



Video Production for Online Streaming

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Agenda

- Why are we doing all this anyway?
- The journey
- Conclusions
- Questions

Why are we doing all this anyway?



- COVID-19 has changed the way we work
- Customers' expectations have not been lowered
- Video conferencing (Zoom, Teams, Skype etc.) has become the new normal
- What used to be acceptable for the odd conference call is no longer good enough
- If they are paying the pressure is even higher!



Starting Point - Laptop

The logo consists of the letters 'BATC' in white, bold, sans-serif font, centered within a dark blue trapezoidal shape. This shape is surrounded by a light blue circular swoosh that curves around it from the top left and bottom left.

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- **Camera**

- Eye-level is preferred
- External Webcam is probably better than the built-in (but Apple does have decent webcams)
- Disabling autofocus / custom exposure can help

- **Sound**

- Avoid using laptop microphone
- Headsets are excellent, affordable options
- Get as close as possible to the mic

- **Light**

- Don't sit with a window behind you
- Avoid mixing light sources (desk lamp + daylight looks odd)

Mobile Phone Sound

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- Apple Earpods (wired) around £20
- Jabra 510 (Bluetooth Speaker Phone) £80
- RØDE SmartLav (TRRS) £45
 - Rode SC6 (TRRS splitter) £11
 - Rode SC3 (TRRS to TRS) £10
- Generally a headset is more cost-effective

Laptop plus budget items

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- Cheap USB webcam
 - Logitech C270 under £40
- USB Headset
 - Microsoft LX-3000 under £40
- Conclusions
 - Sound much better but video as bad or worse!
 - Wearing a headset for eight hours is tiring!





Lighting

- Probably makes the biggest difference!
 - Lots of cheap (around £40) to choose from at Amazon
 - Often poor manufacturing quality and not at all mechanically robust
 - Many brands do not have accurate colour temperature settings
 - Collapse at random
 - Not good enough for a professional set-up!



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Better Lighting

- **Elgato Lighting range**
 - Key Light (£190)
 - Key Light Air (£130)
 - Ring Light (£190)
- **You probably need a pair**
- **Robust, modular and well made**
 - Part of an eco-system
- **Accurate colour temperature settings**
- **Wi-fi controllable**



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Next Upgrade

- **Change to a better USB Webcam**
 - Logitech C920S HD around £90
 - Logitech Brio around £270
 - Set it up!
- **Change to a decent USB Mic**
 - Blue Yeti around £120
- **Great improvement**
 - Let's stop there shall we?
 - Zoom sync issues
 - Blue Yeti was a big disappointment because it picks up far too much ambient noise



Webcam settings

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- **Logitech Utility (Windows) or Webcam Settings App (Mac (£8))**
 - Turn off all auto settings
 - Exposure mode to manual
 - Power line frequency to 50Hz
 - Exposure Time to 300
 - Gain to 0
 - White Balance to 4200K
- **This alone will massively improve your image quality so do not skip it!**
- **Plenty of YouTube videos on this**

Switch to Mirrorless SLR

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- **Sony A6000 series seem to be very popular**
 - **Sony A6400 with kit lens around £850**
 - APS-C Sensor
 - 16-50mm f3.5 – 5.6
 - **Sigma 16mm f1.4 £380**
 - **Clean HDMI output**
 - Add an HDMI Cable (£10)
 - Add a battery eliminator (£30)
 - Add a cage or mount system (£25)
 - **How do we connect it to the computer?**
 - Add an HDMI Capture Device
 - **Plenty of YouTube videos on setting up**

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New Sony ZV1

- Aimed at Vloggers (£700)
- Very compact
- Wider aperture (f1.8) zoom lens
 - Better bokeh
 - Not interchangeable



HMDI Capture Device

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- Elgato Camlink 4K is very popular
 - Around £190
 - Fast USB 3.0
- Other Elgato / Other Capture Devices
- 'Cheap as chips' ones on eBay
 - Around £12
 - Work fine with USB 2.0
 - Video can be a bit choppy at higher FPS



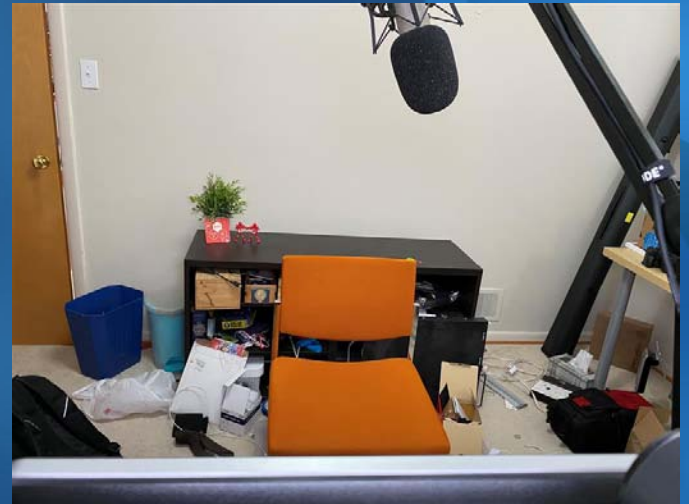
Sony A6400 + Sigma 16mm f.14 lens

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And from the other side ...

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Another Microphone Upgrade

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- Get rid of Blue Yeti and buy RØDE NT-USB
 - Around £150
 - Probably one of the best USB mics around
 - One of the most popular streamer's mics
 - Still USB
 - Still having Zoom time lag problems



A Different Microphone Upgrade

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- RØDE Lavalier GO (£60) mic
- RØDE Wireless GO System (£160)
 - Rx mounted on top of Camera
 - Popular with Vloggers



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Yet Another Solution

- RØDE Video Mic NTG + Tripod (around £250)
 - Hybrid solution : 3.5mm + USB
 - Shotgun mic (includes foam filter)
 - Also popular with Vloggers
 - Some see as the 'best' all-round solution



Green Screen – 1st Attempt

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- Simplest solution is a piece of green cloth hung on a couple of stands (£10 for 2m width from eBay) with bulldog clips
 - Very hard to light (creases)
 - Almost useless
 - Waste of money



Green Screen – 2nd Attempt

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- Pop-up green screen (£25 from eBay)
 - Almost useless
 - Unwieldy
 - Far too thin and not good if light is behind it



Green Screen - Best solution

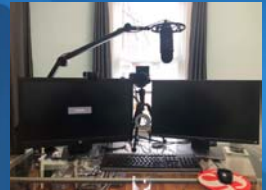
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- **Elgato Collapsible Green Screen (£150)**
 - Self-standing (like a projector screen)
 - Flat, thick
 - Easy to store
 - Easier to light (no creases)
- **Pull-down version also available (£140)**



Compact Workspace

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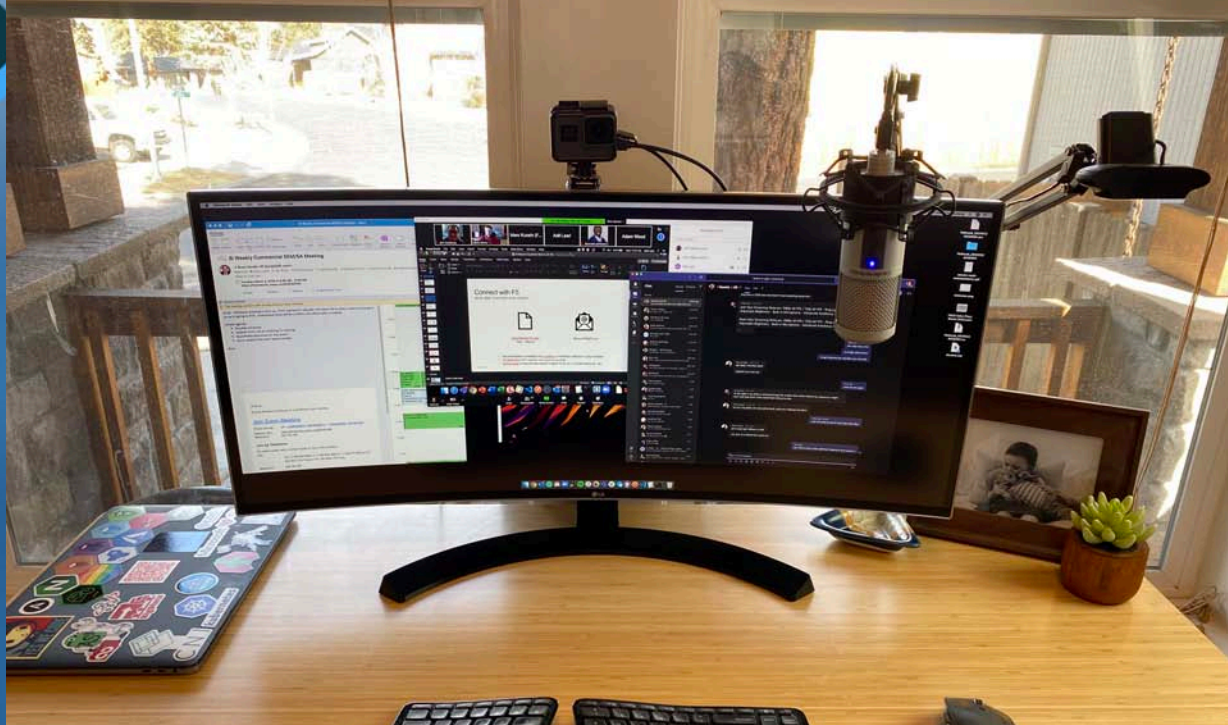
Another Compact Workspace

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GoPro Camera Solution



GoPro Cameras

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- Tiny sensor (newest one is much larger)
- Very wide field of view
- Hero 8 Pro (£350) needs Media Mod (£75) to allow Mini HDMI output and 3.5mm mic input
- Wifi Output possible but may be too risky for business use
- May be useful in a multi-camera set-up
- Popular with Vloggers

Controller

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- **Elgato Streamdeck**
 - Mini (6 key) (£80)
 - Standard (15 key) (£140)
 - XL (32 key) (£210)
- **Very useful for all sorts of other applications**
 - Excellent plug-in for FlexRadio is available
- **You probably also need Companion (Github)**
- **Companion is multi-platform**
 - Headless Raspberry Pi 4 front-end available on Github
- **See CQ-TV 269 for reviews**

Whiteboard

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- **Zoom Built-in Whiteboard**
 - Can be tricky to draw with a mouse
- **iPad Pro with Apple Pencil**
 - Excellent, easy to use but expensive solution
 - How to get the video into Zoom
- **Digital Whiteboard**
 - Can be cost-effective (£50)



All the gear – no idea!

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- Right, we have all the kit, how do we use it?
- We need some software!
- Which platform?
- Which packages?

Streaming Software

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- vMix (\$60 upwards) (Windows only)
- ManyCam (\$100 per annum) (Multi)
- Open Broadcast Studio (OBS) (Multi)
 - Variations such as Streamlabs OBS (SLOBS)
- Ecamm Live (\$240 per annum) (Multi)
- Wirecast (\$600 upwards) (Multi)
- ProPresenter (\$400) (Multi)
- XSplit (\$50) (Windows only – Mac soon!)

Editing Software

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- **Video Editing (not for streaming!)**
 - DaVinci Resolve
 - Adobe Premiere Pro
- **Graphics Production**
 - GIMP (GNU Image Manipulation Program) Free
 - Adobe Photoshop (useful with ATEM)
- **Audio**
 - Virtual Cable (Windows)
 - Loopback (Mac)

So what did we all do?

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- The Windows folks all went with vMix
- The Mac folks all went with ManyCam
 - We had a cheap corporate price!
- Then everybody moved to OBS
 - Still a very, very good platform
 - Very resource-hungry
 - Still a bit buggy
 - Virtual Cam for Mac is new
 - Previously had to build from GitHub

... Until we started getting problems

The logo consists of the letters "BATC" in a bold, white, sans-serif font. The text is contained within a dark blue, trapezoidal shape that has a 3D effect with a lighter blue shadow on its right side. This shape is positioned on the left side of the slide, partially overlapping a large, stylized blue letter "P" that serves as a background element. A light blue circular swoosh or arc is positioned behind the logo, curving around it from the top left to the bottom left.

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- OBS and Zoom do not sit well together on a single desktop (Mac especially)
 - Timeouts / Excessive heat / Spontaneous death of session
- “Let’s dump the software - what we need is a hardware solution!”
- What do the ‘broadcast professionals’ do?

Hardware

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- Elgato Streamdeck
- HDMI Switcher
 - ATEM Mini (£300)
 - ATEM Mini Pro (£600)
 - ATEM Mini Pro ISO (£900)
- ATEM Streaming Bridge
 - Ethernet (H.264) to SDI / HDMI (£250)
- See CQ-TV 269 for reviews



My final office configuration



- + Lights (Ring light and Key lights)
- + Green Screen
- + Clamps and brackets etc.



HDMI In



Multi-view
HDMI Out



USB-C Out



Zoom and Other Services Tips

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- Select 16:9 aspect ratio
- Select the correct resolution and frame rate
 - 720p (1280x720)
 - 1080p (1920x1080)
 - 25fps probably adequate and less costly on CPU than 50fps
- Turn slide transitions off in Powerpoint
- Virtual backgrounds not as clean as green screen
- Record yourself (Check statistics) and replay
- Tell participants to turn off their video
- **New feature allows use of PPT slides as background**
 - **BEWARE!!!**

Conclusions

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- Don't do what we did!
- Need vs want (the perennial radio amateur problem!)
- Who is paying?
- Research, research, research
 - YouTube is very useful

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Questions / Comments?