

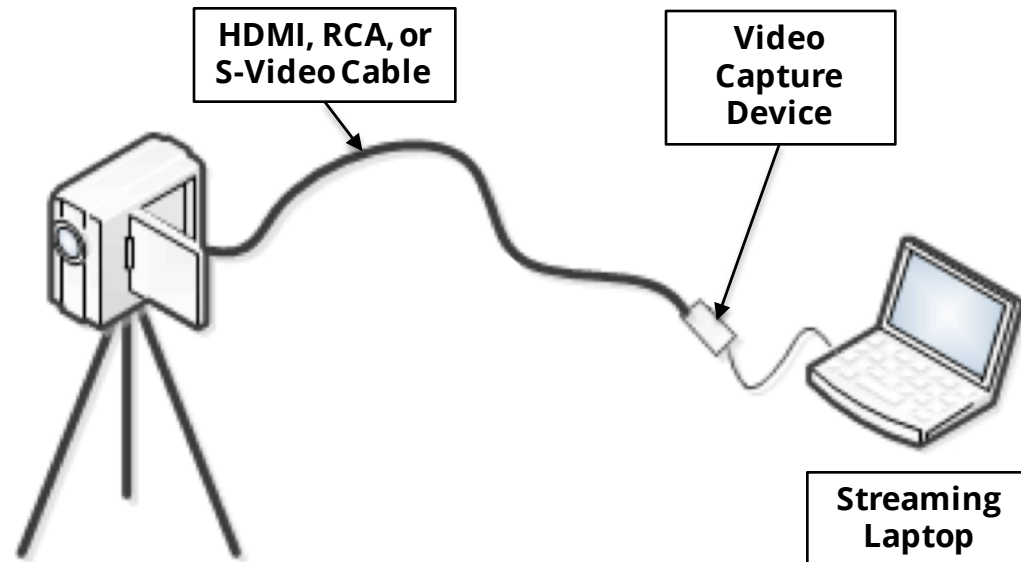
# EQUIPMENT GUIDE



SCHOOL BROADCAST  
**PROGRAM**

POWERED BY **playOn!**  
SPORTS

# ▶ Single Camera, No Announcers Setup



- ▶ Necessary Equipment:
  - Camera
  - HDMI, RCA Cable or S-Video Cable
  - Audio/Video Capture Device, also know as a Video Encoding Device
  - Streaming Laptop

# ► Equipment for Single Camera, No Announcers

- Camera



- RCA Cable (standard with most cameras)



- HDMI Cable

- Video capture device:

- Elgato
- Startech HD



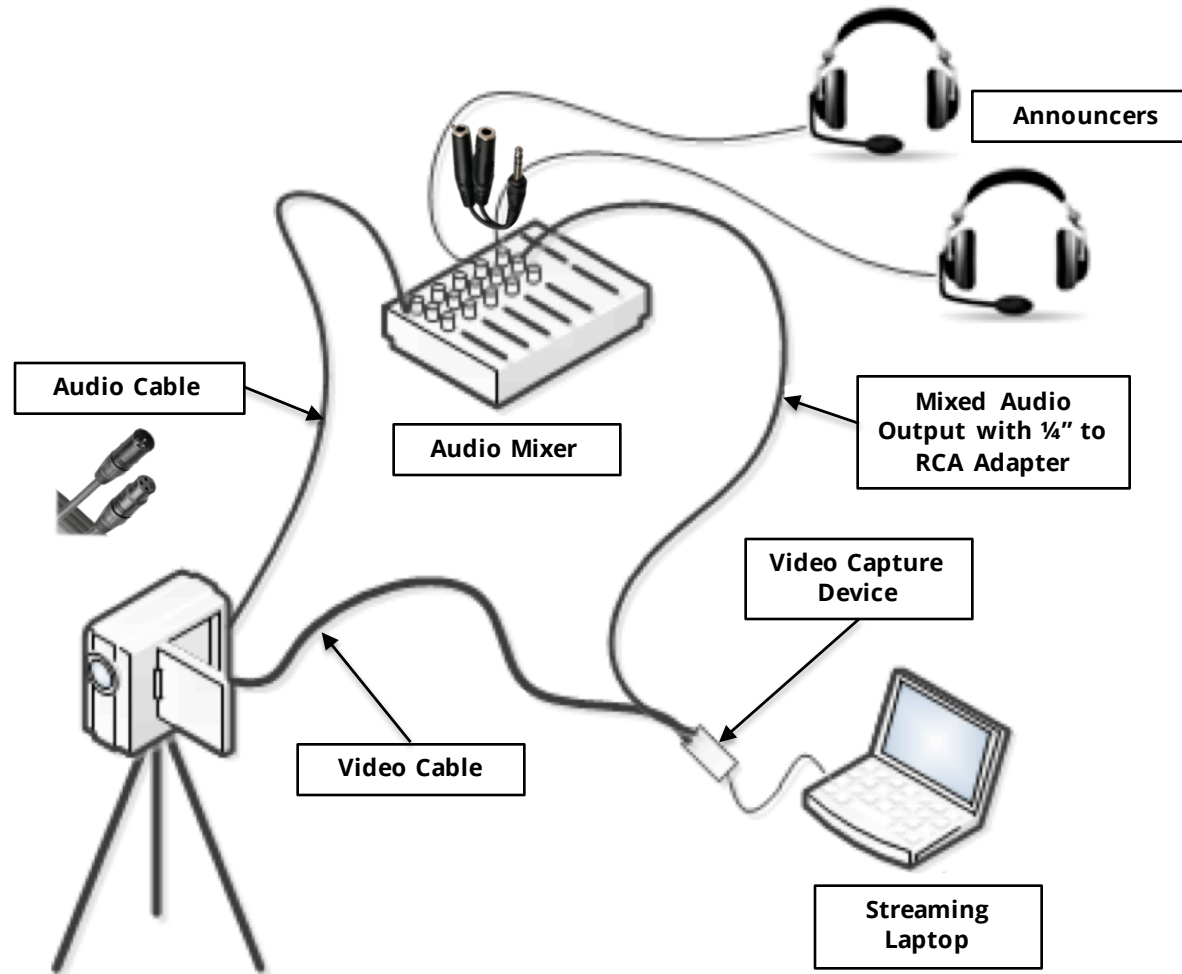
- Streaming Laptop\*:

- Operating system: Windows 7, 8, or 10
- Processor: Intel i5 or i7 @ 2.4 GHz or faster
- Memory: minimum 3 GB of RAM
- Hard drive: 250 GB min. at 7200 RPM
- USB 3.0 port is a bonus, but not required



\*The software runs on a **Windows operating system**, so a PC is preferred, but can run on a Mac with partitioning software such as BootCamp.

# ▶ Single Camera with Announcers Setup



## ▶ Necessary Equipment:

- Camera
- Video Cable
- Audio Cable (2)
- Audio Mixer
- Announcer Headset(s)/Microphones
- Video Capture Device
- Streaming Laptop
- Audio Mixer to Audio Cable

# ▶ Announcers Setup - Detail



# ► Equipment for Single Camera and Announcers

- Camera

- RCA Cable (standard with most cameras)



- Audio mixer: [XENYX 802- 8 Channel Audio Mixer](#) (~\$60)

Behringer makes a line of inexpensive mixers to match your needs.  
Consider future needs when deciding on the mixer that's right for you



- (2) Headsets: [Audio Technica BPHS 1](#) - (~\$200/each)



- (2) 50-foot: [XLR Audio Cables](#) - (~\$25/each)



- (1) 6" [Hosa Technology Stereo 1/4" Male to Stereo 1/4" Female Y-Cable](#) (Splitter) (~\$6)

Used to connect headset earphones for two announcers to audio board



- (1) [Hosa Technology 1/4" Phone Male to RCA Male Unbalanced Cable](#) (~\$7)

Used to connect audio board output to video capture device



- (2) [Comprehensive SPP-PJ Male 1/4" Phone to Female RCA Adapter](#) (~\$2)



**Total Additional Cost: ~\$650**

## ***An Economical Headset option***

- [Koss SB 40](#) (~\$35/each)

You will need to purchase a [1/8" to XLR adapter](#)



# ▶ B&H Photo Video Start-Up Kit Materials

"Start-up kit" from B&H Video. Total cost: ~\$1,300



Canon HF R50 HD Flash Camcorder



Behringer XENYX 1202 12-Channel Compact



Audio-Technica BPHS1 Headsets with Mic (2)



Manfrotto Tripod with 128LP Head



Pelican #1650 Case



Mini HDMI to HDMI cable (15')



AV out to RCA cable



RCA Female Coupler



RCA to RCA Video Cable (50')



2 Phone Male to 2 RCA Audio Cable (20')



1/4" Male to 2 Stereo 1/4" Female Y-Cable (6')



2 RCA Male to 2 RCA Male Audio Cable (15')



6-Outlet Surge Protector (4')

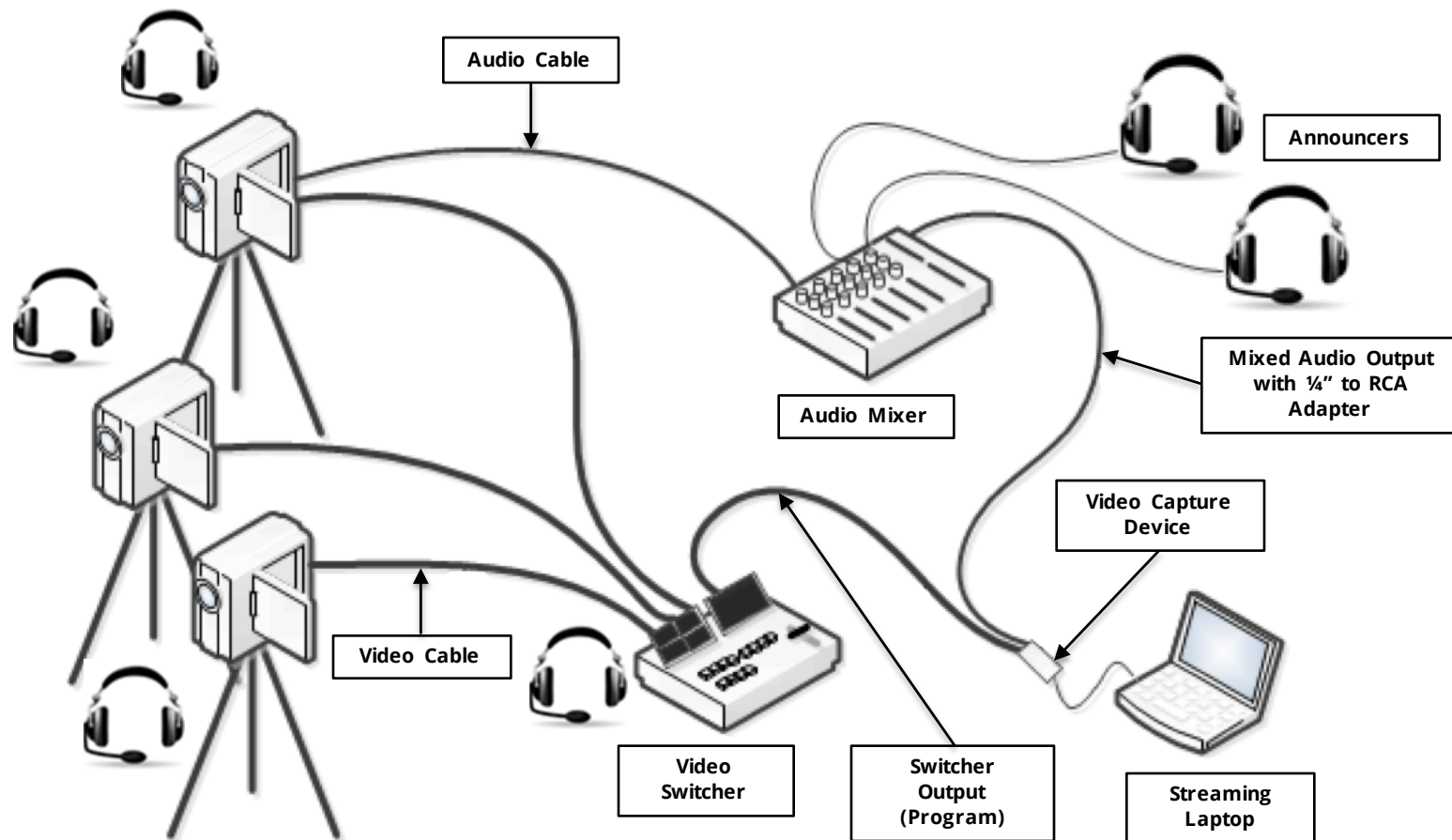


Extension Cord (25')

[http://www.bhphotovideo.com/c/product/1143468-REG/b\\_h\\_photo\\_video\\_xenyx\\_1202\\_12\\_ch\\_2\\_bus.html](http://www.bhphotovideo.com/c/product/1143468-REG/b_h_photo_video_xenyx_1202_12_ch_2_bus.html)



# ▶ Multiple Cameras with Announcers Set Up



## ▶ Necessary Equipment

- Cameras
- Video Cables
- Video Switcher
- Audio Cables
- BNC connectors
- Audio Mixer
- Announcer Headset(s)/Microphones
- Video Capture Device
- Streaming Laptop
- 1/4" to RCA adapter for audio



# ▶ Cameras

## Low



A handycam style camera can be easily mounted to a tripod, and delivers a great picture. Limitations are in the lack of zoom capacities and the smoothness of camera movement due to its lighter weight. A good camera to look into is the [Sony HDR RCX405](#)

\*You may need to purchase an additional mini HDMI to RCA cord if you plan to use an Elgato video capture device

**Price: ~\$200**

## Mid Range



This camera is ideal for a tripod or shoulder mount and has image stabilization built-in. Here's a good camera you may want to consider, [Panasonic AG-AC8PJ](#)

**Price: ~\$1,150 - \$1,500**

## High



This camera has the same features as the mid range and many advanced features including built-in shot transitions, advanced light handling features, and other image control functions. A camera we recommend is the [Panasonic AG-AC160A](#).

**Price: ~\$3,000 - \$4,000**

Most of the recommended equipment can be found at [www.bhphotovideo.com](http://www.bhphotovideo.com) or [www.amazon.com](http://www.amazon.com).



# ► Equipment for Multi-Cameras with Announcers

- Camera (2+)
- 50' or 100' video cable(s) (~\$50 - \$100 each)\*  
You will need one for each camera
- [RCA Female to BNC Male Connector](#) (~\$3 each)\*  
You will need one for each camera
- Intercom system (\$500 - \$900) – Optional\*\*
- Switcher (\$900 - \$6,000)\*\*\*
- Audio mixer: [XENYX 802- 8 Channel Audio Mixer](#) (~\$60)  
Behringer makes a line of inexpensive mixers to match your needs.  
Consider future needs when deciding on the mixer that's right for you.
- (2) Headsets: [Audio Technica BPHS 1](#) – (~\$200/each)
- (2) 50-foot: [XLR Audio Cables](#) – (~\$25/each)
- (1) 6" [Hosa Technology Stereo ¼" Male to Stereo ¼" Female Y-Cable](#) (Splitter) (~\$6)  
Used to connect headset earphones for two announcers to audio board
- (1) [Hosa Technology ¼" Phone Male to RCA Male Unbalanced Cable](#) (~\$7)  
Used to connect audio board output to video capture device

**Total Additional Cost: ~\$3,500 - \$8,500**



\* Cable pricing can vary widely and could be significantly less than the prices suggested here.

\*\* An intercom system is helpful for the director to speak with the camera crew to tell them which camera shots to get (See Page 12)

\*\*\* Switcher costs and functionality can vary widely – several options are identified later in this presentation

## ▶ Audio Equipment - Microphones



There are many types of microphones with multiple capabilities. For voice-overs and table setups, the [Shure SM58](#) with table stand is suggested.



The [Electro Voice 635A Omni-Directional Handheld Dynamic ENG](#) microphone is perfect for any outdoor situation. It is light weight and extremely durable.



The [Sennheiser MD-46](#) is a widely used professional microphone ideal for interviews and on camera reporting.

Most of the recommended equipment can be found at [www.bhphotovideo.com](http://www.bhphotovideo.com) or [www.amazon.com](http://www.amazon.com).

## ▶ Audio Mixers



The [Behringer XENYX 1202](#) (~\$90) is a 12-channel mixer that has 4 microphone inputs and 8 line level inputs. This is the mixer that we recommend most.



The Mackie Mix12FX (~\$120) is a 12-channel mixer with 4 microphone inputs and 10 line level inputs.

The [Behringer 802](#) and 1002 are other lower cost mixer options, but will limit your flexibility as they only have 2 microphone inputs



An extremely inexpensive solution for switching video feeds is this [3-in-1 Composite Switch Box](#) is available for under \$15.

Most of the recommended equipment can be found at [www.bhphotovideo.com](http://www.bhphotovideo.com) or [www.amazon.com](http://www.amazon.com).

# ▶ Switchers

This [Roland V-1HD](#) switcher/mixer combination is a self-contained unit that allows the user to run up to 4 cameras.

## Pro:

- Support for video cameras, action cameras, smart phones, tablet computers and other HDMI devices
- 4 HDMI inputs
- Supports up to Full HD 1080p
- Easy to Use Interface
- Picture-in-picture and split functions
- Two EFFECTS knobs deliver genuine visual performance
- Full 12 Channel Audio Mixer Included
- Easy to Operate with Hardware Controls
- Two HDMI Outputs
- Remote Control via USB or MIDI Connection

## Con:

- Does not have build in DDR (Digital Data Recorder)
- Does not have moving/complex graphics capability
- Does not have RCA port



Most of the recommended equipment can be found at [www.bhphotovideo.com](http://www.bhphotovideo.com) or [www.amazon.com](http://www.amazon.com).



# ▶ Tricasters

Tricasters are high end combination switchers with graphics. Their top models (\$25k+) are used by Fox Sports and MTV among others. They often require additional equipment for full functionality

Pro:

- Can do moving graphics
- Can record to DDR
- Can add additional components for replay
- Has a built in mixer

Con:

- Expensive (\$5k+)
- Additional computer/monitors may be needed (\$200+)
- Need to buy scoreboard package (\$250)
- Additional components are expensive (\$1k+)
- Complicated to use and hook up
- Weighs 19+ pounds



*Monitor not included*



The following models support our customized streaming profile:

- Recommended: TriCaster 40v2, 455, 855, 460, 860, 8000
- Supported: TriCaster 300,450,850,850 EXTREME, 40v1
- **NOT SUPPORTED:** TriCaster 100, Duo, Studio, Broadcast, VideoToaster

Most of the recommended equipment can be found at [www.bhphotovideo.com](http://www.bhphotovideo.com) or [www.amazon.com](http://www.amazon.com).



# ▶ Tricasters

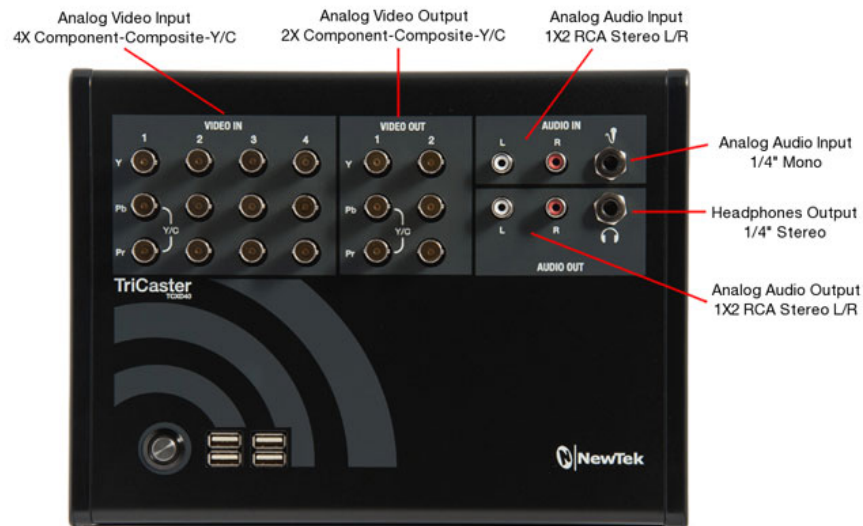
## Tricaster 40

Pro:

- 4 video inputs – HD/SD
- Desktop style
- Can record up to 1080p

Con:

- Analog only – No SDI
- Low flexibility – Only 2 video and 1 audio outputs



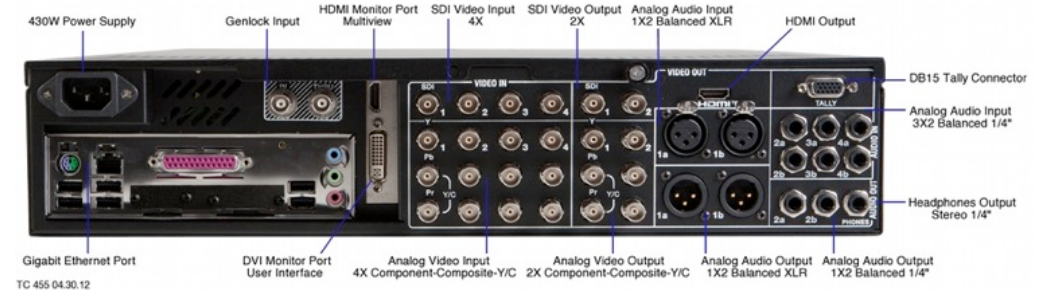
## Tricaster 455

Pro:

- 4 video inputs – HD/SD analog or SDI
- SDI embedded audio + 1 stereo XLR and 3 stereo TRS inputs
- 4 video outputs – 2 SDI/2 analog
- Tally

Con:

- Rack mount style – NOT desktop
- Price



Most of the recommended equipment can be found at [www.bhphotovideo.com](http://www.bhphotovideo.com) or [www.amazon.com](http://www.amazon.com).



## ▶ Additional Setup Equipment



A 25' extension cord is necessary to support all of the electrical equipment.



A power strip is also recommended to power up all the devices.



A 50' A/V cable provides ample range for camera positioning.

Tripods are significant in keeping the cameras steady. An inexpensive option is the Sony VCTR640 (load capacity of 6.6 lbs.).



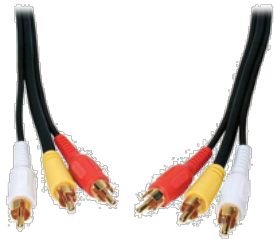
A sturdier, but more expensive option is the Bescor TH-770.



Most of the recommended equipment can be found at [www.bhphotovideo.com](http://www.bhphotovideo.com) or [www.amazon.com](http://www.amazon.com).



# ► Cables and Connectors



RCA Connectors

## Single Camera to Elgato:

Composite Video/Component Audio with RCA connectors (Both Ends) - Typical A/V Cable. We've tested using the [Sony CX-110](#) with 500 ft cable length with no impact on signal quality.



RCA Female to BNC Male Connector

## Camera(s) to Switcher:

Use RCA Connectors [Sony CX-110](#) with the addition of a [RCA Female to BNC Male Connector](#) to connect the video to the switcher. Connect audio to audio board, tricaster, or Elgato using RCA Connectors



Component Audio Connectors

1/4" phone to female RCA Connectors

## Audio Mixer to Elgato:

[Component Audio with RCA connectors](#) (Both Ends) - Typical stereo audio cables (Red/White). Depending on the audio mixer, you'll need (2) [1/4" phone to female RCA connectors](#). These connectors are needed For the Behringer 1202 mixer.



8" to XLR Connector



3.55mm to 1/4" Connector

## Headset to Audio Mixer:

These adapters are needed to connect the Koss SB40/Williams Sound 058 headsets to the audio board.

[1/4" TRS Female- XLR Male Adapter](#) and [3.55 mm - 1/4" Adapter](#)

Most of the recommended equipment can be found at [www.bhphotovideo.com](http://www.bhphotovideo.com) or [www.amazon.com](http://www.amazon.com).

# ▶ Intercom System

The EARTEC [Simultalk 24G](#) is a portable, 4-station, wireless intercom system

- Includes 4 headsets and transmitters
  - 1 for the director who can speak to anyone
  - 3 for the camera people who can only hear and speak to the director
- 10 hours of battery life in Standby mode, 5 hours in Communication mode
- 150 yard range
- No base station required
- Standby (listen only) and Continuous Talk switching
- Independent volume control knob
- No FCC license required

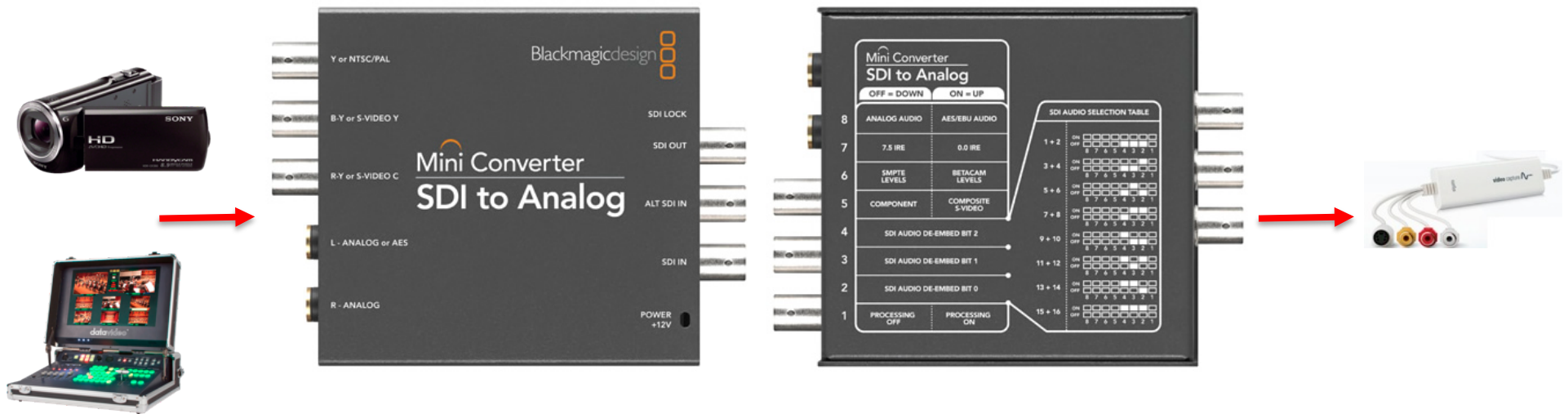
**Total Cost for system: ~\$800**



Most of the recommended equipment can be found at [www.bhphotovideo.com](http://www.bhphotovideo.com) or [www.amazon.com](http://www.amazon.com).



# ▶ SDI to Analog Converter



Converters are an easy solution to connect a camera or switcher, that only outputs a digital signal (**SDI**), to an **analog** signal which is necessary to run PlayOn Producer. The Blackmagic Mini Converter works well.

Most of the recommended equipment can be found at [www.bhphotovideo.com](http://www.bhphotovideo.com) or [www.amazon.com](http://www.amazon.com).

## ► Additional Storage Equipment



To help ensure that your event gets recorded, regardless of what may or may not happen with the laptop and its internet connectivity, you may want to consider purchasing a video recording device. The device hooks up to the audio and video cables before connecting to the video capture device. Having this backup can be invaluable.



Finally, you will want to consider incorporating a storm case to store all of this equipment. The [Pelican iM2750 Storm Case](#) is a great product. It is a padded, multi-level case with a telescoping handle and wheels for easy mobility.

Most of the recommended equipment can be found at [www.bhphotovideo.com](http://www.bhphotovideo.com) or [www.amazon.com](http://www.amazon.com).

# ▶ 4G Cellular Data Cards and Mobile Hotspots

## Verizon Wireless

Jetpack 4G LTE Mobile Hotspot MiFi 5510L:

- Provides a 4G data connection for up to 10 devices
- 5 hours of “Use Time” on single charge
- Approximately \$99/month for 20 GB\*
- Go to [www.verizonwireless.com/b2c/businessSolutions/contactUs.jsp](http://www.verizonwireless.com/b2c/businessSolutions/contactUs.jsp) to have a Verizon representative contact you



## AT&T

Mobile Hotspot MiFi Liberate:

- Provides a 4G data connection for up to 10 devices
- Up to 10 hours “Use Time” on single charge
- Monthly fees vary. Contact your local AT&T for more information



Check 4G coverage maps to determine which carrier is right for you:

AT&T: [www.att.com/network/](http://www.att.com/network/) Verizon: [www.verizonwireless.com/b2c/CoverageLocatorController](http://www.verizonwireless.com/b2c/CoverageLocatorController)

***\*\*Please use caution when streaming with a 4G wireless hot spot. Depending on your location, an Internet connection may be weak or unpredictable. We, however, recognize that, on some occasions, 4G connections are the only option for broadcasting.***



# ► Point-to-Point Wireless Bridge

A Point-to-Point wireless bridge system connects two networks by two antennas; one that is connected to a hard-wired network, and one that is connected to the computer or device that requires Internet access.

- Easy way to get Internet connectivity in remote locations of campus
- More reliable than 4G/3G broadcast connections
- It does not require a monthly bill

**Total Cost for system: ~\$229**

We recommend using Ez-Bridge: [ez-bridge.com/](http://ez-bridge.com/)

