# Contents



# George Controller

The software, amongst other things, replaces software used to control a Kramer A/V matrix switch. Hence the name George Controller.

George Controller controls the following devices;

- SONY EVI-D30 conference cameras using the VISCA protocol.
- 4X4 HDMI Matrix Switch.
- Kramer VS-606xl 6x6 Video Matrix Switch
- Two Epson PowerLite 4650 data projectors
- Extend and retract control of two projector screens.

- Power Control of two power bars.

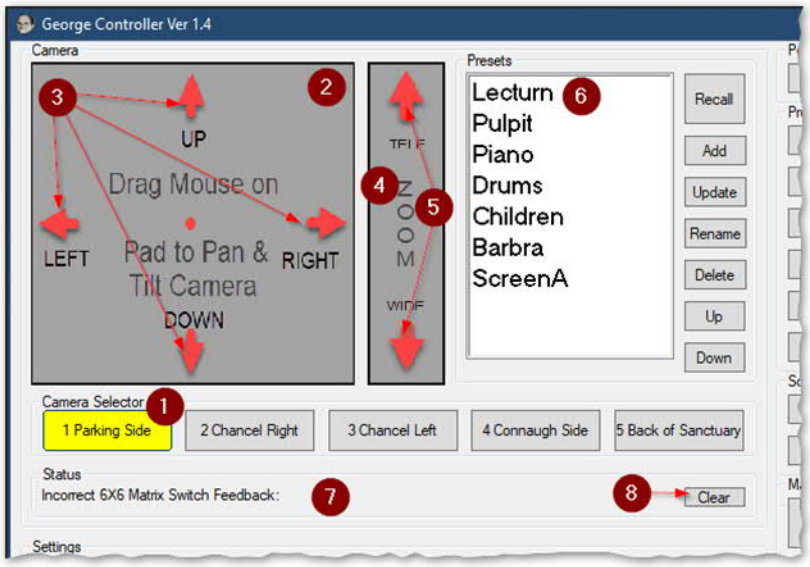
Also, most actions can be recorded into a macro that can be played back. A single Macro can recall presets for multiple cameras, make settings in the matrix switches and select input on the Projectors.

George Controller has a simple web server that allows a macro to be recalled by other systems such as OBS Studio.

You will note that many of the buttons and controls are oversized to make the program touch screen friendly.

## Camera Control

The camera control is shown in the top-left group of controls shown below.




## Camera Selector

The number of cameras, along with their names, are set up in the GeorgeController.INI file. The cameras are represented by a series of buttons in the Camera Selector group 1. The currently selected camera is shown in Yellow. If a camera is not detected when George Controller is started, the corresponding button is shown in red, and the camera can not be selected.

## Camera Pan Tilt Zoom

A click and hold of the primary mouse button (left click) on any of the red arrows 3 will move the selected camera in the direction indicated at its slowest speed. This action is referred to as nudging the camera as it is used to make slight adjustments. When you click and hold the mouse on one of the arrows, the mouse cursor changes to the  and cannot be moved away from the arrow until the primary mouse button is released.

To move the camera at variable (faster) rates, click and hold elsewhere in grey Pan & Tilt Pad 2. The cursor will change to a  and be returned to the Pan Tilt Pad 2 center. As long as you hold down the

primary mouse button down the mouse pointer cannot be moved outside of the grey Pan & Tilt Pad 2. Dragging the cursor in any direction will move the camera in that direction. The further you drag the mouse from the center location, the faster the camera will move. Dragging the mouse to the far edge of the grey Pan & Tilt Pad 2 will move the camera at its most rapid rate in that direction. Both Pan and Tilt can be adjusted at the same time by dragging the mouse cursor in a diagonal direction.

When the camera reaches the desired position, it is natural to return the mouse cursor to the center position to stop the camera's movement; however, this often leads to overcorrection. It is much better to release the mouse button. Releasing the mouse button stops the camera movement instantly.

The Grey ZOOM control works in the same way. Clicking and holding on the arrows 5 will adjust the zoom at the slowest rate available. Clicking and holding down the primary mouse button elsewhere in the grey Zoom Pad 4 will change the cursor to a  and move it to the center of the ZOOM pad. Dragging the mouse cursor up or down will adjust the zoom Tele or Wide respectfully. The further the mouse is dragged, the faster the zoom adjustment.

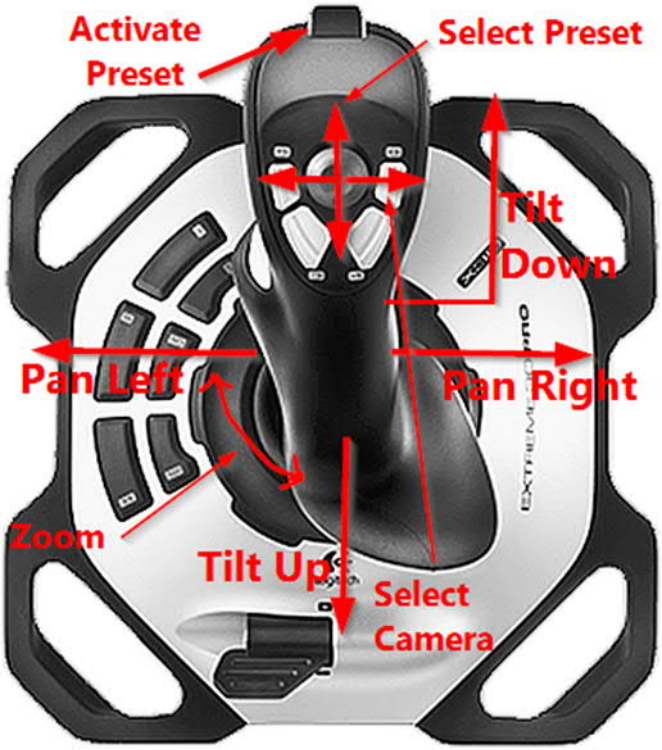
The drag control plus the nudging control provided by the arrows are not standard Windows user interface elements; however, they make the camera positioning easier than the methods used by other VISCA control software.

## JoyStick

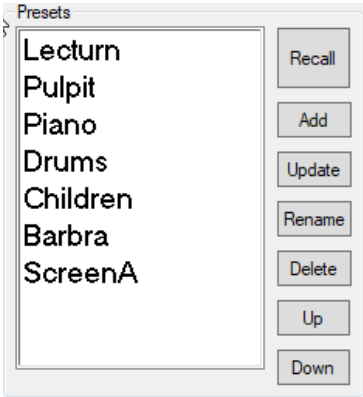
George Controller can control VISCA cameras using a Joystick.

Pushing the joystick forward will TILT the selected camera down; conversely, pulling up the joystick will TILT the camera up. Think pushing the nose of a plane down or pulling the nose up. Left and Right movement will cause the Camera to PAN left and right. Twisting the joystick will adjust the camera ZOOM. Right to Zoom in left TELE will zoom out WIDE.

The POT (Point of View) control can be used to select the camera and preset. Left and Right to select camera, Up and Down to select the preset. The trigger will activate the selected preset.




## Presets




Unlike other VISCA camera control software, George Controller does not rely on the camera's six preset memories; instead, it retrieves the absolute camera position and stores them in the Settings file. George Controller then sends those settings to the camera when Presets 6 are retrieved.

As a result, George Controller allows an unlimited number of Presets 6 to be defined. Also, the order of presets can be rearranged as suited.

When a camera is selected initially, no preset is selected. Until a Preset is selected, the only button in the Presets group that will function is Add. Clicking on an entry in the Preset 6 list will activate a Blue highlight bar.

The Presets group has the following buttons

- Recall
  Sends the camera Pan Tilt and Zoom settings stored with currently selected preset. If no preset is selected, this button does nothing.
- Add
  Adds the current camera position as a new Preset, you will be prompted for a Preset name.
- Update
  The Pan Tilt and Zoom Settings stored with currently selected Preset are updated with the current values. If no preset is selected, this button does nothing.

- Rename
  Prompts for a new name for the currently selected Preset. If no preset is selected, this button does nothing.
- Delete
  Deletes the currently selected Preset. No Preset will be selected after this operation, as the current preset no longer exists. If no preset is selected, this button does nothing.
- Up
  Move the currently selected Preset up the list. If no preset is selected, this button does nothing.
- Down
  Move the currently selected Preset down the list. If no preset is selected, this button does nothing.

When a Preset or Macro name is required, George Controller puts up a Dialog box prompting for a name. While the name dialogue box is presented, George controller can undertake no other operations, including responding to Web Server requests. To prevent George Controller from being left in this state, the Name prompts have a 20-second timeout. The new name must be entered within these 20 seconds.

### Wait Command Complete

When a Preset is recalled, or any other command is sent to a camera, George Controller can perform no additional camera operations till a Command Complete message is received. During this time, the following message will be displayed in the Status window 7;

Wait Command Complete

The serial interface used by the EVI-DS30 is only 9600 baud. The software can quickly generate more commands than the interface can transmit, and the additional commands will build up in the RS232 output buffers. When commands build up in the output buffers, the control of the cameras becomes sluggish. Many of the other software packages available for controlling VISCA cameras suffer from this problem. No additional commands are sent until a Command Complete Message is received from the camera to keep the camera responsive.

While waiting for a Command Complete message, additional George Controller's operations are restricted.

Occasionally George Controller may fail to receive the Command Complete message; when this happens, the status window will continue to display Wait Command Complete. Click on the clear button 8 when this happens to regain control.

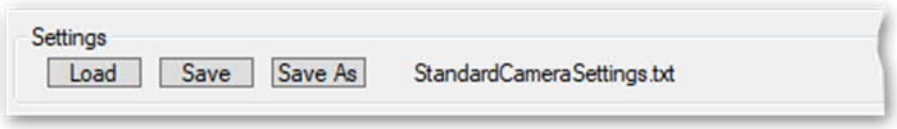
## Status

The status display primarily displays what command is currently being sent to the Cameras. And the Wait Command Complete messages discussed in the previous section.

The Status area will also display messages related to errors from other modules, such as failures reading the Matrix Switches' status and commands sent as a result of other button presses

## Settings

Presets and Macros are both saved and loaded from settings files. The current settings file is displayed in Control Group and is held in the GeorgeController.INI file. When George Controller is launched, it will load the settings file specified in the INI file. When George Controller is shut down, it will save the Settings back to the same file.

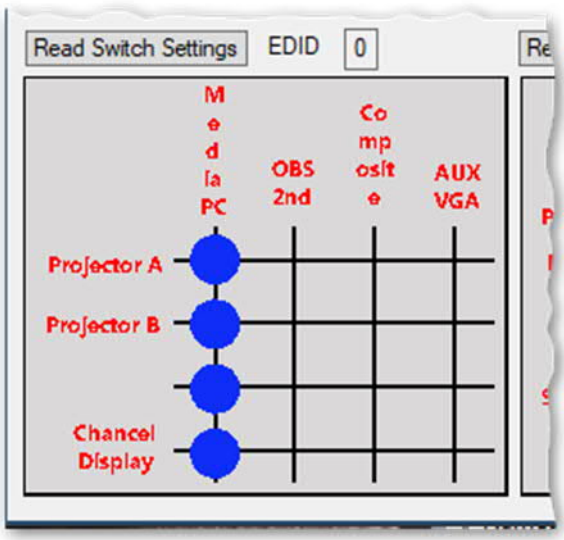



Different settings files can be loaded or created using the Load and Save As buttons, respectively.

When shutting down George Controller by initiating a Windows shutdown sequence, the saving of settings can be interrupted. Other interruptions can cause loss of Settings; the Save button is recommended after Presets or Macros are defined.

## 4X4 HDMI Matrix Switch

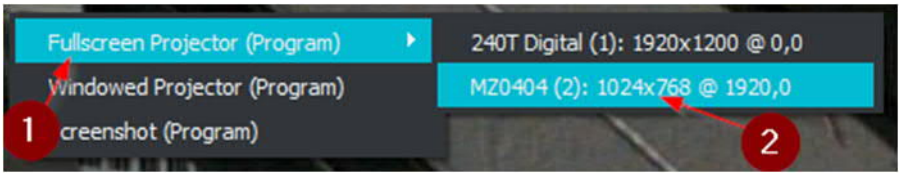
Video from the two computers in the rack, MediaPlayback and OBS Studio, is routed to the Data projectors and Chancel Display using HDMI cabling. The signals are routed via the 4X4 HDMI switch controlled by the following section of the George Controller.




Down the side are the four outputs A through D. Output C is unused. Across the top are the four inputs.

- MediaPC this input comes from the second output of the MediaPlayback computer, used for PowerPoint presentation and playback of videos and audio recordings. When Media is to be made part of a streaming service, it is played back using the OBS Studio computer.

- OBS 2nd this input comes from the second display on the OBS Studio computer; it shows what is being streamed. The second display must be activated each time OBS Studio is started. Right-click anywhere in the program window and select Fullscreen Projector (Program) and MZ0404 (2)... as shown.



- Composite this input comes from a composite to HDMI converter. The input from the converter is connected to Output 3 of the Kramer VS-606xl 6x6 Video Matrix Switch. This input is primarily used to route camera video directly to the Chancel display, connected via HDMI only.

- AUX VGA this input comes from a VGA to HDMI converter. The input of the VGA converter comes from the VGA cable located at the sound desk. This VGA cable is used to connect laptops to the AV system. This input is primarily used to route laptop video directly to the Chancel display, connected via HDMI only.

### Read Switch Settings

The 4x4 HDMI Matrix Switch can be controlled using switches on the rack-mounted device's front panel. Changes made this way are not reflected in George Controller. Use Read Switch Settings to update what is displayed in George Controller.

### EDID

EDID stands for Extended Display Identification Data. It is information from the video displays that indicate, amongst other things, what resolutions they can display. The single EDID digit shows the resolution the HDMI Matrix switch will tell the sources to provide. The resolution is determined by the destination devices Projectors and Chancel Display. When the Chancel Display is turned on after the projectors, the EDID to use is redetermined. The projectors will blank during this process.

## Kramer VS-606xl 6x6 Video Matrix Switch

The output from each video camera is feed to a video capture card in the OBS Studio computer. Each video camera is also fed to one input of the Kramer 6X6 Video Matrix Switch. The Kramer Switch can then be used to provide the Video directly to any of the following outputs.

- Projector A composite input.
- Projector B composite input.
  Both Projector A & B are direct feeds to the projector; Video must be selected on the Projector Group to view these inputs.

- 4X4 HDMI Matrix Switch Composite input.
  This video output is connected to a Composite to HDMI converter that then feeds the 4X4 HDMI Matrix switch. This video feed is primarily used to place camera video on the Chancel Display.

Video captured by the OBS Studio computer and then placed on one of the projectors will have a slight delay, noticeable by some. Also, the Video will be cropped by the 16:9 aspect ratio used by the OBS Studio computer. Using the Kramer 6X6 and 4X4 HDMI Matrix Switch, Video can be routed to the projectors and elsewhere without using the OBS Computer. By feeding the Composite Video directly to the projector, there is no delay, and the native 4:3 aspect ratio produced by the cameras is preserved.

- Basement. A composite video feed to the sound cabinet next to the stage in the basement. It can be used to feed a Data Projector during overflow situations.

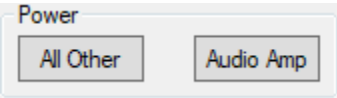
- Sound Desk feeds a composite video to the OBS Studio display. The composite feed is used to display camera video without using OBS Studio.

- DVD Recorder feeds composite Video to AUX 1 on the DVD recorder.

### Read Switch Settings

The Kramer 6x6 Video Matrix Switch remembers settings when powered off. When first started, George Controller will read the current settings, ensuring that what is displayed on the screen reflects the switch settings. The Kramer 6x6 Video Matrix Switch can be controlled using switches on the rack-mounted device's front panel. Changes made this way are not reflected in George Controller. Use Read Switch Settings to update what is displayed in George Controller.

## Power



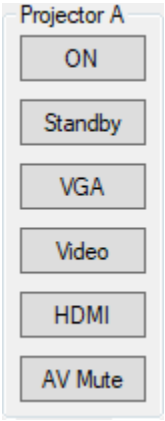

These two buttons allow the power in the equipment rack to be turned on. Each button corresponds to one of the main power switches with the same name. Either George Controller or the matching switch on the equipment rack can turn the related equipment on, but both must be OFF for the equipment to be OFF. The button is highlighted in Yellow when power is turned on.

The Power Group's primary use is turning on equipment when doing remote control sessions to the Control and OBS computers. When a remote session first starts on the Control computer, George Controller will launch, but no cameras will respond as they have not been powered up. Use the All Other buttons to turn on the camera power supply, then exit George Controller. When you restart George Controller, the cameras and the other equipment will be detected and can be controlled.

George Controller does not read the power state when turned on. So the power may be on, but the button will not be highlighted in yellow.

## Projector A & Projector B

These buttons the data projectors the functions are as follows

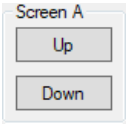



- ON
  Turns the projector on
- Standby
  Turns OFF the projector; the projectors are never entirely off as they need to respond to remote control signals.
- VGA
  Selects the VGA input from the VGA cable located at the sound desk and intended to be used with a laptop.
- Video
  Selects the composite video input that comes from the Kramer 6x6 Video Matrix Switch.
- HDMI
  Selects the HDMI signal from the 4X4 HDMI Matrix Switch
- AV Mute

Audio Video Mute, Blanks the video display regardless of the input. The Audio portion of the projectors is not used. The button is highlighted in yellow when Mute is active.

## Screen A & B

Extends (Down) and Retracts (Up) the projector screens.




## Macros

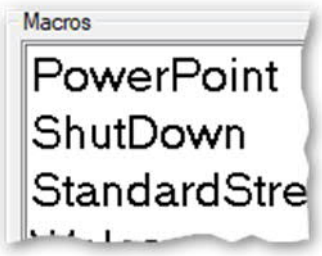
Macros allow the operations of George Controller to be further automated. Macros consist of a single keyword and required parameters separated by a vertical pipe symbol.

Keywords are added to the selected Macro when the Record mode is engaged. Keywords are generated for the following;

- Any Input/Output selection made in the 4X4 HDMI Matrix Switch.
- Any Input/Output selection made in the Kramer 6x6 Video Matrix Switch.
- Any button press in the Power Group
- Any Button click in the Projector Group
- Any Button Press in the Screen control Groups.
- Camera Selection made in the Camera Group
- Preset Recall made in the camera group.

Camera movements are not stored in macros. Macros can only store and recall Camera Presets.

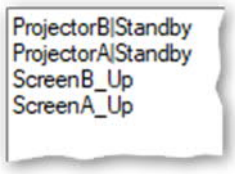
There are two sections on the screen dedicated to Macros. The full list of Macros is displayed on the far-Right of the screen. The selected Macro is highlighted with a blue selector. A Selector will not be displayed under the following situations.




- George Control is first started.
- Settings are loaded.
- The Macro is deleted.

Until a macro is selected, the only macro controls that have any effect are Record and New.

The macro controls are shown toward the bottom and to the left of the macro list. A small edit window is shown below the buttons. The edit window has several functions;




1. Display the contents of the Macro selected from the list on the Right.
2. Allow the selected Macro to be edited.
3. Display the steps of a macro as it played back.
4. Show additional steps added to the Macro by the macro record function.

The Macros follow a logical format, and it is possible to directly edit and or create macros once you are familiar with them.

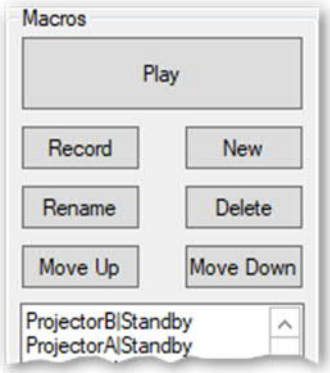
The Macro buttons are as follows

- Play

  Plays the Macro selected from the list on the Right. The contents of the edit window will be cleared, and as each Keyword in the Macro is processed, it will be displayed. If no macro is selected, this button does nothing.
- Record

  Pressing this button places George Controller in macro record mode. The word Record in the button will turn red and will be shown in a larger font. From this point on, the majority of button presses will be added to the currently selected Macro. Pressing the Record button a second time will exit the record mode. Any changes will automatically be saved unless no macro was chosen, in which case anything recorded is lost unless New is first pressed.
- New

  Creates a new blank Macro, unless the Record mode is in effect, in which case the existing Macro is saved as a new macro. Using the Record mode, you can change an existing macro and save it as a unique macro or make a copy of an existing macro. You will be prompted for a new name.




- Rename

  Prompts for a new name for the currently selected Macro. If no Macro is selected, this button does nothing.
- Delete

  Deletes the currently selected Macro. No Macro will be selected after this operation, as the current Macro no longer exists. If no Macro is selected, this button does nothing.
- Up

  Move the currently selected Macro up the list. If no Macro is selected, this button does nothing.
- Down

  Move the currently selected Macro down the list. If no Macro is selected, this button does nothing.

## ShutDown Macro

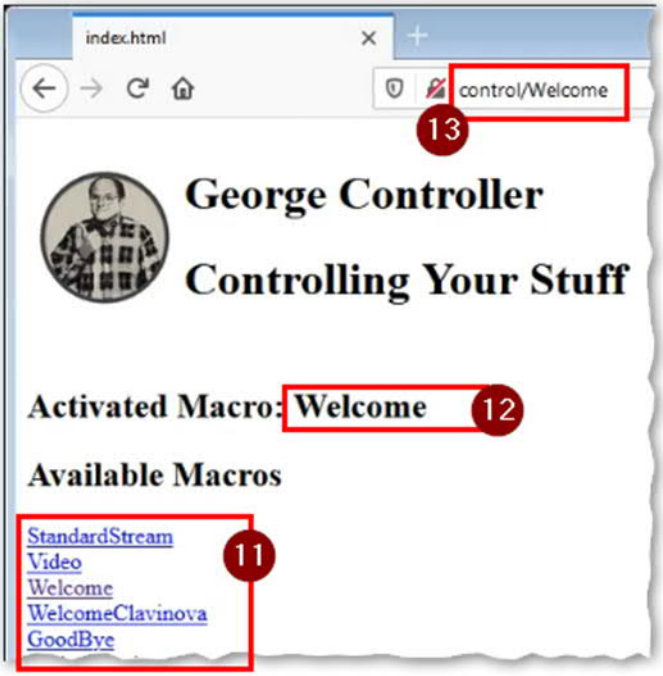
The GeorgeController.INI file allows a shutdown macro to be named. If the named Macro exists in the current setup, it will be run when George Controller is shutdown. The Shutdown macro can turn off the data projectors and retract the projector screen or other such functions.

If George Controller is shut down via a Windows Shutdown, the ShutDown Macro may not complete before windows terminate George Controller.

## WebServer

George Controller has available a simple web server that can be used to activate macros. Its primary function is to allow camera positions to be set from OBS studio. In that way, when a scene is selected in OBS studio, the cameras will automatically be placed in the correct positions.

The George Controller web server can be used from a standard web browser. As shown below

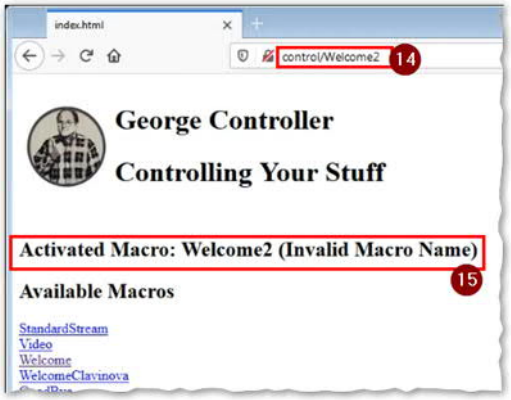



All available Macros are shown as clickable links 11. The last Macro selected from this interface is shown 12.

A macro can also be selected by placing it after the URL separated by a forward slash or backslash 13.

The URL is just the name of the computer running George Controller and must be on the same local network.

The image displayed on the Web page is only returned after macro playback is complete. If several camera presets are recalled in the Macro, playback may take several seconds as George Controller waits for each camera to reach the selected preset position.




If an invalid Macro name 14 is added to the URL, the following is returned 15.

## OBS Studio and Macros

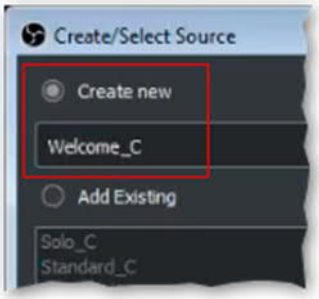
Macros are activated from OBS Studio by setting up the desired Macro as a browser source in OBS studio.

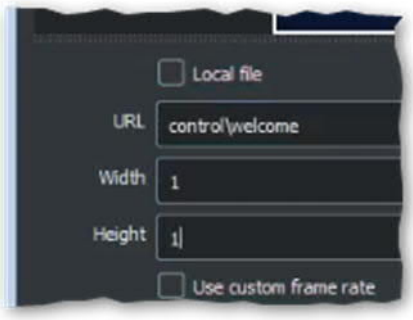
### Add Browser Source to Scene

In the selected Scene, add a source of the type Browser.


If the Macro has already been defined as a Browser source, select Add Existing and the Macro from the list. The Browser source setup is complete.

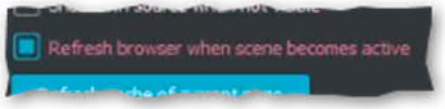
If the desired Macro has not been set up as a source, select Create new. To ease the reuse of Browser Sources, it is best to name the source the same as the Macro name in George Controller. Often macros are named the same as Scene they are created for, so add a _C suffix, the C standing for control.




The purpose of Browser Sources is to add the contents of a webpage to a video. In this use, we do not want the George Controller webpage display in our Video at any time, so the Width and Height are both set to one pixel.

The remaining settings can remain at default values except for Refresh Browser when Scene becomes active, which should be turned on. This setting is at the bottom, and the settings section of the dialogue needs to scroll up so it is visible.



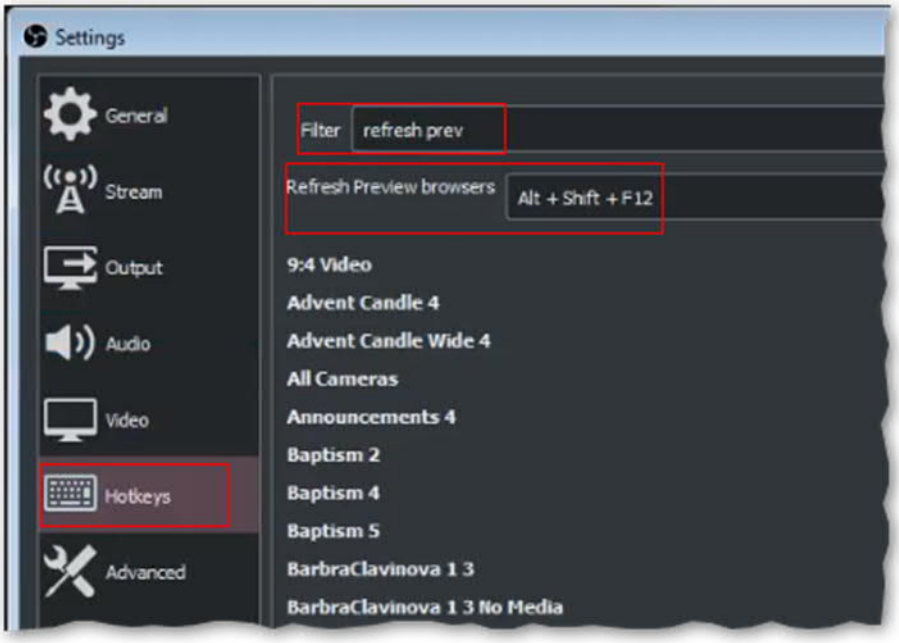

## Studio Mode

When using OBE Studio for streaming services, it is best to use Studio Mode. The Studio Mode allows you to confirm what will be shown before it is delivered. However, the Browsers sources are not refreshed in this mode, activating the camera preset. This arrangement prevents the preview from showing the Scene correctly. The cameras will also be adjusting when the Scene Transitions to the program window, showing the viewers rapidly panning camera, not the desired effect.

It is recommended the OBS script refresh-browser-specific.lua be downloaded and installed. It can be downloaded from the OBS forums at;

https://obsproject.com/forum/resources/reload-browser-in-preview-scene.1030/updates#resource-update-2904

If you need help installing the script, please check online for tutorials. After installation, the Refresh Preview browsers are assigned to a HotKey.




From the menubar, select File -> Settings, Select Hotkeys and then Filter on refresh as shown below, and set the HotKey

A used programmable POS keyboard with removable keycaps was connected to our OBS studio computer in our setup. The keyboard keys were all programmed to key combinations that were very unlikely to be used in any software applications, such as Alt + Shift + F12.

With this additional script, it is relatively easy to recall a scene and then update the camera positions.

| File | Add Video to Streamed Sunday Service.docx | | |
|---|---|---|---|
| Version | Date | Author | Notes |
| 1.0 | 2021-01-07 | Paul Verboom | Initial Writeup |
| 1.1 | 2021-01-08 | Paul Verboom | Added Webserver information. |