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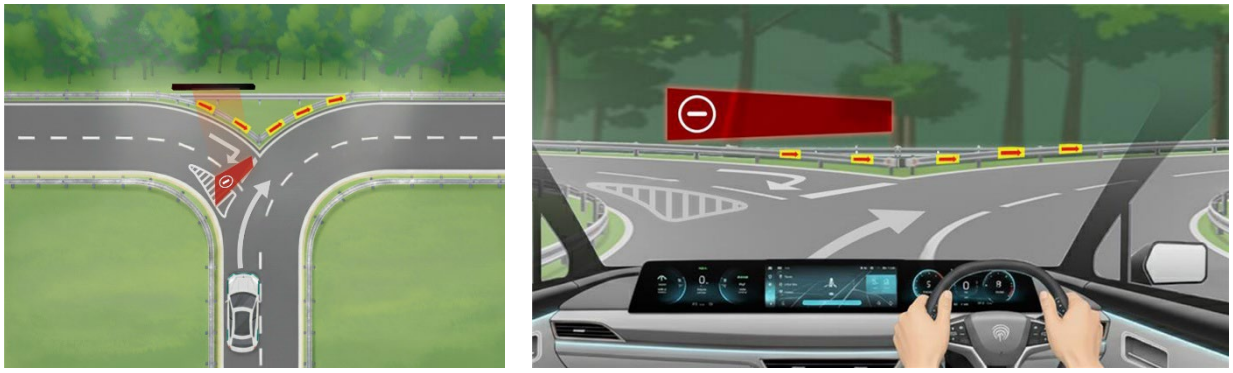
# Mitsubishi Electric's CielVision System Projects Realistic Images in Mid-air with High Brightness and High Definition

*Will enable XR solutions for enhanced safety and convenience and more immersive experiences*



Example of 2D aerial display achieved with CielVision (Image)

**TOKYO, October 6, 2025** – Mitsubishi Electric Corporation (TOKYO: 6503) announced today its development of the CielVision aerial display system. The system projects realistic images in mid-air with high brightness and high definition using new digital-optical technology that combines the company's proprietary aerial-projection optical technology with digital-image processing technology. By significantly improving the visibility of aerial images as well as downsizing the displays, Mitsubishi Electric's new extended-reality (XR) solution is expected to find applications in a wide range of scenarios.

Aerial displays that provide users with a high sense of presence and immersion are attracting attention due to advances in digital technology. Most aerial displays use a low-cost retro-reflection system that reflect light back in direction it comes from. However, such systems rely on retro-reflective materials and half-mirrors, resulting in dark images due to light loss and low visibility due to reduced resolution. In addition, since these optical systems use constant magnification,* a large display screen is required to display a large image, limiting portability.

The new CielVision system uses Mitsubishi Electric's proprietary aerial-projection optical technology to display clear aerial images with just one free-form mirror. Notably, the mirror's optical element has a free-form reflecting surface with a complex curvature that allows precise control of reflected light. The system also

* The display device (light source) and aerial image are the same size, and distances from optical element to display device and aerial image are also equal.

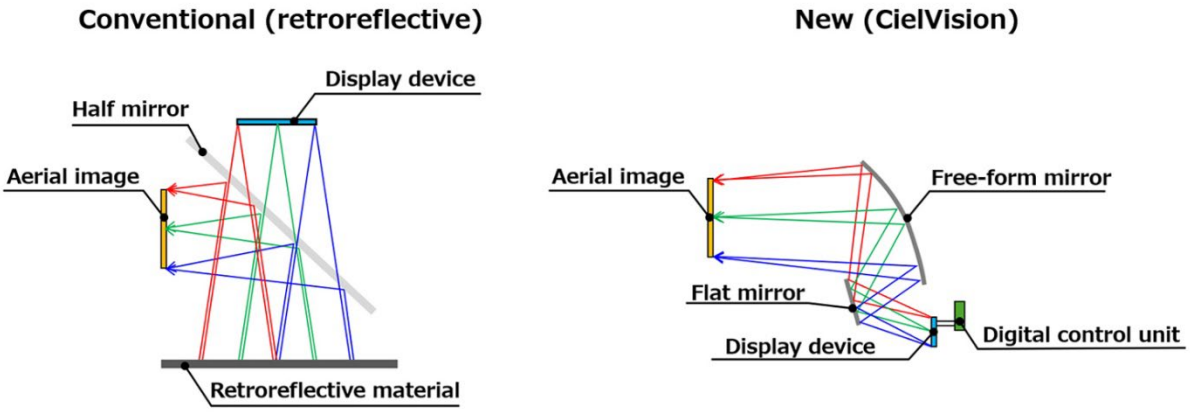
uses digital-image processing technology to correct any distortion of aerial images. In addition to displaying 2D images, CielVision uses an aerial image superimposition function to display parallax images to both eyes simultaneously, achieving 3D aerial images visible to the naked eye. Furthermore, Mitsubishi Electric's solution uses much smaller projection devices than conventional aerial displays, making it more portable.

The new system is expected to enable the use of aerial images in applications that were previously difficult. For example, it can be used in outdoor settings where high luminance is required, or in spaces close to the user's field of vision, such as the center of a corridor, in addition to walls or overhead spaces. Going forward, the system is expected to support highly intuitive decision-making in XR solutions applied to various situations, contributing to greater safety and convenience as well as more immersive experiences.

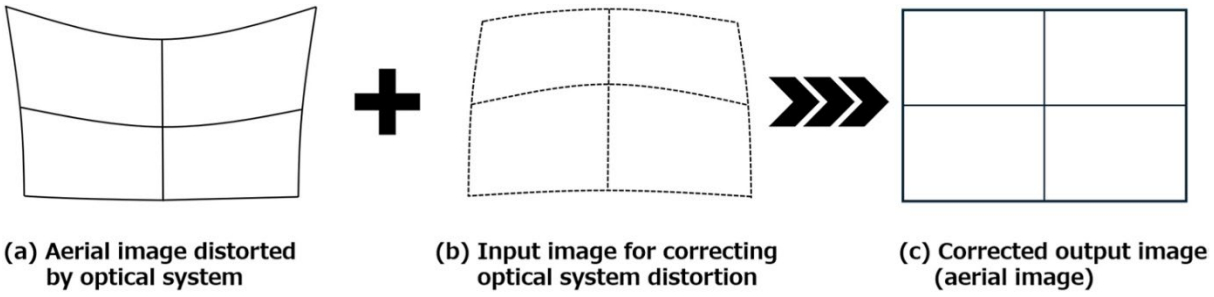
**Features**

***1) High-brightness, high-definition aerial video displays achieved with downsized equipment***

- Using only one free-form mirror optimally designed with proprietary aerial-projection optical technology, Mitsubishi Electric has reduced the variation in image display position within the viewing angle to achieve highly visible aerial images. This is an issue with off-axis optical systems, in which the optical elements are offset from the optical axis, requiring advanced optical design. Using only one mirror also improves light utilization efficiency by approximately 400% compared to conventional systems using retroreflective materials or half mirrors, contributing to image brightness and definition.
- Aerial image distortion, a characteristic of aerial-projection optics, is corrected using software-based digital-image processing technology to achieve distortion-free, high-quality aerial images.
- Even for large images, there is no need to maintain a large distance between the display device and other equipment. This results in a smaller, more portable smaller solution than conventional systems and expands the range of potential applications.



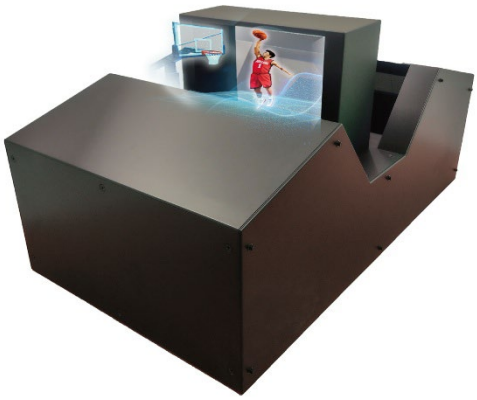

Comparison of aerial display systems




Correction of aerial image distortion using digital-image processing technology

***2) 3D aerial display visible without goggles***

- An aerial-image superimposition function based on 2D aerial-display technology generates two images in the same space.
- By projecting a high-brightness, high-definition, distortion-free parallax image to each eye, a realistic 3D aerial image can be viewed with naked eyes, without wearing goggles.



Rendition of 3D aerial display created with CielVision

**Feature Development**

Mitsubishi Electric aims to use its new system to develop advanced XR solutions for purposes such as aerial signage to prevent wrong-way driving, next-generation human-machine interfaces (HMIs) for in-car entertainment systems, contactless HMIs for supporting medical surgeries, and highly immersive experiences at events and exhibitions.

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**About Mitsubishi Electric Corporation**

With more than 100 years of experience in providing reliable, high-quality products, Mitsubishi Electric Corporation (TOKYO: 6503) is a recognized world leader in the manufacture, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, energy, transportation and building equipment. Mitsubishi Electric enriches society with technology in the spirit of its "Changes for the Better." The company recorded a revenue of 5,521.7 billion yen (U.S.$ 36.8 billion*) in the fiscal year ended March 31, 2025. For more information, please visit www.MitsubishiElectric.com

*U.S. dollar amounts are translated from yen at the rate of ¥150=U.S.$1, the approximate rate on the Tokyo Foreign Exchange Market on March 31, 2025