STREAMING GUIDE FOR REAL TENNIS

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T&RA

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CASE STUDIES

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REAL TENNIS

CASE STUDIES

WHAT DO YOU NEED?

- Before commencing on the streaming journey, consider what the output of the streaming product will look like for your club
- Who is the audience for your stream? This will determine your setup
- Consider consulting other clubs who have made progress with streaming to visit your club – no need to keep reinventing the wheel

CASE STUDY 1 – HATFIELD HOUSE REAL TENNIS CLUB

CHALLENGES

- Hosts regular events of local interest (e.g. Club finals day and tournaments, Billy Ross Skinner)
- Target viewership 5-10 concurrent viewers
- Heritage building
- 1 levels of viewing galleries – limited vantage points to position cameras
- Limited clubroom space to set up equipment away from viewing/marking positions
- Social space has no visibility of the court

CASE STUDY 1 – HATFIELD HOUSE REAL TENNIS CLUB

S O L U T I O N

- Single camera set-up, installed prior to events – no permanent installation
- Single microphone set-up for dedans marking/ambient noise – wireless microphone for net marking
- Manual setup of YouTube backend for posting new streams
- Live stream coverage to clubrooms via Chromecast on YouTube

CASE STUDY 2 – CAMBRIDGE UNI REAL TENNIS CLUB

CHALLENGES

- Hosts regular events of national interest (e.g. Varsity second's, Inter-university cup)
- Target viewership 10-50 concurrent viewers
- Tournaments with large numbers of entries makes club busy – limited internet bandwidth
- 2 levels of viewing galleries – multiple vantage points to position cameras
- Tournament matches played across two courts – matches of interest on both courts

CASE STUDY 2 – CAMBRIDGE UNI REAL TENNIS CLUB

S O L U T I O N

- Multiple camera setup across both courts for major events
  - Dedans Camera (Blue Court & Green Court)
  - Grille Camera (Blue Court & Green Court)
  - 1st floor viewing gallery camera (Blue Court)
  - Potential for side gallery cameras in future (Blue Court)
- Single camera setup for club level events (Blue court dedans)
- Multiple microphone setup (side galleries, dedans) for major events, single microphone setup (dedans) for club events
- Automated script for posting videos to YouTube for club events – no requirement for technically capable persons to be on site
- Speakers installed in clubroom and TV for showing live score updates during matches

CASE STUDY 3 – QUEEN'S CLUB

CHALLENGES

- Hosts regular events of international interest (e.g. British Open, British Amateur Championships)
- Target viewership 100-500 concurrent viewers
- Busy club with significant numbers of spectators at major events – limited internet bandwidth
- Multiple stakeholders – (T&RA, Queen's Club Real Tennis Section, other sports and social facilities)
- 3 levels of viewing galleries – multiple vantage points to position cameras
- Tournaments held primarily on one court (despite other courts being available)

CASE STUDY 3 – QUEEN'S CLUB

S O L U T I O N

- Multiple camera setup on East Court for major events
  - Smart camera with zoom/rotate/pan feature on high back corner of court
  - Smart camera with zoom/rotate/pan feature in grille
  - Static camera can be installed in members bar
  - Static camera to be installed in dedans
- Multiple microphone setup (side galleries) for major events, option for commentary microphones
- Complex streaming product requires in-person setup and monitoring
- Separate room with view of court for managing stream

VIDEO & CAMERAS

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VIDEO AND CAMERAS - CONSIDERATIONS

INSTALLATION

- Will the camera be installed permanently installed or only during major events?
- Will installing the camera affect play? (i.e. would it interfere with a ball striking the corner of the dedans?)
- Is there an option for viewing out of a hole in the grille? Does this interfere with grille images, art or sponsor's logos?
- Can the camera be connected via cable to the installed streaming computer? (Although wireless connections are possible, they are less reliable than cabled connections, introduce lag and potential audio desynchronisation and require somebody to be monitoring the connection throughout the stream)
- Is there a power source close to the camera?
- Does the shape of the underside of the penthouse permit direct installation of a camera, or does it require a specialised mounting bracket?

VIDEO AND CAMERAS - CONSIDERATIONS

P O S I T I O N I N G

Options for positioning cameras:

- Right hand side of the dedans – this is where the marker sits and gives the best view of the whole court, except the position players stand when serving railroads
- Upper galleries – often this provides a view of the whole court and gives a good sense of scale of the match. For first floor upper galleries, position centrally or behind where a player would stand when serving a railroad. For second floor upper galleries, if possible pick a corner adjoining the main wall so as to see underneath the penthouses.
- Grille – a good alternate shot when serving or when a player is aiming for galleries, but usually cannot see the player returning serve. Not ideal for a single camera operation
- Side galleries – only viable as a forth or fifth camera choice for when players change ends or are preparing to serve high serves

VIDEO AND CAMERAS

GoPro

Pros

- Readily available – many members may already have one
- High quality video output with inbuilt wide angle lens
- Wide range of mounting options

GoPro

Cons

- Not shock resistant – not recommended to install in front of gallery netting (preferably behind glass)
- Newer models of GoPro require a media mod to provide micro-HDMI output
- Screen and setup needs to be individually configured before each stream
- Prone to overheating through long use
- Finicky software implementation

VIDEO AND CAMERAS

Security Cameras

Pros

- Once installed, no further setup required
- Vandal-proof security cameras mean can be installed in front of dedans netting without fear of damage
- Capable of HD streaming
- High end options permit pan/zoom
- Low power use means can be left on permanently until required

Security Cameras

Cons

- Installation inside dedans requires customised mounting
- Not generally suitable for installation on upper galleries

VIDEO AND CAMERAS - CONSIDERATIONS

C A B L I N G

HDMI Cabling

- Suitable for short distances between camera and computer (approx. 1-5 m). Longer distances require HDMI to SDI converter (which also requires power source).
- Natural output for GoPro and similar products

SDI/BNC Cabling

- Coaxial cable means good for long distances and for running through walls/exterior of buildings.
- Natural output for security camera and similar products

Fibre optic cabling

- Expensive option useful for very long distances

VIDEO AND CAMERAS - CONSIDERATIONS

CAPTURE CARDS

Input into computer from a camera requires a capture card to convert the signal into a format readable by the machine. USB Capture Cards

- Versatile and suitable for single camera setups. Suitable for laptops and desktops. Plug and play
- Connect to both SDI and HDMI inputs. Multiple cameras require lots of USB inputs
- Magewell USB Capture SDI Gen 2 (SDI) or Elgato Cam Link 4K (HDMI)

Inbuilt Capture Cards

- A more expensive option generally only suitable for desktop computers. May allow many separate inputs. Mixing of HDMI and SDI inputs may not be possible depending on computer hardware.
- Blackmagic Decklink Quad HDMI (HDMI) or Blackmagic Decklink Duo 2 (SDI)

AUDIO & MICROPHONES

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AUDIO & MICROPHONES - CONSIDERATIONS

AMBIENT SOUND

- A minimum requirement for streaming
- Main noises are ball striking penthouse, racquet hits, shoe squeaking
- Effects mics best placed in side galleries – can also be used for markers at the net. Generally located away from spectators (spectators in side galleries tend not to be conversational c.f. spectators in the dedans)
- If installation is an issue, it is possible to locate in the dedans near the marker, but risks picking up spectator conversations
- Omnidirectional microphones with flat frequency response. Lots of options, e.g. RODE NT55

AUDIO & MICROPHONES - CONSIDERATIONS

MARKERS SOUND

- A common cause for complaint is not being able to hear the markers on stream.
- Markers at the net can be picked up with ambient sound
- Markers in the dedans are often near spectators whose conversations shouldn't be recorded, and don't speak loudly enough for side gallery ambient mics
- Options:
  - Lapel mic for marker, though requires battery management and wireless receiver
  - Headset microphone for marker, though may restrict markers mobility
  - Dynamic microphone set up near the marking position, may be permanently installed but higher risk of picking up conversations

AUDIO & MICROPHONES - CONSIDERATIONS

COMMENTARY

- Only required for major events
- Need to position commentators with view of court, access to streaming computer, and away from players so they can have conversations
- Access to YouTube comments stream to enable interaction with audience
- Preferred options
  - Lip ribbon mic – gets levels correct but can be an expensive option
  - Headset mic – cheaper but doesn't allow commentators to leave position or have conversations away from microphone

AUDIO & MICROPHONES - CONSIDERATIONS

C A B L I N G

USB Microphones

- Cheapest option for single microphone setups
- Only suitable if microphone is physically near streaming computer, lower audio quality

XLR cables

- Suitable for distances up to 30m, can be installed within walls. Long lines if unshielded may have unwanted noise
- Common connector for high quality microphones

RCA cables

- Suitable for connecting devices within the streaming setup (e.g. wireless receiver)

AUDIO & MICROPHONES - CONSIDERATIONS

M I X I N G

Setups with multiple microphones need to be mixed to provide a single audio

- Most mixing decks have USB output for direct connection to streaming computer
- Consider the number of connections to the mixing board for both current and future setups
- Behringer XENYX series

COMPUTERS, SOFTWARE & INTERNET

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COMPUTERS, SOFTWARE & INTERNET

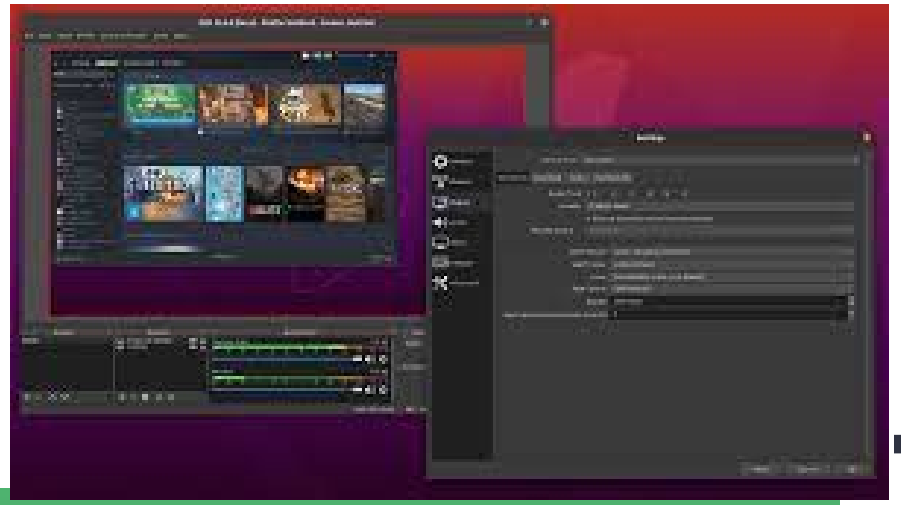
COMPUTERS

- Single camera setups can be streamed from most standard-issue laptops or desktops
- Multiple camera setups generally require higher spec computers
- Desktops can be customised to the budget and spec as required:
- Consider number of USB ports, internal capture cards, CPU and graphics card

COMPUTERS, SOFTWARE & INTERNET

SOFTWARE - STREAMING

- OBS is a free and open source software for video recording and live streaming. Suitable for all use cases from single camera setup to multiple camera setup
- OBS joins the various video and audio streams, scoreboards, sponsor logos into a single video output
- Native upload to YouTube, Twitch, Facebook Live, records video to file by default
- Hotkey to switch cameras, toggle audio and graphics – set up as required



COMPUTERS, SOFTWARE & INTERNET

SOFTWARE – ONE BUTTON STREAMING

- Given a permanent setup of cameras/audio and computer software, it is possible to set up one-button streaming
- Set up video, post to YouTube with description, title etc with one hotkey – no technical knowledge required
- Requires customised script and setup
- Can be paired with Elgato stream deck for ease of use for club and club members

COMPUTERS, SOFTWARE & INTERNET

SOFTWARE – SCOREBOARD

- Incorporating a scoreboard increases viewer retention – lack of a scoreboard leaves viewers without context as to the state of the match
- Scoreboard exists as an overlay on top of the stream compiled in OBS
- Position scoreboard on screen so as not to obstruct play, but still be readable to viewer on a small screen (e.g. phone)
- Scoreboard updated by marker using a tablet or by a dedicated scorekeeper
- Options:
  - Chase One marking app (Android only)
  - Court Marker marking app (beta mode only)
- It is possible to live pair your scoreboard to TV screens elsewhere in your club so people following matches know the score!

COMPUTERS, SOFTWARE & INTERNET

I N T E R N E T

- A reliable internet connection is required to upload stream. Upload streams of >10 Mbps are recommended. Tethered phones do not provide a reliable enough connection
- Consider directly connecting to internet router via ethernet (LAN) cable to improve reliability
- The setup and testing are likely to be done on a day when your club is quiet, as the court is often empty – few people around with few phones connected to WiFi. The event you stream will often be one of your clubs busiest days.
- If you are expecting more than a dozen devices connected to your WiFi network during your stream, consider setting up a dedicated network for your stream.

PROMOTING YOUR STREAM

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PROMOTING YOUR STREAM

PLATFORMS

Several platforms exist for hosting your stream:

- YouTube
  - Dedicated video hosting with a broad audience, simple to navigate and find. Public, Unlisted and Private streaming options
  - No subscriber limit for posting live streams. Videos hosted permanently and easy to find past streams
- Twitch
  - Limited audience skewed to younger viewers
  - Streams removed after 14 days
- Facebook live
  - Limited audience to your Facebook followers
  - Setup more suited for live streaming from phones, not dedicated streaming software

PROMOTING YOUR STREAM

P R O M O T I O N

- For major events, communicate live stream links to your members up to a week before the event
- Promote your event through club newsletters, Twitter, Facebook etc.
- Include a link to the live stream in event promotion. YouTube allows scheduled live streams to be set up weeks in advance of the event
- Create an expectation at your club that events will be live streamed so that club members know that they can follow along when an event is on
- Consider including your club logo and/or sponsor logos on the live stream
- It is possible to incorporate pre recorded club or sponsor videos within the live stream, either before or after the match

CONCLUSION

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CONCLUSION

P R O M O T I O N

- Get help! Other clubs have gone through this before and have faced similar challenges in their own journey
- Consider your scope – what do you want your product to look like? How often will you stream?
- Consider your budget – it is always possible to spend more. Work out what your minimum requirements are and build from there
- Consider your technical knowledge – if something breaks, who has the skills to fix it? A complex setup that depends on the technical knowledge of a few individuals is not resilient. Remember that on event day, your club pro probably has better things to do than fiddle with computers or cameras

CONCLUSION

BUDGET - CAMERAS

- GoPro
  - Camera - £330 per camera
  - Media Mod - £80 per camera, Mounts ~£50 per camera
  - HDMI-HDMI mini cable ~£20 per camera
  - Capture card >£150 per camera
- Security Camera
  - Low budget camera ~£150 (1080p only)
  - Mid budget camera ~£350 (4K, high frame rate)
  - High budget camera ~£2500 (pan/tilt/zoom)
  - Capture Card >£150 per camera
  - Cabling £2.50 per meter + installation

CONCLUSION

BUDGET - MICROPHONES

- RODE area microphones – min ~£150+ per microphone
- Lip ribbon microphones ~£600 per microphone
- Headset microphone ~£30 per microphone, plus ~£150 for receiver
- Dynamic microphone ~£50 per microphone
- Mixer ~£40 (few channels) to ~£120 (many channels)
- Wiring ~£2.50 per meter + installation

CONCLUSION

B U D G E T - C O M P U T E R S

- Software – All freeware
- Minimum spec laptop (single camera stream) ~£900
- Maximum spec desktop (multiple camera stream) ~£2000
- Elgato Streamdeck ~£60