Streamcasting from a Suitcase

This paper describes a mobile live streaming facility that would be useful for post-earthquake communications (or neighborhood events). The goal is to equip a van (or bike trailer) with gear that can go (live) anywhere on a moments notice to report major events. Enabling live streamcasting using inexpensive, portable cameras and simple camera switching software is the objective.

INTRODUCTION

This paper describes a mobile, wireless streamcasting solution that costs under $2500 and fits in a bike trailer. The objective is to preserve the spontaneity and portability of live streamcasting from a phone.

Today, you can watch live streamcasts using Facebook Live and You Tube on your phone. Live streamcasting to thousands of people using smartphones is free. But one phone camera is boring and has limited usefullness. Multiple (live) cameras add engagement and utility to a streamcast. The streamcast stored archive, where most viewers will see the show, particularly benefits.

Switching between cameras, slides, prerecorded videos, and animated effects is the key. Using free, Open Broadcast Software, running on a laptop, will enable switching from multiple sources.

THE VISION: SIMPLE & CHEAP

The vision is simple:

- **Inexpensive** ($100-$500) cameras feed into the laptop.
- **Software on the laptop** switches between cameras and other sources.
- **Output is sent to Facebook Live** or Youtube Live.
- **LTE provides the wireless Internet** connection.
- **A 6-8 hour battery pack** powers it all.
- **All gear can be stored a Pelican case**.
- **Total cost: < $2,000** (less bike trailer and laptop)

MULTIPLE CAMERAS ARE KEY

> Event planners and individuals can now broadcast events over the internet using solutions provided by Facebook and You Tube. Phones can streamcast live, but you really need multiple camera shots and images to engage an audience.

Any 30-60 minute streamcast basically requires software running on a laptop. That enables you to control multiple cameras, sound control, and a wireless LTE connection to the internet.

What do we need to enable live streamcasting in a suitcase or bike trailer? The main criteria is good quality, low price, easy to use, and portable.

Here's what we need:

I. Live Streaming Host (Youtube & Facebook)
II. Streaming software for a laptop (OBS)
III. High quality cameras (sportcams and Mevo)
IV. Audio Mixing (at least 3 audio inputs, battery powered)
V. Laptop (faster is better)
VI. Mobile LTE hotspot (My plan provides Unlimited LTE for $12/mo)

I. LIVE STREAMING HOSTS:

1. YouTube Live. youtube.com/live_dashboard

YouTube Live is a free tool offered to all Google and YouTube users. Up to ten broadcasters may participate simultaneously. Once you go live, anyone with the link can view your livestream. Features include viewing invitations, live chat room comments, and event scheduling. Software encoders, running on a laptop, may include the free OBS software (obsproject.com/), Streamlabs OBS (streamlabs.com/streamlabs-obs), StageTen (https://stageten.tv/facebook/), Wirecast (telestream.net/wirecast/) and XSplit (xsplit.com/partners/youtube). If you don't want to use an encoder, you can live stream via webcam or mobile.

2. Facebook Live. facebook.com/live/create

Facebook Live lets you broadcast live straight from a mobile device. The tool lets you choose your audience, receive real-time feedback in the comments section of your stream, and track how many viewers your livestream brought in at various points. It also works with 3rd party software such as OBS, Wirecast or XSplit.

II. STREAMING SOFTWARE FOR LAPTOPS

1. Open Broadcast Software (obsproject.com/)

Open Broadcaster Software (OBS) is a free and open-source cross-platform streaming and recording programs. There are versions for Windows, macOS and Linux

distributions, such as Ubuntu. It includes many presets for streaming websites such as YouTube, Twitch.tv, Instagram and Facebook.

2. Live. (https://www.cameleon.live/)

Live is a livestreaming app that works on Windows and Mac computers, iOS devices, and internet-capable cameras (including GoPro). Live lets users run simultaneous streaming sessions; you can host a Facebook Live session and YouTube stream at the same time through a central dashboard, making it easier to reach multiple audiences concurrently. So far, Facebook and YouTube livestreaming are offered for free. Live's simultaneous streaming feature is offered for a one-time $9.99 payment. You can broadcast an event over multiple channels through a single program, rather than managing multiple livestream services.

3. Vimeo and Mevo. (https://mevo.com/plans)

The Vimeo Premium ($15/month) and Producer plans enable overlay graphics, lower thirds, PDF presentations, full-screen graphics, slides, and countdown slates directly into your stream in real-time using the Mevo camera app. Mevo, a $200-$400 camera that enables multiple "shots", and video hosting service, Vimeo, have joined forces for live streaming at $15/month. You can upload archives of your videos to Vimeo from the Mevo app. Vimeo Producer has 250GB of storage per year with 7TB Premium. vimeo.com/features/livestreaming

III. STREAMCASTING CAMERAS

1. **Logitech C-920s Pro USB webcam ($60-$70).** (logitech.com/en-us/product/hd-pro-webcam-c920s)

The glass lens and full HD 1080p at 30fps capture better detail with a 78-degree field of view that can frame up to two people at once. It's a USB webcam. Just plug a couple into your laptop. Switch cameras via OBS software.

2. Mevo One-piece Camera System. (https://mevo.com)

Mevo is unique in that this ($200-$400) 4K camera can "take" four different static shots, as well as pan and tilt. It streamcasts only a "cutout" of the 4K picture. You operate it with your phone, while the streamcast goes out over WiFi, Ethernet or LTE. Record 4K videos directly to its SD card or stream to Vimeo, Livestream, Facebook, Youtube, Periscope, Twitter or any custom RTMP destination.

3. DSLR or sportcams with HDMI output to USB video encoder.

The Elgato Cam Link 4K (elgato.com/en/gaming/cam-link-4k), $120, connects your DSLR, camcorder, or action Cam to your PC or Mac. The HDMI camera link has the best quality and enables you can go live with better cameras for lower light and better color.

IV. Portable Audio Mixer

The best audio will always come from a mixing board. But many events (such as interviews) won't have one. Since this is conceived as a one-person operation, we believe a small, 3 input battery-powered mixer which could be mounted on a camera hotshoe, may provide basic sound mixing, vastly improving the camera's own mike.

1. **The Saramonic SR-AX100 3.5mm Audio Adapter** ($55) or a model with similar functionality, can clip to a camera shoe so there is no sound delay between the image and audio, as sometimes happens when mikes go directly into the computer. (saramonicusa.com/products/sr-ax100)
2. **Microphones**. There are lots to choose from. We want something that is small, doesn't require external power, and provides good sound.

V. Laptop

The laptop running OBS software should have 8 Gigs of RAM, an Intel i7 processor and ideally a graphics card. These laptops are available for $500-$1000.

VII. LTE Mobile Hotspot

Coolpad SURF Hotspot ($100) with a monthly service fee of $11.95 can provide the wireless link to the internet. (connectall.org/internet.html)
This deal is offered by Mobile Citizen through the Sprint network. There is no limit on the amount of data that you can use monthly, nor is there any throttling or overage charges. It's available only to 501(c)3 non-profits or low income citizens. A better hotspot would be the InSeeGo Mobile hotspot (inseego.com/4g-lte-mobile-hotspots-usb-modems/) which has external antenna jacks, faster speeds with carrier aggregation, and 2.4/5 GHz ac WiFi ($300).

VII. Misc.

We need a way to mount the cameras and power if none is easily available. We need to be able to run at least four hours. A 280 watt/hr Lithium battery pack could provide 70 watts for about 4 hours. That should do it. Plus we need some very compact light stands to mount the cameras. Fancy pan and tilt tripods not require.

Connecting it all together.

- The Mevo camera provides close up, wide angle and pan/tilt streaming video. It's controlled by a smart phone. The Mevo plugs into the laptop and can provide three different "shots".

- An external camera with HDMI output plugs into the laptop via USB using the Elgato CamLink ($100), or USB webcams like the Logitech C920.

- A small audio mixer, brings three audio sources together and into the main camera. It streams through the HDMI link to the CamLink encoder. This is necessary to prevent lag between audio and video.

- The OBS software running on the Laptop switches between camera and audio inputs.

- The Laptop is connected to You Tube Live or Facebook Live using LTE. The Coolspot LTE hotspot provides unlimited data for $12/month.

- A 280 watt/hour Lithium powerpack provides AC, 12volt DC and multiple USB outputs to power all the equipment for 4 hours (if AC power is not available).

So what have we got?

1. Streamcast host: You Tube or Facebook……..... Free
2. Laptop streamcasting software: Open Broadcaster Software……..... Free
3. One Mevo 4K streamcaster with multi-shot ……. $200
4. One GitUp G3 sportcam with 2nd slave camera & HDMI output $140
5. One Elgato Cam Link HDMI encoder ($130) …….....$130
6. Laptop (provided) …….. N/C
7. Three light stands for mounting cameras inconspicuously ($35) ….. $100
8. Coolpad Mobile hotspot with $12/mo truly unlimited service ……. $100
9. 280 Watt/hr Lithium Power pack ($300) ……..... $300

   TOTAL ……. $970

Hey. I've got 80% of this stuff already! Could it fit in a Pelican Case or a bike trailer? I think so. Could this setup go live? Is it practical? Maybe. I've never done it before.

Operation.

- One small Mevo goes in front of the action and can choose from 3 static shots or pan/tilt between shots.
- One GitUp G3 sport camera shoots from the side. It also has a secondary (slave) camera for a completely different shot. The camera records both shots simultaneously to it's internal SD card.
- The OBS software on the laptop chooses between shots and audio.
- The mobile hotspot sends the live stream out over the LTE link.

What should we streamcast?

- How about monthly Hayden Island News from the deck?
- How about monthly HiNoon meetings?
- How about something completely different?

I think the multiple shot Mevo camera, the high-quality HDMI encoder enabling DSLRs to record the scene, and free OBS streaming software, combined with YouTube Live, Facebook Live and Vimeo could be both useful and fun.

- Sam Churchill, Hayden Island
- www.hayden-island.com/wp-content/uploads/2015/10/Bike-Trailer-Streamcasting.pdf
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  https://myhaydenisland.wordpress.com