

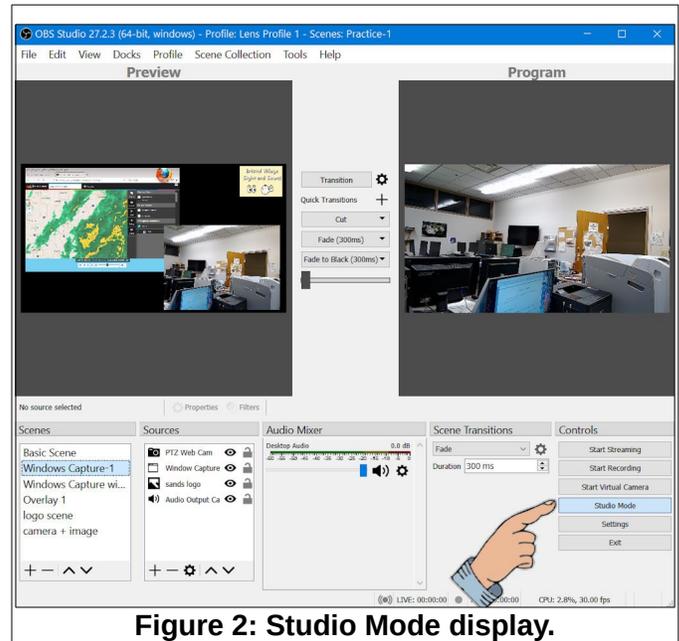
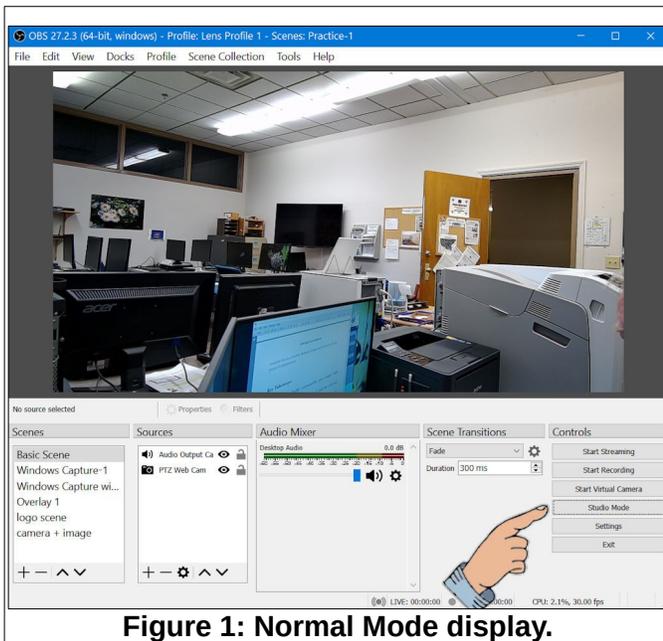
# Using OBS Studio

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## Introduction

**OBS Studio** is a free program that provides options for Recording or Streaming video from a variety of sources. OBS Studio is available in the BV Sound Booth on both the BV **Laptop** and **Tower** Computers. The OBS display can be toggled between **Normal Mode** and **Studio Mode**.





## Scenes and Sources

The two basic concepts to understand when using OBS Studio are **Scenes** (1) and **Sources** (2). Figure 3 shows the basic OBS display in **Studio Mode**.

**Scenes** can contain one or more **Sources**.

When the **Transition** button (3) is selected (See Figure 3) the **Scene** shown in the **Preview** window will be moved to the **Program** window.

**NOTE:** The **Program** window shows what will be recorded, or streamed, or sent to the BV Auditorium **Projector**.

When the **Transition** button is selected, the current transition style will be activated. The **Transition style** can be selected from a pop down list (See Figure 4).

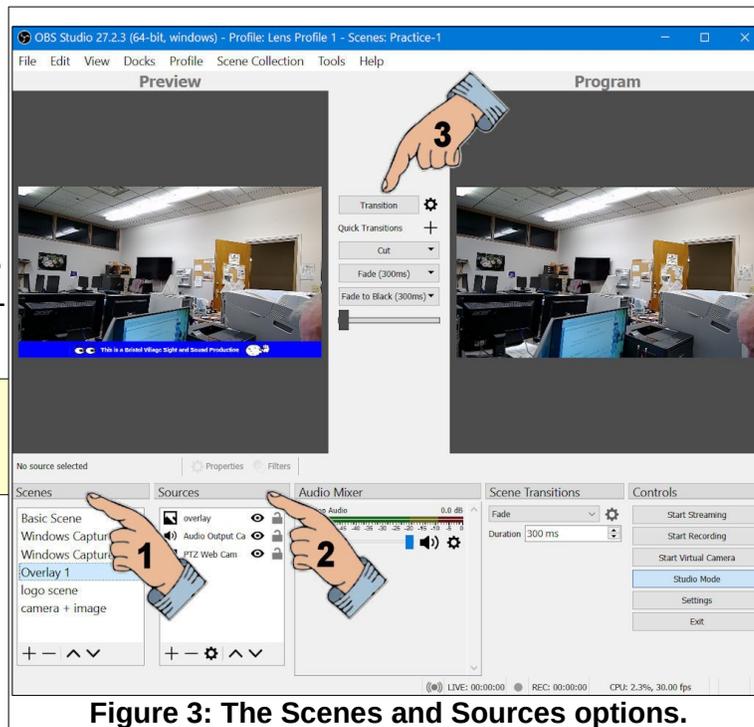


Figure 3: The Scenes and Sources options.

Several **Quick Transitions** can be added to the **Quick Transition list** by selecting the + button. However, when the **Transition** button (1) is selected, the current Scene Transitions style (2) will be used.

Figure 4 shows that several **Scenes** (3) have been added. When a **Scene** is selected, the **Sources** (4) for that Scene are listed.

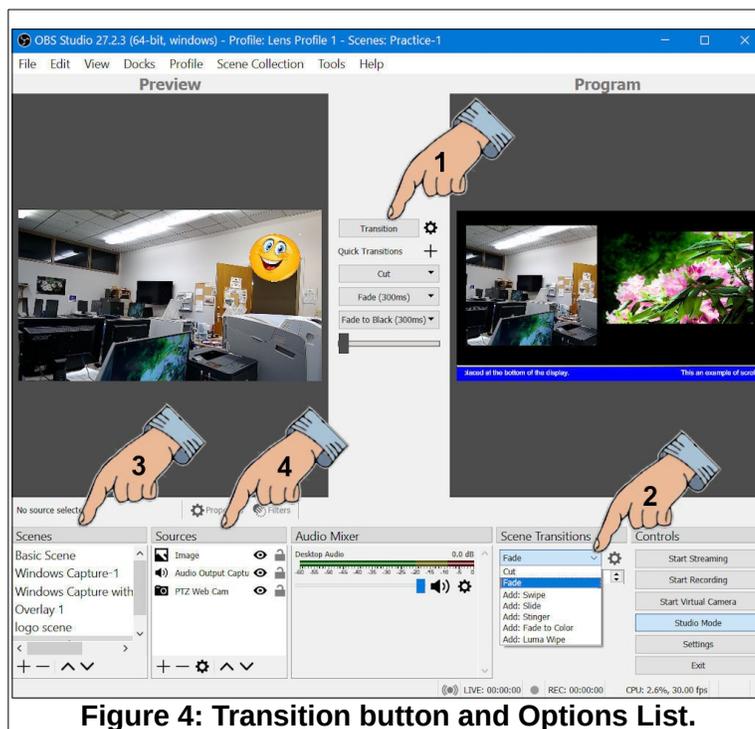


Figure 4: Transition button and Options List.



In Figure 5, the **Scene** named **Camera + Image** has been selected (1). Selecting a scene puts that scene in the **Preview** window. The **Source list** (4) shows that there are 3 sources in the **Camera + Image** scene. Each item in the **Source list** can be made visible or not by selecting the **eye** icon, or it can be locked or unlocked by selecting the **lock** icon (2).

In Figure 5 a source named **Image** has been moved to the top of the source list using the up or down tools and is selected. The image appears in the **Preview** window with a red box around it (3). This image box can be dragged around or resized.

Camera sources can also be resized and moved around. The **Program** window in Figure 5 shows a scene that has a camera source and a graphic image that have been resized and moved. That scene also has a blue rectangle graphic image, and a text source on top of the blue rectangle. Details about how to create a scene similar to this will be covered later in this document.

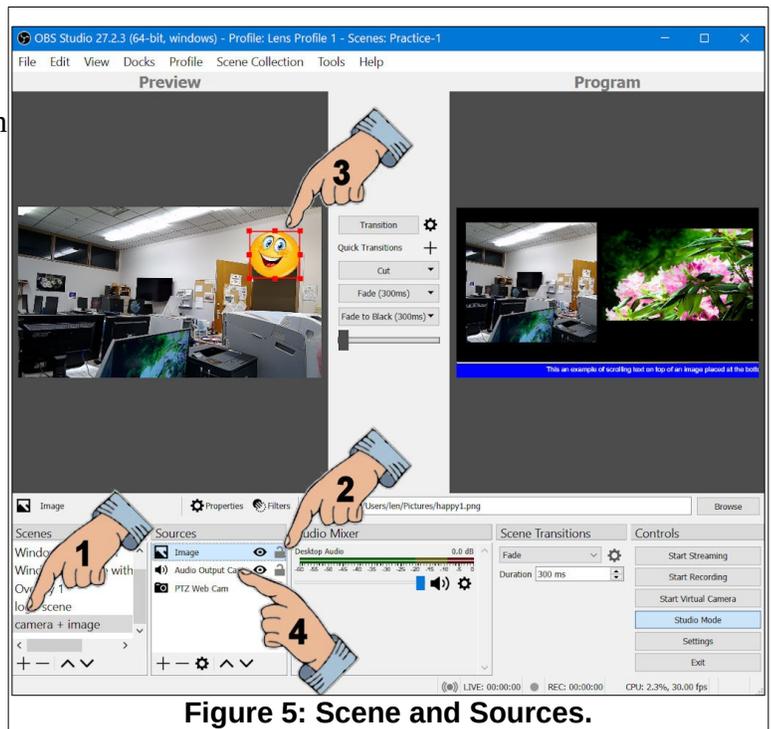


Figure 5: Scene and Sources.

The **Audio Mixer** list shows the audio sources for the current scene in the **Program** window. In Figure 5 there is only 1 audio source listed, but it's possible to add additional audio sources.

### Creating a New Scene Collection

OBS provides for developing **Scene Collections**. Each of the **Scene Collections** should have different names that relate to the function of the scenes in the collection. In this example, a **Scene Collection** will be created for the purpose of this tutorial.



Figure 6: Scene Collection menu option.

- ✓ From the OBS Studio **Menubar**, select **Scene Collection, New**.
- ✓ In the **Add Scene Collection** dialog box, enter **My Scene Collection**.

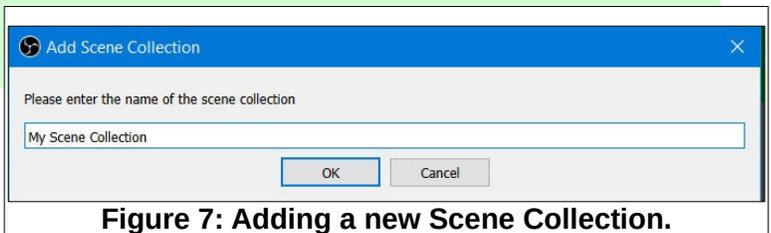


Figure 7: Adding a new Scene Collection.

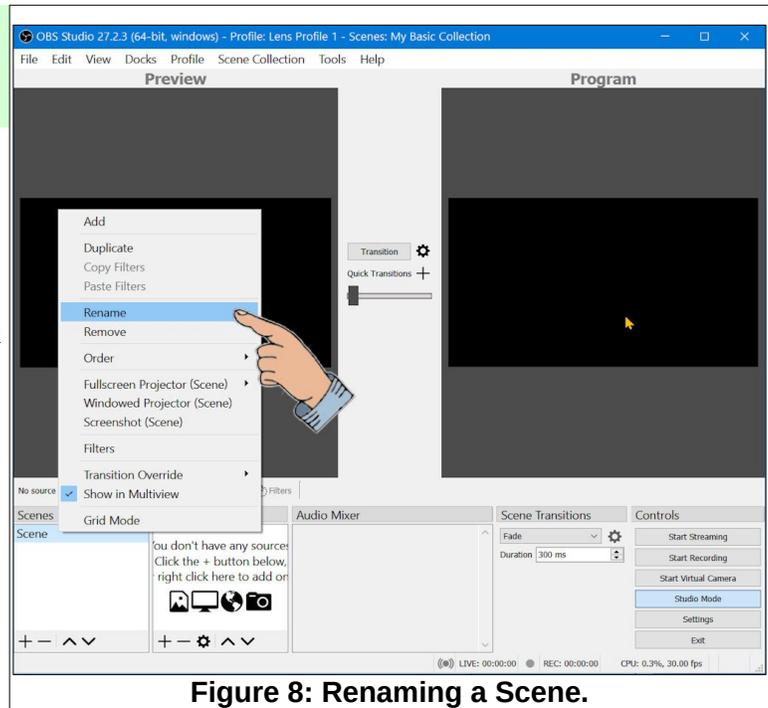
The new **Scene Collection** will have a new default scene named Scene. This scene will be renamed **My Scene Base**.



✓ **Right click** on the default scene and select **Rename** from the context menu.

✓ Name the scene **My Scene Base**.

Figure 7 shows the **Rename** option in use. As you add additional scenes, there will probably be a number of sources common to all of the scenes. Adding the common sources to a base scene will allow you to duplicate the scene so you will not have to insert these sources in each new scene.



**Figure 8: Renaming a Scene.**



## Adding Sources

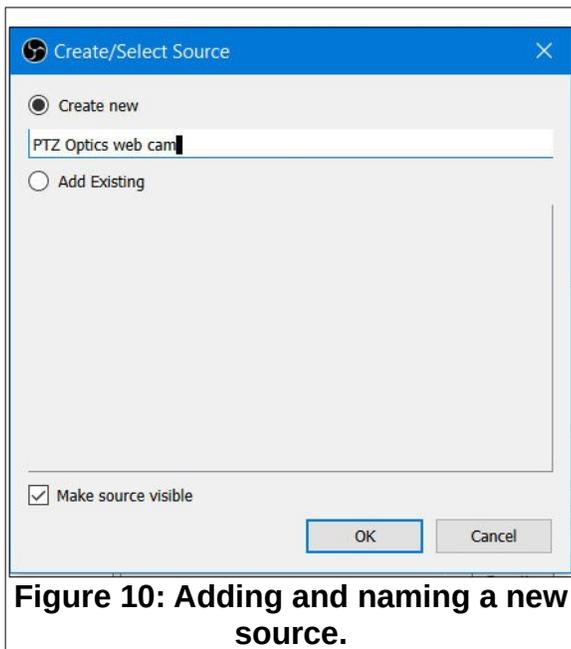
Each **Scene** can have one or more **Sources**. For this exercise, a **Video Capture Device** will be added.

**NOTE: Video Capture Devices** are connected to a computer either internally with an added video capture card, or through a USB adapter. The Laptop and Tower computers in the BV Sound Booth have HDMI video output from the VB800 video mixer **Program** connected to an HDMI to USB adapter that is then connected to a computer USB port. The network cameras in the BV Auditorium are not directly connected to a computer. However, they can be used as a **Media Source** in OBS rather than as a **Video Capture Device**. Cameras as Media Sources will be discussed later in this document.

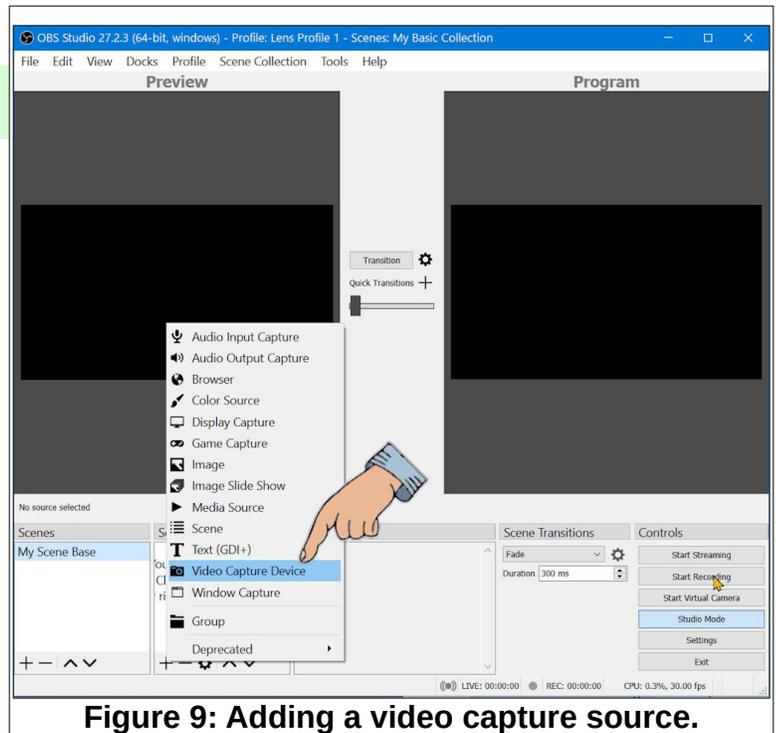
- ✓ Select the + tool in the **Sources** window.
- ✓ From the pop up list, select **Video Capture Device**.



- ✓ In the **Create/Select Source** dialog box, enter a name for the new source.

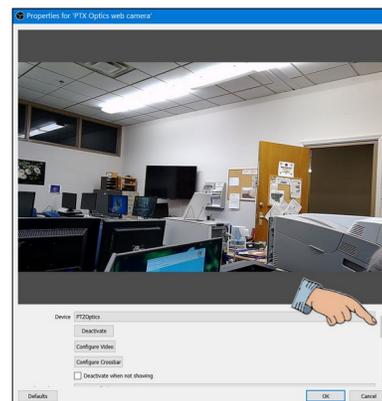


**Figure 10: Adding and naming a new source.**



**Figure 9: Adding a video capture source.**

Observe that the **Source Properties** dialog box has a scroll bar to reel additional options.



**Figure 11: The source properties dialog box.**



## Adding Audio Sources

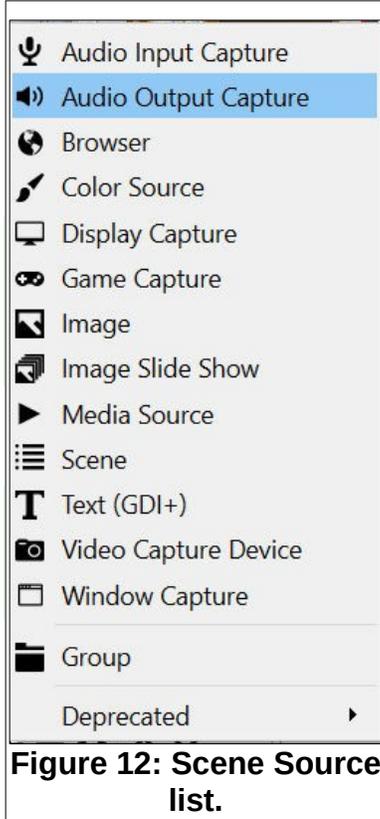


Figure 12: Scene Source list.

Next, an **Audio Source** will be added to the **My Scene Base Source** list. Possible audio sources include both input and output capture from the computer. **Audio Input Capture** devices might be microphones connected to the computer or other devices connected through the computer **line input**. **Audio Output Capture** uses the sounds that are normally going to the computer speakers.

- ✓ Select the + tool in the **Sources** window.
- ✓ From the pop up list, select **Audio Output Capture Device**.
- ✓ Name the new audio source **Computer Audio**.



To test the audio source a computer app that is making sound needs to be opened.

- ✓ Open a media player or web browser and play something.
- ✓ Press **Alt+Tab** to return to the OBS Studio window.
- ✓ With the **My Scene Base** selected, click on the **Transition** button.

Observe that the Audio Mixer displays a line indicating the volume of audio. The PTZ Optics web cam has a built in microphone and the sound from this mic was automatically added as an audio source.

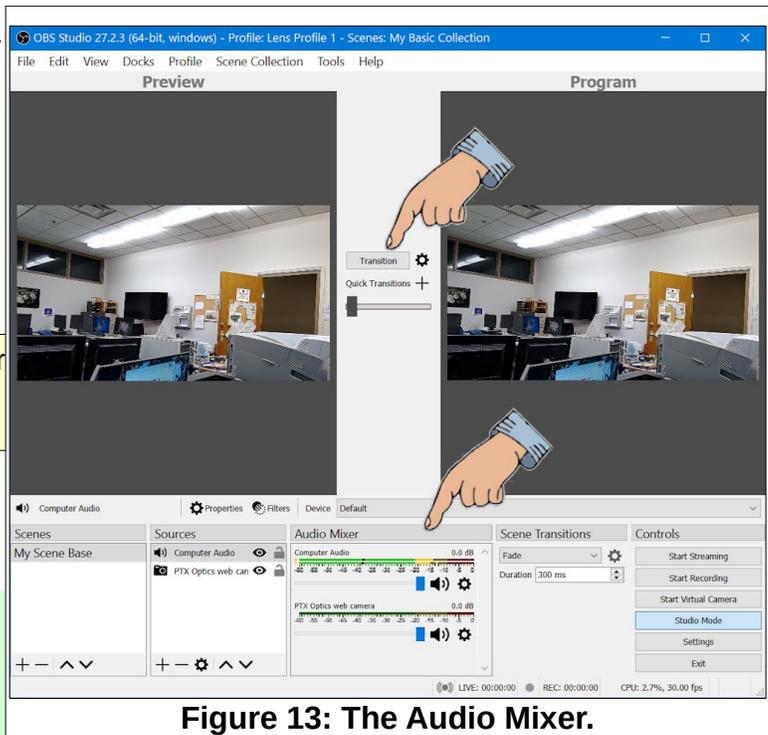


Figure 13: The Audio Mixer.

web cam has a built in microphone and the sound from this mic was automatically added as an audio source.

Selecting the speaker tool on the Audio Mixer devices list will toggle between **Live** and **Mute**.

The **My Scene Base** scene can be duplicated and then the duplicate scene can be modified without changing the original.

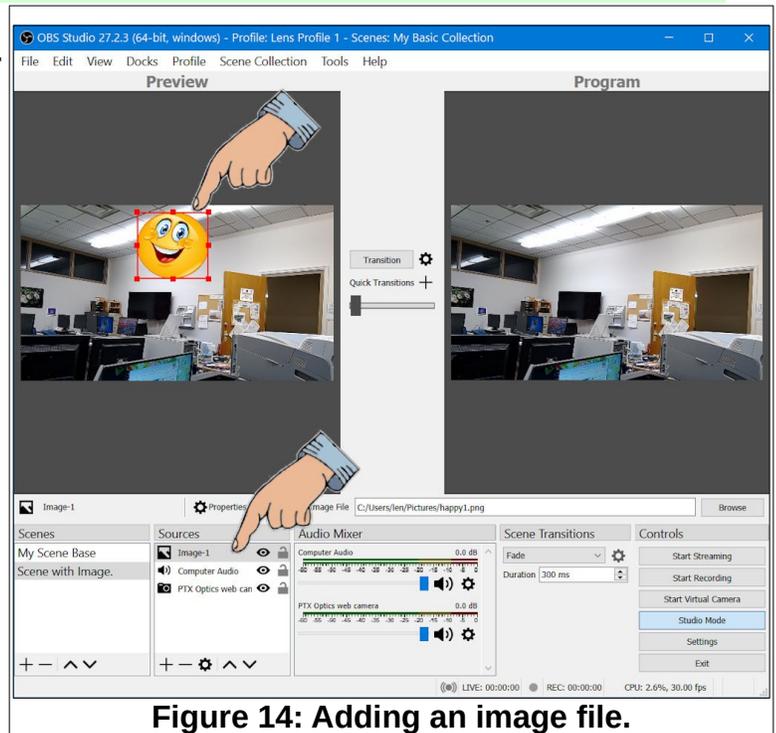
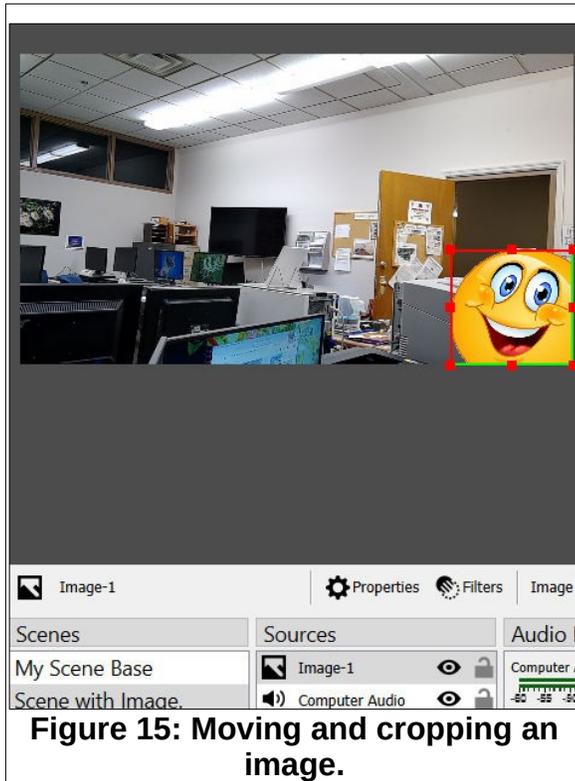
- ✓ Right click on **My Scene Base** and select **Duplicate**.
- ✓ Enter **Scene with Image** as the name for the new scene.
- ✓ Select **Scene with Image**.
- ✓ Select the + tool in the **Sources** window.
- ✓ From the pop up list, select **Image**.
- ✓ Name the new image **Image-1**.
- ✓ In the **Properties** dialog box, browse for an image file.





✓ Open the File and select **OK**.

The new image file will appear in the **Preview** window. A red box with grab points will appear around the new image. The grab points can be dragged to resize the image.



When you hold down the **Alt** key and then **drag** a grab point, you can **crop** the image.

The tools at the bottom of the **Scenes** and **Sources** windows include 5 tools. The **plus** and **minus** tools are used to add or remove



Scenes or Sources from the list. The **Gear** tool opens the **Properties** dialog box. The **Up** and **Down** arrow tools are used to move the selected Scene or Source up and down on the list. You can also **drag** Scenes or Sources up and down in the list.

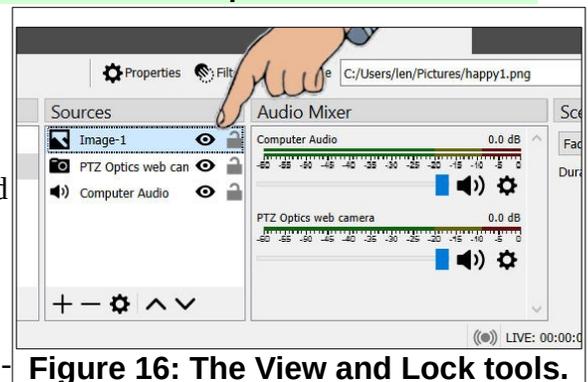
✓ In the **Scene with Image** scene, move the **PTZ Optics web cam** to the **top** of the Sources list.

Observe that this puts the selected Source on top of the other Sources. If the selected Source fills the screen, it will hide the other sources.

Observe that the Sources list has two tools on the right side of the list. The **Eye** tool will toggle visibility of the source on and off. The **Lock** tool will toggle the Lock option on and off. If a source is locked, it cannot be adjusted.

## Capturing an App Window

It is possible to use either the entire computer display, or a program Window (App), as a Source. In the next example, the Paint Shop Pro window will be added as a source.

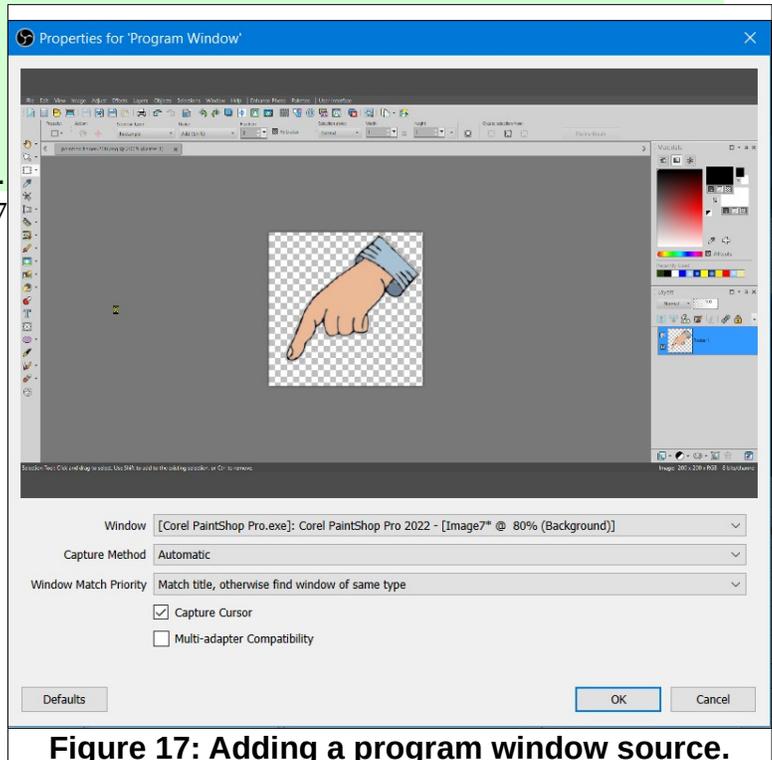


✓ Right click on **My Scene Base** and select **Duplicate**.

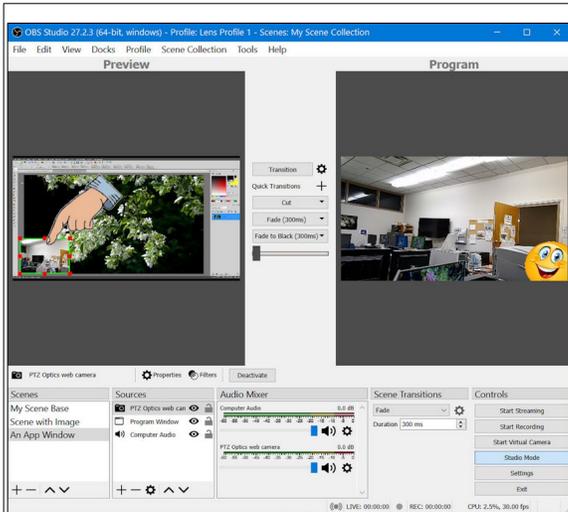


- ✓ Enter **An App Window** as the name for the new scene.
- ✓ Select **An App Window** Scene.
- ✓ Select the + tool in the **Sources** window.
- ✓ From the pop up list, select **Window Capture**.
- ✓ Name the new source **Program Window**.
- ✓ In the **Properties** dialog box, browse for an open program window and select **OK**.

The **An App Window** scene shown in Figure 17 has both the program window and web cam sources. The web cam source was moved to the top of the Sources list, and then moved and cropped to the location shown.



**Figure 17: Adding a program window source.**



**Figure 18: Program window plus camera.**

The program window plus camera is a good option for creating tutorial videos. The next section will show how to use OBS Studio to capture the entire Windows display.



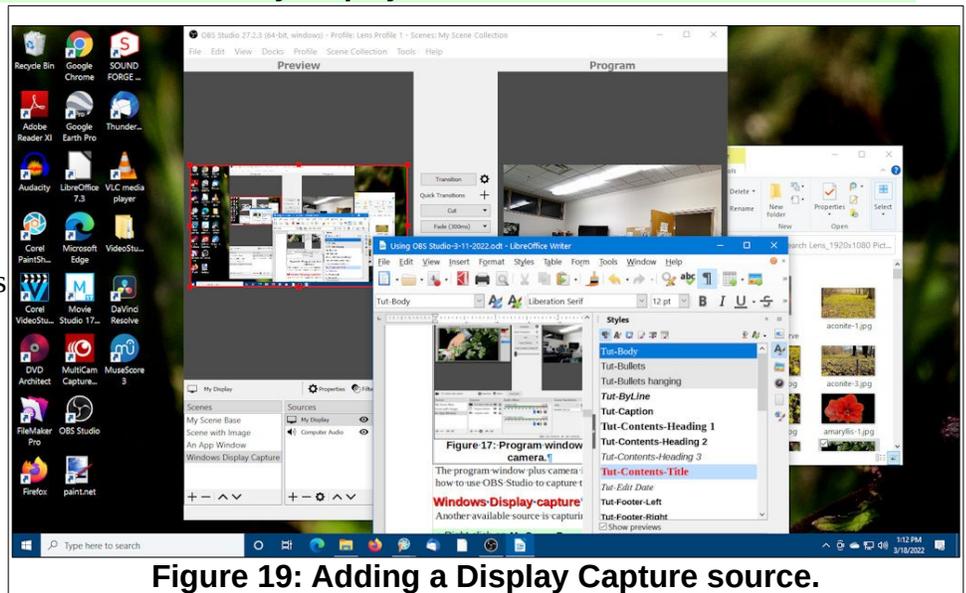
## Windows Display Capture

Another available source is capturing the entire Windows display.

- ✓ Right click on **My Scene Base** and select **Duplicate**.
- ✓ Enter **Windows Display Capture** as the name for the new scene.
- ✓ Select the **Windows Display Capture Scene**.
- ✓ Remove the web camera source from the scene.
- ✓ Select the **+** tool in the **Sources** window.
- ✓ Select **Display Capture** and name the source **My Display**.



Figure 19 shows a screen capture that has 3 different Windows, each one of which does not fill the entire display. Observe the difference between **Display Capture** and **Window Capture**. The Window Capture source only displays the contents of the selected App (or Program), while Display Capture includes everything currently open on the computer. If the different open Apps are not set to fill the display, all program windows are visible in the Windows Capture source.



**Figure 19: Adding a Display Capture source.**

If you are doing a production where you need to switch between Apps (or Programs), use **Display Capture**, set each app window to full screen, and use **Alt+Tab** to quickly switch to the desired App.



## Adding Network Camera Sources

Network cameras are *not* considered **Video Capture Devices**. Instead, they are actually **Media Sources**. To add a network camera as a source, the ip address of the camera must be known.

The BV Auditorium has 4 cameras connected through a local network switch. These cameras can be added as sources to an OBS Studio **scene**.

- ✓ Select the + tool in the **Scenes** window and name the new scene **View Camera 1**.
- ✓ Select the + tool in the **Sources** window.
- ✓ From the pop up list, select **Media Source**.
- ✓ Name the new source **Network Camera 1**
- ✓ In the **Properties for Network Camera 1** dialog box, toggle the **Local File** option **Off**.



**NOTE:** The ip address shown is for a camera in the BV Auditorium. If you are in a different location, you must enter the ip address appropriate for your location.

- ✓ In the Input box, enter **rtsp://192.168.1.92**.
- ✓ Follow the same procedure to add the other 3 cameras in the BV Auditorium.

The ip address for the BV Auditorium are:

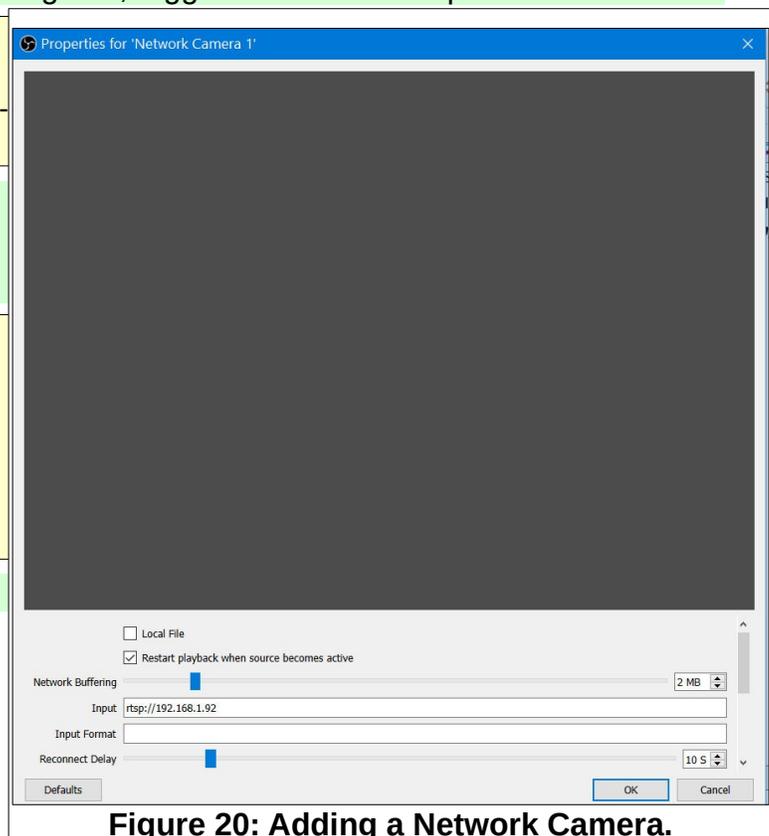
Camera 1 - 192.168.1.92

Camera 2 - 192.168.1.91

Camera 3 - 192.168.1.93

Camera 4 - 192.168.1.100

- ✓ Repeat this process to add each camera.



**Figure 20: Adding a Network Camera.**

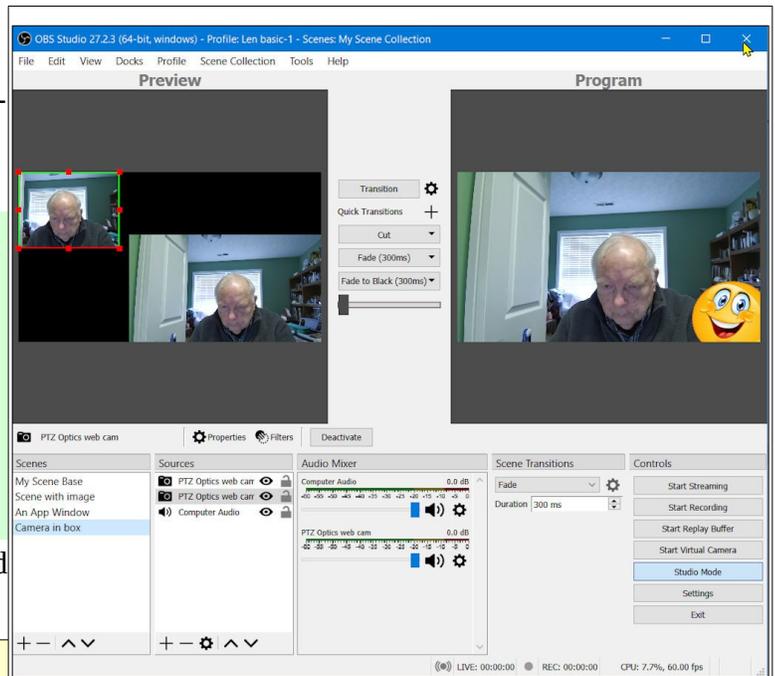


Remember that when you add a camera to a scene, it does not have to fill the screen. Figure 21 shows a scene with 2 camera sources. (Actually, the same camera was used as two different sources in this example.)

- ✓ Duplicate **My Scene Base** and name the new Scene **Camera in box**.
- ✓ Add a second camera source to the scene.
- ✓ Resize one of the cameras as shown in Figure 21.
- ✓ Resize and Crop the second camera source as shown in Figure 21.

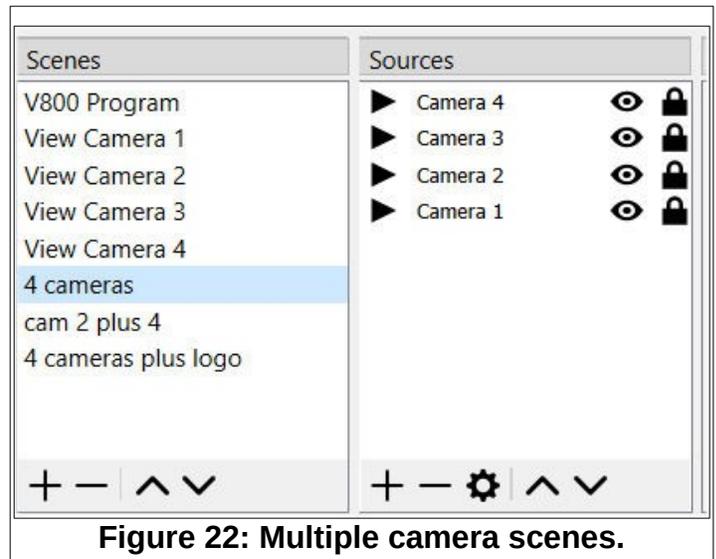
Figure 21 shows the camera sources resized and dragged to new locations.

**NOTE:** To **Crop** a **source**, hold the **Alt** key down while dragging a grab point.



**Figure 21: A multi camera scene.**

In the BV Auditorium, one or more of the four camera sources can be arranged into a single scene. Figure 22 shows several scenes using different combinations of the 4 Auditorium cameras. The selected scene uses all 4 cameras.



**Figure 22: Multiple camera scenes.**



## Adding Text Sources to Scenes

Another source option for scenes is text.

- ✓ Add a new scene to the scenes list.
- ✓ Name the new scene **A Text Scene**.
- ✓ Add **Text** source to the new scene.
- ✓ Name the text source **Title Text**.
- ✓ In the **Properties** dialog box, enter **Some Title Text**.

Observe that the scroll bar on the right side of the **Properties** dialog box provides additional options.

Figure 23 shows the Color, Alignment, and Outline properties for the example.

- ✓ Set the text **Properties** as desired.

The **Background Color** and **Opacity** can be used to control the appearance of the text source.

When a source is selected, it will have a red box around it. As with earlier sources, the grab points can be used to resize and crop the source.

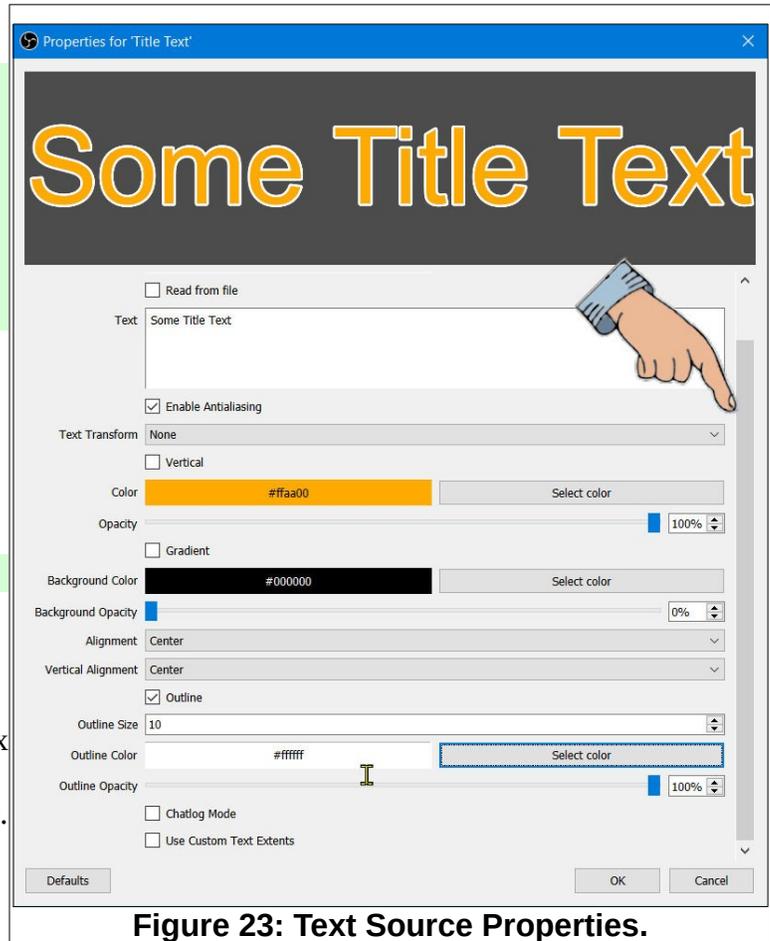


Figure 23: Text Source Properties.

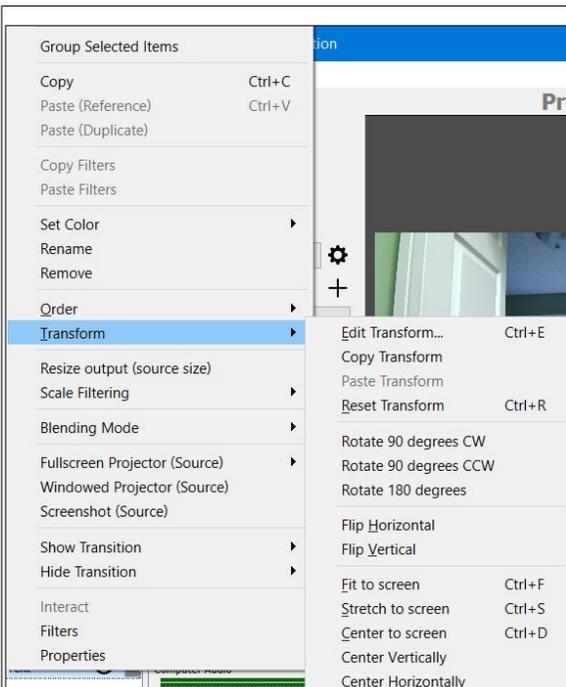


Figure 24: Source Transform options.

If you **right click** on a **Source** in the **Source List**, a **context menu** will appear that provides a number of options for modifying the source. Figure 24 shows the **Transform** options that can be applied to the selected source.

Also observe that when a text source is selected, there are options for editing (from right to left) the Text, Color, Font, and Filters. The Properties option will reopen the Properties dialog box. (see Figure 25)



Figure 25 shows the location of the text options.

The **Filters** option provide additional ways to modify sources. In the **Text** source, one of the **Filter** options is **Scroll**. This makes it fairly easy to add scrolling text to a scene.

Let's add a new Text source and then add horizontal scrolling to the text.

- ✓ With the **A Text Scene** selected, add a new **Text** source.
- ✓ Name the new source **Scrolling Text**.
- ✓ Add **This text will scroll across the display**.
- ✓ Set the **Horizontal Speed** to **300**.
- ✓ **Drag** the new text source to the bottom of the display.

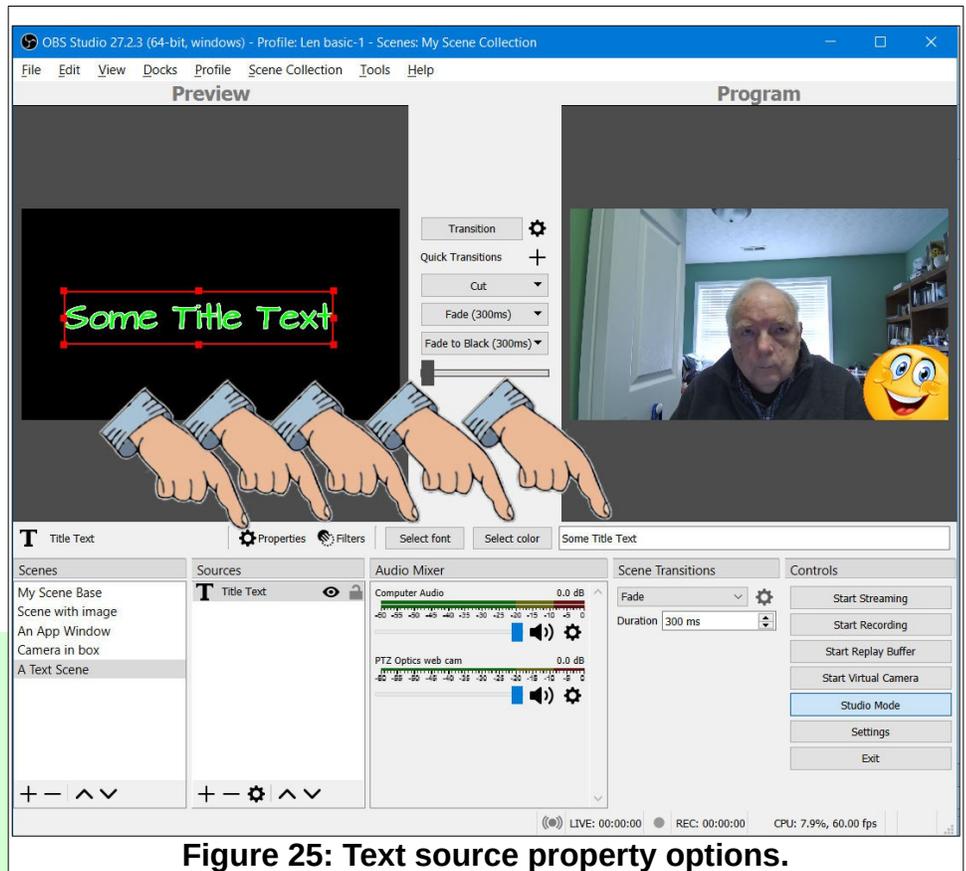


Figure 25: Text source property options.

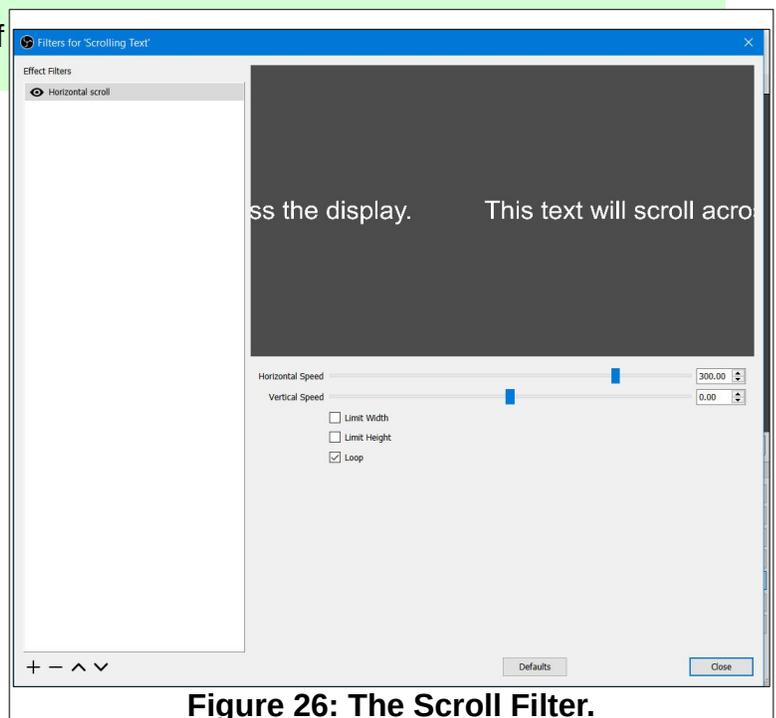


Figure 26: The Scroll Filter.



## ✓ Adjust the text properties as desired.

So far, the text sources have been placed on a blank scene. However, it is possible to have the text share a scene with other sources such as Images, Color backgrounds, or cameras.

Figure 27 has a background color source added, a 100% opaque background color for the scrolling text, and some additional changes have been made to the title text.

You should take some time to play around with the various text source options.

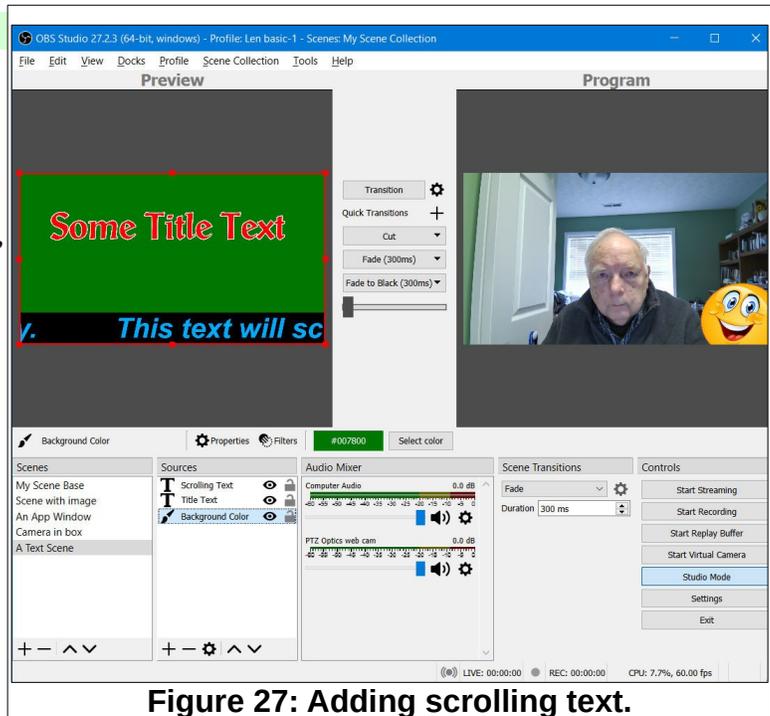


Figure 27: Adding scrolling text.

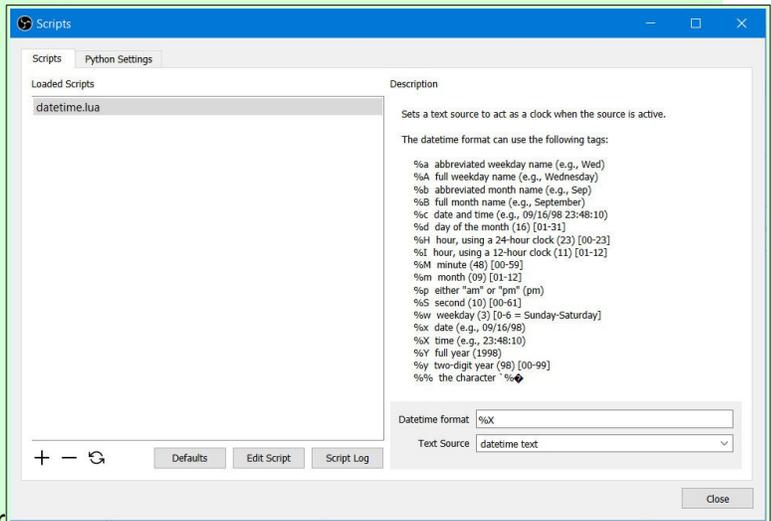
## Adding Date and Time Text to OBS

Adding date and time text to an **OBS Scene** requires the use of a **script**. The text for the required script has been downloaded from instructions found in a YouTube video.

<https://www.youtube.com/watch?v=SgqT58peTQs>

The required script was saved as a **txt** file and then a copy was renamed with **lua** instead of **txt** as the file name extension. A copy of the script text is found at the end of this document.

- ✓ Create an **OBS Scene Collection** (in this example the new scene collection was named **datetime scene**).
- ✓ In the new **Scene Collection** rename the default scene to **Scene Base**. In the Scene Base, add **Sources** that will be used in all new scenes, **background color**, **video sources**, **audio sources**, etc.
- ✓ Duplicate the **Scene Base** and name the new scene **datetime scene**.
- ✓ In the **datetime scene**, add a **text source** named **datetime text**.
- ✓ In the **datetime text** source add some dummy text (the this example **date goes here** was used as the dummy text).
- ✓ Adjust the size, **color**, **location** and other **Properties** of the dummy text.
- ✓ In OBS, go to **Tools, Scripts** select the + tool and add the **datetime.lua** script.
- ✓ In the **Scripts** Properties dialog box, enter **datetime text** as the source and select **Close**.



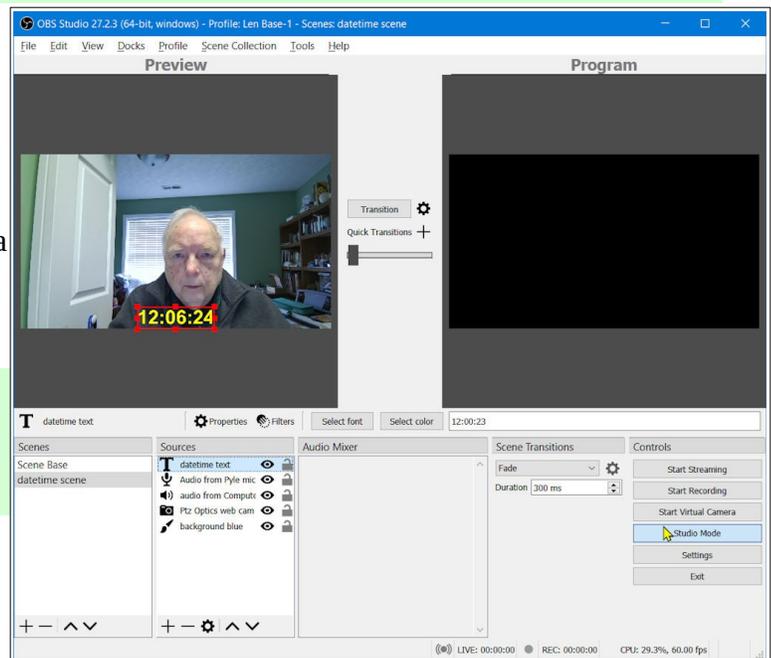
In the OBS Preview window, verify that the datetime text source contains the current time.

The default format for the datetime.lua script is %X. This format uses a 24 hour digital clock that shows hour, minutes, seconds.

You will probably want to change this. Here is a format variation to try.

**%l:%M %p - %A - %B -%d, %Y**

- ✓ In OBS, select **Tools, Scripts**, and in the Properties dialog box enter the above text in the **Datetime format** box. And select Close.

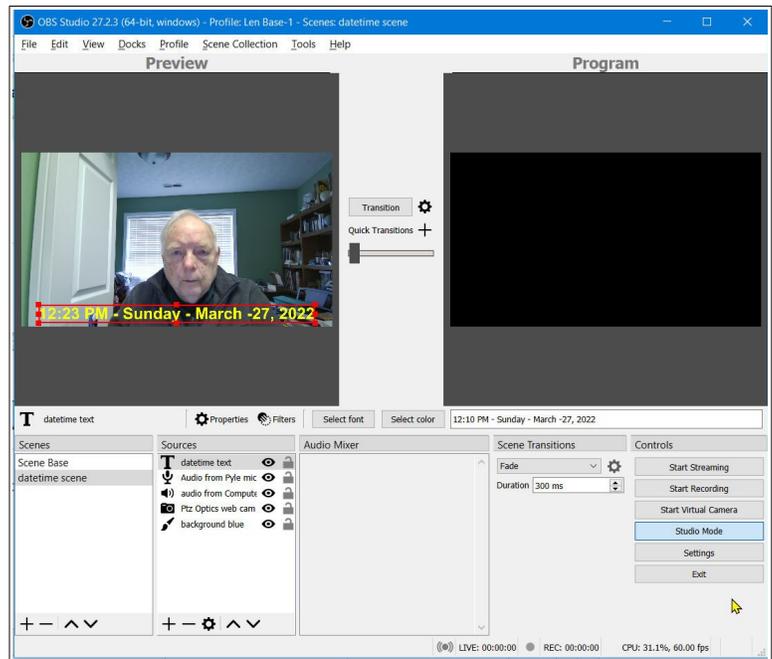




You should now see the modified Text Source in the Preview window.

The datetime format can use the following tags:

- %a abbreviated weekday name (e.g., Wed)
- %A full weekday name (e.g., Wednesday)
- %b abbreviated month name (e.g., Sep)
- %B full month name (e.g., September)
- %c date and time (e.g., 09/16/98 23:48:10)
- %d day of the month (16) [01-31]
- %H hour, using a 24-hour clock (23) [00-23]
- %I hour, using a 12-hour clock (11) [01-12]
- %M minute (48) [00-59]
- %m month (09) [01-12]
- %p either "am" or "pm" (pm)
- %S second (10) [00-61]
- %w weekday (3) [0-6 = Sunday-Saturday]
- %x date (e.g., 09/16/98)
- %X time (e.g., 23:48:10)
- %Y full year (1998)
- %y two-digit year (98) [00-99]
- %% the character ` %`



`%I:%M %p - %A - %B -%d, %Y`

Check the tags in the above line with the text shown in the screen shot. Note that each tag starts with **%**. **Spaces** and **-** are added between the tags to get the result shown. Here is an alternative **Datetime format** text.

`%A, %B %d, %Y ☺`

To change the **Datetime format** properties, open **Tools, Scripts** and modify the **tags**.



## The datetime script text

---

```
--[[ OBS Studio datetime script
```

This script transforms a text source into a digital clock. The datetime format is configurable and uses the same syntax than the Lua `os.date()` call.

```
]]
```

```
obs                = obslua
source_name        = ""
datetime_format    = ""
```

```
activated          = false
```

```
-- Function to set the time text
```

```
function set_datetime_text(source, format)
    local text = os.date(format)
    local settings = obs.obs_data_create()

    obs.obs_data_set_string(settings, "text", text)
    obs.obs_source_update(source, settings)
    obs.obs_data_release(settings)
end
```

```
function timer_callback()
    local source = obs.obs_get_source_by_name(source_name)
    if source ~= nil then
        set_datetime_text(source, datetime_format)
        obs.obs_source_release(source)
    end
end
```

```
end
```

```
function activate(activating)
    if activated == activating then
        return
    end
```

```
    activated = activating
```

```
    if activating then
        obs.timer_add(timer_callback, 1000)
```

```
    else
        obs.timer_remove(timer_callback)
```

```
    end
```

```
end
```

```
-- Called when a source is activated/deactivated
```

```
function activate_signal(cd, activating)
    local source = obs.calldata_source(cd, "source")
    if source ~= nil then
```



```

        local name = obs.obs_source_get_name(source)
        if (name == source_name) then
            activate(activating)
        end
    end
end

function source_activated(cd)
    activate_signal(cd, true)
end

function source_deactivated(cd)
    activate_signal(cd, false)
end

function reset()
    activate(false)
    local source = obs.obs_get_source_by_name(source_name)
    if source ~= nil then
        local active = obs.obs_source_showing(source)
        obs.obs_source_release(source)
        activate(active)
    end
end

-----

function script_description()
    return "Sets a text source to act as a clock when the source is active.\
\
The datetime format can use the following tags:\
\
%a abbreviated weekday name (e.g., Wed)\
%A full weekday name (e.g., Wednesday)\
%b abbreviated month name (e.g., Sep)\
%B full month name (e.g., September)\
%c date and time (e.g., 09/16/98 23:48:10)\
%d day of the month (16) [01-31]\
%H hour, using a 24-hour clock (23) [00-23]\
%I hour, using a 12-hour clock (11) [01-12]\
%M minute (48) [00-59]\
%m month (09) [01-12]\
%p either \"am\" or \"pm\" (pm)\
%S second (10) [00-61]\
%w weekday (3) [0-6 = Sunday-Saturday]\
%x date (e.g., 09/16/98)\
%X time (e.g., 23:48:10)\
%Y full year (1998)\
%y two-digit year (98) [00-99]\
%% the character \"%\""
end

function script_properties()
    local props = obs.obs_properties_create()

    obs.obs_properties_add_text(props, "format", "Datetime format",
obs.OBS_TEXT_DEFAULT)

```



```
        local p = obs.obs_properties_add_list(props, "source", "Text Source",
obs.OBS_COMBO_TYPE_EDITABLE, obs.OBS_COMBO_FORMAT_STRING)
        local sources = obs.obs_enum_sources()
        if sources ~= nil then
            for _, source in ipairs(sources) do
                source_id = obs.obs_source_get_id(source)
                if source_id == "text_gdiplus" or source_id ==
"text_ft2_source" then
                    local name = obs.obs_source_get_name(source)
                    obs.obs_property_list_add_string(p, name, name)
                end
            end
        end
        obs.source_list_release(sources)

        return props
end

function script_defaults(settings)
    obs.obs_data_set_default_string(settings, "format", "%X")
end

function script_update(settings)
    activate(false)

    source_name = obs.obs_data_get_string(settings, "source")
    datetime_format = obs.obs_data_get_string(settings, "format")

    reset()
end

function script_load(settings)
    local sh = obs.obs_get_signal_handler()
    obs.signal_handler_connect(sh, "source_show", source_activated)
    obs.signal_handler_connect(sh, "source_hide", source_deactivated)
end
```

---



## The Multiview Window

Figure 28 shows that a **Multiview** window has been added to the display by selecting **View, Multiview (Windowed)**.

There are 5 scenes in the Scenes list shown in Figure 28. The **Multiview Window** shows the available scenes below the Preview and Program windows. If you select a scene in the Multiview window, it will be moved to Preview.

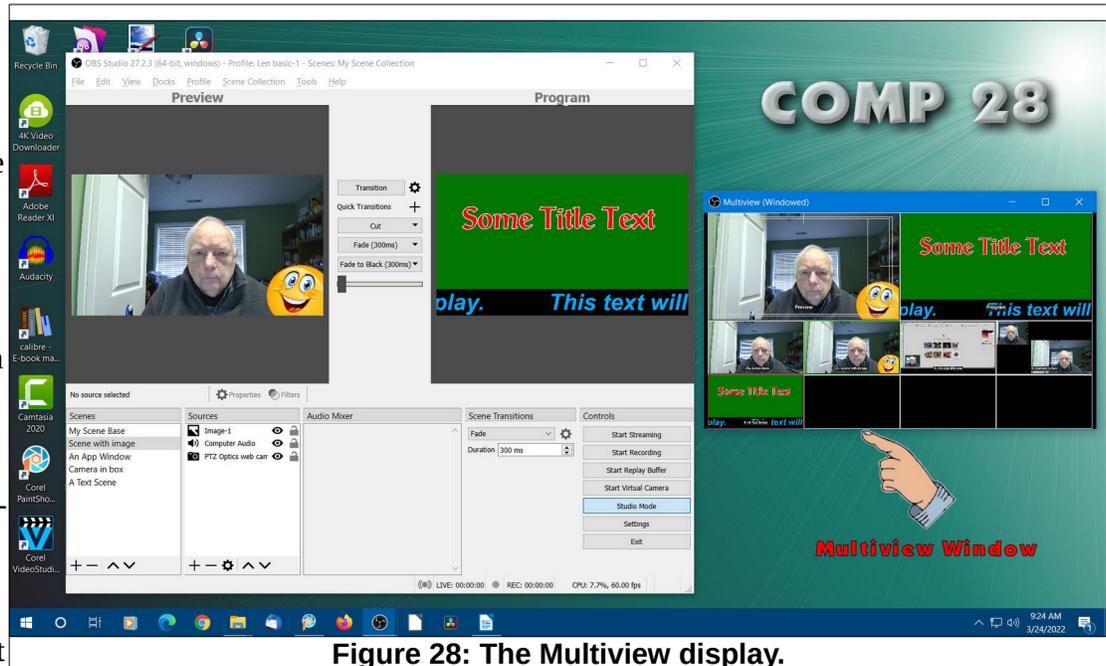


Figure 28: The Multiview display.

**NOTE:** The **Multiview Window** default is to show **8** scenes. There are other Multiview Window display options found in **Settings**.

The Multiview Window provides a quick way to switch between scenes. It is possible to define Hot Keys for Transitions between the Preview and Program windows. (More about Hot Keys later in this document.)

## Saving Your Scenes

It is possible to create several different **Scene Collections**. Figure 29 shows the Scene Collection drop down menu.

Observe that the **Title Bar** in Figure 29 shows the name of the currently active scene collection.

The lower part of the menu shows the list of scenes that have been saved on the current computer. The upper part of the menu shows the Scene Collection options.

To save a scene collection, from the Menu Bar, select **Scene Collection, Export**.

It is possible to **Export** a scene collection and **Import** it on a different computer. Keep in mind that if you export scene collections to different computers, the sources in an exported collection must be available on all computers.

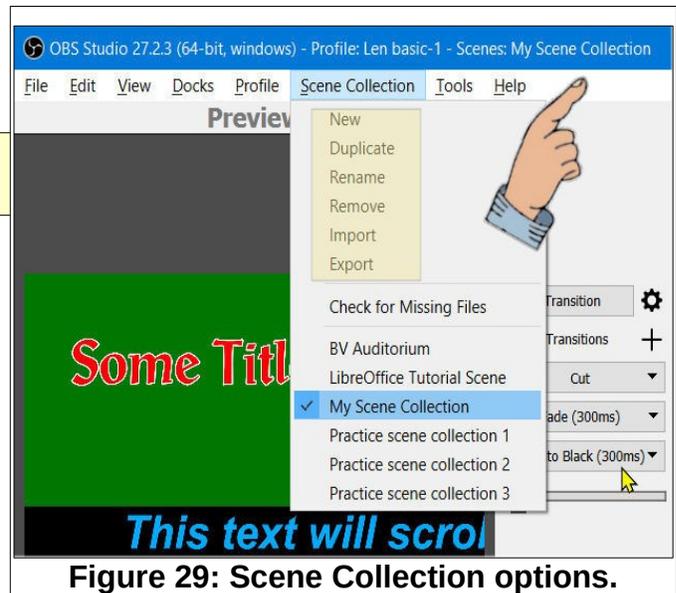


Figure 29: Scene Collection options.



## Using Hot Keys

Hot Keys provide a quick way to execute OBS functions.

- ✓ Select **Settings** and then select **Hotkeys**.

Figure 30 shows the Hotkeys dialog box. In this example, the Insert key was set as the Hotkey for starting and stopping recording.

Scroll down the dialog box to see additional Hotkey options. Hotkeys can be set to switch to individual scenes.

**NOTE:** When **Studio Mode** is in use, pressing a Hotkey for switching to a scene will place that scene in the **Preview** window. If Studio Mode is **not in use**, pressing a Hotkey for switching to a scene will move the scene directly to the **Record** window.

If you are using OBS Studio to record Apps (Programs), avoid using keys that are commonly used in the application as Hotkeys.

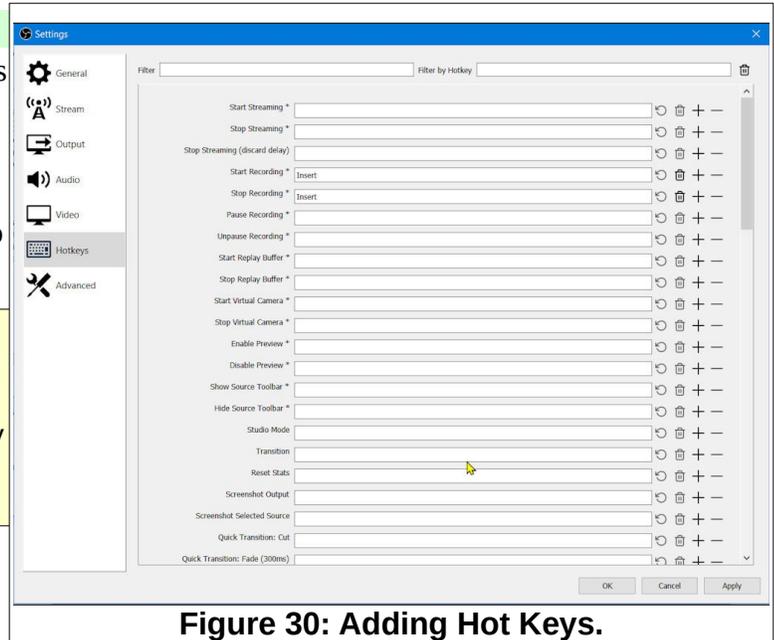


Figure 30: Adding Hot Keys.

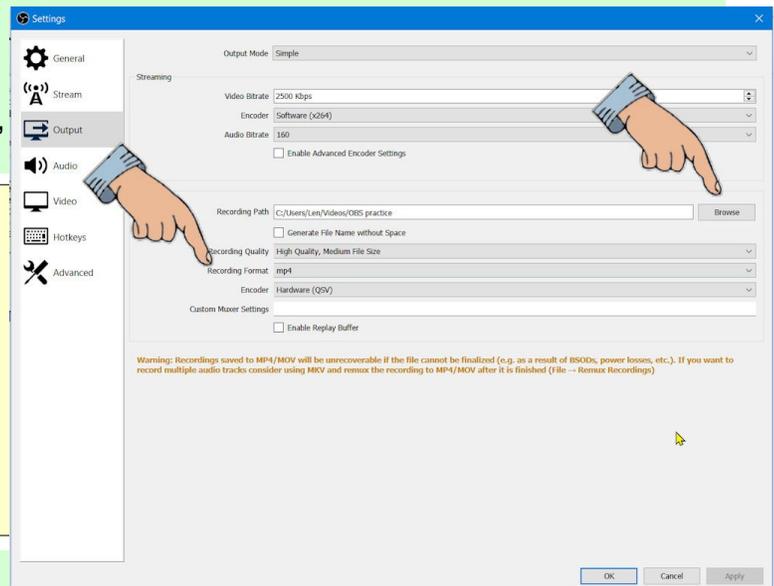
## Recording with OBS Studio

- ✓ Select **Settings**, **Output**.
- ✓ In the **Settings** dialog box, select the desired **Recording Format**.
- ✓ In the **Settings** dialog box, select **Browse**, and set the path for saving the file.

**NOTE:** A common video file format is **mp4**, and this is one of the options available in OBS. If you select mp4, you will see a warning message. If OBS crashes during recording, mp4 files will not complete. If MKV is selected and OBS is interrupted the file will be safe, Some video editors and players can open MKV files. If an MKV file is saved, and an mp4 file is needed, select **File Remux Recordings** to convert from MKV to mp4.

- ✓ Use the **Start Recording** control to start recording. During recording this control will change to **Stop Recording**.

Adding a Hotkey for starting and stopping recording is a useful trick.



*This document was edited Tuesday, April 5, 2022.*