modified date. Note the manager will not allow 2 sequences with the same name to be loaded.

A sequence can be deleted from the manager at any time. However, CSC will check the entire show to see whether this sequence is used in any cues: It is

not possible to remove a sequence which is attached to a cue without first removing it from the cue.

Any sequence in the sequence list can be edited by highlighting and then clicking on the **Edit** button, or by double clicking on the list when not in *Add/remove from cue* mode. This will display the edit sequence window, discussed separately. When editing or creation is finished, if the sequence is saved it will be automatically loaded back into the sequence manager.

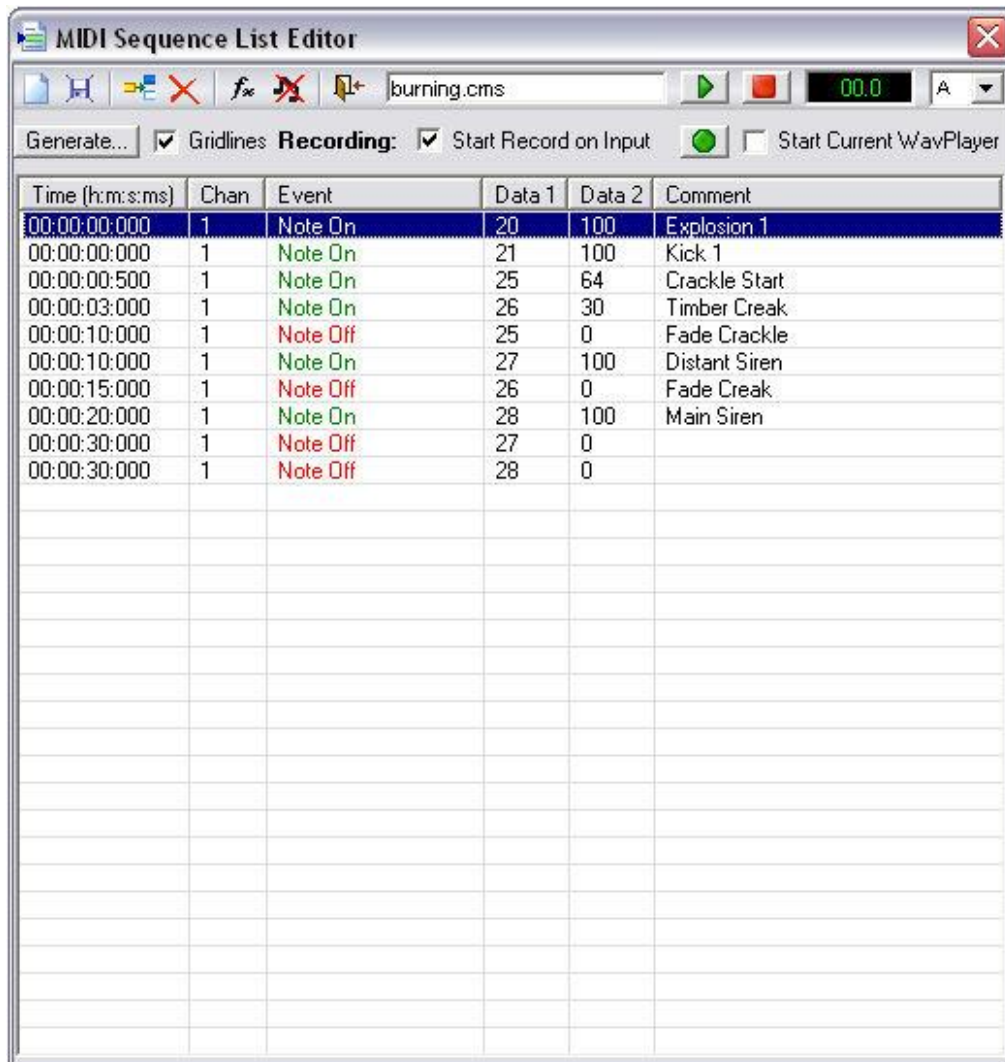
This happens in 2 stages:

1. The `.cms` file is saved to disk in the location entered by the user (create sequence), or the original disk location (edit sequence).
2. Sequence Manager reads the file on disk, loads it to memory and creates or updates the list entry.

**File Management** – Note that although CSC stores `.cms` files on disk, the MIDI data is loaded to memory and streamed from there during a show. When a CSC show file is saved the MIDI data is also saved with it. This means that a single show file can be moved to a new computer without having to transfer the sequence files also. However, any changes to a sequence during editing will save a new `.cms` file to disk. If the original location is not present on that machine, a new saveable location must be specified. If CSC is unable to save the file to disk, the changes will not be successfully updated in memory.

## MIDI Sequence List Editor

The List Editor enables a sequence of MIDI events such as Note On and Note Off messages to be built up and stored as a single .cms file for playback in the MIDI Sequence Players. This can be used to fire a sequence of events on a sampler or computer based virtual instrument run alongside CSC.



### Toolbar Options

**New Sequence:** Clear the current sequence and start a new sequence.

**Save Sequence:** Save the current sequence to disk.

**Insert New Event:** Display the *Add Event* dialogue to enter a new event into the sequence.

**Delete Event:** Delete the selected event from the sequence list.

**Function Editor:** Display the function editor dialogue to make changes to the sequence.

**All Notes Off:** Send an *All Notes Off* command to the selected Output Port.

**Exit Editor:** Exit the sequence editor and return to the Sequence Manager.

### **Other Options**

**Sequence Name:** Name of the sequence being created or edited.

**Play:** Play the sequence from the highlighted position. To play an individual event, right click on the event in the list editor.

**Stop:** Stop playback of the sequence.

**Time Position:** Current playback position of the Sequence in seconds.

**Port:** MIDI Output Port to stream the sequence to.

**Generate:** Open the MIDI Control Change Sequence Generator Module.

**Gridlines:** Display gridlines in the sequence list view.

**Start Record On Input:** After pressing record, the record timer will not start until the first MIDI event is received on the input port. Without this checked recording will start straight away.

**Record:** Record a new MIDI sequence from a connected input device.

**Start Current WavPlayer:** Start playback of the current selected WavPlayer as the MIDI sequence editor starts recording. This enables MIDI Commands such as lighting or MSC events, etc, to be recorded in time with a playing wave file.

## **Creating a New Sequence**

To insert an event, click the *Insert Event* button on the toolbar. This will display the *Add/Edit MIDI Sequence Event* dialogue.





The dialog box is titled "Add/Edit MIDI Sequence Event". It contains the following fields and controls:

- Time (h:m:s:ms):** Four input boxes showing "00", "00", "10", and "000".
- Chan:** A dropdown menu showing "1".
- Event:** A dropdown menu showing "Note On".
- Val 1:** A dropdown menu showing "27".
- Val 2:** A dropdown menu showing "100".
- Comment:** A text input field containing "Distant Siren".
- Buttons:** A green play button, a red stop button with a slash, a circular arrow button, a "Cancel" button, and an "OK" button.

**Time:** Enter a time in h:m:s:ms format at which the event should occur from the beginning of the sequence playback.

**Chan:** The channel on which to output the event (1-16).

**Event:** Choose the standard MIDI message to send with the event.

**Val 1:** Specify a Value 1 parameter for the event. In the case of Note On this should be the Note value, in the Program Change this should be the desired program number.

**Val 2:** Specify a Value 2 parameter for the event. In the case of Note On this should be velocity of the note.

**Comment:** Enter a textual description of the event. This is useful for overseeing a MIDI sequence and to quickly decipher what all the events are.

**Preview:** Preview the command to be added.

**All Notes Off:** Resolve any stuck notes.

**Keyzone Lookup:** Insert an event already added to the Keyzone module.

Clicking **OK** will add the new event to the list. Further events can be added in the same way.

To move an event, edit the event and enter the new required time. The event will be auto-sorted by time in the sequence list view.

Closing the editor will prompt for the new sequence to be saved, and will then be automatically loaded into the sequence manager and also to memory.

## Recording from an External Source

The Sequence Editor can also record from an external MIDI device through the assigned MIDI Input device in the settings dialogue.

This can be used to record a sequence of events such as Note On events from a keyboard, or to record custom mixing desk fades using Control Change messages.

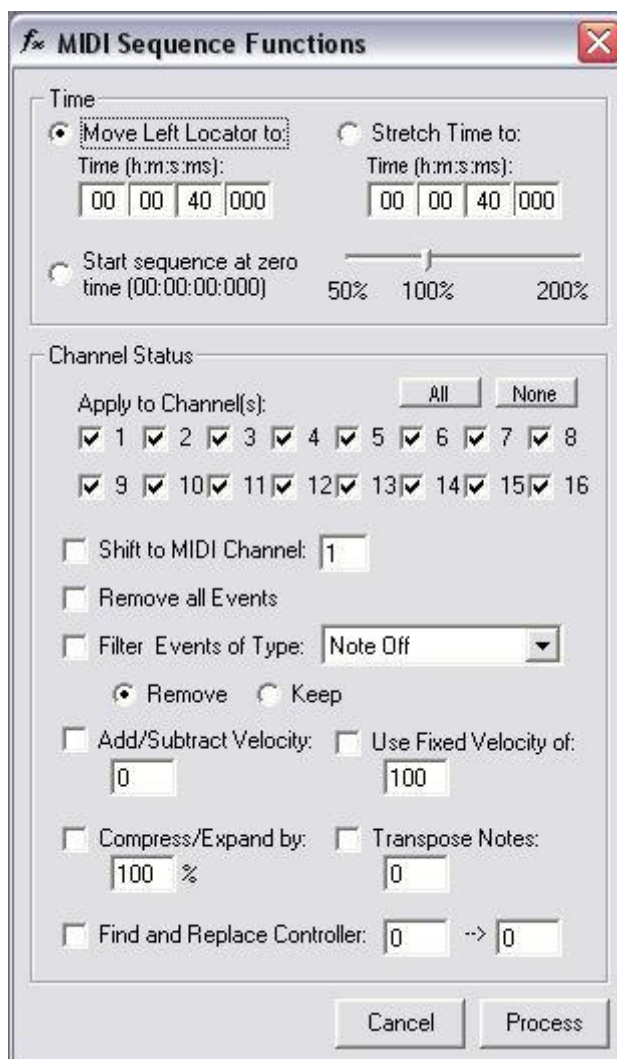
Pressing the **Record** button will begin recording. If the **Start Record On Input** checkbox is ticked, the record timer will not start until the first MIDI event is received at the MIDI Input.

Events are displayed in the sequence list view as they are received.

When recording is finished, press the **Stop** button. Closing the editor will prompt for the new sequence to be saved, and will then be automatically loaded into the sequence manager and also to memory.

### Editing a sequence using the Function Editor

The sequence editor includes a powerful function editor to perform global or targeted edits on the current sequence.  
Click on the **fx** button to display the function editor.



## Time

**Move Left Locator to:** Specify a new position for the start of the sequence to create an offset.

**Start Sequence at Zero Time:** Reset the starting position of the sequence to 00:00:00:000.

**Stretch Time to:** Stretch or compress the length of the sequence to fit events to a new time period, or to change tempo of the sequence.

## Channel Status

**Apply to Channel(s):** Select the channels to apply the functions to.

**All:** Select all channels

**None:** Remove all channel selections.

**Shift to MIDI Channel:** Move all events on the selected MIDI Channel to the new channel specified.

**Remove All Events:** Remove all events on the selected channels.

**Filter Events of Type:** Remove or Keep the selected message type on the selected channels.

**Add/Subtract Velocity:** Add or subtract a velocity amount to all Note On events on the selected channels, up to the bounds 0-127.

**Use Fixed Velocity of:** Specify a velocity to shift all Note On events on the selected channels to.

**Compress/Expand by:** Specify a multiplication percentage to compress/expand all Note On events on the selected channels. For example, for a value of 50%, a velocity of 50 is decreased to 25, whilst for a value of 200%, the velocity is increased to 100.

**Transpose Notes:** Shift all Note On events on the selected channels up or down by the number of specified Notes.

**Find and Replace Controller:** Find a specific controller value and replace it with a new value. Can be used when recording fades on MIDI compatible moving-fader mixing desks to move saved fades between desk channels.

Click **Process** to confirm editing functions, or **Cancel** to discard all changes.

## Cue Trigger Map

This module displays an overview of all MIDI triggers linked to all cues in cuelist. The listing is broken down into 3 areas: Note On Triggers; Program Change Triggers and MTC (MIDI Time Code) Triggers.

The screenshot shows a software window titled "Cue MIDI Trigger Map". It has three radio buttons at the top: "Note On" (selected), "Program Change", and "Time Code". To the right of these buttons is a "Refresh" button. Below the controls is a table with three columns: "Value", "Cue", and "Description". The table contains six rows of data.

Value	Cue	Description
001	6.00	Sketch 2: Local Shop
002	7.00	FX: Door Tinkle
003	9.00	FX: Open Can
004	10.00	Sketch 1: Bar Banana
005	11.00	FX: Glass smash
010	14.00	Sketch 3: Car Park

The list can be sorted by cue order or by trigger data order by clicking on the relevant column's header.

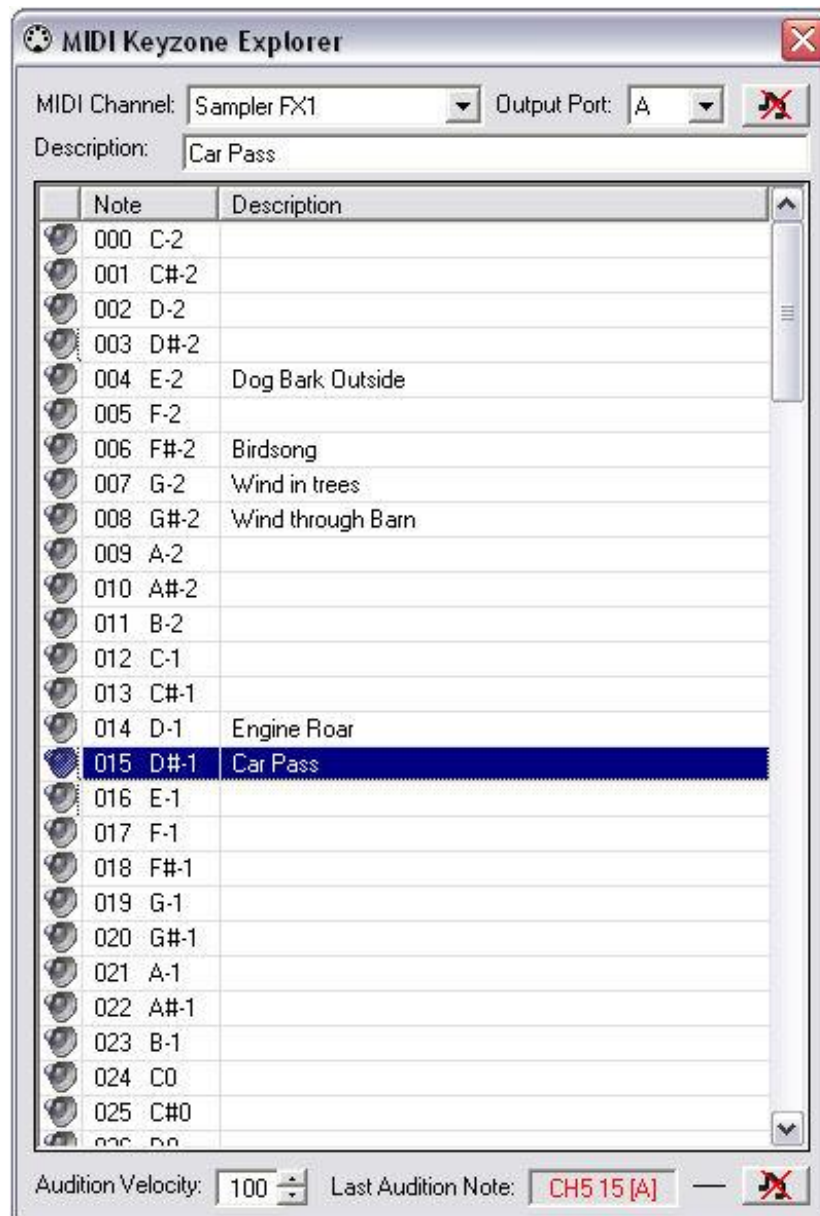
Note that changes are not automatically updated on the trigger map, instead a manual refresh is required to see any new or changed information by clicking on “Refresh”.

## MIDI Keyzone Explorer

This module provides a simple database to enter details of events triggered by Note On messages for each MIDI Channel.

This could represent a Sampler, or video image generator connected on the MIDI ports of CSC.

The module can also be used live to trigger events “on the fly”.



**MIDI Channel:** Select the MIDI Channel to display key Information for. The names and devices shown in this list are drawn from the MIDI Channel Setup window.

**Output Port:** Select which MIDI Port to view channels for.

**Description:** Enter a description for the selected note.

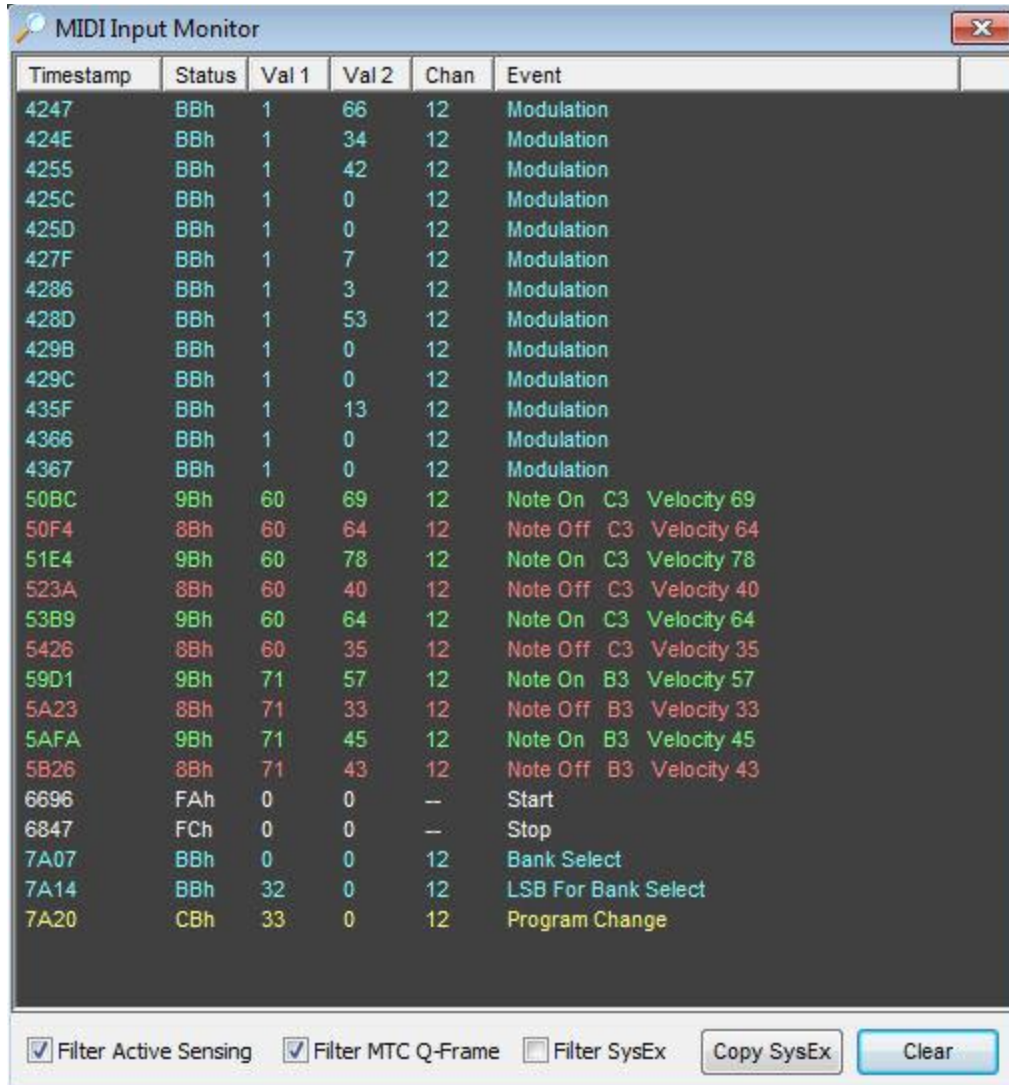
**Audition:** Click on this speaker symbol to send the MIDI Note to the output port.

**Audition Velocity:** Set the velocity with which audition notes are sent.

**Last Audition Note:** Shows the last note sent by clicking on the speaker symbol. This note that will be cancelled also clicking on the NOTE OFF symbol.

## MIDI Input Monitor

The Input monitor provides a data readout of MIDI information appearing at the selected MIDI input port.



Timestamp	Status	Val 1	Val 2	Chan	Event
4247	BBh	1	66	12	Modulation
424E	BBh	1	34	12	Modulation
4255	BBh	1	42	12	Modulation
425C	BBh	1	0	12	Modulation
425D	BBh	1	0	12	Modulation
427F	BBh	1	7	12	Modulation
4286	BBh	1	3	12	Modulation
428D	BBh	1	53	12	Modulation
429B	BBh	1	0	12	Modulation
429C	BBh	1	0	12	Modulation
435F	BBh	1	13	12	Modulation
4366	BBh	1	0	12	Modulation
4367	BBh	1	0	12	Modulation
50BC	9Bh	60	69	12	Note On C3 Velocity 69
50F4	8Bh	60	64	12	Note Off C3 Velocity 64
51E4	9Bh	60	78	12	Note On C3 Velocity 78
523A	8Bh	60	40	12	Note Off C3 Velocity 40
53B9	9Bh	60	64	12	Note On C3 Velocity 64
5426	8Bh	60	35	12	Note Off C3 Velocity 35
59D1	9Bh	71	57	12	Note On B3 Velocity 57
5A23	8Bh	71	33	12	Note Off B3 Velocity 33
5AFA	9Bh	71	45	12	Note On B3 Velocity 45
5B26	8Bh	71	43	12	Note Off B3 Velocity 43
6696	FAh	0	0	—	Start
6847	FCh	0	0	—	Stop
7A07	BBh	0	0	12	Bank Select
7A14	BBh	32	0	12	LSB For Bank Select
7A20	CBh	33	0	12	Program Change

☒ Filter Active Sensing  
 ☒ Filter MTC Q-Frame  
 ☐ Filter SysEx  
 Copy SysEx  
 Clear

The columns, from left to right:

**Timestamp:** The time in Hex format, after the MIDI Input was first opened by the application, at which each packet of data arrived at the port.

**Status:** The MIDI status byte of the incoming packet. Refer to MIDI Implementation data for full explanation of these values.

**Val 1:** The first data byte of the incoming MIDI packet. For example, a Note On status byte has a Val 1 value referring to a Note Number.

**Val 2:** The second data byte of the incoming MIDI packet. For example, a Note On status byte has a Val 2 value referring to the notes velocity.



**Chan:** The channel number of the incoming MIDI packet.

**Event:** A text description of the incoming MIDI packet. Control Change messages are expanded to show their default MIDI parameter. If the packet was a System Exclusive (SysEx) message, the message is shown in Hex byte format.

There are 3 options at the bottom of the window:

**Filter Active Sensing:** Active sensing is used by some manufacturers to determine whether a MIDI connection is still active. For example, a keyboard or sampler module can be set to receive an active sensing signal every 200ms. If a normal MIDI message or active sensing message is not received within this period, the instrument can assume the MIDI connection is broken and to resolve any hung notes. Ticking this box prevents these messages being displayed on the input monitor.

**Filter MTC Q-Frame:** MIDI Time Code is sent using a special status byte, the “Quarter Frame” message, and is sent, as its name suggests, every quarter of a frame. This is the reference “tick” for a MIDI Time Code link. Ticking this box prevents these messages being displayed on the input monitor.

**Filter SysEx:** Ticking this box prevents System Exclusive messages being shown on the Input Monitor, leaving only the standard Note On, Note Off etc messages.

**Copy SysEx:** Copies the selected string of SysEx to the clipboard for pasting into a cue or other application.

The **Clear** button clears all displayed data.

Note this window is automatically cleared after 5000 lines of data are received to prevent buffer overflows.

Note also that all incoming MIDI data is diverted to this window whilst monitoring and so MIDI triggers will not be executed.

## Timecode Clock

A display of the incoming MIDI Timecode (MTC) to ensure external devices are running correctly and observe the current time position.



Time is displayed in the H:M:S:F (Hours:Minutes:Seconds:Frames) format.

CSC automatically detects the incoming frame rate, but ensure that any cue triggers are set within the bounds of the frame rate.

The timecode clock can also be sourced from an Internal Timer or from the System Clock. Cue triggers are still entered in the normal manner in the Add/Edit window, but the event which triggers them will depend on the settings of the Timecode Source.

So, for example, to set a cue to fire at a particular time of day, ie. 5.15 pm. ensure the timecode window is set to CLK (System Clock), and in the cue edit window enter in the timecode trigger:

H: 17  
M: 15  
S: 0  
F: 0

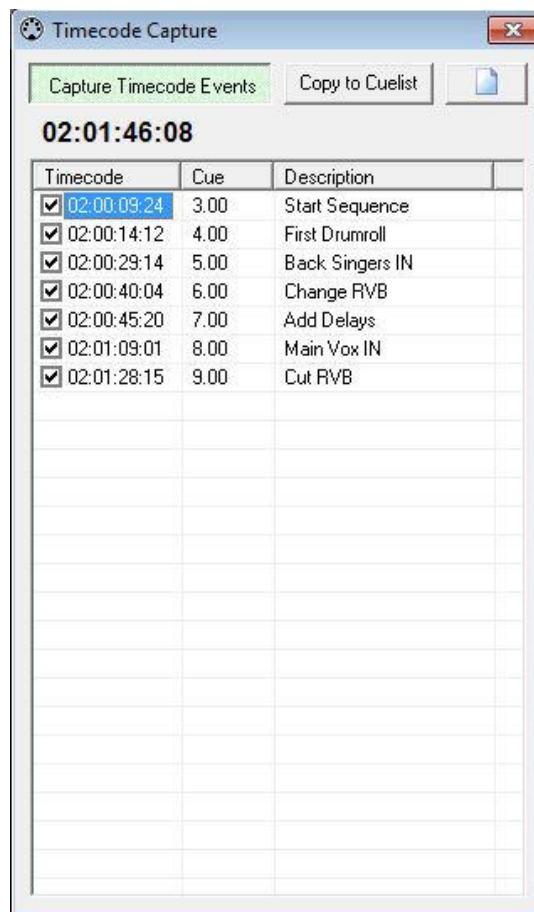
When the timecode window displays 17 15 0 0 the cue will be fired.  
If "Data Only" was selected this will not affect the cuelist position.

Internal Timer has a resolution of 0.01 secs, and so the "Frames" window will show a reading of 0-99, more than the maximum 29 when in 30FPS.

The Source can also be toggled, even mid-show, from the System Command Module, or by clicking the option box by each source.

Note that cue triggers are still executed even if this window is hidden from view.

## MIDI Timecode Capture



Sometimes plotting a list of timecode points into a cuelist can be hard work, especially if many of these points are in the middle of musical sections generated from external hard disk players or sequencers. By enabling timecode input in the *Settings* window, or by using the internal timer, and then opening this window it is possible for CSC to remember the timecode positions at which each GO command was sent.

**Capture Timecode Events:** Enable this to begin recording the timecode position at which each GO command was sent. Without this enabled the module will not remember any timecode positions.

**Copy to Cuelist:** Clicking this will copy all selected recorded events to the cuelist and apply the timecode trigger to each fired cue. Only events with a tick next to the will be copied so if only a few timecode points were required these can be filtered down using the checkboxes. Note the each cue in CSC requires a unique timecode, so any cue which already has a timecode matching the one recorded in this module will be queried.

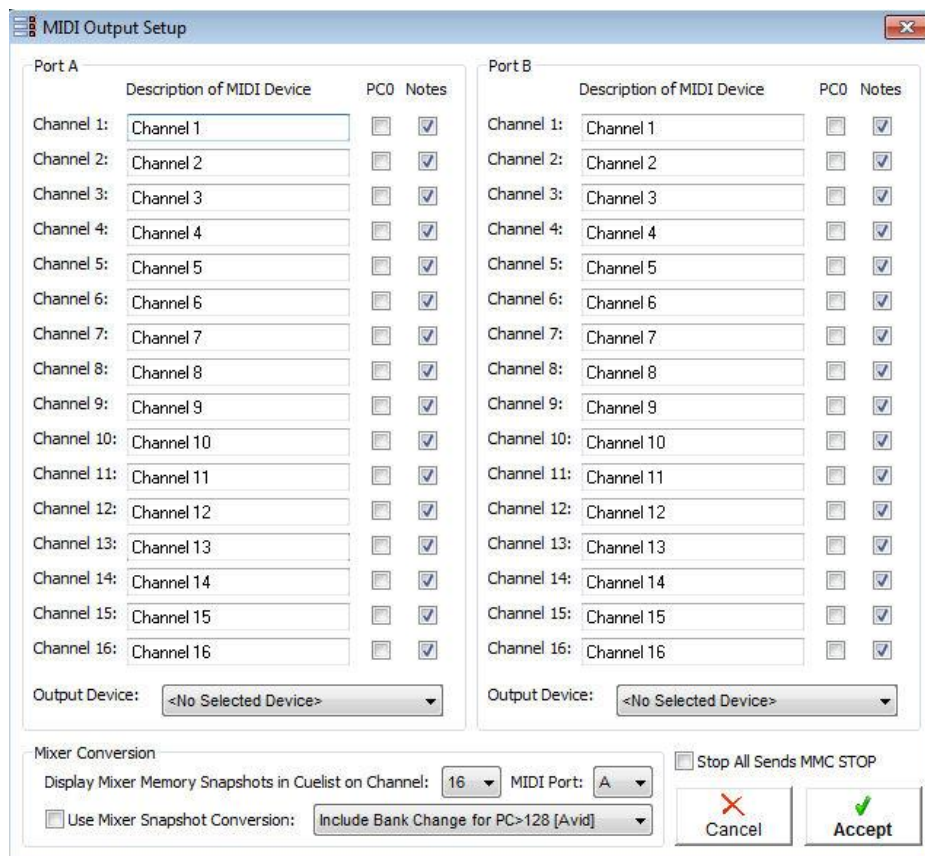
**New:** Begin recording a fresh list of timecode points.

## Machine Control



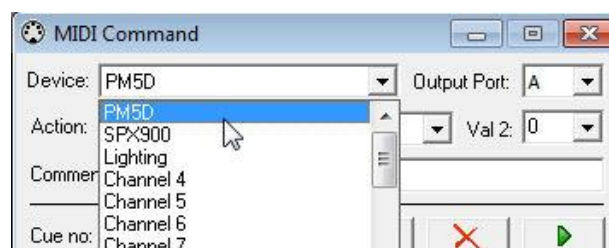
This universal transport control gives quick control over multitrack recorders or sequencers set to respond to MMC commands from CSC. PLAY, STOP, RWD, FWD and REC commands with a device ID 7F (All devices) are sent to both MIDI ports.

## MIDI Setup



This window is used to label MIDI devices and set up MIDI output ports for use in the show.

The window displays all 16 MIDI Output Channels for both Port A and Port B, and can be used to name an individual channel with a custom entry, rather than using the default “Channel 1”, “Channel 2” etc. If, for example, a mixing desk is on the MIDI chain, set to respond to channel 1, the name for channel 1 could be set to “PM5D”. These names are copied to the MIDI control window, and the *Device* dropdown box will then have the entry “PM5D”.



Events in the event list and expanded cuelist view will then also refer to “PM5D”, making a show much easier to read rather than just seeing a list of channel numbers.

The MIDI Mapper also has 2 other parameters which can be set for each channel: **PC0** and **Notes**.

**PC0:** Program Change value ranges vary between equipment manufacturers. Some manufacturers refer to program changes as “memories”, and start at 1, whilst others use the standard MIDI data range of 0 -127. Whilst the actual MIDI data is the same in either case, the displayed value can cause difficulties when programming shows due to the offset.

Ticking this box sets a channel to list possible program change values from 0-127 in the MIDI Control window. An unchecked box sets the channel to list possible program change values from 1-128.

**Notes:** When selecting *Note On* or *Note Off* in the MIDI Control window, the *Val 1* dropdown box can be set either to show actual Note names or MIDI Note values.

Ticking this box sets an individual MIDI Channel to display Note data as actual Note names. An unchecked box sets the channel to display Note data as numbers.

CSC has a MIDI Note range of C-2 to G8, with C3 referring to Note value 60.

MIDI names and Channel data is stored within a show.

**Output Device:** Specify a device to use for MIDI Output Ports A+B. The dropdown combo box will list all currently active devices in the system. If an expected device is not present in the list, ensure it is correctly installed under Windows Control panel. USB MIDI devices may need to be connected before the application is opened.

There are known issues with certain USB MIDI drivers which do not correctly release when their corresponding device is disconnected. This may result in the entry `<unknown device>` being present in the dropdown list.

Note how the presence of USB drivers can also affect the order of listed ports, and this may be of significance when devices are plugged and unplugged regularly since a show stores the order of devices in the system, not the device itself.

**Display Mixer Program Changes on Channel:** Set the channel and port on which CSC will communicate with a mixing desk. The cuelist will scan for MIDI commands stored which match this entry and display them in the “Mem” column of the cuelist.

It also enables program change numbers above 128 to have a control change value attached to them on this channel. See *Setup* for more information on this.

### **Mixer Snapshot Conversion:**

**Include Bank Change for PC>128 [Avid]:** Can be used to select memories greater than 128 on equipment responding to bank changes such as Avid Venue/D-Show Systems. For example, some mixing desks can hold 128

memories in Bank 0, a further 128 in Bank 1, etc. Normally a control change can be sent to switch banks, and then a Program Change command to select the memories in this new bank. CSC can automatically work out which bank a memory is in and send the Control Change 0 + value for the bank followed by the correct Program Change for the memory. So to select memory 145, this is greater than 128, so CSC will send a Bank Change 0, value 1 message, followed by a Program Change 17.

By allowing CSC to do this translation, cuelist programming becomes much simpler as only the "145" needs to be entered into the MIDI control window.

Note this process only happens on the channel designated to be the Mixing Desk Channel as detailed above.

***Send as Control Change (CC16-19) [Digico]:*** The Digico range of consoles do not directly respond to Program Change data. Instead, scene selection is done via Control Change messages 16-19. Use this mode to translate memory snapshot numbers into the necessary Control Change Data.

***Display CC Not PC in Cuelist Mem Column:*** If the Digico translation is not used, but snapshots are to be entered manually using Control Change information, select this mode to display the Control Change values in the Memory column in the cuelist rather than any Program Change data matching the selected mixer MIDI channel.

***Include Bank Change for PC>128 [Yamaha]:*** As Avid above, but expanded to use a MSB-LSB bank numbering system (controller 32, controller 0), so this mode send bank changes on controller 32 (MSB) followed by bank value to work with Yamaha consoles. Note that LSB values are ignored so only the first 127 are accessible.

***Stop All Sends MMC Stop:*** Tick this box to also send an MMC Stop command when issuing a Cuelist Stop All Command.

\*PM5D is a trademark of Yamaha Corporation.

## MIDI Control Mapping

CSC has support for an extensive range of MIDI Commands to remote control cuelist operations, as well as assist in level setting during show design.

### Cue Control

**Cue Control MIDI Input**

Input Port:

Opt. MTC Port:

Respond to incoming MIDI on channel:

MIDI Show Control and MIDI Machine Control ID (Will always respond to 7F):

**MIDI Thru (Port A)**

☒ Off ☐ During Record ☐ Echo All

**Global MIDI Options**

☐ Show System trigger PC as 0-127

☐ Show Cue trigger PC as 0-127

Debounce Time on MIDI "GO" ms :

☒ Also Use Debounce for Trigger Lists

**Cue Control MIDI Assignment (Double Click to Begin Capture)**

Command	Note On (Vel>0)	Program Change
GO NEXT CUE		4
STOP CURRENT ACTION		5
STANDBY -		6
STANDBY +		7
RESTART SHOW		
CUE BACK		
GO SELECTED CUE		
PREVIEW -		
PREVIEW +		
GO NEXT ACT		
PAUSE ALL AUDIO		
RESUME ALL AUDIO		

Apply Cancel OK

**Input Port:** Specify a device to use for MIDI Input to the application. This is the device used to read MIDI Timecode and Cue Triggers, as well as recording external MIDI sequences. If multiple MIDI streams are needed to trigger the application, such as one source for triggers, and another for MTC it is suggested to use a MIDI Merge Device. Alternatively, if 2 MIDI Input devices are present in the system, system and cue triggers can be sent through this port and MTC signals can be sent through the Opt. MTC Port.

**Opt. MTC Port:** This optional MIDI Timecode port can be assigned to read timecode streams without having to merge the MIDI signal with other MIDI trigger data. This can be important in complex MIDI chains as MTC quarter frame messages can occur up to every 8ms and can easily collide with other data through a non-intelligent Merge device.



**Respond to incoming MIDI Data on channel:** Specify a MIDI channel to listen to for incoming MIDI data. Set to “omni” to listen to all channels.

**Respond to MIDI Show Control On ID:** Specify a device ID for CSC as part of a MIDI Show Control network. CSC will also respond to ID 7F (All Devices). MSC commands must be state “Sound Category” in their message. See Appendix for supported MSC Commands.

**MIDI Thru (Port A):** Allow data received at the MIDI Input to pass to the MIDI output, such as connecting a keyboard to trigger a sampler but passing through CSC to record the keyboard strokes. Select between **Off**, **Only during recording**, or **Echo All**.

**Show System Trigger PC 0-127:** Display Program Change messages for the global triggers as 0-127 rather than 1-128.

**Show Cue Trigger PC 0-127** Display Program Change messages for cue triggers (displayed in the add/edit window) as 0-127 rather than 1-128.

**Debounce Time of MIDI “GO” ms:** A debounce time can be assigned to any MIDI controlled “GO” commands to prevent double hits. Enter time here in ms for which a second trigger is ignored.

**Also Use Debounce for Trigger Lists:** Assign a debounce time to each trigger list as well as the global cue control system.

**Cue Control MIDI Assignment:** Control operation of the cuelist and the external trigger lists via incoming MIDI. Each of the actions can be assigned a Note On or Program Change value, with data between 0 and 127 for Note On, and 1-128 for Program Change, unless the System Trigger 0-127 is selected, and will respond upon receipt of a message on the correct “incoming MIDI channel” which matches the entered value. Double click a box to enter a value or choose from the drop down list. To clear a value simply delete the text entry.

## **MIDI Capture**

Double click on any of the Command Entries to enter MIDI capture mode. Once in this mode, any MIDI Program Change or Note On events received via the MIDI input port will be mapped to the selected MIDI Controller.

To exit from the mode if no suitable MIDI message is received press the Cancel button.

The MIDI Input monitor window can be used to analyse incoming MIDI if this method is failing to accept messages.

The MIDI trigger settings are globally stored for the application, and are not show file dependent.

## **Live Mixer MIDI Control**

CSC has support for external MIDI Control surfaces to remote control the Live Mixer.

The MIDI link is bi-directional, so any changes on the MIDI surface are reflected on the internal mixer, and any changes on the screen – including stepping through cues – are reflected on the surface.

Hardware surfaces as well as tablet based software surfaces all work equally well.

The MIDI mapping for the selected Controller Mode is shown in the grid.

**MIDI Input Port:** Select a MIDI device to be used for MIDI input to the Live Mixer. This must be a unique port to any defined on the Cue Control tab. If the same MIDI input is required, then select the Also respond to Cue Control MIDI port.

**MIDI Output Port:** Select a MIDI device to be used to send mixer change data out to, usually the pair to the Input port.

**MIDI Control Mapping**

Cue Control | **Live Mixer MIDI Control**

Live Mixer MIDI Control

MIDI Input Port: UNIT1 ☐ Also respond to Cue Control MIDI port

MIDI Output Port: <No Selected Device>

Controller Mode: Generic MIDI Controller

Generic Controller Map

Player Control: ☒ Send ☒ Send ☒ Send ☒ Send Channel: 01, 02

Mixer Channel	Fader CC	Pan CC	Mute CC	Mute Mode	Solo CC	Solo Mode
Player 1 (CH: 01)	0	32	64	Abs	96	Abs
Player 2 (CH: 01)	1	33	65	Abs	97	Abs
Player 3 (CH: 01)	2	34	66	Abs	98	Abs
Player 4 (CH: 01)	3	35	67	Abs	99	Abs
Player 5 (CH: 01)	4	36	68	Abs	100	Abs
Player 6 (CH: 01)	5	37	69	Abs	101	Abs
Player 7 (CH: 01)	6	38	70	Abs	102	Abs
Player 8 (CH: 01)	7	39	71	Abs	103	Abs

Master Control: Channel: 03

Command	Control Value	Mode
Master Level	1	Abs
Master Mute	2	Abs
Reset Mute	3	Abs
Reset Solo	4	Abs

Apply Cancel OK

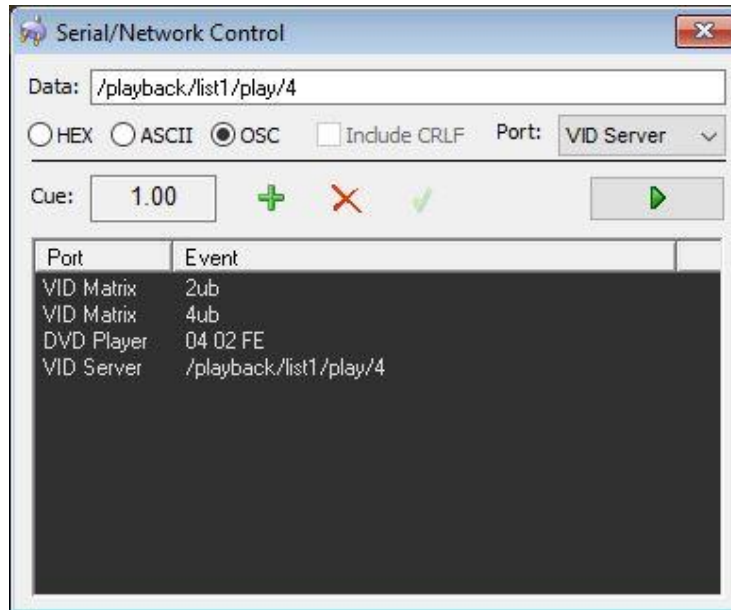
**Controller Mode:** Select the MIDI surface emulation mode

**Generic Controller Map:** Displays the controller map for the selected Controller Mode.

**Send:** Tick to send the MIDI data for each of the mixer components, Fader, Pan, Mute and Solo status. If not all data is required, uncheck components not needed to reduce the amount of MIDI data being sent.

Note that these settings are application specific and will persist between sessions. They are not show file dependent.

## Serial/Network Control



This module gives access to 4 serial communications ports for sending ASCII and hexadecimal control commands to devices having a serial port, 8 ports for sending Telnet commands via a TCP socket and 8 ports for sending OSC commands via a UDP socket. This typically includes CD/MiniDisc players, DVD players, video switching systems, etc.

The serial ports must be setup and working in Windows before CSC can access them.

**Data Entry:** Enter the command string in the data entry box.

**Preview:** Click this arrow to preview data in the data entry box. This will be sent to the port selected in the port dropdown box.

**Hex:** Check this option if the device is expecting to see a Hexadecimal string as its control source. The characters will appear to be grouped into hex bytes and these are the commands CSC will transmit. The only available input options are the number 0-9 and characters A-F.

**ASCII:** Check this option if the device is expecting to see an ASCII (normal text) command. The characters will appear in the window as one long string. CSC will transmit each character one at a time. All numbers and characters are valid entries for this mode of operation.

**OSC:** Check this option to enter messages using the Open Sound Control protocol format. CSC will attempt to parse each section of the message and interpret as either a String, Integer or Float message. Any message containing non-numerical characters will automatically be interpreted as a string, numbers without a corresponding decimal point will be interpreted as an integer, and a

number with a decimal point will be interpreted as a float. Other messages types are not supported. See *OSC format* below.

**Include CRLF:** Check this option if the device is expecting to see a Carriage Return + Line Feed after every command. CSC will send a Chr(13) and Chr(10) command after the entered data. This option is not available for OSC messages.

**Port:** Choose which of CSC's 20 ports to send the data to. These ports must be set up in the *Settings* window with the correct computer port number, baud rate and Flow Control options.

Ports 1-4 refer to installed RS232 ports, Ports 5-12 refer to TCP Telnet connections, and Ports 13-20 refer to UDP OSC connections.

**Cue number:** Shows the currently selected cue and therefore the cue to which this serial data is being added.

**Apply:** Double click on a data entry to edit its contents. Once this is completed, click the apply button to store the new information back to the entry.

**Add:** Click to add the data in the data editor to the current cue

**Remove:** Click to remove the selected data from the current cue.

### **OSC Format**

The unit of transmission of OSC is an *OSC Packet*. Any application that sends OSC Packets is an *OSC Client*; any application that receives OSC Packets is an *OSC Server*. The contents of an OSC packet must be either an *OSC Message* or an *OSC Bundle*. An OSC message consists of an *OSC Address Pattern* followed by an *OSC Type Tag String* followed by zero or more *OSC Arguments*.

CSC is able to send data formatted as OSC Messages.

OSC messages can be entered into the Serial/Network Control window in the format:

/address/argument1/argument2/argument3

CSC will parse the data and convert the first /address entry to be the Address Pattern, and each piece of data between the / delimiters will be sent as further arguments.

CSC will try and interpret arguments as one of 3 OSC Types: **int32**, **float32** or **OSC-String** and tag them as appropriate.

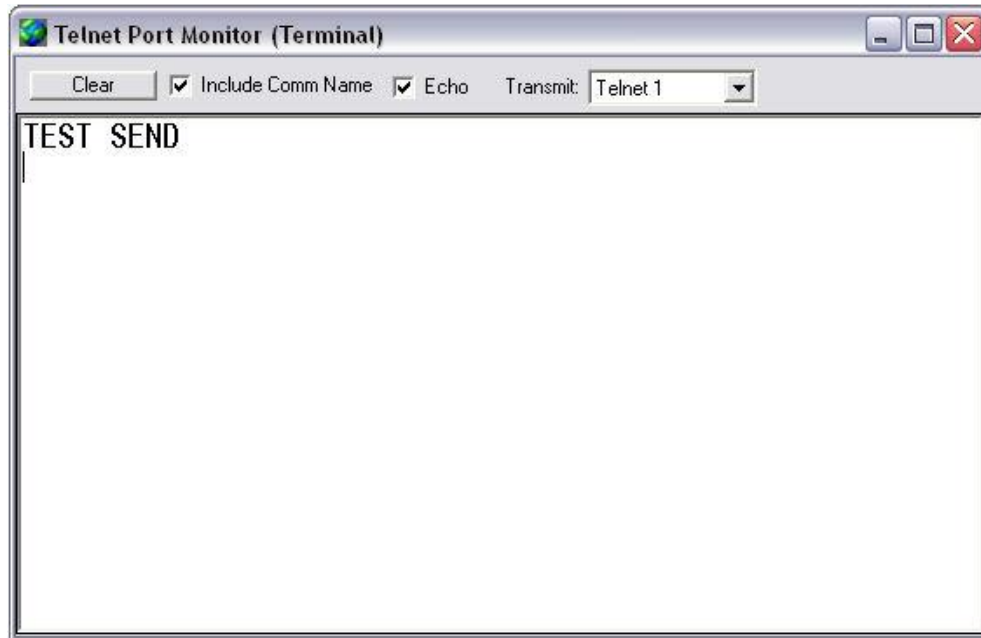
If the argument entered is a whole number, CSC will assume this is an int32.

If the argument entered is a number with a decimal point, CSC will assume this is a float32.

If the argument contains any other ASCII values CSC will assume this is an OSC-String.

## Telnet Port Monitor (Terminal)

A simple terminal client to test and monitor telnet connections between CSC and external equipment. Data can also be sent from this window by typing directly into the received data box.



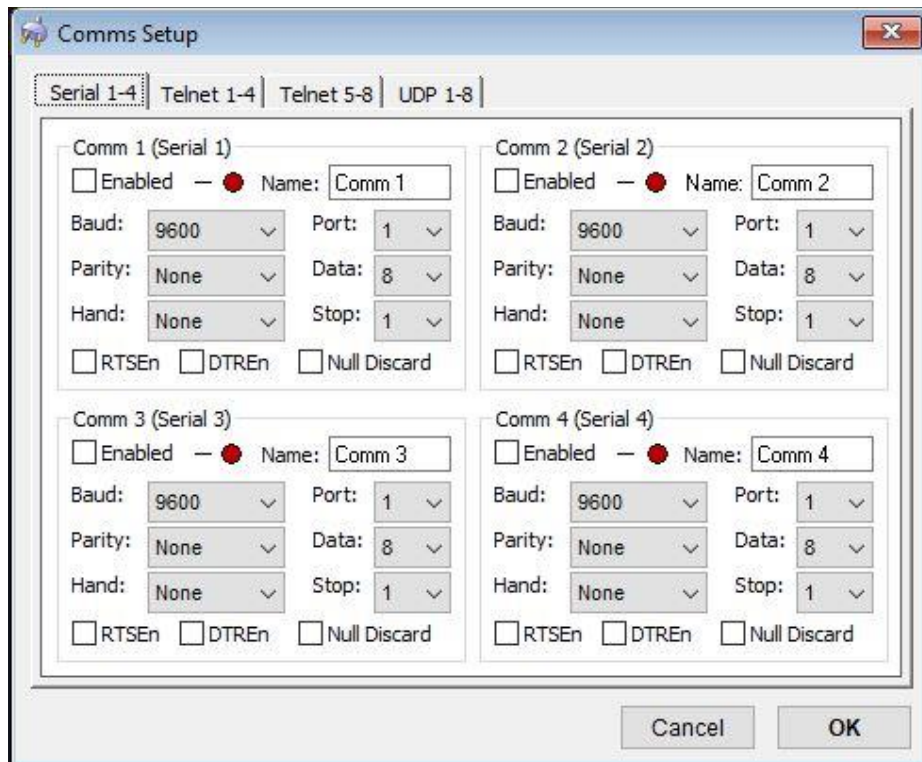
**Clear:** Clear the data window of any received characters.

**Include Comm Name:** All 8 telnet ports will write to this window when they receive data. Selecting this will prefix any data with the name of the port which received the data.

**Echo:** Will show any characters typed in the data window as well as transmitting them to the selected port. Some equipment will automatically echo characters back to the sending machine and so this option should be left off.

**Transmit:** Specify a port to transmit any typed characters to.

## Comms Setup



### Serial

CSC can talk to 4 serial RS232 ports installed on the computer. The commands to send are entered with the serial module. Use this tab to map CSC Comm. Ports 1-4 to actual system communications ports.

**Enabled:** Tick to use this Comm port in CSC.

**Name:** Give the Comm port a name which will be used in the Serial Module.

**Baud:** Set the Baud Rate of the serial port on the computer.

**Parity:** Set Parity options for the serial port.

**Hand:** Set the type of handshaking required with the connected serial equipment.

**Port:** Set the physical computer serial port to be used by the Comm port.

**Data:** Set the number of Data bits required by the connected serial equipment.

**Stop:** Set the number of Stop Bits required by the connected serial equipment.

**RTSEn:** Request to Send Enable

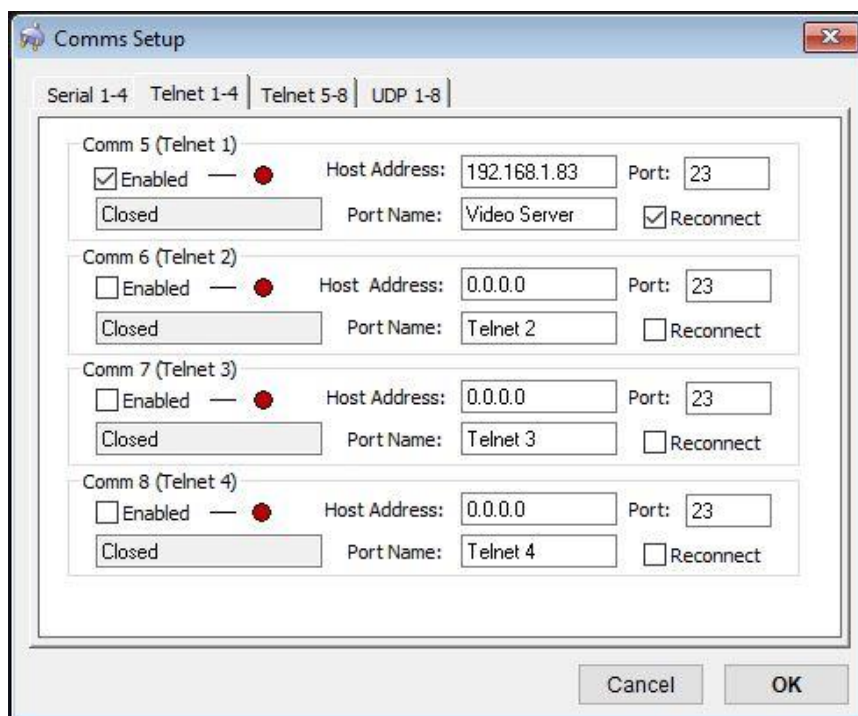
**DTREn:** Data Terminal Ready Enable (Flow Control)

**Null Discard:** Null Discard

A green light by Enabled indicates the serial port has been successfully opened.

## Telnet

Telnet is a simple text transfer protocol which can be used over TCP/IP. The Serial module can also be used to send commands between telnet ports on the local or remote computers. The Telnet ports appear to the serial module as Comm 5-12.



**Enabled:** Enable the port to be used by CSC.

**Status:** Shows the current status of the connection, either Closed, Connecting, or Connected.

**IP Address:** Enter the IP address of the computer to communicate with. This entry should take this form of a standard IP address xxx.xxx.xxx.xxx. Ensure the remote machine is located on the same subnet as the sending machine. To communicate with the local machine (localhost) enter 127.0.0.1.

**Port:** Set the port over which communication should occur. Ensure this port is not blocked by any firewall in use on the machines.

**Port Name:** Enter the name of the Port to be displayed in the Serial module.



**Reconnect:** Will detect a connection has been remotely closed and attempt a reconnect every 10 seconds. Without this ticked, an enabled port will remain closed after disconnection until manually reconnected by deselecting Enable and reselecting, the show is re-opened, or the settings dialogue is entered and exited. This feature will only function after the IP has been entered and saved to the system.

## UDP

CSC allows up to 8 UDP ports to be defined. In comparison to TCP, UDP has a lighter overhead due to the lack of packet delivery guarantee. This is advantageous to devices sending and receiving large amounts of real-time data where speed is more important than the occasional dropped packet. Many devices configured to use the OSC protocol will prefer UDP as their transport method on this basis.

The ports will show as Comm 13-20.

	Port Name:	Host Address:	Port:
UDP 1:	OSC Device 1	192.168.1.40	5060
UDP 2:	UDP 2	0.0.0.0	0
UDP 3:	UDP 3	0.0.0.0	0
UDP 4:	UDP 4	0.0.0.0	0
UDP 5:	UDP 5	0.0.0.0	0
UDP 6:	UDP 6	0.0.0.0	0
UDP 7:	UDP 7	0.0.0.0	0
UDP 8:	UDP 8	0.0.0.0	0

**Port Name:** Enter the name of the Port to be displayed in the Serial module.

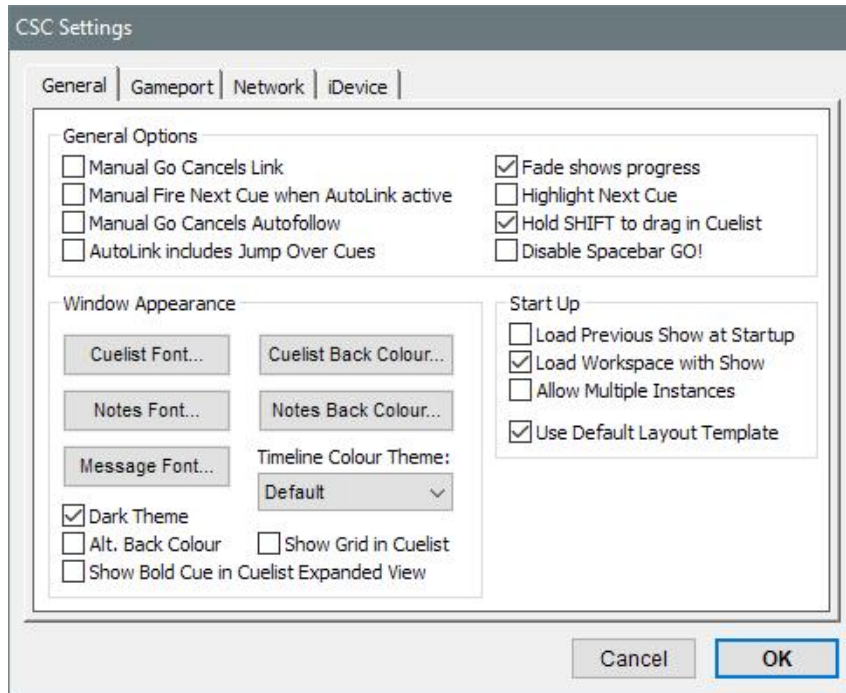
**Host Address:** The IP address of the device to be communicated with.

**Port:** The port number used to communicate with the device. Ensure any firewall is configured to allow pass-through for that port.

## Settings

Use this dialogue to set parameters for the application.

### General



### Start Up

**Load Previous Show at Startup:** Load the last saved show back into the application when starting up.

**Load Workspace with Show:** Select whether to load all window and module placements back into the workspace when a show is loaded.

**Allow Multiple Instances:** Check to allow multiple copies of CSC to be open simultaneously.

### General options

**Manual Go Cancels Link:** Used in conjunction with “Manual Fire Next...” (See below), when checked, a timed auto-link is cancelled when the “Go Next” command is sent.

**Manual Fire Next Cue when AutoLink active:** Allows intermediate cues to be fired whilst a timed link is active to selectively fire further cues depending on the unpredictable nature of live shows. Also allows spot cues to be fired in the

middle of timed sequences. If left unchecked, the “Go Next” command will cancel the timed link and fire the linked to cue instantly.

**Manual Go Cancels Autofollow:** Will cancel a WavPlayer autofollow flag when a manual GO is sent.

**AutoLink includes Jump Over Cues:** When selected, the cuelist autolink function will jump over cues marked as “Jump Over” in the same way as a manually fired cue.

**Fade Shows Progress:** When checked, the WavPlayer File Overview window shows fade progress as part of the description column, and continues to show the time progress of the file in the time column.  
When unchecked, the fade progress is shown instead of the time progress.

**Highlight Next Cue:** Alters the cuelist display mode to highlight the next cue in the cue stack to be fired as opposed to highlighting the current cue. Modules also display the data for the next cue to preview events to be fired. This mode is found to be preferential during show running, whilst deselecting this mode during editing can make the task of editing easier.

**Hold SHIFT to drag in cuelist:** When checked, ensures that items cannot be accidentally dragged up and down the cuelist unless the <SHIFT> key is held down.

**Disable Spacebar GO!:** Prevent the keyboard spacebar from firing the cuelist.

### **Window Appearance**

**Cuelist Font:** Displays a standard dialogue to select the cuelist font.

**Notes Font:** Displays a standard dialogue to select the notepad font.

**Message Font:** Displays a standard dialogue to select the network chat font.

**Cuelist Back Colour:** Displays a standard dialogue to select the background colour of the cuelist.

**Notes Back Colour:** Displays a standard dialogue to select the background colour of the notepad window.

**Timeline Colour Theme:** Select a colour theme to be used in the cue timeline view.

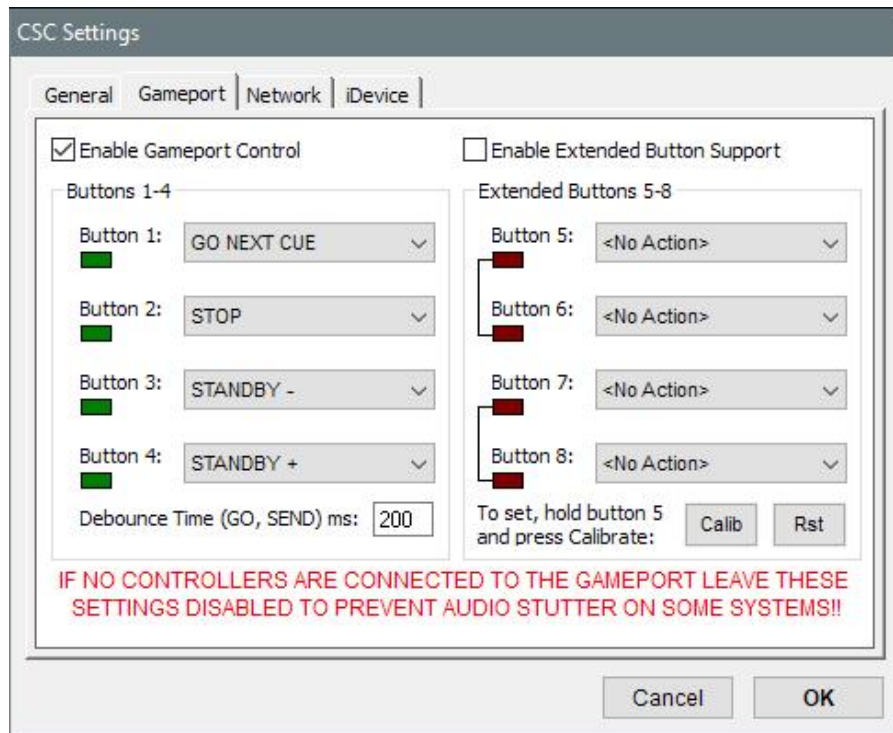
**Dark Theme:** Darken many of the CSC module colours to prevent light spill in a dark environment.

**Alt. Back Colour:** Provides a darker alternative background colour to the default.

**Show Grid in Cuelist:** Displays a grid in the cuelist window.

**Show Bold Cue in Expanded View:** Display the Cue Description in Bold and cue events in normal font to make reading the cuelist easier in Expanded mode.

## Gameport



CSC can be externally triggered by using a joystick/gamepad or specially designed button box connected to the systems gameport. Laptops or computers which are not fitted with a gameport connector can use this feature by purchasing a USB-Joystick adapter.

**Enable Gameport Control:** Enable or disable the gameport button scanning routine.

**Important:** Note that this should be disabled when there is no Gameport connected to the system otherwise the constant polling of an empty port can cause high CPU use and/or glitches in audio on some systems.

**Button 1-4:** Select an action for buttons 1-4 to on the gameport.

**Enable Extended Button Support:** Also scan the X and Y joystick axis to generate a further 4 buttons. Consult documentation on the CTR Electronics website for suggested circuits.

Buttons 5 and 6 are generated by the X-Axis, and so cannot be used at the same time, and buttons 7 and 8 are generated by the Y-Axis and also cannot be used at the same time.

All soundcard and joystick devices report slightly different axis values, and as such CSC will need to be taught where to centre its threshold between buttons 5/6 and 7/8. This can be done by pressing and holding button 5 (or 7) and pressing the calibrate button. If this is not done, spurious random button presses may be seen.

**Debounce Time:** Set the time between responding to successive “GO” commands.

### Available Actions:

**GO NEXT CUE:** Send the next cue, or the cue in standby, in the cuelist

**STOP:** Stop the current action.

**STANDBY-:** Set the previous cue before the currently selected one into standby mode.

**STANDBY+:** Set the next cue after the currently selected one into standby mode.

**RESTART SHOW:** Sends a “Top of Show” command to restart the show at cue 0.00.

**CUE BACK:** Restores the cuelist to the previously sent cue.

**GO SELECTED CUE:** Send the highlighted cue without advancing the cuelist.

**PREVIEW-:** Preview the cue before the currently selected cue

**PREVIEW+:** Preview the cue after the currently selected one.

**GO NEXT ACT:** Move the cuelist forward to the next act. Requires the cuelist is divided into acts.

**PAUSE ALL AUDIO:** Pause all WavPlayers.

**RESUME ALL AUDIO:** Resume all Paused WavPlayers.

**RWD ALL PLAYERS:** Hold down the button to Rewind all WavPlayers simultaneously. (Not supported in v3)

**FWD ALL PLAYERS:** Hold down the button to Fast Forward all WavPlayers simultaneously. (Not support in v3)

**FADE ALL AUDIO:** Fade out all WavPlayers.

**GO TRIGLIST 1:** Send a GO command to trigger list 1.

**GO TRIGLIST 2:** Send a GO command to trigger list 2.

**GO TRIGLIST 3:** Send a GO command to trigger list 3.

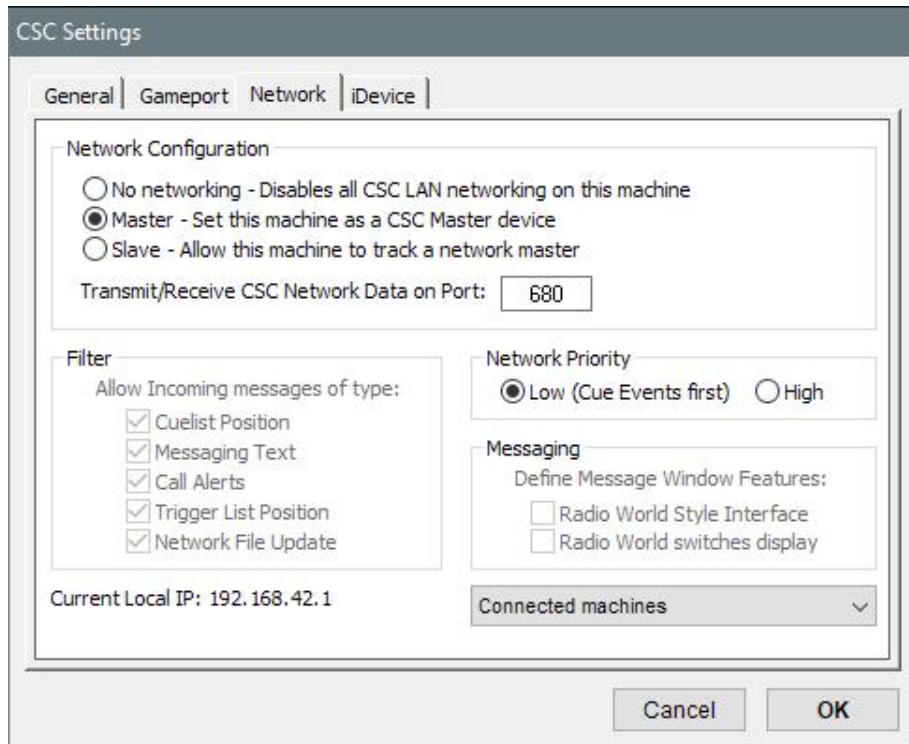
**GO TRIGLIST 4:** Send a GO command to trigger list 4.

**STOP ALL AUDIO:** Stop All Playing Audio.

The buttons can be tested by monitoring the “LEDs” next to each button selection box.

### Network

CSC features a flexible level of sophisticated networking options. This tab allows the application to be configured for this purpose.



See the network appendix for more information about Networking.

**No networking:** Disable all networking capabilities and turn off all TCP/IP network socket connectors.

**Master:** Sets the application as a CSC Master Device. When in this mode, the application becomes responsible for maintaining the network, and performs 3 major roles.

1. Becomes a CSC LAN network server, listening for requests from Slave machines to join the network, and adds them to the list of connected machines.
2. Becomes a network chat server, and routes all chat messages to all slave machines or chat clients.
3. Sends cuelist data out to slave machines so they may track this machine in case a system failure.

When in Master mode, a new networking icon appears on the toolbar, which is yellow when the master is online, and green when connected to a slave.

**Transmit/Receive Data on Port:** Allows a custom network port to be specified for communication. If configuring a firewall, ensure both TCP and UDP ports are opened.

**Slave:** Sets the application as a CSC Slave Device. When this mode is selected, CSC will immediately try scanning the local network for a master unit, and when found, will connect itself to it.

### **Filter**

Used to determine which packets of network data affect a slave machine.

**Cuelist Position:** Allow incoming data containing recently fired cue information.

**Messaging Text:** Allow incoming network chat messages.

**Call Alerts:** Allow message window flash commands.

**Trigger List Position:** Allow position of external trigger lists

**Network File Update:** Allow network reload commands.

### **Network Priority**

Choose whether to send network tracking messages before dealing with cue module events (useful for tighter audio sync between machines) or after cue processing has occurred.

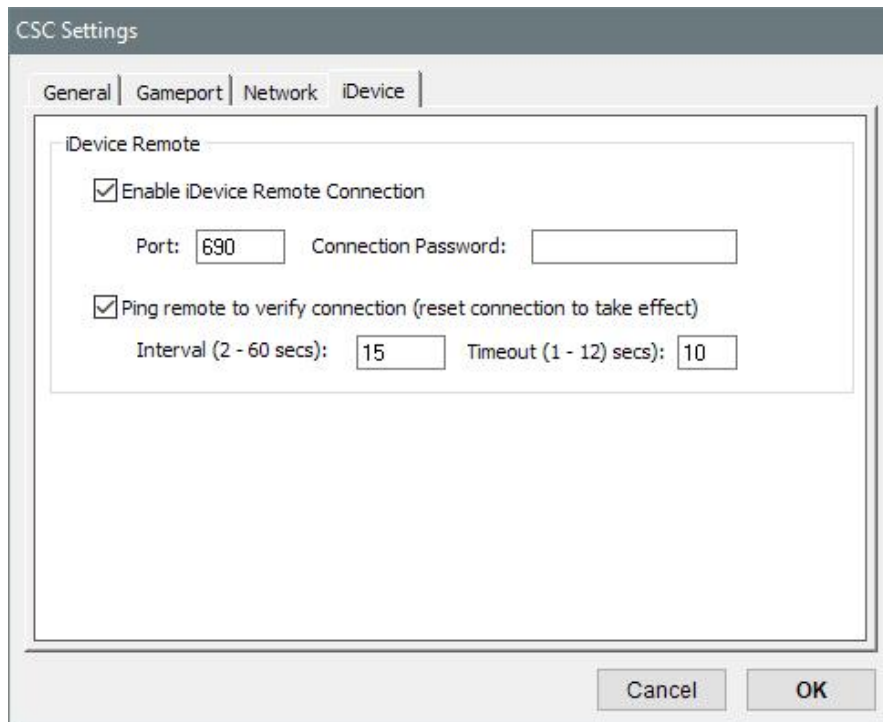
**Current Local IP:** When master is selected, this displays the machines current local IP.

**Connected Machines:** When master is selected, displays a list of machines currently connected to the CSC LAN.

**Current Status:** When Slave is selected, displays the status of the network link and the IP address of the master unit the system is connected to.

### **iDevice**

When combined with the iOS application 'tRemote' (available for iPhone, iPod and iPad from the Apple App Store), CSC is able to remotely sync a nominated trigger list to allow visual inspection of trigger list standby position and (if enabled), interaction with the list.



**Enable iDevice Remote Connection:** Enable CSC to listen for incoming connections from tRemote applications. Note that only 1 connection is possible between the CSC host and a tRemote application. Further connections will not be possible until the first connection has been released.

**Port:** Specify the TCP port number to be used for network connection. By default this is 690.

**Password:** Specify a connection password (if required) to secure the remote link. tRemote connections with an invalid password will be disconnected immediately.

**Ping remote to verify connection:** As the connection to tRemote is wireless, there are many parts of the network link which are vulnerable. CSC will not be aware that tRemote is no longer present unless a socket error occurs. With a TCP/IP connection this may not always occur, and long protocol release times may indicate the application is still responsive when in fact there is a network break somewhere.

Pinging the device regularly ensures the application is still present and the data is valid at the remote end.

**Interval:** Set this low enough to ensure an accurate indication of the remote status, but high enough not to consume too much system resources. Default setting is 10s.

**Timeout:** Set the timeout period on receiving a response to a ping request. If no response is received within this timeout period, the remote is automatically disconnected, assuming the network path is broken, resetting the network link ready for a new connection.



Be aware as the tRemote connection is a wireless one, care must be taken over the placement of routers and frequency allocation. For any 'Mission Critical' Remote applications we recommend the use of a physical wired GO button in addition to the additional benefits of tRemote.

For more information see the online guide at:  
<http://www.ctrelectronics.co.uk/ios-support.php/>

# Section 3

<h2>Appendix</h2>
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## Appendix A: Networking

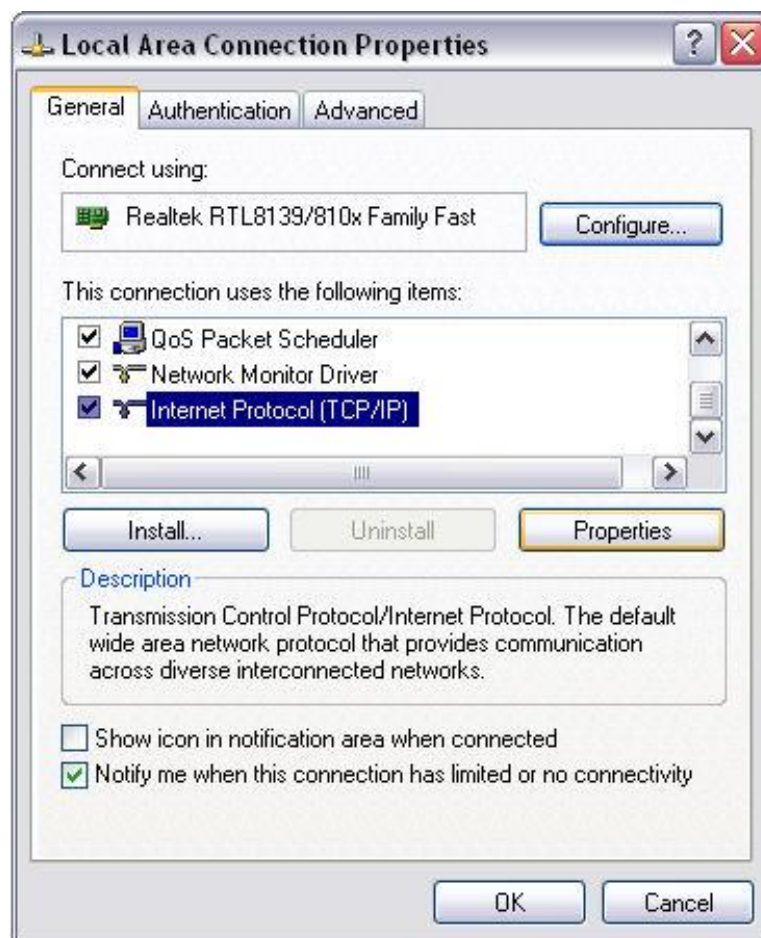
CSC has built in networking functions to enable multiple computers to form a CSC Local Area Network (LAN).

The computers can communicate through standard Ethernet connections using the TCP/IP protocol. This means machines can be connected using crossover cabling or through network Hubs or switches.

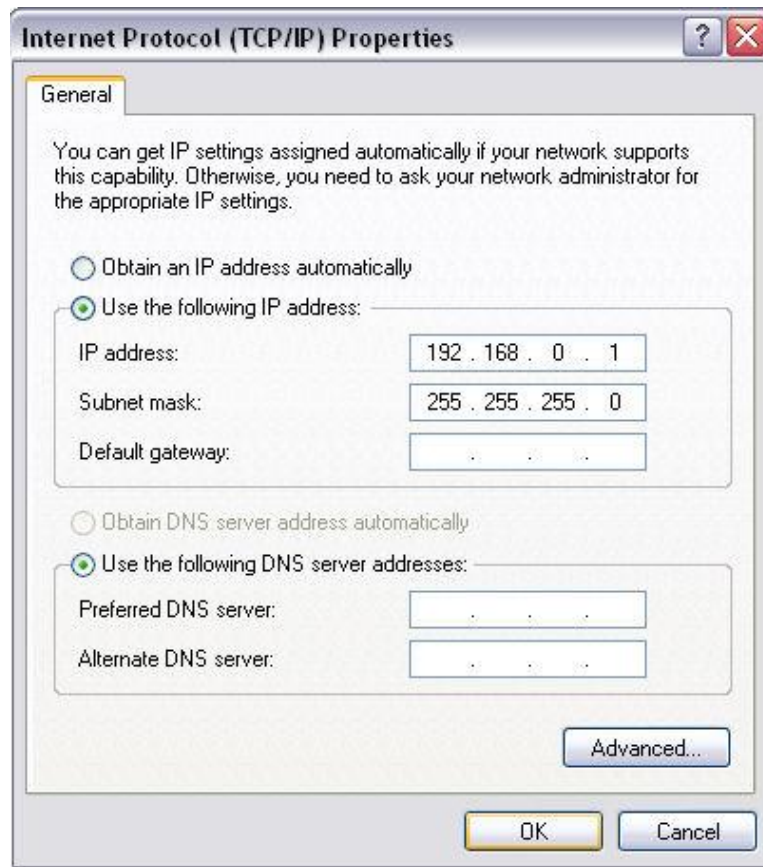
CSC LAN devices must all have static or dynamically assigned IP addresses within the same subnet, usually part of one of the 3 private IP address ranges such as 192.168.0.1 – 192.168.0.255.

For example, a Master machine can set to the IP address of 192.168.0.1 and the slave set to have an IP address of 192.168.0.2.

IP address can be set on a Network Adapter in Windows by navigating to Control Panel -> Network Connections, and right clicking to select "Properties" on the Network connection to be used, in most cases, "Local Area Connection". In Windows 10 this can be accessed by right-clicking the Start Menu and selecting Network Connections.



Scroll through the Connection Items and look for “Internet Protocol”. Highlight and select Properties.



Select “Use the following IP address” and enter the desired IP for each machine.

A CSC LAN can consist of one Master and multiple Slave Machines.

A Master device performs 3 major functions:

1. Becomes a network server for the LAN
2. Distributes Network chat information across the LAN
3. Sends cue information for slave machines to track the master.

Once a Master machine is set (see *Settings* for exact information on how to do this), it will open a listening socket on the port specified in the Settings Window. Any firewall in use on the network or the computer must have this port opened to enable network operation.

It will listen for Slave machine requests to connect to it, and when they arrive, will attach them to the network and form a TCP connection between the machines.

A Slave machine connects to the network by first scanning the local subnet for a master device. Once a master device is located, it sends a connection request to the machine.

When a slave machine is connected to the network, it can send network chat messages to the master, which then distributes to each machines on the network.

The slave can also receive cue information from the machine about the position of the cuelist to enable it to track the master.

If a network connection fails, the device will continue to attempt connection until the link is restored, and under normal circumstances should resume operation.

Since the network is self-restoring, it should not matter which order the computers are switched on to recreate the network.

When in master mode the computer will show a new toolbar icon indicating the status of the network. A yellow box indicates the master is online, waiting for Slave connections. When a slave is connected, this box will turn green, and remain green until the last slave is disconnected.

In Slave mode, the box will stay red until a successful connection to a master machine is made.

### Typical Network Setup

In a typical scenario, 2 computers will both be loaded with the same show file, one will be set to be a Master and the second a Slave.

The 2 computers will be connected to a suitable switching system, capable of switching Keyboard, Video, Mouse, Gameport and MIDI signals and an audio switcher to switch between 2 soundcards. Bear in mind where digital audio systems are used, such as ADAT links, clock synchronization between the machines will also be necessary.

The show is run on the Master machine, but if the machine fails, the switchover system can be toggled to resume operation as soon as possible,

This method does require both computers to be running the same show.

If tighter audio playback synchronization is required, switching Network to “High Priority” may help to improve performance.

Sometimes, edits may need to be performed during show time, such as altering the playback level of cues, or altering MIDI commands.

CSC has an extra feature in the network protocol called **Force Network File Update** which tells a slave machine to reload its show file, without the need to actually touch the machine.

If the networking is set up in such a way that the master machine holds the show file, and the slave machine loads the file from the master via a Shared Network folder (i.e. \\master\showfiles\myshow.csc), only one copy of the show file needs to be updated to keep both machines updated. When a change is

made to the file on the master, clicking Save will send a message to the slave machine to reload the new file. This process can also happen manually by selecting *Tools -> Force Network File Update*.

This does, of course, assume that all wave files are present on both machines since although it is perfectly possible to stream the wave files across the network connection, if the master machine dies, so does the wave file storage area.

It is not important that access to the show file is no longer possible since the show has already been loaded into memory and can continue running until the master machine has been rebooted.

Network File Updates can be filtered out on the slave machine by selecting the filter options in the *Settings* dialogue.

## Appendix B: Importing/Exporting a Show

It is not always possible to build the show on the computer which will be running the show. Sometimes, for example, a show may have to be built on a laptop and transferred to a main machine when it becomes available. Or maybe a show needs to be archived for a period of time before moving to a new venue on a new machine.

To do this efficiently, it is important to understand how CSC deals with Importing and Exporting Shows. It is also suggested to try this before relying on it to backup shows to ensure familiarity with the routine.

A CSC Show file contains all the information required to recreate the cuelist, workspace layout, MIDI commands, Notes, MIDI Sequences etc. MIDI Port mappings and Soundcard allocations are also saved within this file. The only external dependency CSC relies are audio wave files, the show file stores pointers to their locations only.

### **Exporting a Show**

In order to successfully backup or export a show, 2 things are required:

1. The .csc3 show file
2. Every wave file used in the show

It is safer to include a copy of all .cms MIDI sequence files also, but this is not essential.

Exporting the .csc3 show file is easy, just copy it to the new location.

Exporting the .wav files 'should' also be easy, just make a copy of the Audio Files folder and stores it in the new location.

Although the ideal file management of wave files would see every file used in the show in the same folder, so that one main folder could be copied, in pressured technical rehearsals and rushed edit files tend to be loaded from wherever they can be found, and so copying just the "assumed" wave file folder may miss a few files.

CSC helps this in 2 ways:

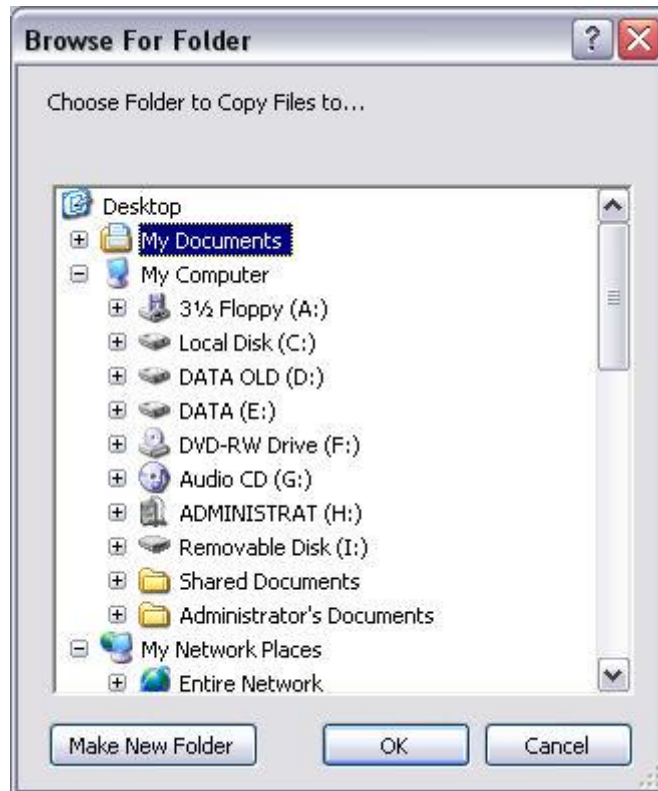
1. The *Show Media Files* window will show the location of all files referenced in the show.
2. The *Export Show To New Folder* routine can be used.

### **Copy Audio To New Folder**

As the name suggest, CSC will scan the cuelist for every attached wave file, find it on the system and copy it to a new location as specified. This ensures no files are missed, and is the suggested method of backing up a show.

Either select **Export Show To New Folder** from the *File* menu, or **Copy Audio to New Folder** from within the *Media Manager* window. The following assumes the quick method **Export Show To New Folder** selected from the File menu.

A Choose Folder dialogue is shown, and an existing directory can be selected, or a new Folder created on the computer. It is suggested to first create the export folder on the same computer, and then later copy that entire folder to the backup media or new computer; otherwise the process of writing to external target may slow the process down somewhat, or even cause it to fail.



Once the required folder is highlighted, select OK and CSC will begin copying all Wave Files used in the show to this new location. It will not alter or remove the original files, so ensure your target disk has enough free space to deal with the files.

Once the process is completed, a copy of the show file is automatically saved in your selected folder, unless you used the Media Manager option, whereby you would need to specify this before beginning the copy. See *Media Manager* for more details.

Note that it is recommended to run this command from a fresh restart of CSC, since media files can sometimes remain open and locked in the OS, preventing successful copy to a new folder. Fully closing and reopening CSC before exporting should prevent this from happening.

### **Importing a Show**



Importing a show to a new machine is a slightly more involved process than exporting.

It can be broken down into stages as follows:

1. Copy all audio files, Sequence files (If any) and the show file to the new machine in the desired locations. Open CSC and point it to the .csc show file.
2. Locate all missing audio files and update the cuelist as necessary
3. Remap the soundcard devices
4. Remap the MIDI ports
5. Check the show runs correctly

If you copied the show from the original computer by copying the original folder structure, then simply paste this onto the new computer. If the folder path is identical to the original computer then the following steps will not apply and you can skip to the Audio and MIDI mapping section.

If you used the export show option then all media files and a copy of the file show will be in the same folder. When opening the show file, if CSC cannot find the files in the original location, it will check the folder in which the show file is located to see if it can find it there. If it can, it will automatically 'fix' the cuelist and re-target to the new location.

However, in some cases re-locating of files will be necessary to tell CSC where the new files are. The integrity check dialogue will immediately display when opening a show to inform there are missing or corrupt audio files.



**Cancel Integrity Check:** Stop Searching for missing audio files. Only select this if no audio playback is required from the current session, such as checking cue placement.

**Remove From Show:** Remove the missing audio file from the cuelist and continue checking the rest of the show.

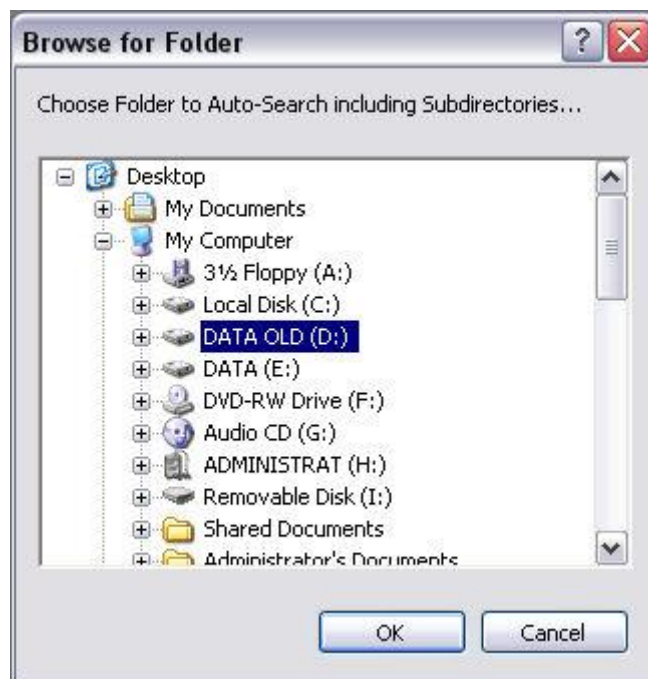
**Ignore This File:** Ignore this missing file, but leave in the cuelist and continue checking the rest of the show.

**Auto Search Folder:** Specify a top level Folder or drive to search for the missing file. Select this option to automatically search the computer for the missing file, starting with the specified folder and checking all subfolders beneath it.

Once a filename matching the missing file is found, the cuelist is automatically overwritten with the location of this new file.

If multiple files are missing, the integrity check will continue to look in this new location to find any other missing files and load the new location automatically.

Note that this process can take a while to search depending on the starting location entered.



If the actual location of the missing files is known, as in the case of importing a newly moved folder, specifying this folder in the initial Folder chooser will result in the fastest search. It is also the fastest way to import a new wave file location to a cuelist since the only user input required is a location to start searching.

**Care must be taken specifying the initial directory, since if there are 2 wave files with the same name on the computer, CSC will automatically use the first file it locates and use the same location for all other files. This may not always be the correct file.**

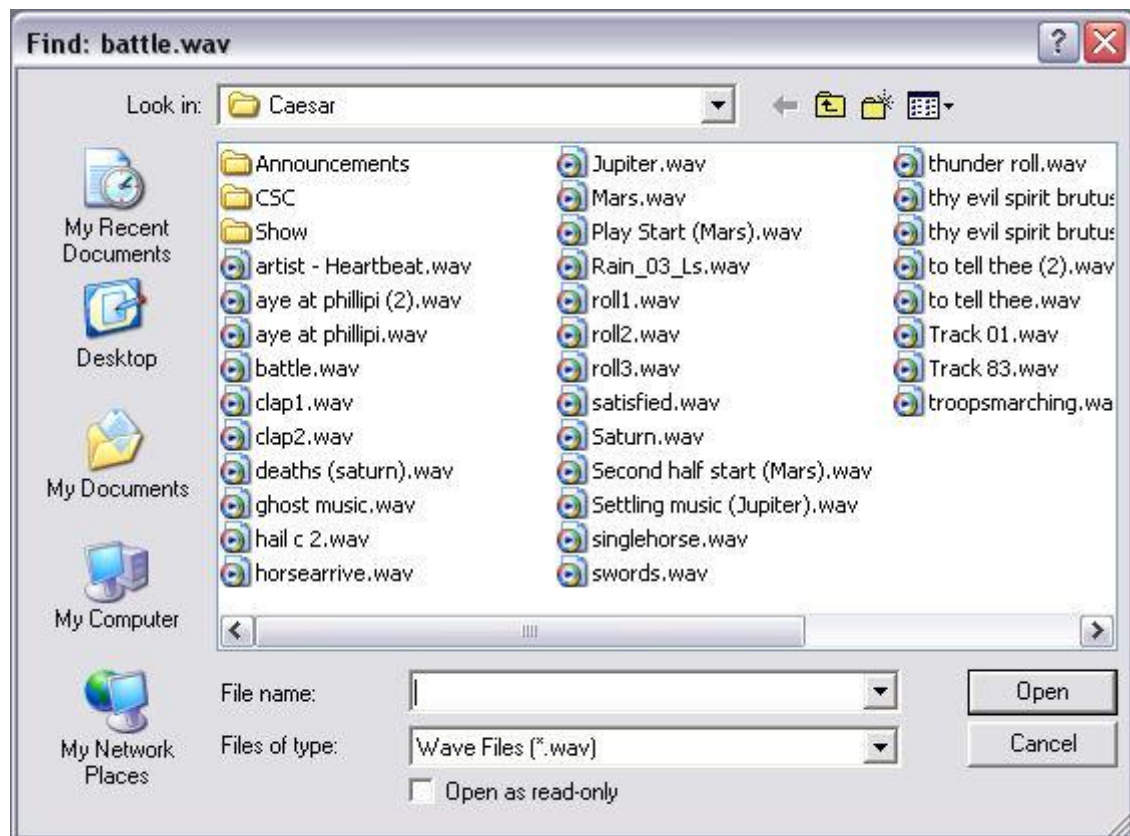
**Manually Search:** Displays a standard File dialogue allowing the user to manually locate the missing file.

The new location for the file must be known and this should be selected in this dialogue, and the missing wave file highlighted and **Open** clicked.

CSC will then perform a check on the wave file to verify its integrity to ensure it is a valid, readable and non corrupt wave file. It will also check the markers (if any) are still valid and the sample rate has not been changed externally.

If a wave file with a name other than the missing file is selected, it will be rejected and a second match will be required.

If the actual file cannot be found, click **Cancel** to remove the file from the show and continue checking the cuelist.



Once the correct file is successfully located CSC will ask whether to use this new location for following missing wave files.



Clicking **Yes** to this dialogue forces CSC to check this location for further missing wave files, and if it finds them there will use them automatically in the show.

Once all wave files have been found and their locations updated in the cuelist, CSC will check the audio port mappings.

### Audio and MIDI Mapping

When a show is saved, CSC saves both the name of the soundcard outputs, and also their unique ID in the system (GUID). If there is no matching device in the new system CSC will show an error and the correct mapping can be chosen in the *Audio Setup* dialogue.

In many cases CSC will attempt to fill this Audio Setup bus mapping for you, but it is advised to check this and set accordingly.

The final step to importing a show is to ensure the MIDI mapping is correct. CSC identifies MIDI devices by their enumeration position, and on a new system this position may be out of range, or point to an invalid device.

To check this new mapping and correct it, enter the *Settings* dialogue and confirm the MIDI ports are correct.

The show should now be successfully imported.

Remember to configure the system-persistent items such as Gameport remote control, MIDI Control and cuelist font in the application, since these items are not stored in the show file and are part of the specific computers settings.

## Appendix C: MIDI Command Control

### Standard MIDI Commands

#### Cue:

MIDI Note ON: 0x90h, <note>, <vel>

Channel 1-16, Omni (Set by Global MIDI In Settings)

Note: Assigned by cue edit window

Velocity <1 Ignored

MIDI Program Change: 0xC0h

0-127

Can be internally shown as 1-128

#### Global:

MIDI Note ON: 0x90h, <note>, <vel>

Channel 1-16, Omni (Set by Global MIDI In Settings)

Velocity <1 Ignored

MIDI Program Change

0-127

Can be internally Shown as 1-128

#### Live Mixer:

MIDI Control Change: 0xB0h, <cc1>, <cc2>

#### ***Generic Controller Map:***

##### **MIDI Channel 1:**

cc1 values 0-31 map to channels 1-32

cc2 values 0-127 map to fader levels -100dB to 0dB

cc1 values 32-63 map to channels 1-32 PAN positions

cc2 values 0-127 map to Pan positions L-R

cc1 values 64-95 map to channels 1-32 MUTE

cc2 values 0 – 63 map to MUTE off, 64-127 map to MUTE on

cc1 values 96-127 map to channels 1-32 SOLO

cc2 values 0 – 63 map to SOLO OFF, 64 – 127 map to SOLO on

### **MIDI Channel 2:**

cc1 values 0-31 map to channels 33-64

cc2 values 0-127 map to fader levels -100dB to 0dB

cc1 values 32-63 map to channels 33-64 PAN positions

cc2 values 0-127 map to Pan positions L-R

cc1 values 64-95 map to channels 33-64 MUTE

cc2 values 0 – 63 map to MUTE off, 64-127 map to MUTE on

cc1 values 96-127 map to channels 33-64 SOLO

cc2 values 0 – 63 map to SOLO OFF, 64 – 127 map to SOLO on

### **MIDI Channel 3:**

cc1 value 1 maps to Master Level

cc2 values 0-127 map to Level fader

cc1 value 2 maps to Master Mute

cc2 values 0-63 map to MUTE off, 64-127 map to MUTE on

cc1 value 3 maps to Reset Mute

cc2 value ignored

cc1 value 4 maps to Reset Solo

cc2 value ignored

cc1 value 5 maps to Link Mixer to Cuelist

cc2 values 0-63 map to LINK off, 64-127 map to LINK on

cc1 value 6 maps to Restore Mixer from Cuelist

cc2 value ignored

cc1 value 7 maps to Save Mixer Settings

cc2 value ignored

cc1 value 8 maps to Create Live Mixer Cue

cc2 value ignored

cc1 value 9 maps to Go Next Cue

cc2 value ignored

cc1 value 10 maps to Stop Current Action

cc2 value ignored

cc1 value 11 maps to Standby Previous  
cc2 value ignored

cc1 value 12 maps to Standby Next  
cc2 value ignored

cc1 value 13 maps to Send Current  
cc2 value ignored

## **MIDI Show Control**

**Format:** F0 7F <deviceId> 02 10 <command> F7

**Category:** CSC Only responds to Sound Category

### Recognised Commands:

All Examples below show a Device ID of 7F (All Devices).

**01 GO:** Advances Cuelist

e.g. F0 7F 7F 02 10 01 F7 (Q Num, Q List, Q Path ignored)

**02 STOP:** Performs a Stop Current Action Command

e.g. F0 7F 7F 02 10 02 F7 (Q Num, Q List, Q Path ignored)

**07 FIRE:** Fire a specified trigger list

e.g. Fire Trigger List 3: F0 7F 7F 02 10 07 03 F7

**08 ALL OFF:** Stop all WavPlayers, Stop Current Action

e.g. F0 7F 7F 02 10 08 F7

**0A RESET:** Restart Show

e.g. F0 7F 7F 02 10 0A F7

## **MIDI Machine Control**

**Format:** F0 7F <deviceId> 06 <command> F7

### Recognised Commands:

**01 STOP:** Performs a Stop Current Action Command

e.g. F0 7F 7F 06 01 F7

**02 PLAY:** Advances Cuelist (GO!)

e.g F0 7F 7F 06 02 F7

**03 DEFFERED PLAY:** Send Current Cue

e.g. F0 7F 7F 06 03 F7

**04 Fast Forward:** Highlight Next Cue

e.g. F0 7F 7F 06 04 F7

**05 REWIND:** Highlight Previous Cue

e.g. F0 7F 7F 06 05 F7

## **MIDI Timecode**

Recognised Data:

**Full Frame Timecode Message**

e.g. F0 7F 7F 01 01 hr mn sc fr F7

**Quarter Frame Message 0xF1h**



## Appendix D: Gameport Remote

*This article is taken from the CTR Electronics Website and there may be a newer version online. Please note that Gameport Technology is now seen as a legacy option – MIDI control is a preferred method.*

CSC can be triggered using button boxes or switches connected to the computers gameport connector. This is the 15-pin D-Sub connector located on a standard soundcard. If one of these is not available, a USB-Joystick adaptor will also work.

The circuitry is inexpensive and simple to build, and button boxes consisting of 4 or 8 buttons to remotely control CSC can be created. This makes the process of controlling the show much easier since the operator doesn't have to worry about knocking other keyboard or mouse buttons, and much space can be saved on cramped DSM or sound operators work desks by physically locating the mouse and keyboard away from the main work area.

Once correctly configured, a typical setup might give the operator the controls **GO, STOP, PREV, NEXT**.

There are 2 versions of the circuit available. A simple 4-button remote, whereby the buttons are assignable in CSC, or, from version 2.4 onwards, an 8-button remote. The 8-button remote could be split and used in 2 different manners, and when combined with the external trigger lists (2.4 onwards), yields a simple but powerful stage control system. This is discussed later in this document.

### The Hardware

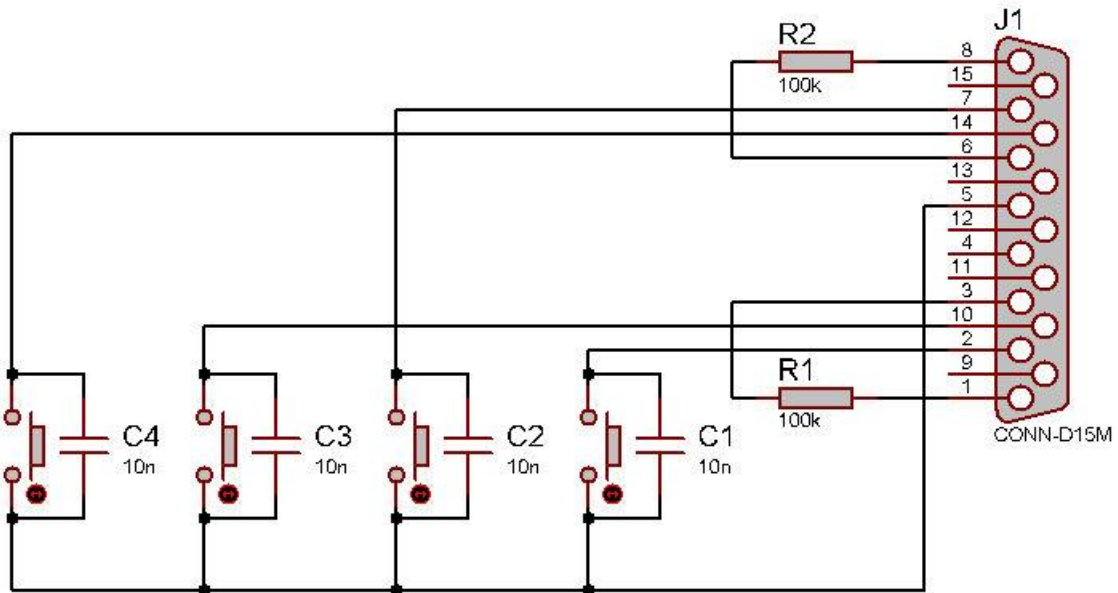


A typical 4-button remote control (Photo courtesy of Orbital Sound).

#### 4-Button Remote Control

This circuit requires very few components: 1x Male 15-pin D-SUB connector, 3m 5-core data cable, 2x 100k resistors, 4x Momentary Switches, 4x 10nF capacitors and suitable box to mount the switches in.

The circuit layout is as follows:

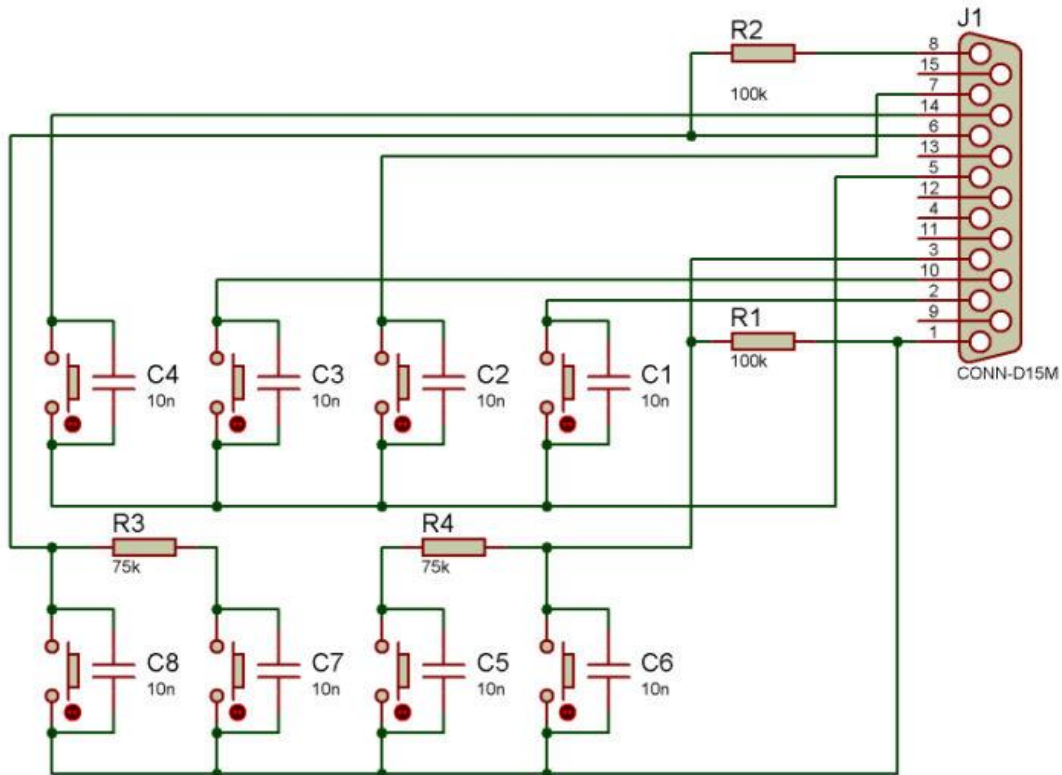


**Note:** The joystick connector is able to supply a high current on the +5V rail so be careful not to short any pins when wiring the D-SUB or testing this box.

This circuit arrangement has been successfully used down long lengths of cable (>80m), so there should be no problem in using some of the buttons as MD start/stop buttons for example.

#### 8-Button Remote Control

This circuit is an extension to the 4-button remote, and requires 4 extra momentary switches, 4 extra 10nF capacitors and 2x 75k resistors.



## Variations

It should be noted that not all 8 switches in this circuit need be mounted in the same box. The circuit could be split such that 4 of the buttons drive the cuelist, and the other 4 could be microswitches placed in props or parts of staging to be used as trigger sources. For example, a microswitch could be placed in a mock telephone and CSC's trigger list could be set to stop the "phone ringing" sound effect and play a further "decay" sound the moment the phone is picked up, to achieve a perfectly natural sounding effect. The trigger list could also be locked to prevent accidental triggering whilst moving a prop for example. See *External Trigger Lists* for more information.

## Windows Configuration

In order to use the new hardware, Windows must know what it is, and where it is. To do this, go to Control Panel -> Game Controllers, then Click "Add"

Select "4-button Gamepad"



Then click OK.

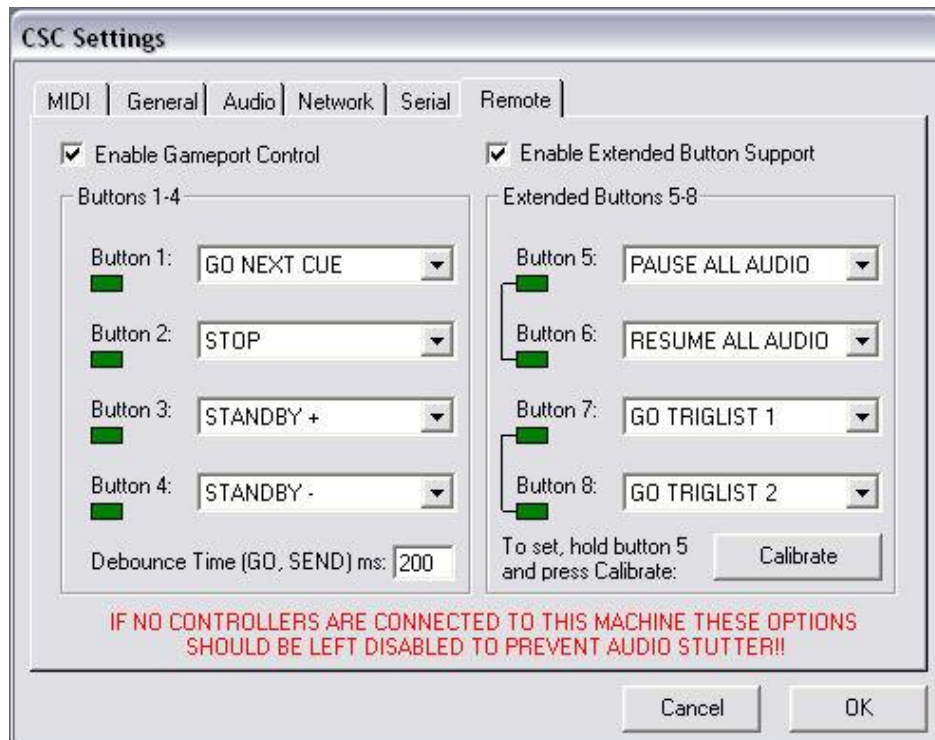
If the operation has been successful, you will see "Status OK".



Clicking on Properties will show the state of the 4 buttons, and pressing each should show the corresponding indicator illuminate.

## CSC Configuration

In order to use the button controller in CSC, it will need to be enabled in the Settings Window:



Next to each button is a drop down list selecting the desired action for that button. Experiment with the combination of buttons to find an arrangement suitable for the show, but a typical layout is shown above. If CSC is correctly linking to the joystick sub-system, pressing each of the buttons will illuminate the corresponding "LED".

The debounce time sets the minimum time allowed between successive "GO" commands. This can be a value between 1 and 999ms.

If using the Extended buttons, chances are everything will be fine first time. However, if when enabling the extended buttons one button appears to be on continuously, hold down button 5 and press calibrate. This will set CSCs axis threshold to match your gamecontroller. This should only be done when a gamecontroller is connected.

Exclusivity: Note from CSC 2.4.1 onwards that buttons 1-4 are independent. This is to say button 1 will still function even if button 2 is held down. Buttons 5 and 6, however, are paired, as are buttons 7 and 8 because they are based on the gameport axis. This should be remembered when designing any trigger controllers.

**Note:** When no joystick is connected it is advisable to uncheck the Gameport Controller because on some systems this can cause jitter on the mouse, and in some extreme cases stuttered audio. This is due to the consistent polling of the port which in turn is unable to resolve a suitable data value. The actual extent of the problem depends on the soundcard and its driver, but if in doubt it is advised to leave this option unchecked when no button box is connected.

## **Windows Vista/7/8/10 and laptop Computers**

At time of writing, Windows Vista/7/8/10 has no support for the standard 15 pin Gameport controller. There are some ways around this and information can be found on the internet about installing a gameport using a Creative compatible interface although CTR Electronics does not support this method.

However, USB joysticks are fully supported and CSC has been tested with a USB gameport converter and with specialist USB button boxes.

The solution for both laptop computers not having an onboard gameport and Vista is to invest in a low cost USB Nest Converter, such as the ones made by Rockfire (RM203). In the UK these can be purchased from retail outlets such as Maplin or online from suppliers such as CPC.

CTR Electronics recommends the use of a MIDI controller rather than the gameport style devices.

## Appendix E: Supported Audio Formats

CSC 3.4's audio engine is capable of directly playing audio files in a large variety of different formats, sample rates and bit depths.

In mission-critical roles, the efficiency of CSC's audio engine is of high importance. Many factors are involved when it comes to efficiency, from the type of file formats in use, the number of outputs, the number of concurrent files and even the sample rate of the files.

44.1kHz is the sample rate of a standard Compact Disc, and as such, any CDs 'ripped' to the WAV file format will be 44.1, 16 bit by default.

Some professional setups will require a digitally connected system, which much of the time will run at the higher 'professional' sample rate of 48kHz or even 96kHz.

Ensuring correct sample rate matching can help improve efficiency. If a soundcard is externally locked to a certain clock frequency, setting CSC's audio engine to the same sample rate will prevent unwanted sample rate conversion between the output mixers and the soundcard driver. If the soundcard is clocked internally when using ASIO, CSC will attempt to set the soundcard to the same sample rate as the Audio Settings menu option. When using Windows Soundsystem, the OS will determine the final output sample rate so be careful to ensure no other applications are also running on the machine at the time of opening CSC.

File sample rate should then also be considered. If the soundcard is locked to 48kHz and the Audio Settings are set to 48kHz, but a 44.1kHz audio file is played back, the audio engine will need to re-sample the lower rate file to match the output mixers running at 48kHz. This will create a slightly higher CPU overhead than 'pre-rendering' the file to 48kHz on disk. On a modern day CPU this processor hit may not even be noticed although this can be monitored using Windows Task Manager or CSC's *Audio Engine Info* dialogue.

The preferred playback file format for the CSC audio engine is PCM WAV format. Whilst this may seem limiting in the current world of numerous file formats including MP3, MP4, WMA, etc, it should be noted that most of these formats are compressed, unlike the WAV format. This means the files will need to be decoded in order to play them back, resulting in a much higher demand on the computers CPU power. A computer attempting to play 32 MP3 files in a multitrack sequence will undoubtedly be doing much more work than one playing back 32 WAV files, which require no further CPU intervention.

On top of the format decoding, consider that files may be at different bit depths and sample rates, also requiring sample rate conversion.

All in all, these activities not only put much more pressure on the playback machine's CPU, risking the possibility of audio dropout if one of these files is not decoded in time, but also put the whole playback computer in a much less stable state. We feel this conversion shouldn't be happening at show time.

By ensuring the engine is only dealing with uncompressed and identically sampled source files, CSC is able to put much less demand on the CPU and remain a lot more stable than if trying to deal with all the additional file conversion.

If the source files are in a non-WAV format, or of a different sample rate to the audio engine, you have several options.

Firstly, you could batch convert all files to one standard format and a sample rate matching the system setup. This isn't always practical during show design time and ensures a good degree of file management. The second option is to allow CSC to convert and import a non-standard file for you. Import options within the Media Manager window will allow you to decide whether CSC should warn about non-WAV files only, or even scan WAV files to check sample rate and bit depth and convert if they don't match. The third option is to ignore all of the format issues and ask CSC's audio engine to decode on the fly.

If the system sample rate is changed once a show is designed, it is possible to adjust CSC's audio settings Sample Rate to reflect the new system, and then perform an 'Update Media Folder' or 'Export to New Folder' whilst ensuring the 'Convert Files' checkbox is ticked. This will batch copy and convert all media files to the new sample rate automatically.

For the additional time taken versus ease of use, we strongly suggest allowing CSC to convert to WAV with a standardized bit depth and sample rate when adding a file to the cue list.

Note that discs in the Audio CD format can be imported using the converter tools, by selecting the \*.cda file for the corresponding audio track. The audio converter will then give you the option to rename the audio file rather than just calling it "Track 1.wav", "Track 2.wav" etc.

### **Supported Files (Directly or Indirectly through Converter):**

16 bit, 24 bit, 32 bit, 32 bit float sample bit depths, mono or stereo.

Audio Interchange File Format: (\*.aiff, \*.aif, \*.aifc)

Compact Disc Audio Track: (\*.cda)



Free Lossless Audio Codec: (\*.flac)

Monkey's Audio Files: (\*.ape)

MPEG-1 Audio Layer 3: (\*.mp3)

MPEG-4/AAC Format: (\*.m4a, \*.aac)

Ogg Media Format: (\*.ogg)

Waveform Audio Format: (\*.wav)

Windows Legacy Audio Components: (\*.acm)

Windows Media Audio Files: (\*.wma)

## Credits

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## **NOTES**

**-END OF DOCUMENT-**

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