

# Designing a Church Video System

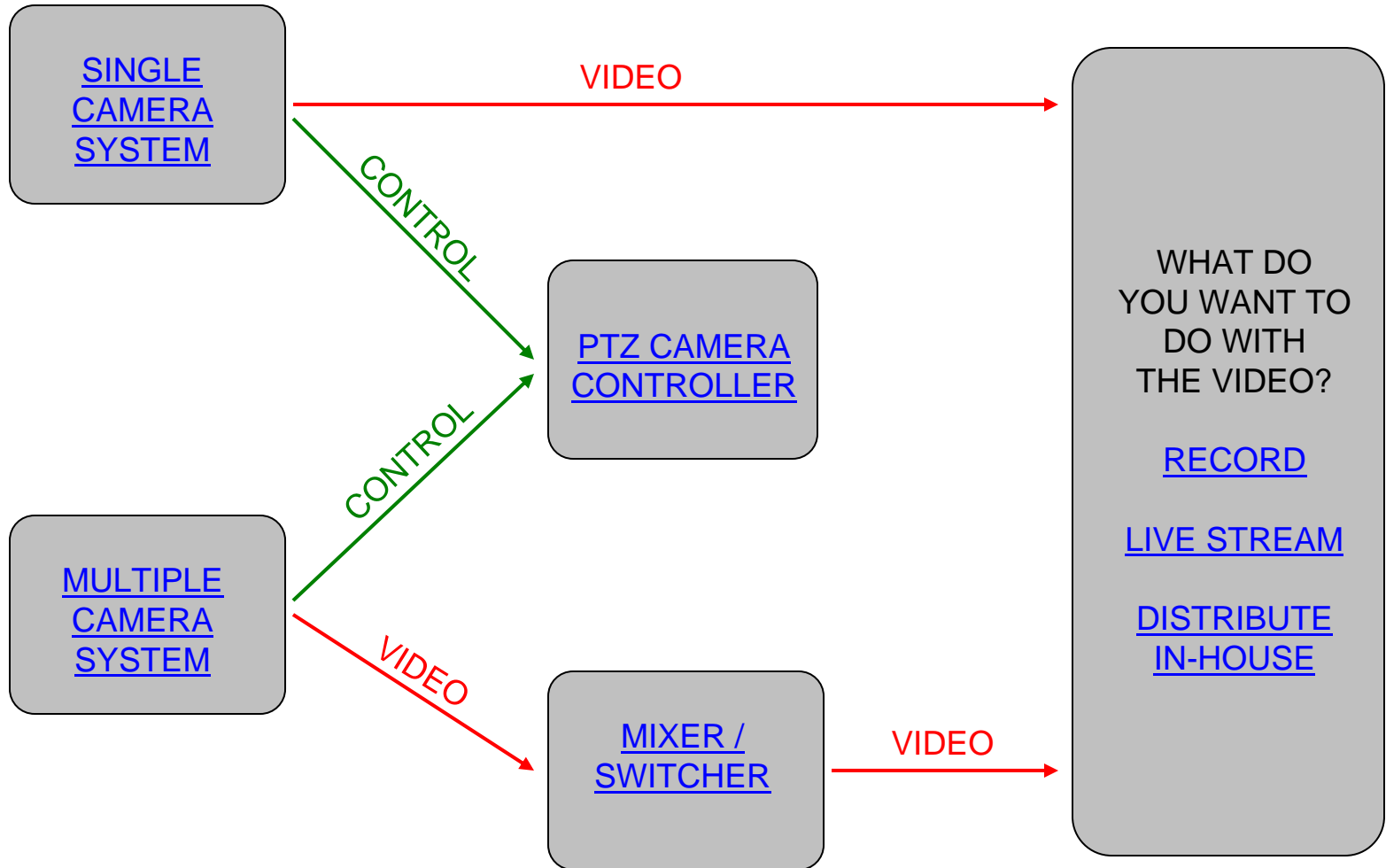
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This guide will help you understand the basic components of a church video system, the things to consider to determine the best solution to meet your needs and provide product recommendations and links to these products on our website [www.goelectronic.com](http://www.goelectronic.com).

For additional assistance in assembling a video system for your house of worship, [CONTACT US](#) with your specifications and requirements.

# Basic Workflow of Video System



# CAMERAS

When selecting a camera for your church there are a few decisions to be made:

- Standard Definition vs High Definition

Obviously a high definition camera would be preferred as it provides better picture quality. However, HD is still cost prohibitive for some.

- Single vs Multiple Camera System

A single camera system is often adequate given the PTZ capabilities of the recommended cameras.

However, for larger sanctuaries, multiple cameras may be needed in order to adequately capture an event. Or, you may want multiple cameras simply to capture more angles (e.g., a camera positioned on a side wall closer to the front of the sanctuary can capture the stage as well as the congregation).

## Standard Definition Cameras

Our recommended standard definition PTZ cameras offer good resolution, low-light performance and zoom capabilities. Both cameras offer s-video and composite video outputs.



- ❖ [Sony EVI-D80](#) - “Best Value”

- ❖ [Sony EVI-D90](#) - Offers superior zoom capabilities, wider angle of view and Wide-D technology for improving picture in highlight/shadow situations.

## High Definition Cameras

- ❖ [Sony SRG-300H](#) - Offers superior zoom and wider angle of view, but poorer low light capabilities. However, HDMI video output is limited in distance cable can be run without using an extender.

- ❖ [Go Electronic GOHD400](#) - “Best Value” - Incorporates some of the best feature of several of the existing HD PTZ cameras at a more affordable price: 20x zoom, excellent low-light sensitivity, image-flip, mirror image-flip, on-screen menu and more. Select from HD-SDI and DVI/HDMI outputs or use both simultaneously.

# PTZ CONTROLLER

There are several benefits to using PTZ cameras with a joystick controller in a church:

- One person can control PTZ functions of multiple cameras from a remote location using one joystick controller (eliminating the need for multiple volunteers to “man” video cameras).
- Cameras can be mounted on the wall or on the ceiling, out of the way of the congregation.
- The joystick controller is more reliable than the IR remote that comes with the PTZ camera as it does not rely on being within line-of-sight and within close proximity of the camera.

## GO ELECTRONIC RCC4000

With only a few PTZ controllers to choose from, the [Go Electronic RCC4000](#) is one of the most budget-friendly options.

- ❖ Control up to six cameras with one controller. Use short-cut keys for easy camera selection.
- ❖ Set and recall camera preset positions for ease of operation. Use short-cut keys to recall four preset positions.
- ❖ Use VISCA cable or Cat5 cable to connect camera to controller and camera to camera.
- ❖ Select from three speed ranges (low, medium and high) for pan and tilt control. The low speed range is best in applications where the camera is kept zoomed in tight and conversely the high speed range is best where the camera is zoomed out. The selectable speed range also gives new users the ability to start operating the controller at a slower speed and then increase the speed as they become more comfortable with the joystick.
- ❖ If controlling multiple cameras, cameras must be installed in a daisy-chain configuration for control (camera 1 connects to controller, camera 2 connects to camera 1, camera 3 connects to camera 2, and so on).



# MIXERS

When selecting a mixer for a multi-camera system there are several considerations:

- Required I/Os

What type of video inputs do you require (s-video, composite video, SDI, HDMI)?  
How many inputs do you need?

What type and how many outputs do you require?

Do you need to mix audio with the video?

- Flexibility for Expansion or Upgrading

Do you plan to add more cameras to your system in the future?

Do you think you might upgrade from standard definition to high definition?

What do you want to do with the “mixed” broadcast now or in the future (e.g., record, distribute in-house, stream online)?

## Software-Based Mixer

A software-based mixer has several benefits:

- More economical
- More flexible - Purchase video capture devices for your specific cameras, easily add more camera/capture devices as needed
- Multi-functional – Facilitates live streaming, recording and in-house distribution



## Wirecast

Wirecast software was primarily created as a live streaming solution. However, the software also serves as a cost-effective mixing solution. Wirecast supports an unlimited number of input devices including live camera feeds, audio, video, graphics and more. Capture video from multiple cameras (SD and HD) to your PC using the appropriate capture device. Broadcast the desktop of the Wirecast computer or another computer during your webcasts (i.e., incorporate scripture/lyrics in broadcast). With Wirecast's user-friendly interface, you can add transitions as you switch between cameras and add titles, watermarks and lower-thirds to your broadcast. Eliminate the need for external preview monitors since you can preview video from all video sources simultaneously on your PC monitor via Wirecast. You have the options to stream live and/or save the broadcast to your PC (or external hard drive) and/or output the broadcast for distribution to monitors or projectors in-house.

### ❖ [Wirecast Studio](#)

- Output only video for in-house distribution

### ❖ [Wirecast Pro](#)

- Output audio and video for in-house distribution
- Advanced audio controls with sync delay

# MIXERS (cont'd)

## Stand-Alone Mixers

Stand-alone mixers are sometimes preferred by users:

### [Datavideo SE-500](#)

- ❖ Standard definition only: Composite and s-video, 4-channel video mixer
- ❖ 3-channel audio mixer

### [Roland V-1SDI](#)

- ❖ 3G-SDI (3x) and HDMI (2x), 4-channel video mixer
- ❖ 14-channel audio mixer
- ❖ Multiview output shows all four input sources on a single display.

### [Roland VR-4HD](#)

- ❖ 6-input, 4-channel video mixer
- ❖ Supports HDMI (HDCP compliant), RGB/Component, and Composite video inputs up to 1080p
- ❖ 18-channel digital audio mixer plus embedding/de-embedding of audio with delay settings
- ❖ Built-in touch quad-input multi-viewer with audio metering
- ❖ Built-in USB 3.0 for web streaming and recording

### [Roland VR-50HD](#)

- ❖ SD plus HDMI plus SDI: Composite, RGB/component, HDMI and SDI
- ❖ 4-channel video mixer
- ❖ 12-channel digital audio mixer plus embedding of audio with delay settings
- ❖ Built-in 7" preview touchscreen monitor or external multi-view output via HDMI
- ❖ USB output for live streaming and recording to PC

# RECORDING

Probably the most common need for a video system in a church is to record services and events.

Many churches are familiar with recording to a DVD recorder. Although still popular, there is a trend toward recording to a computer (from which one can easily burn a DVD) or to a solid state disk or hard disk drive.

## To PC

Record to your computer and archive footage on storage media or burn to DVD.

❖ [Startech SVID2USB23](#) - USB capture cable records analog video (s-video or composite) and RCA audio to your computer with real-time MPEG-1, MPEG-2, and MPEG-4 encoding.

❖ [Telestream Wirecast Software](#) - Not only offering live production and encoding capabilities for live streaming, Wirecast also serves as a recorder (save as ProRes or MJPEG file). Wirecast is an especially economical solution for multi-camera system since Wirecast also acts as a software-based mixer.

## To SSD / HDD

❖ [Blackmagic HYPERD/STM](#) - HyperDeck Studio Mini portable dual SD and UHS-II recorder with SDI inputs for master program or ISO recording.

❖ [Blackmagic HYPERD/ST/PRO2](#) - HyperDeck Studio Pro SSD recorder with HDMI, SDI and analog video inputs plus separate analog and XLR audio inputs. Built-in Thunderbolt port for capture of video and audio.

❖ [Datavideo HDR-60](#) - HD/SD-SDI HDD Recorder with removable USB hard drive.

❖ [Datavideo DN-600](#) - DV/HDV/Analog HDD Recorder with removable USB hard drive.



# LIVE STREAMING

Many churches are now streaming live their weekly services or special events such as baptisms and weddings to expand their audience and to reach shut-ins.

A computer, on-site internet connection, encoding solution and streaming service are required.

- Computer

Whether buying a new computer or repurposing an existing one, following are the recommended specifications:

- i7 Intel Processor
- 8GB RAM
- 1GB Video RAM

- On-site Internet

Make sure the network you are streaming on has at least a 700Kbps upload speed or 3000Kbps for HD.

- Streaming Service Considerations

Although it is possible to set up your own video streaming server, the majority of churches will subscribe to an existing CDN (content delivery network) such as Sermon.net, SundayStreams.com or Ustream.tv.

## Wirecast

[Wirecast](#) is our go-to cost effective live streaming solution. Wirecast software enables the capture, live production, encoding and archiving of facility events. Wirecast has partnered with most CDNs (e.g., Sermon.net, Sunday Streams, Churchstreaming.tv, Ustream, Brightcove). This integration allows users to easily select the CDN service they subscribe to, log in to their account, and stream direct to their platform right from the Wirecast user interface.

Wirecast allows for the capture of video from multiple cameras (SD or HD) to your computer using the appropriate capture device. Broadcast the desktop of the Wirecast computer or another computer during your webcasts (i.e., incorporate scripture/lyrics in broadcast). With Wirecast's user-friendly interface, you can add transitions as you switch between video sources and add titles, watermarks and lower-thirds to your broadcast.

You have the options to stream live and/or save the broadcast to your PC (or external hard drive) for future archiving or DVD duplication. You can also output the broadcast for distribution to in-house monitors or projectors.



# VIDEO CAPTURE DEVICES

If using a computer for recording or streaming, a video capture device is required to capture video from your camera(s) to the computer.

- Do you have a PC or Mac? Laptop or desktop?
- How many cameras or video sources do you need to capture?
- What type of video connection(s) do you require (e.g., s-video, composite video, HD-SDI, HDMI)?

## USB

When to choose a USB video capture device?

- If using a laptop (laptops do not have PCIe slots)
- If you want an easy plug-and-play solution
- ❖ [Startech SVID2USB23](#) (1-channel composite video/s-video, Windows/Mac)
- ❖ [Magewell 32050](#) (1-channel SDI plus audio, Mac/Windows)
- ❖ [Magewell 32040](#) (1-channel HDMI plus audio, Mac/Windows)

Note, you will run into problems if you try to use multiple one-channel USB capture devices to capture video from more than one camera. In this case, you will want to use a multi-channel PCIe capture card.



## PCIe

Recommended single channel PCIe capture cards:

- ❖ [Blackmagic Decklink Mini Recorder](#) (1-channel HDMI/SDI, Windows/Mac)

Recommended multi-channel PCIe capture cards:

- ❖ [Magewell XI006AE-PRO](#) (6-channel composite video, Windows)
- ❖ [Magewell PC-200-DE-SDI](#) (2-channel SDI, Windows)
- ❖ [Magewell PC-200-DE-HDMI](#) (2-channel HDMI, Windows)
- ❖ [Magewell XI400DE-SDI](#) (4-channel SDI, Windows)
- ❖ [Magewell PC-400-DE-HDMI](#) (4-channel HDMI, Windows)



# IN-HOUSE DISTRIBUTION

Many churches want to distribute services live to monitors or projectors in the main hall or to other areas of the facility such as overflow rooms or nurseries.

Things to consider:

- How many monitors?
- What length cables will you require to go from the media/control room to each monitor?
- Do you need to send video AND audio to monitors or just video?
- What type of inputs are available on your monitors?

## Over Composite

- ❖ [RF-Link AVS-14](#) 1x4 AV Splitter with Composite and Component Video

## Over SDI

- ❖ [Blackmagic CONVMSDIDA4K](#) 1x8 SDI Distribution

## Over HDMI

- ❖ [Kanexpro SP-HD20-1X24K](#) 1x2 HDMI Amplified Splitter System
- ❖ [Kanexpro SP-HD20-1X44K](#) 1x4 HDMI Amplified Splitter System
  - Note, running over HDMI is limited to 100 ft

## Over Cat5

When long cable runs are required, HDMI can be converted to Cat5

- ❖ [Kanexpro HDEXT50M](#) 1x1 HDMI Over Cat5 (up to 165 ft)
- ❖ [Kanexpro SP-HDCAT1X4](#) 1x4 HDMI Splitter System Over Cat5 Extenders

## Over Coax

- ❖ [Channel Plus 5415](#) RF modulator facilitates standard definition distribution over coax
- ❖ [ZeeVee ZVPRO810](#) HD modulator facilitates HDMI distribution over coax



# CONVERTERS

There are times when it's necessary to convert a video signal coming out one component of your system so it can be connected to the next component.

A common mis-conception is that you can convert standard definition to high definition video and the picture quality will be improved. Although it is true that you can convert from a standard definition format (e.g., composite video) to a high definition format (e.g., HDMI), the quality of the video will remain the same.

Converters are very useful and sometimes necessary. However they should be used sparingly. Too many converters in a single system can result in delays in transmission and problems with syncing audio and video sources.

## SDI to Analog

- ❖ [Blackmagic CONVMASA](#) – Converts SDI to analog video (HD/SD component, NTSC and PAL video) plus balanced AES/EBU and analog audio.
- ❖ [Datavideo DAC-50S](#) – Converts 3G/HD-SDI to analog video (YUV, CV, Y/C) and two unbalanced analog audio channels.

## HDMI to Analog

- ❖ [Kanexpro HDRCA](#) – Converts HDMI with embedded audio to analog composite video with R/L audio.

## SDI to HDMI

- ❖ [Blackmagic CONVCMIC/SH](#) - Converts SDI (with embedded audio) to HDMI (with embedded audio).
- ❖ [Link Electronics HAC-66](#) - Converts SDI plus analog audio to HDMI with embedded audio.

## Other

- ❖ [Blackmagic CONVMCAUDS4K](#) - Embeds 4 channels of analog audio or 8 channels of AES/EBU digital audio into any SDI video connection.

# INSTALLATION CONSIDERATIONS

- ❖ Cameras must be powered near mounted location
- ❖ For control, cameras must be installed in a daisy-chain configuration.
- ❖ Control and video can be converted to Cat5 if longer distances must be covered.