Capturing MR/VR Apps for Publishing

A Developer Playbook on Capture Techniques and Best Practices

∞ Meta

Contents

01
Introduction

1 Introduction

This playbook provides essential tips and best practices to help you present your mixed reality (MR) and virtual reality (VR) experiences on Meta Quest headsets at the best quality!

This playbook outlines the following:

- Detailed technical specifications and settings for optimal captures

- Design fundamentals for MR and VR captures

- Advanced techniques for recording MR in third person

- Additional post-production techniques and tips for leveling up your content

- Guidelines when recording footage

NOTE: You need to use a Meta Quest Pro to capture mixed reality experiences at the best quality.

02
Publishing Guidelines

2 Publishing Guidelines

As you prepare to create content for the publishing approval process, there are two main areas to consider for the final product:

1. Trailer Requirements as defined by the Meta Quest Store Asset Design Guidelines

2. Compliance for Meta Quest Store Policies and Content Guidelines

If the requirements and policies are not met from your submission, it can delay the approval process, so make sure your content follows the criteria outlined in these guidelines. New safety recommendations when recording are also available in the Appendix.

03
Creating the Story

3 Creating the Story

With any footage, recording at the highest quality is the main priority. However, by leveraging filmmaking techniques, you can refine the presentation of your experience and focus on capturing key moments, such as important interactions or features. By creating a story around your experience, you can leave a lasting impression for your audience.

What to Film

Within a short trailer, it becomes extremely important to focus on the user's experience as well as the major themes and mechanics of the application. By creating storyboards to highlight key moments within MR, you can develop a sense of what kind of recordings or user shots you want. Specifically, if you have a single player experience, you will probably be limited to first person footage. To support the storyboard, something like a loose script can be used, so that you can flow through the story of your experience and focus on the details of your footage.

Where to Film

Especially with MR, users are able to experience the world physically around them. Because of this, it is important to have a clean set around you while recording. By blocking the set, you can capture a user from different parts of the room (or even different rooms entirely) and show the motion of your application. It's good practice to remove some of the extra clutter in the room, this will allow the focus to remain on the game assets you would like to feature. See the Appendix for additional requirements.

Lighting the Area

With an ideal area to film our users in the experience, lighting can also play an important role and make the video editing process easier. With entry level LED lights, you can illuminate the area in front of a user to highlight their hands or make sure an entire room is well lit with several lights. The amount of lighting needed will reflect the kinds of shots you're trying to capture.

Who to Film

Send a casting call out to hire actors to help sell the story that reflects the target audience of your application. Make sure to review several applicants before hiring so you can find the best fit for your trailer. In cases where there is no need to hire professional actors or your budget does not allow for it, try to find some friends to play the part so you can focus on directing the actor to best represent the app. Please refer to the User Traits section in the Appendix for further casting guidelines to ensure your asset meets Meta's compliance requirements.

Product demo only. Not representative of final product.

04
Recording and Editing

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Recording and Editing

Now that you have an idea of the story you are telling, here are some recommendations for how to capture first and third person perspectives from your headset. Specifically, the following sections will allow you to capture MR and VR experiences with Meta Quest headsets.

Recording the Content

MR/VR POV Capture

Capturing MR/VR footage in this perspective will give viewers a sense of what it's like to play the game themselves. In particular, this perspective can be helpful for Portrait mode viewing with short format content— enabling a viewer to be immersed in the experience. We will go over the highest settings available to you in headset. For those looking to capture at the highest quality, the **Meta Quest Developer Hub** section will have more details on unlocking these options.

Capturing POV will give viewers a sense of what it's like to play the game themselves.

Specific Steps and Optimal Settings for POV Capture

1.   Put on your Meta Quest headset and open the **Camera** app.

2.   Select the "gear" icon to open **Camera Settings**.

3.   Set the following video recording advanced settings:

- •   YouTube/Facebook Aspect ratio: **Landscape (1920 × 1080 px)**

- •   Mobile-Native Aspect Ratio: **Portrait mode (1080 × 1920 px)**

- •   Frame rate: **36 fps (variable)**

- •   Bit rate: **20 mbps**

- •   Image stabilization: **Low**

- •   Eye preference: **Whichever is most comfortable**
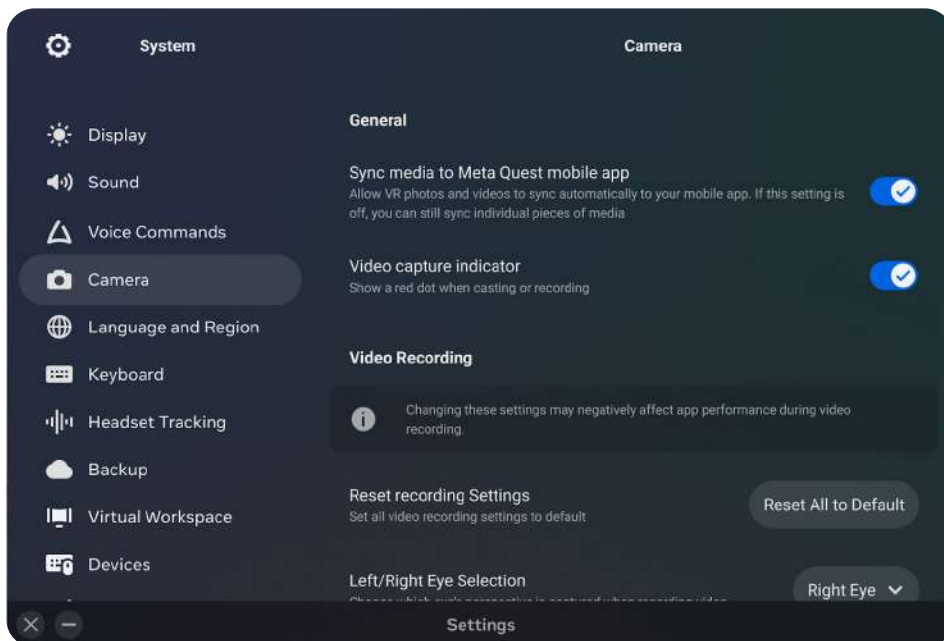
With all of these settings in place, once you fire up your app you can click the Oculus menu button and press the camera icon on the same window to start recording, your headset will start capturing everything you see! For best results with MR/VR POV capture, **use slow head movements**, being sure that whichever eye you select in the camera settings to record, you take a moment to frame your shot. Remember, you will be acting as the camera operator.

MR/VR Third Person Capture

Please note that this is only applicable for games that allow multiplayer or developers who are able to add multiplayer to utilize a second or third player as a camera.

Capturing VR/MR third person footage will often create a more compelling perspective for the viewer, increasing engagement and interest. As the camera operator, you are able to capture specific angles around the user to see a larger environment. In addition, you can move around or with the user to add more action to your footage.

Capturing third person will often create a more compelling perspective for the viewer.


Product demo only not representative of final product.

Specific Steps and Optimal Settings for Third Person Capture

1.   Put on your Meta Quest headset and open the **Camera** app.

2.   Select the "gear" icon to open **Camera Settings**.

3.   Set the following video recording advanced settings:

   •   YouTube/Facebook Aspect ratio: **Landscape (1920 × 1080 px)**

   •   Mobile-Native Aspect Ratio: **Portrait mode (1080 × 1920 px)**

   •   Frame rate: **36 FPS (variable)**

   •   Bit rate: **20 Mbps**

Whether it's one or 10 people, you can capture the engagement of your app in different ways. You can be off to the side as objects fly at a player or right in front of them to see simple interactions. Remember that as the camera operator, the best practices for POV capture such as slow movements still apply.

You will also want to take the game's environment into account as the application may not be able to tell the distance of the person from the camera being captured, creating some issues with game assets that may be overlaid on their body even though they are behind the user. With this in mind, it is best to capture footage where game objects are intentionally in front of the user being captured.

Additionally using an additional player to capture footage in a VR app will only show in app visuals and not the real life player. For more information on viewing someone in third person in a VR app check out the Advanced Third Person Camera Tools section.
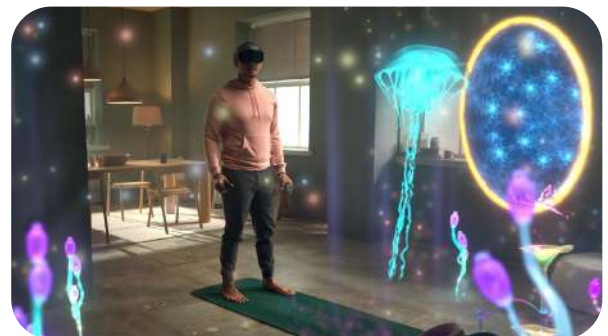
Using the Footage

Now that you have the recordings you want, you'll need to get them onto a computer to edit the footage. This will help to cut out unnecessary or bad recordings and focus on the story of your experience. *Please keep in mind this process is not compatible with Mac.* Please refer further to the [Meta Quest Developer Hub](#) section for more information on transferring saved files from Mac.

Transferring from Headset to PC via Link Cable

1. Connect the headset via a Link cable to your computer.

2. Within the headset, a window with a pop-up will appear: "Allow Access to Data." Select "Allow."

3. On your computer, you can navigate to your file manager and find the Oculus device and navigate to **Oculus/Videoshots** to see what is saved on the headset.

4. Drag and drop these files onto your computer (ideally a different folder for just the recordings)!

In just a few steps, your recordings are now available to be edited!

Editing the Footage

Finally, you can use your video files in video editing software to clean up your recordings. Here are some editing suggestions:


Color Correction

Depending on the title, VR and MR content can appear too dark, making it difficult to watch. By leveraging the image settings within video editing software, you can make sure that your footage is bright enough to actually see your user or dark enough to remove focus from the background. Additionally, you can adjust tones and saturation so that the colors show accurately.


Image Stabilization

Most modern video editing software can help stabilize your recording with one button. Something to keep in mind—if your footage is too shaky, the software can crop out a lot of the image area, so try to keep your movements clean!
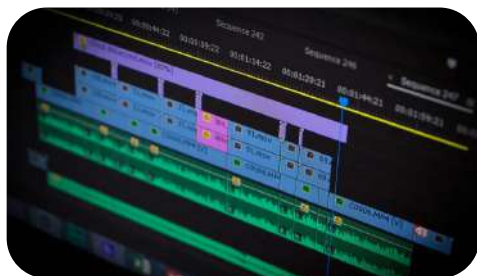
Trimming Footage

To keep your story concise, you can organize all of your recordings into a sequence that aligns with your storyboard. Additionally, you can cut out segments of your clips that are unnecessary, so that they don't detract from the story.
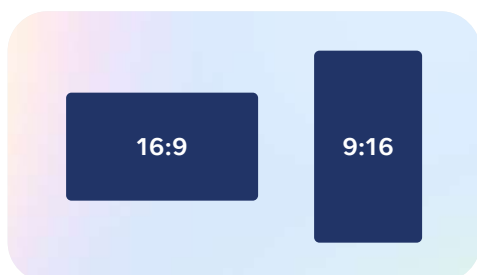
Video Aspect Ratio

Ideally, this should already be mimicked from the settings you had set up from the headset, but as an additional check, you can resize the video to fit the perspective of your target platform (for example 1920 x 1080 vs. 1080 x 1920).

With your footage all cleaned up, you are ready to export it to a video file, such as an .mp4, and upload it to any platform!

05
Advanced Techniques for Capture

5 Advanced Techniques for Capture

Now, whether you've just started with capture or have been capturing your experiences for a long time, this section has some additional tips for techniques and software. All of these are a level above simply capturing footage and putting it online, but some of these do require a considerable amount of extra time or resources.

Recording the Content

For alternatives to recording footage directly on the headset, you can leverage other software and tools, such as the Meta Quest Developer Hub, or capture from PCVR utilities.

Meta Quest Developer Hub (MQDH)

1. *Hardware requirements*

    •   You will need a compatible USB cable (such as a USB-C to USB-C or USB-A to USB-C) to connect your Quest headset to your PC.

2. *Software installation*

    •   Download and install the Meta Quest Developer Hub software on your Windows or Mac.

3. *Quality settings*

    •   With your device connected to your desktop, open the **Meta Quest Developer Hub** and select the **Device Manager** page

    •   Select the **Record Video** settings

    •   For maximum quality choose **2160p @60FPS** (variable) and **40 Mbps**

        (You may need to reduce settings here but performance will be dependent on how many resources your application needs for stable, usable, footage.)

4. *File transfer:* With your device connected to your computer and **Meta Quest Developer Hub** open, access the left-most panel and navigate to "file manager" where you will now be able to access the USB storage of the device and transfer the videos you recorded on the device located in. Note: if your video files are more than 500 MB, you will need to update your MQDH settings via Settings > General > Turn on "Download Large Device Files."

5. *Perspective Best Practices:* Please see the previous recommendations for how to use the headset to capture either POV or third person footage.

If your MR/VR application requires a lot of system performance, you may notice periodic frame dropping. If that is the case, we suggest using the settings recommended in the *MR/VR Capture Fundamentals* section.

PCVR Capture

If the quality of the native Meta Quest output does not meet your needs, please use a PCVR build with at least 1080p 60 FPS Fixed and at least 20 Mbps configured.

You can use the Oculus Mirror utility as a simple way to capture your headset on a computer and leverage OBS to record the content. Alternatively, you can also capture the casting output in a web browser. The quality will be lower than MQDH recording, so this workaround may be effective for short-form video capture.

Advanced Third Person Camera Tools

For alternatives to recording footage directly on the headset, you can leverage other software and tools, such as the Meta Quest Developer Hub, or capture from PCVR utilities.

Research has shown that showing a user interacting with your app in third person helps engage viewers and better represent the experience as opposed to a trailer that only shows first person POV.

Capturing third person footage with an MR app does come with some considerations. A VR app has an entirely virtual environment where users can be captured on a greenscreen and composited into the VR world. MR applications utilize the player's real world environment, meaning you will need to instead composite the virtual objects into the real world camera feed since you will not be able to easily remove the player from the background without a green screen.

This will mean you need to employ some custom processes to make third person footage true to the game, which we will mention later in this document.

There are a few methods that more advanced developers can explore to produce MR third person capture. Many use the following process. These methods are being validated for use in MR single/ multiplayer apps. You will need to integrate the following into your set up:

1.   Add a secondary camera to your app with the Unity Camera Rig and output the feed to the desktop or other preferred camera render process. While in engine, align the 3rd person game camera to your real world cameras position and dial in the FOV + position till the game view matches your real cameras perspective.

2.   Leverage a MR capture (MRC) tool to handle the calibration process.

   •   Movable MRC camera (https://www.liv.tv/)

   •   OR Fixed position MRC camera

Third person MRC is a fairly advanced technique; however, it can be accessible to most developers with some minor camera/rigging/lighting investments and experimentation. VR creators, like TougeVR, have great tutorials for making high-quality MRC content.

When shooting an MR application you will need to either render out a separate alpha channel with your third person camera to use in the editing tool of your choice to mask out the game objects or alternatively turn the background of your game world green (or other vibrant color not in your app) to key out everything as you would a green screen except in the game instead of your camera feed.

For those who are looking to get more technical and have access to a phone with a lidar camera, another option available to you is to use the lidar camera to get the depth data from your camera so you can properly position the MR objects in front of and behind your player. Fabio with the Reality Mixer app has some great examples of this process for creators who do not have a green screen you can check out here.

06
Post-production
Best Practices

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Post-production Best Practices

It's recommended that you export your headset captured media through the [Meta Quest Developer Hub](#) via the File Manager page. For cases where connecting through USB aren't possible or you are using a secondary account that cannot be accessed over USB, you can use the sync option located in the three dot menu on each video file to sync the videos recorded to your Meta app or log into your preferred file sharing solution on the browser in your headset to upload there.

Additional Development Features to Support Capture

To go above and beyond recording, adding in specific developer only features can help streamline the recording process. **Keep in mind** that all of these require additional work outside of the core functionally of your experience, so it is entirely up to you to add these features.

Here is a list of features we recommend you add to your app so the VR window on your PC has the highest quality capture.

- A flythrough camera for more cinematic environment and wide shots. We recommend adding a hideable UI with these options:

    - No clip to go through objects

    - Speed toggle to go slower or faster

    - Translate and rotate smoothing for smooth camera moves/stabilized shots

    - Depth of field toggle (if possible)

    - LOD slider to adjust shots while setting up

    - FOV slider to capture wider or more narrow shots

    - Brightness slider to brighten or darken a scene

    - Controller/Joystick support for flying a camera

- Ability to restart a scene, NPC dialogue, or other action to recapture multiple times

- God mode/invincibility so you can play through the levels more easily and spend less time capturing

- UI toggles not limited to just HUD elements, but also outlines or icons

- Spawn items, enemies, etc. for ease of capture especially if your app is procedurally generated in any aspect

07
Closing Thoughts

7 Closing Thoughts

Regardless of the method you choose, it is crucial to consider your hardware limitations, optimize your capture settings, and conduct thorough testing to ensure the best possible video quality.

By following these recommendations and considering the alternatives provided, you will be well-equipped to capture high-quality video recordings with your Meta Quest headset. Enjoy creating and sharing your immersive VR experiences!

Appendix

Guidelines for Video Capture and Production

Content should adhere to the general principles of the [Meta Quest Health and Safety Guidelines](#).

The Set

Minimum clear play/work area

- VR

  - Show users in a clear play area that is a minimum of 6 × 6 feet.

  - Play area must be free of obstacles.

  - Ensure that users are NOT co-located in a single play area.

- MR (color passthrough)

  - Show users in a clear work area, free of obstacles.

  - Ensure that users are NOT co-located in close proximity.

  - Users must be at least arms distance apart.

  - Depicting talent seated or standing near a PC, desk, whiteboard, or other work environment may be okay.

  - Users should not be shown eating or drinking in the device

The play/work area and a buffer zone around it should be free from objects that could interfere with clear play space:

- Overhead objects (ceiling fans, lights, hanging plants, etc.)

- Protrusions (table or floor lamps, shelving, tables, cat climbing trees, etc.)

- Fireplaces, heaters, or other sources of heat

- Aquariums, sinks, beverages, or other sources of water/liquid

The play/work area should be away from hazardous objects or areas.

The play/work area should NOT be shown near:

- Stairwells

- Balconies

- Raised or lowered portions of rooms

Buffer zone

- Users should be shown indoors.

- Users should NOT be shown in the following areas:

  - On a street

  - On a balcony or building stoop

  - In a front- or backyard

  - On a roof

If shown being set up or put away, the headset should be shown as stored in appropriate locations:

- NOT in direct sunlight (next to windows, in sun glare, etc.)

- Away from sources of heat or water (not next to heaters, fireplaces, sinks, aquariums, etc.)

- Consider getting the headset in/out of an official Meta Quest accessory travel case.

Noticeable brands or other existing IPs

User Traits

Ages 13 and older

Meta Quest products are for ages 13+. Any talent depicted using the device should be and obviously appear to be 15 or older. For mature content, the talent depicted using the device should be and obviously appear to be 18 or older.

Attire

Users should be shown wearing attire appropriate to the activity.

Unimpaired

Users should NOT be shown in a state of obvious or implied impairment, such as:

- Being inebriated on alcohol or drugs

- Donning the headset after partaking in alcohol or drugs

- Donning or wearing the headset in a setting like a party or a bar where all or most other participants are taking alcohol or drugs

- Donning or wearing the headset while obviously emotionally distraught

Donning the Headset and the Touch Controllers

Headset positioning and fit

Make sure the headset fits appropriately by

- Adjusting top and side straps to fit the head

- Placing the headset on head so that it is balanced in front of eyes

Lanyards

The Touch controllers' lanyards should be around the user's wrists while using the headset, tightened so they are neither too loose nor too tight.

- Consider showing the Touch controllers dangling from wrists when users put on headsets to demonstrate good user behavior.

- Since they come installed, the lanyards should NOT be removed for hero shots.

Additional accessories

All hardware for games sold on the quest store should be showing Quest hardware without any third party accessories.

Activity

Controlled movements

Users' movements should be intentional/controlled, NOT wild, so that they are depicted as remaining within their clear play area. Guardian boundaries should be depicted if users approach boundaries.

- Users should NOT be shown:

  - Flipping

  - Floor spins

  - Jumping + off furniture

  - Running at high speed (jogging a couple steps may be appropriate, depending on context, and jogging in place may be appropriate)

Aligned with content

Users' movements should be appropriate to the content shown. For example, lunges and squats may be appropriate for fitness content; but similar movements may not be accurate for entertainment or gaming content.

- Food and drink. Users should NOT be shown eating or drinking while wearing the headset.

Content

Appropriate content

Users should be shown using content that will:

- Work in their play space

    - No room-scale content or activity in a small play space

- Have the appropriate comfort level and age grade

    - Users closer to 15 should always be shown using content appropriate for their age based on ESRB ratings.

Non-players and pets

Non-interference

Non-users should be depicted away, giving adequate space to the player, and not in the clear play space.

Pets

Pets generally should NOT be shown in the same room as users, unless they are

- Calm (like a cat relaxing on a couch) or

- Restrained (like a bird in a cage or a dog being held by a non-user).

Teens

Meta Quest is for ages 13 and older. Any talent depicted using the device should look and be 15 and older.

Meta