Virtual reality headsets are widespread today. They have been created by many companies in unique, creative forms. We will look at some of the most popular virtual reality, or ‘VR’, headsets that have been released to the public today.

Arguably the most popular VR headset would be the ‘Oculus Rift’, designed by a division of Facebook. This headset was shipped on March 28th, 2016. The first model was named ‘CV1’, standing for ‘Consumer Version 1’, and was released on May 21st, 2016. It boasts a 1080x1200 display per-eye, leading to a combined resolution of 1080x2400 overall. ‘CV1’ also has a 90Hz refresh rate, with a 360-degree positional tracking system, 110-degree field of view, and integrated audio output[[1]](#footnote-1). With this model, there was a clear focus on ergonomics and overall beauty of the headset. Shortly after ‘CV1’, the ‘Rift S’ was developed. Shipped on May 21st, 2019, this headset came with a 2560x1440 LCD 80Hz display, a 115-degree field of view, positional tracking, and in-built audio[[2]](#footnote-2). This headset uses ‘Oculus Insight’, which is its method of tracking motion in the real environment using five cameras on the headset. These cameras observe the surrounding area and notice changes, reflecting these changes in the gameplay[[3]](#footnote-3). The ‘Rift S’ also uses ‘Oculus Home’, which is outputted to the headset when there is no other output to be displayed. This displays things such as a VR store, list of applications and more, making it easy to access applications and other things quickly. This headset, compared to the others that will be mentioned, was one of the pioneering products in the VR world.

Sony’s take on VR was nothing short of the quality of the ‘CV1’. Shipped in October 2016, ‘PlayStation VR’ contained a 5.7-inch OLED panel, which had a resolution of 960x1080 per-eye, giving a combined resolution of 1920x1080 overall, with a refresh rate of 90-120Hz[[4]](#footnote-4). One flaw of this headset is that there is no official option to transfer use to another system. ‘PlayStation VR’ is only officially supported to be used on PlayStation 4 or, in the future, PlayStation 5. This headset also boasts 3D audio, a 100-degree field of view, and has 9 positional LEDs to track 360-degree movement of the head[[5]](#footnote-5). With ‘PlayStation VR’ supporting a refresh rate of 120Hz, it is clearly a high-tier headset, and seeing as most PlayStation 4 titles only support up to 60FPS, the headset used “a motion interpolation technique” called asynchronous reprojection (Wikipedia, n.d). This technology is aimed at improving the smoothness of the framerate of video, especially in virtual reality headsets, achieved by “warping” the previous frame into a prediction of how the next frame will look[[6]](#footnote-6). This allowed the ‘PlayStation VR’ headset to view these high framerates, even if the game wasn’t designed to run at this level. Another advantage of this headset would be the compatibility. This headset has one design, and anything designed to be run by the headset only needs to be designed to suit one specification. This leads to less compatibility issues, which can not be said for any of the other headsets that have been/will be mentioned. In terms of quality, however, ‘PlayStation VR’ certainly matches the hardware quality and ergonomics of the other headsets.

The ‘HTC Vive’ was released on the 5th of April 2016. The quality and beauty of the Vive certainly matched that of both the Oculus and the PlayStation VR headsets. Developed by HTC, and using technology developed by Valve (who, in turn, develop their own VR headset), the Vive grew to become one of the most popular VR headsets upon release for their high quality. This headset comes with a 1080x1200 display per-eye, combined for a 2160x1200 display overall. Using a 90Hz refresh rate, there is also a 110-degree field of view, leading to great immersion whilst playing/watching using the headset[[7]](#footnote-7). The Vive uses a safety camera and software, similar to ‘Oculus Guardian’, labelled as a ‘Chaperone system’, and it displays a virtual wall for the user if an obstacle is nearby in the real world[[8]](#footnote-8). The Vive uses many infrared sensors on the headset to detect the infrared pulses from the ‘base stations’ that are set up around the play area. This is its method of detecting movement of the headset in the play area, which differs slightly from other headsets. The base stations are 2 black boxes, which create a 360-degree play virtual space, known to all as the ‘play area’. These base stations emit 60 pulses per second, so that the user is tracked consistently, and doesn’t wander outside the play area. The Vive also comes with handheld controllers, which contain around 24 infrared sensors on the ring of the controller in order to determine the location of the controllers in the play area (extremely accurate). In comparison to the other headsets, the HTC Vive is certainly one of the higher tier headsets. While things like display may not reach the highs other headsets have, the build quality, ergonomics and mechanics of this headset is arguably the best.

The ‘Valve Index’ is the most recent VR headset to be released, shipping in June 2019. The Valve Index certainly boasts the highest quality (and retail price), with a 1440x1600 per-eye resolution, combined for a 2880x1600 LCD display. One can select the refresh rate, either 80, 90, 120, or an experimental 144Hz. The Index also uses a field of view of 130 degrees[[9]](#footnote-9). This field of view is what sets the Index apart from its competition. The lenses being closer to the eyes means a wider field of view, which is essential to feel more immersed in the headset[[10]](#footnote-10). Similar to the Vive, Index uses the Valve lighthouse system as a means of motion tracking, but it is an improved version. It also has the option for Valve Index controllers, which are also compatible with the Vive. For the most part, the operation and mechanics of the Index is similar to the Vive, with a much higher production quality.

1. ‘Oculus Rift’*, Wikipedia*, n.d, <https://en.wikipedia.org/wiki/Oculus_Rift>, retrieved 4th May, 2020. [↑](#footnote-ref-1)
2. Kevin Carbotte, ‘Oculus Rift S Review: First-Gen VR Gets a Reboot’, *TomsHardware*, 2019, <https://www.tomshardware.com/reviews/oculus-rift-s-vr-headset,6148.html>, retrieved 6th May 2020. [↑](#footnote-ref-2)
3. ‘Powered by AI: Oculus Insight’, *Facebook*, 2019, <https://ai.facebook.com/blog/powered-by-ai-oculus-insight/>, retrieved 6th May 2020. [↑](#footnote-ref-3)
4. ‘PlayStation VR’, *Wikipedia*, n.d, <https://en.wikipedia.org/wiki/PlayStation_VR>, retrieved 5th May 2020. [↑](#footnote-ref-4)
5. ‘PlayStation VR Tech Specs’,*PlayStation,* n.d, <https://www.playstation.com/en-ca/explore/playstation-vr/tech-specs/>, retrieved 6th May 2020. [↑](#footnote-ref-5)
6. ‘Asynchronous reprojection’, *Wikipedia,* n.d, <https://en.wikipedia.org/wiki/Asynchronous_reprojection>, retrieved 6th May 2020. [↑](#footnote-ref-6)
7. ‘HTC Vive’, *Wikipedia*, n.d, <https://en.wikipedia.org/wiki/HTC_Vive>, retrieved 7th May 2020. [↑](#footnote-ref-7)
8. ‘Chaperone’, *Xinreality*, n.d, <https://xinreality.com/wiki/Chaperone>, retrieved 7th May 2020. [↑](#footnote-ref-8)
9. ‘Valve Index’, *Wikipedia*, n.d, <https://en.wikipedia.org/wiki/Valve_Index>, retrieved 7th May 2020. [↑](#footnote-ref-9)
10. Nick Pino, ‘Valve Index review’, *TechRadar,* 2019, <https://www.techradar.com/reviews/valve-index>, retrieved 7th May 2020. [↑](#footnote-ref-10)