

HUMAN SPACE ENDEAVOURS SYMPOSIUM (B3)
ISS Utilisation (3)

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THE ERASMUS RECORDING BINOCULAR 2 (ERB-2)

Abstract

We present the Erasmus Recording Binocular 2 (ERB-2), a stereoscopic 3D video camera built for use onboard the International Space Station. ERB-2 has been developed by cosine (Leiden, NL) in collaboration with Techno System Developments (Naples, IT), and is the second generation of the stereoscopic camera family started with the ERB-1, which was successfully launched with Soyuz 22P on the 29th June 2006. ERB-2 was built within just a year of its commissioning by the Human Space Flight and Operations Directorate of the European Space Agency. The ERB-2 was launched with Progress 44P on the 3rd February 2010, and since then allows simulating human binocular vision on board of the International space Station (ISS), and therefore to capture 3D films of the scenes seen by the camera. The main features of ERB-2 can be summarized as follows:

- HD resolution: 1280 x 720 pixel (HD720p), thereby achieving a compatible resolution with current commercial HDTV equipment.
- Allows live broadcast of stereo films by using the High Rate Data Link (HRDL) available on board the ISS.

We present also the ERB-2 many technological challenges in the area of image compression, data encoding in space protocol formats and integration of dual data stream in both viewing and transmitting. The camera remains one of the unique developments that integrates stereo viewing on separate OLED displays.

Also the aspects of the User Home Base (UHB), developed in parallel by the industrial consortium are presented. As a perfect example of decentralised space operations, it allows controlling the camera on board the ISS, processing and visualizing the ERB-2 3D content on the 3D projector in the European Space Research and Technology Centre (ESTEC). The whole broadcasting chain from the ISS down to ESA ESTEC in the Netherlands, was successfully commissioned on the 6th August 2011, when NASA astronaut Ron Garan operated the ERB-2 providing, for the first time ever, 3D live streaming from space to ground at ESTEC. Here, viewers wore polarised glasses similar to those used in cinemas and were amazed by the quality of the images. These near-real 3D images not only change the whole viewing experience, but can also be used in supporting science operations on the Station and robotics operations in Extra Vehicular Activities, as often has been reported by the various astronauts that had a chance to use it. ESA is considering the possibility to initiate a development for such activities.