MEDIA**SHOW**

INSTRUCTION MANUAL

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ABOUT MEDIASHOW

MEDIA**SHOW** is a media display software application that uses a button-box interface to enable the user to show images and video in a display window, and even launch other applications. It was developed primarily for fixed and portable planetariums but can be used in a variety of settings. The app has two versions:

Pro: full-featured windowed version (1000 x 736 px) best used in setups with 2 video displays

Mirror: minimized interface version (1400 x 60 px) for single displays and mirror projection setups

MEDIA**SHOW** can display and manipulate a variety of image types. It can also play a sequence of images from a common directory over a fixed length of time, and even sync that sequence to an audio file. The primary purpose, however, is controlling and playing video clips. MEDIA**SHOW** supports a number of video formats: .AVI, .MP2, .MP4, and QuickTime™ .MOV (h.264 codec recommended). The user can control the start and end time of the video clip, in addition to displaying subtitles in multiple languages.

> **NOTE:** MEDIA**SHOW** uses core video processes in OS X (AVFoundation) and Windows (DirectShow) to display video. No additional codecs or decoders are necessary. Windows users will notice a required filters support folder (\resources\filters) that should not be altered or moved.

Each edited group of buttons is saved as a buttonset, so multiple sets of shows can be prepared in advance by multiple users. A full selection of customized buttons can be easily loaded and accessed in an instant for playback.

MEDIA**SHOW** can even launch other programs when selecting a button (e.g. Stellarium or WorldWide Telescope), automatically dropping into the background.

The user interface is programmed to be easily accessed by mouse or touchscreen, and all interface elements have tool-tip rollovers to help guide the user.

MEDIA**SHOW** is available for Mac OS X (10.11-10.14 *not 10.15 Catalina*) and Windows OS (7, 8, 10).

INSTALLATION

Current operating systems have security features to restrict user access to certain directories and files. We recommend that MEDIA**SHOW** users have system administrator rights on the install machine. In addition you may also want to temporarily disable virus protection software as it may cause problems with the install.

INSTALLERS	Launch the installer for your platform and follow the directions
MAC	MediaShow_X.X_MAC.pkg
WIN	MediaShow_X.X_WIN.exe
APPS	Applications and resources are installed into **Applications** (MAC) or **Program Files** (WIN)
MAC	`HD:Applications:MediaShow:`
WIN	`C:\Program Files\MediaShow\` (32bit) `C:\Program Files (x86)\MediaShow\` (64bit)
CONFIG	Config files (**mediashow_config.ini**, **mediashow_display.cfg**) are installed in **Local App Data**
MAC	`HD:Users:USERNAME:Library:Application Support:MediaShow:`
WIN	`C:\Users\USERNAME\AppData\Local\MediaShow\` (Vista, 7, 8, 10)
DATA	Data files are installed into the **Users Shared** (MAC) | **Public** (WIN) directory
MAC	`HD:Users:Shared:MediaShow:`
WIN	`C:\Users\Public\MediaShow\` (Vista, 7, 8, 10)

> **NOTE:** A data directory can be located anywhere with read/write access. To change the location from the default, the data path setting MEDIA**SHOW** uses to locate **buttonsets** and **media** files must be updated by going to SETUP and selecting the CONFIG option (*see APPENDIX C*).
>
> *In this manual, the data directory path is referred to as* {DATA} *with* MacOS ":" *path delimiters.*

REGISTRATION

When you first launch the MEDIA**SHOW** application, it will ask you to confirm the licensing agreement. It will then ask for a registration key. Enter your username and key, or select "Demo" for a 30-day trial. If you need a to purchase a key, contact support@eplanetarium.com or visit us online at eplanetarium.com to register and continue using MEDIA**SHOW** after the trial period.
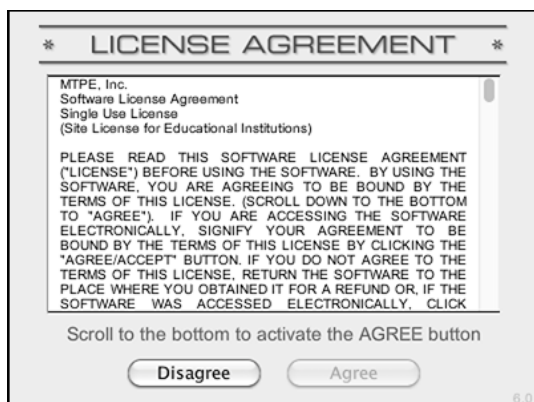
SETUP

MEDIA**SHOW** stores settings for the target display window in an external binary config file called mediashow_display.cfg. Changes to these settings are made by selecting SETUP. MEDIA**SHOW** determines if there are 1 or 2 displays connected and shows options for setting the target display window based on the dimensions of those detected displays.

> **NOTE:** MEDIA**SHOW** detects all attached displays, but as it only supports single or dual display setups, it will only show options for the first two displays detected (a typical setup is a primary display + a secondary display or projector).

To change your display settings:

1. Select the **SETUP** button.

2. Use the **SIZE** menu to choose the desired resolution of the target display window.

3. Use the mouse to select which detected display to use. If the size of the chosen target display window does not fill the selected display, you have the option to center the target window on the display, align it with one of the 4 corners, or center it on the top, bottom, left or right.

4. To use the new display settings you must select the **SAVE DISPLAY SETTINGS** button. The new settings will be saved to the mediashow_display.cfg config file, making them the new default every time MEDIA**SHOW** launches.

> **NOTE:** The first time you launch MEDIA**SHOW** (or if you change your display hardware setup) it may show an alert message about the configuration file being invalid. This is normal. When you re-select your display in SETUP and SAVE DISPLAY SETTINGS that message will no longer appear.

To change the default location of your data directory:

1. Select the **CONFIG** button in **SETUP** (use the **DATA** button in MEDIA**SHOW** Mirror) to set a new path (option 1 of the available settings).

2. Select the folder on your computer where you have moved your **buttonsets** and **media** folders.

The new data path is saved to the mediashow_config.ini file and used as the new default location for the **buttonsets** and **media** directories and files.

SPLASH SCREEN

The splash screen (i.e. the image that shows on the target display when MEDIA**SHOW** launches or after loading a new buttonset) can easily be changed from its default to any image you wish. Simply place any JPEG image named "splash.jpg" in the data directory alongside the **buttonsets** and **media** folders, and restart the MEDIA**SHOW** application. That image will then be used, filling the display width, and aligned to the bottom of the display window while preserving the image aspect ratio.

> **NOTE:** The splash screen can only be customized in a registered version of MEDIA**SHOW**. During the DEMO trial period this feature is disabled.
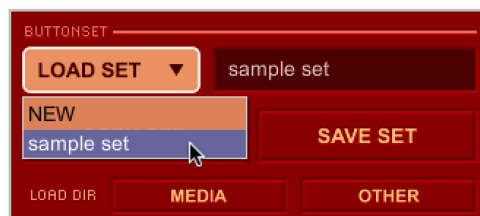
BUTTONSETS

Select the **LOAD SET** menu to load an existing buttonset, or or choose NEW to create a new set and begin editing buttons.

A sample buttonset (named "sample set") is provided as an example with a variety of button types and config settings for files found in {DATA}:media:samples.

The buttonset name can be selected and edited. Selecting **SAVE SET** renames and saves the file.

OPTION/ALT + **SAVE SET** will create and save a **DUPLICATE** of the current buttonset file.

> **NOTE:** Buttonsets are stored and loaded from the {DATA}:buttonsets directory. Deleting a buttonset is done by removing the corresponding ".bst" file from this directory.

CREATING BUTTONS

Begin creating buttons by using the **LOAD DIR** option buttons, or selecting a specific button to **EDIT**.

LOAD DIR : There are two options for auto-filling a buttonset – select **MEDIA** to fill available buttons with all images and video files from the top level of the {DATA}:media directory, or select **OTHER** to choose a directory and **MEDIASHOW** will fill available buttons with all images and video files found there. This is a quick way to fill buttons which can then be saved as a buttonset.

EDIT : To edit a specific button, select **EDIT** and then select any empty or occupied main button – OR – select any occupied main button to load it and then select EDIT. Once a button is in editing mode, the config options are enabled and the button settings can be changed.

> **NOTE:** Each buttonset consists of 100 buttons (Pro: 5 pages of 20 buttons each, Mirror: 20 pages of 5 buttons each). There is no limit on the number of buttonsets you can create.

EDITING BUTTONS

There are 4 ways to begin editing a main button.

1. Select **EDIT** and any empty main button. Select a button type (IMG, SEQ, VIDEO or APP) to assign to the button.

2. Select **EDIT** and then select any occupied main button. This will load the button and enable editing mode and all the button config options.

3. Select any occupied button to load it. Then select **EDIT** which will enable editing mode and all the button config options.

4. Selecting any main button while holding down the Option/Alt key triggers a shortcut popup-menu that allows quick access to assign either an image or video to the button. This is the only **EDIT** feature available in **MEDIASHOW** Mirror.
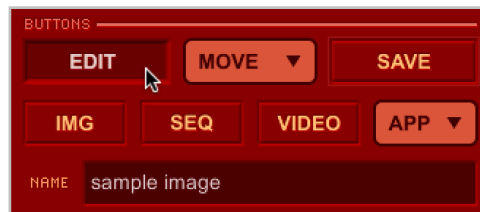
> **NOTE:** Selecting the **EDIT** button while active will cancel editing without saving any current changes.

ASSIGNING MEDIA

Once a button is in editing mode, a media type must be assigned if it is not already. Select either **IMG** (image file), **SEQ** (image directory), **VIDEO** (video file) or the **APP** menu (application file). An Open/Save dialog box will appear initially pointed to the {DATA}:media directory. You may choose media from there, or navigate anywhere else on your computer.

The following media file types are supported:

IMG	BMP, JPG, GIF, PNG, TIF
	Maximum image width is **4095 pixels**. Larger images are resized when imported. 72 dpi is the recommended resolution for speed, memory and compatibility with the user interface. Higher resolutions are supported but may cause memory issues, longer load times, and or confusing display results. Images should be created with the target display resolution in mind.
SEQ	Any directory containing a file sequence of supported images.
	For a sequence to load properly, all images in the directory should be named alphabetically in the order they are to appear. (e.g. "hst25_01.jpg", "hst25_02.jpg", "hst25_03.jpg", …)
	The SEQ option for button assignment is only available when using MEDIA**SHOW** PRO*. Sequence buttons saved in PRO are however available in MIRROR for playback.*
VIDEO	MP2, MP4, AVI, QuickTime® (H.264 codec recommended for compatibility)
	For the best cross platform playback using MEDIA**SHOW**, use an MP4 format saved with H.264 (video) and AAC (audio) codecs.
APP	**MAC** : Menu choices are the ".app" packages in the "Applications" directory and one level of sub-directories, or you can manually locate any application on the hard drive.
	WIN : Menu choices are the ".exe" files in the "Program Files (x86)" directory, or you can manually locate any executable application on the hard drive.
	The APP option for button assignment is only available when using MEDIA**SHOW** PRO*. Application buttons saved in PRO are however available in MIRROR for playback.*

NOTE: If media files are moved from their original location when they were saved to a button, an error message stating "*The source media for this button has changed or is missing*" may appear. The solution is to return the media to its original location, or re-edit the button and reassign the media file(s).

BUTTON NAMES

A default name is created for any new button based on the media file name. To edit the button name, select in the button name text box and make changes to the text. Button names are limited to 30 characters.

BUTTON ICONS

The icon for a button can be set while the button is being edited. To set the icon, click on the icon graphic inside the button. An image button's icon is set to the current display of the image (nudge, zoom and rotate); a sequence button's icon can be created from any image in the sequence; and a video button's icon can be set to a particular frame by first advancing the movie to that frame using the playback slider and controls, and then selecting the icon graphic to update it.
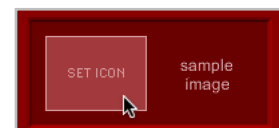
BUTTON MOVE | DELETE | COPY | SWAP

While a button is in editing mode, it can be moved or deleted with the **MOVE** popup menu. Moving a button inserts it at the target button location (default is on the current button page), shifting the surrounding buttons up or down depending on the direction of the move. (*Occupied buttons are marked in the list with an asterisk*).

Use the keyboard with this menu to enable several useful options:

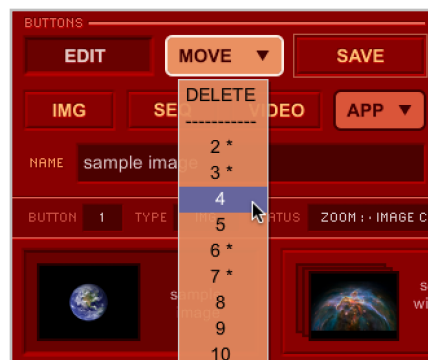|	
SHIFT + **MOVE** :	insert button on ANY button page
OPTION/ALT + **MOVE** :	**COPY** button to empty button location on current button page
SHIFT + OPTION/ALT + **MOVE** :	**COPY** button to empty button location on ANY button page
CONTROL + **MOVE** :	**SWAP** button with button location on current button page
SHIFT + CONTROL + **MOVE** :	**SWAP** button with button location on ANY button page

> **NOTE:** Remember to save changes to buttons and buttonsets while editing. The **SAVE** button saves ONLY the state of the button being edited, disabling the editing mode. It does NOT save the overall buttonset.
>
> Selecting **SAVE SET** saves the buttonset AND any changes to the currently edited button.
>
> OPTION/ALT + **SAVE SET** changes the button to **DUPLICATE** which creates and saves a copy of the current buttonset.

CONTROLLING MEDIASHOW

WINDOW LAYERING

The MEDIA**SHOW** PRO interface is a movable window that launches initially in front of the display window, if they are on the same computer display. Selecting the target display window will bring it to the foreground which can hide the control window interface. To toggle the windows between foreground and background, use the "D" key ("*D*" *for* "*display*"). The **PRO** interface can also simply be moved out of the way if needed.

The MEDIA**SHOW** MIRROR is intended for single display setups using display mirroring with a projector system. Its interface is fixed as a strip at the top of the primary computer display. This control strip interface cannot be moved. Depending on the mirror system setup, it may not need to be hidden if it displays outside the view of an audience. It can however be hidden behind and brought back in front of the target display window just like the **PRO** version by using the "D" key on the keyboard.

QUITTING

To quit MEDIA**SHOW** PRO simply close the control window, hit the ESC key, or hit CONTROL+Q (Windows OS) or COMMAND+Q (Mac OSX). In MEDIA**SHOW** MIRROR select the **EXIT** button.

CONFIGURING AND CONTROLLING MEDIA FILES

Buttons can be configured to display images, image sequences, and videos. The following sections describe the configuration options and playback controls for these media types.

> **NOTE:** The active playback controls are limited by the config settings you save for a given button.

IMAGE CONFIG

MEDIA**SHOW** buttons can be configured to control the zoom and rotation of an image. These image display options are made using the **CONFIG** settings when editing an image assigned button.

ZOOM	
ZOOM POINT MENU	Menu sets the point on the display window that the zooming of the image is locked to.
	The following options are fixed zooms that disable zoom controls and image rotation:
	fit to window : locks the image to the window center and zooms to fit preserving aspect ratio
	fill window X : locks the image to the window center and zooms to fill screen horizontally
	fill window Y : zooms image to fill the display window height
	The following options are user variable zooms that allow image rotation:
	image center : locks the center of zooming to the center of the image
	window center : locks the center of zooming to the center of the window
	window left : locks the center of zooming to the left edge of the window
	window right : locks the center of zooming to the right edge of the window
	window top : locks the center of zooming to the top edge of the window
	window bottom : locks the center of zooming to the bottom edge of the window
MIN SLIDER	Slider sets the min zoom percentage allowed for the image (range = 0% to MAX).
START SLIDER	Slider sets the start zoom percentage allowed for the image (range = MIN to MAX).
	TIP : Click the START value to set the START zoom to the CONTROL zoom value.
MAX SLIDER	Slider sets the max zoom percentage allowed for the image (range = MIN to 400%).
ROTATE	
ROTATE POINT MENU	Menu sets the point on the screen about which the image can be rotated. The options are only available when there is a user variable zoom point setting:
	image center : locks the center of rotation to the center of the image
	window center : locks the center of rotation to the center of the screen
MIN SLIDER	Sets the minimum rotation in degrees allowed for the image (range = 0% to MAX).
START SLIDER	Sets the start rotation in degrees allowed for the image (range = MIN to MAX).
	TIP : Click the START value to set the START rotation to the CONTROL rotation value.
MAX SLIDER	Sets the maximum rotation in degrees allowed for the image (range = MIN to 359°).

IMAGE CONTROL

When an image button is selected and loaded, MEDIA**SHOW** can control the nudge, zoom and rotation of the image during playback with the image CONTROL buttons and sliders.

POSITION	
ARROW BUTTONS	Arrow buttons nudge image left, right, up or down by 10 pixel increments. SHIFT+select these buttons nudges image by 1 pixel increments. The center button with inward facing arrows restores the nudge values to (0, 0).
X | Y INPUTS	Values for nudging the image can be manually entered using the X and Y input boxes. Select the button with the solid square icon or hit the RETURN key to set the nudge of the image to the entered values.

ZOOM	
SLIDER	The zoom slider controls the current image zoom value between the MIN and MAX config settings. This slider is inactive when the image is set to a fixed zoom in the **ZOOM POINT** CONFIG options.
- | + BUTTONS	These buttons control the zoom of the image with finer control. Select these buttons to zoom the image by ± 10%. SHIFT+select these buttons to zoom the image by ± 1%.
VALUE	Select the displayed zoom value to get a shortcut popup menu, if zooms are not disabled, with the following options: **start zoom** : saved button zoom value **fit to window** : zooms image to fill display window preserving aspect ratio **fill window X** : zooms image to fill the display window width **fill window Y** : zooms image to fill the display window height **full size** : zooms image to its 100% full size

ROTATE	
SLIDER	The rotate slider controls the current image rotation value between the MIN and MAX config settings. This slider is inactive when the image is set to a fixed zoom in the **ZOOM POINT** CONFIG options.
LEFT | RIGHT BUTTONS	These buttons control the rotation of the image with finer control. Select these buttons to rotate the image by ± 10°. SHIFT+select these buttons to zoom the image by ± 1°.
VALUE	Select the displayed rotation value to get a shortcut popup menu, if rotations are not disabled, with the following options: **0°, 30°, 60°, 90°, 120°, 150°, 180°, 210°, 240°, 270°** : rotate image by N degrees

NOTE: Image rotation in a planetarium setting is primarily useful with fisheye systems. Rotating images in a mirror projection system may cause odd distortions.

SEQUENCE CONFIG

MEDIA**SHOW** buttons can be configured to display a folder of images as an image sequence. The position, zoom and rotation settings made with the sequence config options are used for all images in the sequence.

ZOOM	ROTATE	
ARROW BUTTONS	Arrow buttons nudge sequence images left, right, up or down by 10 pixel increments. SHIFT+select these buttons to nudge sequence images by 1 pixel increments.
	The center button with inward facing arrows restores the nudge values to (0,0).
X|Y INPUTS	Values for nudging the sequence images can be manually entered using the X and Y input boxes. Select the button with the solid square icon or hit the RETURN key to set the nudge of the sequence images to the entered values.
ZOOM POINT MENU	Menu sets the point on the display window that the zooming of the image is locked to.
	The following options are fixed zooms that disable zoom controls and image rotation:
	fit to window : locks the image to the window center and zooms to fit preserving aspect ratio
	fill window X : locks the image to the window center and zooms to fill screen horizontally
	fill window Y : zooms image to fill the display window height
	The following options are user variable zooms that allow image rotation:
	image center : locks the center of zooming to the center of the image
	window center : locks the center of zooming to the center of the window
	window left : locks the center of zooming to the left edge of the window
	window right : locks the center of zooming to the right edge of the window
	window top : locks the center of zooming to the top edge of the window
	window bottom : locks the center of zooming to the bottom edge of the window
	NOTE: *This is the preferred setting for most videos shown with a mirror projection system. For flatscreen images to be shown as widescreen with minimum distortion, set the zoom to 40-50%.*
ZOOM SLIDER	Slider sets the zoom percentage for the sequence images (range = 0% to 400%)
ROTATE POINT MENU	Menu sets the point on the screen about which the image can be rotated. The options are only available when there is a user variable zoom point setting:
	image center : locks the center of rotation to the center of the image
	window center : locks the center of rotation to the center of the screen
ROTATION SLIDER	Slider sets the rotation for the sequence images (range = 0° to 359°). This slider is inactive when a fixed zoom setting is selected in the **ZOOM POINT** menu.

SEQUENCE	
IMAGE DELAY SLIDER	Slider sets the delay in seconds between image sequence transitions – i.e. the time a sequence image is displayed.
	This option is disabled if an audio file is selected and the **SYNC** preset is selected. In that case the delay is automatically set to time the sequence to the length of the audio file.

AUDIO FILE MENU	Optional menu to select an audio file from the {DATA}:media:audio directory to play while the image sequence is running.
	If **SYNC** preset is selected, the delay is automatically set to time the sequence to the length of the audio file. If **SYNC** is not selected then the audio file will loop, if necessary, until the image sequence is complete.

PRESETS	
AUTOPLAY	Sets whether the sequence begins automatically when the main button is selected.
LOOP	Sets whether the sequence loops and repeats when completed.
AUDIO SYNC	Sets whether the sequence is synced to the selected audio file (*disabled if no audio file selected*).
LOAD NEXT	Sets whether the next adjacent button loads automatically when sequence ends but does not loop.

SEQUENCE CONTROL

When a **sequence** button is selected and loaded, MEDIA**SHOW** can control the play|pause and specific image in the sequence using the sequence CONTROL buttons and sliders.

PLAYBACK	
CONTROL SLIDER	Slider advances as the sequence is played. It can be selected and dragged, which pauses the playback, and changing the current time and image of the sequence.

CONTROL BUTTONS	These playback buttons control the playback of the sequence.
	      rewind : rewinds sequence to the beginning
	      step back : backs up sequence by 1 image, adjusting elapsed time and audio
	      **play
		pause** : play or pause the sequence
		      step forward : advances sequence by 1 image, adjusting elapsed time and audio
		      fast-forward : advance the sequence to the end
		      loop : sets the looping of the sequence – *overrides the LOOP preset*

VOLUME MENU	Sets the volume of the sequence audio file. Options are 0 - 10 (off - MAX).

PLAYBACK VALUES	The sequence playback values update here as the sequence executes.
	      sequence count : image number / image sequence total
	      sequence time : image elapsed time before transition to next in sequence (MM:SS)

> **NOTE:** The left and right arrow keys can be used to pause the playback of the sequence and manually advance through the sequence images. To resume execution, hit play or use the spacebar.
>
> All the keyboard shortcuts available to control a sequence are listed in APPENDIX B.

VIDEO CONFIG

MEDIA**SHOW** buttons can be configured to display a variety of video file types. Start and stop times, zoom and position onscreen, and background images can all be set using the video CONFIG options. In addition, if there are subtitle files, size, location and language selection (if multiple languages found) can all be set.

CLIP	
START SLIDER	Slider sets the start time (frame) of the video clip.
	TIP: *Mouse-click the text START values to set the clip START to the current time (frame) as controlled by the main playback slider.*
END SLIDER	Slider sets the end time (frame) of the video clip.
	TIP: *Mouse-click the text END values to set the clip END to the current time (frame) as controlled by the main playback slider.*
ZOOM - | + BUTTONS	Sets the zoom of the video (default = 100%). This feature is useful for displaying non-warped video on warped systems at a smaller size to minimize distortion. Use **BUMP** to shift the video towards the bottom or top of the display.
BUMP - | +BUTTONS	Sets the vertical position of the video as a percentage from the bottom of the display window, dependent on the zoom setting of the video. This feature can be used in conjunction with **ZOOM** to position a small video on the display.
BACKGROUND MENU	Optional setting selects an image from the default {DATA}:media:background directory (or "Select any image" from the computer) to be shown behind the displayed video. This feature can be useful to frame a video zoomed smaller than fullscreen.
MAX VOLUME SLIDER	Optional maximum volume limit setting for video (range 0 - 10, default = 10).
	NOTE: *This optional setting limits the maximum volume of a video that might be too loud if played at full volume – the CONTROL volume setting options will then range from 0 to this MAX VOLUME setting.*

SUBS	
FONT SIZE - | + BUTTONS	Sets the subtitle font size (relative size range = 1-30).
	NOTE: *The subtitle size depends on the size and resolution of the entire display and not the display window set in MediaShow.*
POSITION - | + BUTTONS	Sets the position of the subtitles as a percentage of display height measured from the bottom of the display (range 0% - 100%).
LANGUAGE MENU	Sets the subtitle language. Options are NONE and all properly formatted subtitle files found in the same directory as the video file (*see APPENDIX D*).

PRESETS	
AUTOPLAY	Sets whether the video begins automatically when the main button is selected.
LOOP	Sets whether the video loops and repeats when completed.
SUBTITLES	Sets whether the subtitles are displayed when the main button is selected for playback.
LOAD NEXT	Sets whether the next adjacent button loads automatically when video ends but does not loop.

VIDEO CONTROL

When a video button is selected and loaded, MEDIA**SHOW** can control all aspects of video playback, including looping, subtitles (if available) and volume using the video CONTROL buttons and sliders.

PLAYBACK	
CONTROL SLIDER	Slider advances automatically during playback. Select and drag to set the time (frame) of the video clip (range = MIN - MAX frame)

CONTROL BUTTONS	These buttons control the playback of the video.
	
	rewind : rewinds video to the beginning
	step back : backs video up by the "frame SKIP" setting
	    SHIFT+button: backs video up by "frame STEP" setting
	play | pause : play or pause the video
	step forward : advances video by the "frame SKIP" setting
	    SHIFT+button: advances video up by "frame STEP" setting
	fast-forward : advances the video to the end
	loop : sets the looping of the video – *overrides the LOOP preset*

SUBTITLE BUTTON/MENU	Toggles subtitles on or off if available and **SUBTITLE** preset is enabled. In addition, CONTROL+select acts as a menu if multiple subtitle language files are found, allowing the user to change languages during video playback from the one selected by the CONFIG settings.
VOLUME MENU	Audio volume popup menu (range = 0 - MAX VOL)
PLAYBACK VALUES	The video playback values update here as the video plays. **video time** : current time of video file (MM:SS) **video frame** : current frame of video file

AUTOPLAY

A **SEQ** or **VIDEO** button that is set to **AUTOPLAY** (*see the PRESETS config options for sequences and video*), will automatically begin playing when that main button is pressed.

LOAD NEXT

If the button is also set to **LOAD NEXT**, it will automatically load the next button after playback has completed if it is not also set to **LOOP**. Using this feature a series of buttons can be created to play one after the other creating an entire self-running show of sequences and videos, and can even end on a final image button. The auto-play of buttons will stop advancing when it encounters an image button, a sequence or video button that is set to loop, or an empty button in the buttonset.

Note that **IMG** buttons do not have an **AUTOPLAY** option. The image remains on the display window until another button is selected.

APPENDIX A : INTERFACE REFERENCE GUIDE
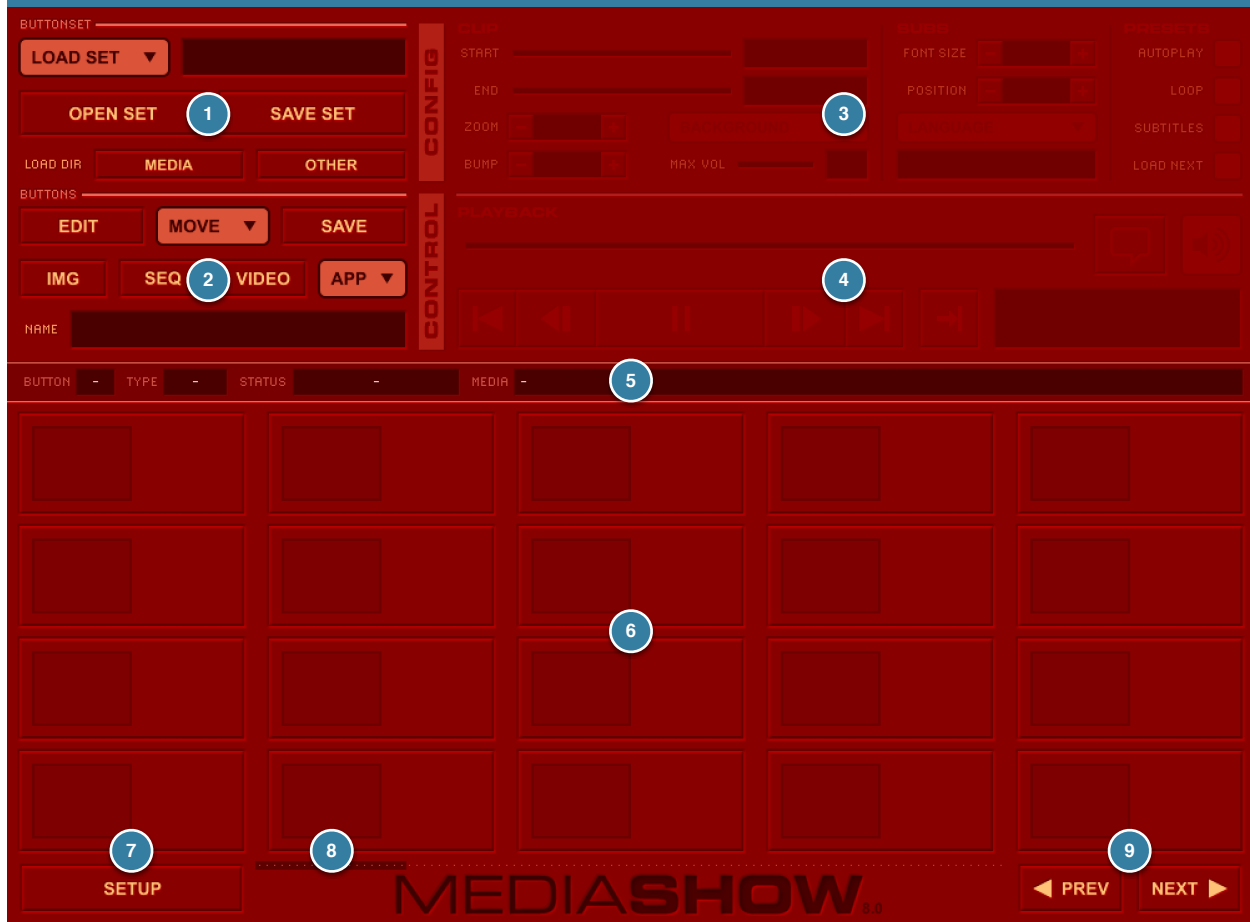
MAIN	INTERFACE GUIDE

1	Controls for buttonset loading, opening, saving, duplicating, and auto-filling from media directories
2	Controls for button editing, moving, copying, swapping, saving, media assignment, and naming
3	This area contains the configuration settings for a selected button media type (active only when the button is being edited)
4	This area contains the playback controls for the active button
5	Displays the active button number, type, status and media path
6	Main media buttons [20 per page, 100 per buttonset]
7	SETUP button used to configure the display window settings, and change the default data directories
8	Graphic indicating the occupied state of all buttons and marking the current button page (dots = empty, squares = loaded, shaded region = button page). Selecting sections along this graphic line will jump to that button page.
9	PREV and NEXT advance through the pages of buttons in the buttonset
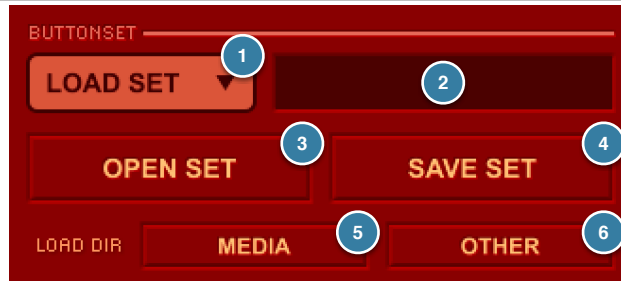
1	Load buttonset from saved {DATA}:buttonsets directory
2	Buttonset name – select to edit
3	Open buttonset from any directory
4	Save the currently open buttonset - this also automatically saves any active button being edited. Option/Alt + **SAVE SET** changes to **DUPLICATE** which creates and saves a copy of the current buttonset.
5	Auto fill the main buttons from the {DATA}:media directory (and sub-folders based on CONFIG settings)
6	Auto fill the main buttons from a user selected directory (and sub-folders based on CONFIG settings)
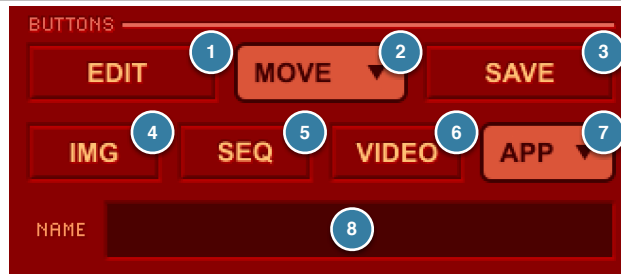
1	Edit selected main button - editing mode remains active until button or buttonset are saved
2	While editing, used to move the button, inserting it at the location on the current button page. Other options: SHIFT + **MOVE** : move button, inserting at location on ANY button page OPTION/ALT + **MOVE** : **COPY** button to empty location on current button page OPTION/ALT + SHIFT + **MOVE** : **COPY** button to empty location on ANY button page CONTROL + **MOVE** : **SWAP** button with button at location on current button page CONTROL + SHIFT + **MOVE** : **SWAP** button with button at location on ANY button page I + **MOVE** : **INSERT** empty button at current location, shifting others up
3	Save settings for the current button being edited
4	Create an IMAGE button using a user selected image for the current button being edited
5	Create an SEQUENCE button using a user selected image directory for the current button being edited
6	Create an VIDEO button using a user selected video for the current button being edited
7	Assign an APPLICATION to launch with the current button being edited
8	Button name - select to edit (defaults to file name for IMG and VIDEO, and directory name for SEQUENCE)

1	Sets the image zoom point - the point from which the image zooms in or out.
	The following options are fixed zooms that disable zoom controls and image rotation:
	fit to window : zooms image to fill display window preserving aspect ratio **fill window X** : zooms image to fill the display window width **fill window Y** : zooms image to fill the display window height
	The following options are user variable zooms that allow image rotation:
	image center : zooms from center of image **window center** : zooms from center of display window **window left** : zooms from left edge of display window **window right** : zooms from right edge of display window **window top** : zooms from top edge of display window **window bottom** : zooms from bottom edge of display window (*Best for mirror projection systems*)
2	Sets the minimum zoom percentage allowed for the image (range = 0% to MAX)
3	Sets the start zoom percentage allowed for the image (range = MIN to MAX)
4	Sets the maximum zoom percentage allowed for the image (range = MIN to 400%)
5	Set the image rotate point - the point around which the image can be rotates left or right.
	The following options are only available when there is a user variable zoom point setting:
	image center : rotates image around its center **window center** : rotates image around the center of display window
6	Sets the minimum rotation in degrees allowed for the image (range = 0% to MAX)
7	Sets the start rotation in degrees allowed for the image (range = MIN to MAX)
8	Sets the maximum rotation in degrees allowed for the image (range = MIN to 359°)

1	Nudge control buttons to move image left, right, up or down in 10 pixel increments. Center button resets the nudge values to (0, 0). **NOTE:** *for finer control, SHIFT + left, right, up, down buttons = nudge image by 1 pixel increments*
2	X and Y values for nudging the image can be manually entered using these text inputs. Hit return or select the solid box button (3) to set nudge to entered values.
3	Sets the nudge values to those entered in the X and Y inputs. Same as hitting return after entering a value.
4	Zoom slider to control image zoom percentage from MIN to MAX settings (disabled for fixed zooms)

5	Current zoom percentage value.
	
	Also active as a shortcut popup menu, if zooming is enabled, with the following options:
	
	        start zoom : saved button zoom value
	    fit to window : zooms image to fill display window preserving aspect ratio
	    fill window X : zooms image to fill the display window width
	    fill window Y : zooms image to fill the display window height
	        full size : zooms image to its 100% full size

6	"**+**" and "**-**" buttons zoom the image by 10% increments **NOTE:** *for finer control, SHIFT + "+" or "-" buttons = zoom image by 1% increments*
7	Rotation slider to control image rotation angle from MIN to MAX settings (disabled for fixed zooms)

8	Current rotation angle value.
	
	Also active as a shortcut popup menu, if rotations are not disabled, with the following options:
	
	        NONE : saved button rotation value
	  30°, 60°, ... : 30° increment values from MIN to MAX rotation settings

9	"rotate left" and "rotate right" buttons rotate the image by 10° increments **NOTE:** *for finer control, SHIFT + "left" and "right" buttons = rotate image by 1° increments*

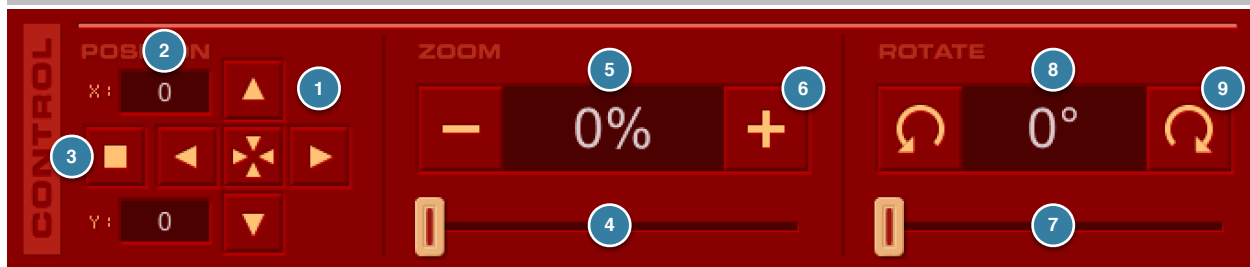| 1	Nudge control buttons to move sequence images left, right, up or down in 10 pixel increments. Center button resets the nudge values to (0, 0). (ALL sequence images will use these values) **NOTE:** *for finer control, SHIFT + left, right, up, down buttons = nudge image by 1 pixel increments*
2	X and Y values for nudging the sequence images can be manually entered using these text inputs. Hit return to set nudge to entered values. (ALL sequence images will use these values)
3	Sets the nudge values to those entered in the X and Y inputs. Same as hitting return after entering a value.

4	Set the image zoom point - the point from which the image zooms in or out.
	
	The following options are fixed zooms that disable zoom controls and image rotation:
	
	      fit to window : zooms image to fill display window preserving aspect ratio
	      fill window X : zooms image to fill the display window width
	      fill window Y : zooms image to fill the display window height
	
	The following options are user variable zooms that allow image rotation:
	
	      image center : zooms from center of image
	     window center : zooms from center of display window
	        window left : zooms from left edge of display window
	      window right : zooms from right edge of display window
	        window top : zooms from top edge of display window
	  window bottom : zooms from bottom edge of display window

5	Sets the start zoom percentage allowed for the image (range = 0% - 400%)

6	Set the image rotate point – the point around which the image can be rotates left or right.
	
	The following options are only available when there is a user variable zoom point setting:
	
	      image center : rotates image around its center
	     window center : rotates image around the center of display window

7	Sets the start rotation in degrees allowed for the image (range = 0° - 359°)
8	Sets the delay in seconds between images in the sequence. This option is disabled and automatically calculated from the audio file length and number of sequence images if the **SYNC** preset is selected.
9	Optional selection of audio file from {DATA}:**media:audio** directory to play while image sequence is running. If **SYNC** is selected, the **IMAGE DELAY** will automatically be set to time the sequence to the length of the audio file. If **SYNC** is not selected then the audio file will loop, if necessary, until the image sequence is complete.
10	**AUTOPLAY** preset – sets whether the sequence begins automatically when the main button is selected
11	**LOOP** preset – sets whether the sequence loops and repeats when completed
12	**AUDIO SYNC** preset – sets whether the sequence is synced to the selected audio file (disabled if no audio)
13	**LOAD NEXT** preset – sets whether the next adjacent button loads when sequence ends and does not loop

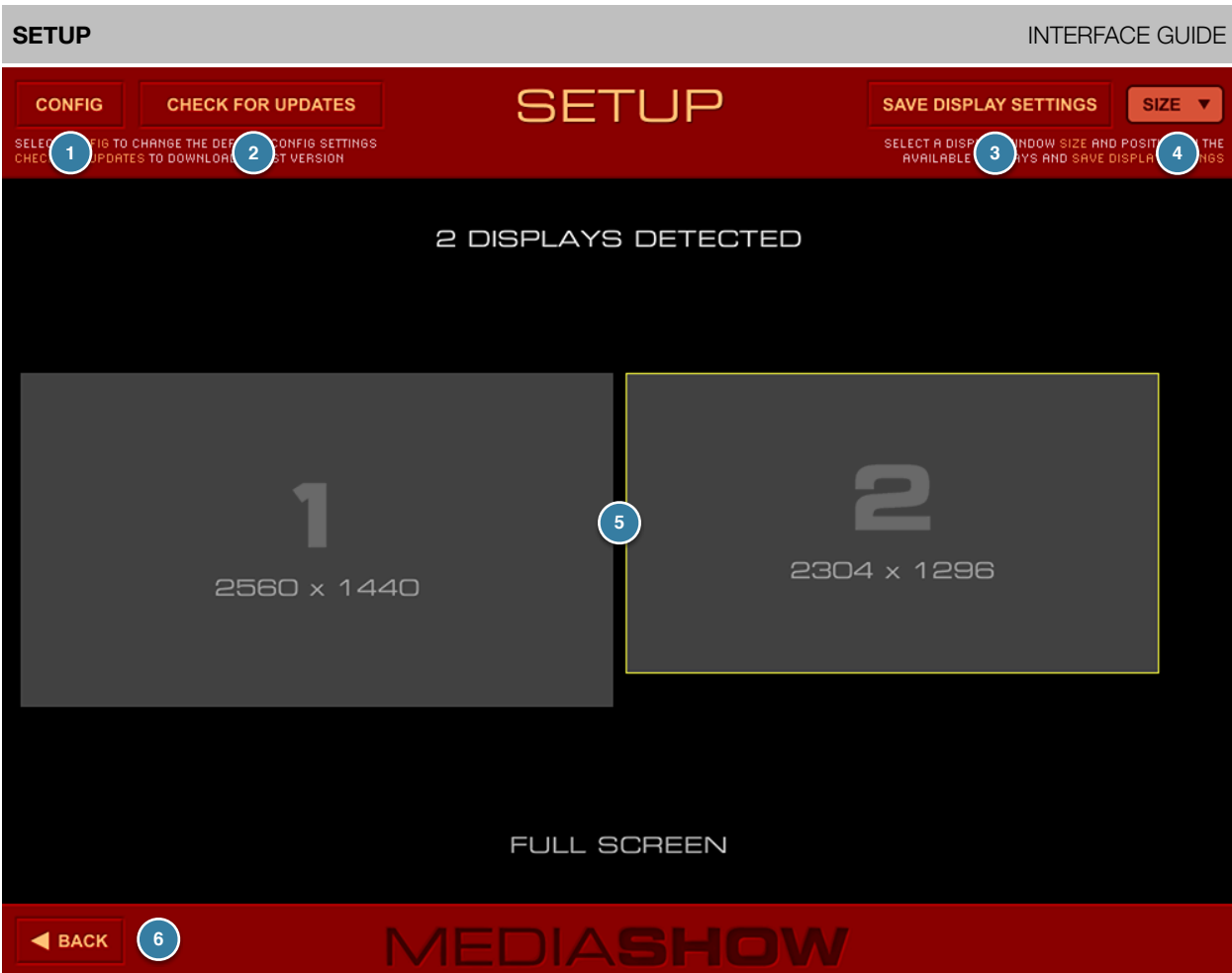|	
1	Sequence playback slider – select and drag to change the time and image of the sequence
2	Rewind the sequence to the beginning
3	Back the sequence up by 1 image and adjusts elapsed time and audio to match
4	Play	Pause the sequence
5	Advance the sequence by 1 image and adjusts elapsed time and audio to match
6	Advance the sequence to the end
7	Toggles between playing once and looping the sequence – overrides the **LOOP** preset
8	Audio volume popup menu (range = 0 - 10). The value displays in the menu corner (**MEDIASHOW** Pro only).
9	Current image number and image total
10	Elapsed time onscreen for current image before transitioning to next image

1	Slider sets the start time (frame) of the video assigned to button
2	Slider sets the end time (frame) of the video assigned to button
3	Values of the start and end times and frames for the video **NOTE:** *selecting these text boxes will set the selected time (frame) to the current time (frame) of the displayed video as controlled by the main playback slider, providing a shortcut to setting the start and end time (frames)*
4	Zoom setting of video (default is 100%)
5	Bump setting as a percentage from bottom of display window and dependent on zoom setting of video
6	Optional background image displayed behind video **EXAMPLE:** *a background image framing a non-warped video clip on a dome where the user might want to display the video at a reduced zoom percentage just above the horizon of the dome for minimum warping*
7	Optional maximum volume setting for video (range 0 - 10, default = 10) **NOTE:** *the purpose of this optional setting is to limit the maximum volume of a video that might be too loud if played at full volume – the control volume setting options will then range from 0 to this MAX VOL setting*
8	Subtitle font size **NOTE:** *the appearance onscreen will depend on the size and resolution of the display – e.g. a setting size may look large on a small display window, and small on a fullscreen HD display.* *Fonts appear ~3x larger on Windows than on Mac OS X for the same config size setting due to how they are rendered onto the video. Because of this, only relative point sizes (1 - 30) are used as settings for subtitles. This is to make the same setting appear approximately the same size on both platforms.*
9	Subtitle position – percentage of display height measured up from bottom of display (range 0% - 100%)
10	Subtitle language – options are NONE and all properly formatted subtitle files found in the same directory as the video file **NOTE:** *subtitles files must be in .SRT format and follow the naming convention of videoFileName.xx.srt where videoFileName = same filename as the video without the file suffix, and xx = language code (see Appendix E) e.g. video = "Impact_clip.mp4", English subtitle file = "Impact_clip.en.srt"*
11	**AUTOPLAY** preset – sets whether the video begins automatically when the main button is selected
12	**LOOP** preset – sets whether the video loops and repeats when completed
13	**SUBTITLES** preset – sets whether the video displays subtitles when the main button is selected and loaded
14	**LOAD NEXT** preset – sets whether the next adjacent button loads when video ends and does not loop

1	Video playback slider – select and drag to change the time (frame) of the video (range = MIN - MAX frame)
2	Rewind the video to the beginning
3	Back video up by the "frame SKIP" value set in **mediashow_config.ini** (default = 30 frames) **NOTE:** *for finer control, SHIFT + button = back video up by the "frame STEP" value (default = 1 frame)*
4	Play | Pause the video
5	Advance video up by the "frame SKIP" value set in **mediashow_config.ini** (default = 30 frames) **NOTE:** *for finer control,SHIFT + button = advance video up by the "frame STEP" value (default = 1 frame)*
6	Advance the video to the end
7	Toggles between playing once and looping the video – overrides the **LOOP** preset
8	Toggles subtitles on | off if they are available CONTROL+select for shortcut menu of available subtitle languages for video
9	Audio volume menu (range = 0 - MAX VOL). The value displays in the menu corner (**MEDIASHOW** Pro only).
10	Elapsed time of video (MM:SS)
11	Current frame of video

| CONFIG | CHECK FOR UPDATES | SETUP | SAVE DISPLAY SETTINGS | SIZE ▼ |

SELEC...FIG TO CHANGE THE DEF...CONFIG SETTINGS
CHEC...UPDATES TO DOWNLOA...T VERSION

SELECT A DISP...NDOW SIZE AND POSIT...THE
AVAILABLE...YS AND SAVE DISPLA...NGS

2 DISPLAYS DETECTED

1
2560 x 1440

2
2304 x 1296

FULL SCREEN

◄ BACK

MEDIASHOW

1	Access config settings, including the default data path to **buttonsets** and **media** (*See APPENDIX C*).
2	Check for updates to MEDIA**SHOW**. If a new version is available, a download link is enabled. (*Pro only*)
3	Save selected display settings to the config file. To exit without saving, select the **BACK** button (**6**).
4	Select the display window size on the selected target display. Options are based on size of detected displays:

       FULL SCREEN : display window will fill the selected display
MAX   1 x 1   [1.00] : max size preserving 1.00 aspect ratio
MAX   4 x 3   [1.33] : max size preserving 1.33 aspect ratio
MAX 16 x 10 [1.60] : max size preserving 1.60 aspect ratio
MAX 16 x 9 [1.78] : max size preserving 1.78 aspect ratio
MAX   UHD   [1.90] : max size preserving 1.90 aspect ratio

and depending on the size of the selected display, the following display sizes are shown as options:

small square	360 x 360	[1.00]	small HD	640 x 360	[1.78]	small wide	1080 x 360	[3.00]
SVGA	800 x 600	[1.33]	720 HD	1280 x 720	[1.78]	UXGA	1600 x 1200	[1.33]
XGA	1024 x 768	[1.33]	WXGA	1366 x 768	[1.78]	1080 HD	1920 x 1080	[1.78]
SXGA	1280 x 1024	[1.25]	SXGA+	1400 x 1050	[1.33]	WUXGA	1920 x 1200	[1.60]
WXGA	1280 x 800	[1.60]	WXGA+	1440 x 900	[1.60]	2K	2048 x 1080	[1.90]

| **5** | Use the mouse to select a target display and window position from the detected displays |
| **6** | Leave SETUP and go back to the main app interface. The display window will reset and buttonsets will unload. |

		APPENDIX B : KEYBOARD SHORTCUTS	

APPLICATION WINDOWS

	D	toggle display window to foreground or background by hiding controls
SHIFT	D	toggle visibility of display window
	K	toggle kiosk mode which covers the controls
	B	toggle visibility of menubar (MacOS) or taskbar (WinOS)

BUTTONSETS

OPTION/ALT	**SAVE SET**	changes to **DUPLICATE** to make a copy of the current buttonset

EDITING BUTTONS

SHIFT	**MOVE**	move button, inserting at location on ANY button page
OPTION/ALT	**MOVE**	**COPY** button to empty location on current button page
OPTION/ALT + SHIFT	**MOVE**	**COPY** button to empty location on ANY button page
CONTROL	**MOVE**	**SWAP** button with button at location on current button page
CONTROL + SHIFT	**MOVE**	**SWAP** button with button at location on ANY button page
I	**MOVE**	**INSERT** empty button at current location, shifting others up

CONTROLLING BUTTONS

	1,2,3,4,5,6,7,8,9,0	directly select buttons 1-10 on current button page (Pro, 1-5 in Mirror)
SHIFT	1,2,3,4,5,6,7,8,9,0	directly select buttons 11-20 on current button page (Pro)
OPTION/ALT	MAIN buttons	activates **IMG** | **VIDEO** mini-menu options for selected main button
	[	previous loaded button
	]	next loaded button

IMAGE

	← → ↓ ↑	nudge image left, right, down, up 10 pixels
SHIFT	← → ↓ ↑	nudge image left, right, down, up 1 pixel
	R	reset the image nudge values to 0 (i.e. nudge center)
SHIFT	R	reset the image nudge, rotate and zoom to saved button settings
	A	zoom image IN by 10%
SHIFT	A	zoom image IN by 1%
	Z	zoom image OUT by 10%
SHIFT	Z	zoom image OUT by 1%
	.	rotate image right (clockwise) by 10°
SHIFT	. (>)	rotate image right (clockwise) by 1°
	,	rotate image left (counter-clockwise) by 10°
SHIFT	, (<)	rotate image right (counter-clockwise) by 1°

	C	set image center as ZOOM point
	X	set image center as ROTATE point
	S	set screen center as ROTATE point
	F	set image to fill screen (zooms to fit image preserving aspect ratio)

SEQUENCE		
	←	pause and go to previous image in sequence
	→	pause and go to next image in sequence
	SPACEBAR	play | pause the sequence
	L	turn looping on | off

VIDEO		
	←	step backward by frame SKIP setting
	→	step forward by frame SKIP setting
SHIFT	←	step backward by frame STEP setting
SHIFT	→	step forward by frame STEP setting
	R	rewind video to beginning frame
	F	fast-forward video to end frame
	SPACEBAR	play | pause video
	L	turn looping on | off
	A	turn audio on | off
	S	turn subtitles on | off
CONTROL	SUBTITLE toggle	enables menu of available subtitle language files for video
CONTROL	1,2,3,4,5,6,7,8,9,0	set video volume level from 1 - 10 (min - max)

Software config settings are stored in the **mediashow_config.ini** file. This contains the dataPath where MEDIA**SHOW** looks for the **buttonsets** and **media** folders. It also stores video renderer (Windows OS only), subtitle and frame editing settings. The remaining parameters control default settings for new buttons.

This file can be edited with a text editor, but only change the parameter *values* of the **mediashow_config.ini** file. Do NOT alter the parameter *names* or make changes to any comment lines that start with "#".

To avoid errors, users should instead use the **CONFIG** feature found on the **SETUP** screen of MEDIA**SHOW** Pro. This allows edits to the **mediashow_config.ini** file without opening the file itself. Be sure to select **UPDATE** to save any config changes.

In MEDIA**SHOW** Mirror, **SETUP** only has a **DATA** button option for changing the data directory path.

PARAMETER	DEFAULT	RANGE	TYPE	DESCRIPTION
dataPath	DEFAULT	any dir with user read/write access	string	Path to the directory containing **buttonsets** and **media** folders
folderLevels	1	1…4 [1 = top level of selected dir]	integer	Folder levels to search for media
audioVolume	8	0…10 [0 = Off]	integer	Button audio volume setting
autoplaySet	1	0 , 1 [0 = False | 1 = True]	boolean	Button autoplay setting
loopSet	0	0 , 1 [0 = False | 1 = True]	boolean	Button loop setting
loadNextSet	0	0 , 1 [0 = False | 1 = True]	boolean	Button load next setting
smartButtonNames	1	0 , 1 [0 = False | 1 = True]	boolean	Remove file extensions and replace underscores with spaces when creating button names from filenames
frameStep	1	1…60 [0-2 sec @ 30fps]	integer	Frames to step using the fine controls (SHIFT+frameSkip button) during video playback
frameSkip	30	30..1800 [1-60 sec @ 30fps]	integer	Frames to skip using frameSkip buttons during video playback
subtitleFontSize	8	1…30	integer	Cross-platform relative font size value for subtitle text
subtitleOffset	10	0…100 [0 = bot | 50 = center | 100 = top]	integer	Subtitle vertical position as a % offset from bottom of display
videoRenderer [WinOS ONLY]	VMR-7	Legacy VMR-7 VMR-9 Enhanced Haali	string	WinOS setting controlling which DirectShow renderer is used. High-end graphics cards can try VMR-9 or Enhanced, but in general use the default VMR-7.

Default **mediashow_config.ini** file:

```
#-------------------- MEDIASHOW CONFIG ----------------------
# THIS FILE CAN BE EDITED TO CHANGE DEFAULT SOFTWARE OPERATION
# CHANGE ONLY THE SETTING VALUES - DO NOT CHANGE SETTING NAMES
#------------------------------------------------------------
# Data path to buttonsets and media dir [string]
# Default = DEFAULT
#------------------------------------------------------------
dataPath = DEFAULT
#------------------------------------------------------------
# Folder LEVELS [integer]
# Default = 1 (1..4)
#------------------------------------------------------------
subFolders = 1
#------------------------------------------------------------
# Button VOLUME [integer]
# Default = 8 (0..10)
#------------------------------------------------------------
audioVolume = 8
#------------------------------------------------------------
# Button AUTOPLAY [boolean | 0 = FALSE, 1 = TRUE]
# Default = TRUE
#------------------------------------------------------------
autoplaySet = 1
#------------------------------------------------------------
# Button LOOP [boolean | 0 = FALSE, 1 = TRUE]
# Default = 0
#------------------------------------------------------------
loopSet = 0
#------------------------------------------------------------
# Button LOAD NEXT [boolean | 0 = FALSE, 1 = TRUE]
# Default = 1
#------------------------------------------------------------
loadNextSet = 0
#------------------------------------------------------------
# Smart Button Names [boolean | 0 = FALSE, 1 = TRUE]
# Default = 1
#------------------------------------------------------------
smartButtonNames = 1
#------------------------------------------------------------
# Frame STEP [integer]
# Default = 1 (1..60)
#------------------------------------------------------------
frameStep = 1
#------------------------------------------------------------
# Frame SKIP [integer]
# Default = 30 (30..1800)
#------------------------------------------------------------
frameSkip = 30
#------------------------------------------------------------
# Subtitle size [integer]
# Default = 8 (1..30)
#------------------------------------------------------------
subtitleFontSize = 8
#------------------------------------------------------------
# Subtitle position (% offset) from display bottom [integer]
# Default = 5 (0..100)
#------------------------------------------------------------
subtitleOffset = 5
#------------------------------------------------------------
# VideoRenderer WIN ONLY [string]
# Default = VMR-7 (Legacy | VMR-7 | VMR-9 | Enhanced | Haali)
#------------------------------------------------------------
videoRenderer = VMR-7
```

MEDIASHOW supports the **SRT** subtitle format for video files. It looks for subtitle files in the same directory as the video file, and the filenames must match that of the video file with the addition of a 2-letter language code prior to the ".srt" suffix.

> Example: If the video file to be displayed is named "video_file.mp4", then **MEDIASHOW** will recognize and load any valid SRT files it finds in the same directory that have the naming convention "video_file.XX.srt" – where XX is the 2-letter language code of the subtitles (*See Appendix E*)
>
> So if there were 4 language subtitles for this video, they should all be placed together in the same directory:
>
> {DATA}:media:samples:video_file.mp4 = MP4 video file
> {DATA}:media:samples:video_file.en.srt = **English** subtitles
> {DATA}:media:samples:video_file.es.srt = **Spanish** subtitles
> {DATA}:media:samples:video_file.hi.srt = **Hindi** subtitles
> {DATA}:media:samples:video_file.ko.srt = **Korean** subtitles

A **SRT** subtitle file is just a UTF-8 text file containing timecode and subtitle text in a specific language. Each subtitle entry that displays onscreen consists of four parts:

1. A number indicating which subtitle it is in the sequence.
2. The time that the subtitle should appear on the screen, and then disappear.
3. The subtitle text itself.
4. A blank line indicating the start of a new subtitle.

Here is part of an example **SRT** file:

```
1
00:00:01,300 --> 00:00:04,400
Millions of asteroids and comets
lurk among the planets,

2
00:00:04,400 --> 00:00:07,740
left over bits and pieces from
the solar system's formation

3
00:00:07,800 --> 00:00:10,680
four and a half billion years ago.
```

SUBTITLE TOOLS

Aegisub (www.aegisub.org) is an excellent, free, cross-platform, open source tool for creating and modifying subtitles.

APPENDIX E : FOREIGN LANGUAGE CODES

ab	Abkhazian	**gd**	Gaelic	**lb**	Luxembourgish	**sn**	Shona
aa	Afar	**gl**	Galician	**mk**	Macedonian	**ii**	Sichuan Yi
af	Afrikaans	**ka**	Georgian	**mg**	Malagasy	**sd**	Sindhi
sq	Albanian	**de**	German	**ms**	Malay	**si**	Sinhala; Sinhalese
am	Amharic	**el**	Greek	**ml**	Malayalam	**sk**	Slovak
ar	Arabic	**gn**	Guarani	**mt**	Maltese	**sl**	Slovenian
an	Aragonese	**gu**	Gujarati	**gv**	Manx	**so**	Somali
hy	Armenian	**ht**	Haitian	**mi**	Maori	**st**	Sotho, Southern
as	Assamese	**ha**	Hausa	**mr**	Marathi	**es**	Spanish
ae	Avestan	**he**	Hebrew	**mh**	Marshallese	**su**	Sundanese
ay	Aymara	**hz**	Herero	**mo**	Moldavian	**sw**	Swahili
az	Azerbaijani	**hi**	Hindi	**mn**	Mongolian	**ss**	Swati
ba	Bashkir	**ho**	Hiri Motu	**na**	Nauru	**sv**	Swedish
eu	Basque	**hu**	Hungarian	**nv**	Navaho, Navajo	**tl**	Tagalog
be	Belarusian	**is**	Icelandic	**nd**	Ndebele, North	**ty**	Tahitian
bn	Bengali	**io**	Ido	**nr**	Ndebele, South	**tg**	Tajik
bh	Bihari	**id**	Indonesian	**ng**	Ndonga	**ta**	Tamil
bi	Bislama	**ia**	Interlingua	**ne**	Nepali	**tt**	Tatar
bs	Bosnian	**ie**	Interlingue	**se**	Northern Sami	**te**	Telugu
br	Breton	**iu**	Inuktitut	**no**	Norwegian	**th**	Thai
bg	Bulgarian	**ik**	Inupiaq	**nb**	Norwegian Bokmal	**bo**	Tibetan
my	Burmese	**ga**	Irish	**nn**	Norwegian Nynorsk	**ti**	Tigrinya
ca	Catalan	**it**	Italian	**ny**	Nyanja	**to**	Tonga
ch	Chamorro	**ja**	Japanese	**oc**	Occitan (post 1500)	**ts**	Tsonga
ce	Chechen	**jv**	Javanese	**or**	Oriya	**tn**	Tswana
zh	Chinese	**kl**	Kalaallisut	**om**	Oromo	**tr**	Turkish
cu	Church Slavic	**kn**	Kannada	**os**	Ossetian	**tk**	Turkmen
cv	Chuvash	**ks**	Kashmiri	**pi**	Pali	**tw**	Twi
kw	Cornish	**kk**	Kazakh	**pa**	Panjabi	**ug**	Uighur
co	Corsican	**km**	Khmer	**fa**	Persian	**uk**	Ukrainian
hr	Croatian	**ki**	Kikuyu	**pl**	Polish	**ur**	Urdu
cs	Czech	**rw**	Kinyarwanda	**pt**	Portuguese	**uz**	Uzbek
da	Danish	**ky**	Kirghiz	**ps**	Pushto	**vi**	Vietnamese
dv	Divehi	**kv**	Komi	**qu**	Quechua	**vo**	Volapuk
nl	Dutch	**ko**	Korean	**rm**	Raeto-Romance	**wa**	Walloon
dz	Dzongkha	**kj**	Kuanyama	**ro**	Romanian	**cy**	Welsh
en	English	**ku**	Kurdish	**rn**	Rundi	**fy**	Western Frisian
eo	Esperanto	**lo**	Lao	**ru**	Russian	**wo**	Wolof
et	Estonian	**la**	Latin	**sm**	Samoan	**xh**	Xhosa
fo	Faroese	**lv**	Latvian	**sg**	Sango	**yi**	Yiddish
fj	Fijian	**li**	Limburgan	**sa**	Sanskrit	**yo**	Yoruba
fi	Finnish	**ln**	Lingala	**sc**	Sardinian	**za**	Zhuang
fr	French	**lt**	Lithuanian	**sr**	Serbian	**zu**	Zulu

CREDITS

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for AVFoundation and DirectShow code assistance

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