STREAMING NEXT STEPS: FIRST THINGS FIRST

Invest. Invest. Invest.
Not just money - but time, attention, evaluation, effort, and most importantly, people – both yourself and in others. Be a good steward of what you have been given.

Experience and Knowledge
Tools are only as the skills of those who use said tools. Sure, it requires dedication and persistence, but through patience, develops character and hope. Keep at it. There is always more to learn, and if you think you have learned it all, pour into someone else and teach them everything you know.

Content is King
So many get caught up in the keeping-up-with-the-Joneses when it comes to gear. Focus first on your content and everything that happens before you touch a piece of equipment. Your scripts, where you shoot, who is in the video, what is going to happen in the video, art direction, colors, and the tone of the video are questions to ask first. Expensive and extensive gear isn't necessary to create effective content, and often, fancy gear can't make poor content better.

Audio > Visuals
Quality audio can make or break a video because we as humans are generally more sensitive to what we hear than what we see, so listen before you look.

Lighting
Cameras can only work with the light that they have been given in an environment, so be sure to make lighting a priority.

Camera Lens > Camera Body
Let's be honest. Your camera lens is WAY more important than your camera body. It is like putting perfume on a pig to give more attention to the camera body over the camera lens. When you focus on the above first, the camera you choose doesn't seem as intimidating. It's

Camera
When everything before the camera is done well, camera selection suddenly becomes less intimidating. It's still a very important piece of equipment, but now there is a realistic expectation for the camera body rather than expecting it to make up for the shortcomings of the other aspects of production. Cameras bodies are magical, but only when everything before it gets the appropriate attention.

Everything Else
The most important work is done. A lot of other things in are still critical, but you focused and taken steps towards the main things first, which will help your production be a solid one.

<u>**STREAMING NEXT STEPS: ENCODING DEFINITIONS**</u>

<u>DEFINITION OF TERMS</u>
First things first. Let's make sure we are all on the same page when it comes to terms.

ENCODE
Converting into a coded form. Specifically, when it comes to live streaming, encoding is the process of converting uncompressed video and audio into a compressed format.

HARDWARE ENCODER
Hardware encoders are stand-alone devices that receive an uncompressed video signal (usually HDMI or SDI), encode it, and then upload/transmit that stream, usually to a destination like a streaming platform (also called a CDN).

HARDWARE ENCODERS VS SOFTWARE ENCODERS
Uncompressed video files are huge. As an example, uncompressed video with a resolution of 1920 x 1080 at 60 frames per second requires 2.98 Gbps of bandwidth. That's GIGA-bits, one thousand MEGA-bits, nearly 3 of them, and every second.
Processing that data in real time requires a lot of power to do well consistently and efficiently. Hardware encoders take the guesswork out of that process. They are engineered to handle it efficiently, consistently, and reliably. On top of that, they are usually cheaper when compared to a well-made computer, video capture device, monitor, and other accessories.

USING ENCODERS TO RECORD
Many hardware encoders offer built-in recording, usually to memory cards and/or USB drives. However, hardware streaming encoders almost always make poor recorders.
The file formats used for streaming are not the same as file formats used for recording to drives, and it is common to see failures and corrupt files with encoders. Therefore, I recommend recording with these units for backup purposes only and to do your main recording on a separate hardware when at all possible.

STREAMING NEXT STEPS: ENCODER EQUIPMENT

Living As One Ray Encoder
Living As One takes streaming quality and reliability to a whole new level. Subscription plan options include social only (distribution to YouTube or Facebook), web streaming with an embeddable player and variable bitrates, and multisite capability to connect remote physical locations. While the Ray Encoder is tied only to Living As One's platform and is a minimum requirement, that's a good thing when you want an encoder and platform that just works.
Input: 3G-SDI
Input Formats: Up to 1920 x 1080 at 60 fps
Output Formats: H.264 or H.265/HEVC using Resilient Streaming Protocol
Supported Destinations: Living As One (embeddable player), Facebook, and YouTube
Multiple Destinations: Yes, to any destination supported in subscription plan
Recording: Yes (SD card or USB drive)

Blackmagic Design ATEM Mini Pro
This is an encoder with a built-in switcher, and I believe this distinction is important.
The ATEM Mini Pro is an amazing feature-rich and budget-friendly encoder.
The ATEM Mini Pro is an inadequate video switcher. A typical video switcher acts as the hub or core of a video system - inputs come in and outputs are sent out. Inputs and outputs are of equal importance and the lack of either can make or break the versatility and value of a switcher. Previewing sources passing through the switcher is also very important. And this is where the ATEM Mini and ATEM Mini Pro fall short. The ATEM Mini Pro only has one physical HDMI output. If the HDMI output is used for a preview or multiview monitor (which I highly recommend with any switcher), no other video outputs are available. No output to a separate recorder, no output to local displays, no IMAG, no output to overflow rooms, nothing. If the HDMI output is used for any of those things, no preview or multiview output is available. After many conversations, I have found this important limitation is often misunderstood or even missed completely.
Input: 4x HDMI
Input Formats: Up to 1920 x 1080 at 60 fps
Output Formats: H.264 (Maximum 70 Mbps)
Supported Destinations: RTMP, Facebook, YouTube, and Twitch
Multiple Destinations: Requires third-party re-streaming service
Recording: Yes (USB-C port)

Teradek VidiU Go
The best quality bang for the buck encoder.H.265/HEVC support means better video quality at lower bitrates compared to H.264.If you're looking for a reliable encoder to stream up to 1080p60 to most destinations, look no further.
Input: HDMI or 3G-SDI
Input Formats: Up to 1920 x 1080 at 60 fps
Output Formats: H.264 or H.265/HEVC up to 1920 x 1080 at 60 fps (Maximum 12 Mbps)
Supported Destinations: RTMP, RTSP, Facebook, YouTube, Vimeo, Twitch, and more
Multiple Destinations: Requires Teradek Core or another third-party re-streaming service
Recording: Yes (32GB or less SD card or USB drive)

Magewell Ultra Stream
While this may be the budget-friendly pick, it doesn't hold back on features. HEVC support, internal recording, and 4K capable HDMI input - a crazy good deal.
Input: HDMI or 3G-SDI
Input Formats: Up to 4096 x 2160 at 30 fps (4:4:4/4:2:2 HDMI signals), 4096 x 2160 at 60 fps (4:2:0 HDMI signals), or 2048 x 1080 at 60 fps (SDI)
Output Formats: H.264 or H.265/HEVC up to 1920 x 1080 at 60 fps (Maximum 8 Mbps)
Supported Destinations: RTMP, Facebook, YouTube, and Twitch
Multiple Destinations: Stream to 2 destinations simultaneously, but total maximum bitrate is capped at 8 Mbps
Recording: Yes (32GB internal storage, USB drive, or up to 1280 x 720 at 30 fps to a connected smartphone or tablet)

LiveU Solo
Need a reliable stream but don't have a reliable Internet connection? LiveU's Reliable Transport (LRT) can work across 4 data connections, including 2 USB cellular modems, to make it happen. Already a solid encoder for regular RTMP streaming, LRT and bonding are the cherry on top! *LRT (streaming over multiple bonded data connections) requires a monthly or yearly subscription
Input: HDMI only
Input Formats: Up to 1920 x 1080 at 60 fps
Output Formats: H.264 (Maximum 8 Mbps)
Supported Destinations: LRT, RTMP, RTMPS, Facebook, and YouTube
Multiple Destinations: Requires a third-party re-streaming service
Recording: No

AJA HELO
A reliable and proven option that's been around a few years, it still remains a solid choice. Built-in scheduler and control API give this tons of flexibility for your workflow.
Input: HDMI or 3G-SDI
Input Formats: Up to 1920 x 1080 at 60 fps
Output Formats: H.264 up to 1920 x 1080 at 60 fps (Maximum 20 Mbps)
Supported Destinations: RTMP, RTMPS, Facebook, YouTube, Vimeo, Twitch, and more
Multiple Destinations: Requires a third-party re-streaming service
Recording: Yes (SD card, USB drive, or a SMB or NFS network destination)

DEVICE
Apple iPad 10.2-Inch (Late 2019)
Fast, great screen, good cameras, excellent ecosystem - an amazing deal.
Storage: 32GB
Wi-Fi: Yes
Cellular Data: No
Video Formats: Up to 1920 x 1080 at 30 fps (main camera) or 1280 x 720 at 30 fps (front-facing camera)

CAMERA SUPPORT
Camera support and placement is important. A proper mount will provide ways to securely attach the device to tripods, stands, grips, and other types of support.

Aluminum iPad Tripod Mount
Made from aluminum, this is a solid iPad mount that doesn't interfere with ports or buttons. It comes with a built-in Arca-Swiss quick release plate base, but also has a 1/4"-20 mounting hole on the bottom for mounting to other plates or stands. Cold shoe mount on top - a great place to mount accessories like a light or microphone.

Endurax 66" Tripod
A simple and budget-friendly tripod.
Maximum height of 66" gives you enough to get the iPad camera around 72" high.
Maximum load capacity of 11 pounds gives you plenty of room to add other accessories.

AUDIO

Aside from your content, audio is the most important part of your production. Period. Viewers are much more sensitive to sound than they are to visuals, so audio clarity and consistency should be a top priority. The solutions listed below will help you achieve that, with 2 options to accommodate different situations and needs:

Camera-Mounted Microphone

This solution works well for personal recording or streaming, where one or two people are within a few feet of the camera.
It can also work well to pick up general ambiance in front of the camera.
It will not work well for picking up voices or sounds clearly from further away or in noisier environments.

> #### Saramonic Vmic Mini
> A great budget-friendly on-camera mini shotgun microphone.
> Comes with a TRS to TRRS cable that works directly into the iPad's 3.5mm headphone port. Female TRS connector on the mic gives you freedom to use different connectors and cable lengths.

Audio Interface

This solution provides more versatility and options when it comes to microphone choices and audio signals.
You can use this interface to receive signals from another audio console, plug in various XLR microphones, or plug in musical instruments.

> #### Saramonic Smartrig II
> Single channel XLR or 1/4″ preamp with 48v phantom power and headphone jack.
> Use any mic level input. 3.5mm output frees up the iPad's Lightning port for power or other tasks

<u>LIGHTING</u>

Remember, lighting is WAY more important to the quality of your video than the camera you use. Cameras like light and need plenty of it to get good results. This simple and budget-friendly lighting setup will give you good light output and a pleasing light quality that will work well for many situations.

16" Paper Lantern

Paper lanterns have been an industry standard in film and television lighting for nearly a century. They are versatile and provide natural, flattering, soft light that works great for lighting people and large areas without breaking the bank. They are lightweight and can be hung from ceilings, doorways, ceiling fans, shower curtain rods, and many other types of lighting stands.

Hanging Lantern Socket & Cord

Use this cord and socket to hang the China ball lantern and light bulb.
This is a 2-pack, but they accept a higher wattage than most (375 watts) and are from one of the only brands I trust.

Clear Incandescent Light Bulb (200 Watts)

Incandescent light bulbs are becoming harder to find, but they still provide the best brightness and color accuracy for the price.
IMPORTANT: Be cautious and careful when using incandescent bulbs in paper lanterns. Make sure the bulb is hung directly in the center of the lantern and does not touch any part of the paper to prevent fires.

<u>APPLICATIONS</u>

Now that you have the gear, here are great apps to help you record or stream the best quality video possible.

Filmic Pro

Easily one of the most popular and feature-packed video recording apps available. Filmic Pro gives you professional features and controls unavailable in the default Apple camera app. Gain manual control of camera settings like aperture, shutter speed, white balance, and gain. Includes tools and features like manual focus, more recording formats and data rates, false color, contrast peaking, and color profiles.

LumaFusion

Amazing, powerful, intuitive video editing right in iOS. Not cheap by mobile app standards, but well worth every penny if you need a powerful video editing app.

PLATFORMS
Facebook Live
With 2.5 billion monthly active users and live videos receiving some of the best engagement on the platform, Facebook Live is a natural choice to send your live stream.

Streamlabs
About the best live streaming app on iOS, giving you tons of features and a great ecosystem to support many different situations. Stream to most social platforms or any generic RTMP destination. *Requires monthly subscription to Streamlabs Prime to remove watermark from mobile streams*

UPGRADES

Apple iPad 128GB
If you plan on recording video, then the extra storage for the 128GB model is well worth the investment.

Manfrotto 755XB MDeVe Tripod
My budget-friendly tripod pick.
Better build quality and reliability will give you a tripod that lasts much longer.
Requires an additional fluid head for mounting a camera or device
Material: Aluminum
Head Mount Type: Flat (3/8"-16 male threaded center post)
Maximum Height: 64.9"
Minimum Height: 16.4"
Folded Length: 25"
Weight: 5.25 lbs
Payload Capacity: 15.4 lbs

Manfrotto MHXPRO Fluid Head
My budget-friendly fluid head pick.
A reliable fluid head will give you smooth pans and tilts if you need to do any camera moves.
Base Mount: Flat Base with 3/8"-16 Mounting Hole
Camera Plate: RC2 Quick Release
Load Capacity: 8.8 lbs

Rode VideoMic NTG
Combining the quality of their NTG shotgun microphones and the versatility of their VideoMic on-camera microphones, Rode has merged the best of both worlds to create the VideoMic NTG.

Rode Wireless Go
If you want a wireless mic solution, this is a great bang for the buck.

Saramonic Smartrig+
A dual channel upgrade to the Smartrig II.