

Teradacho  
Fireloop

JAPAN



LUMIX PRO Case Study

## VR images using the BS1H

COVID-19 has also had a serious impact on the music industry. Looking ahead to the post-COVID-19 era, Hiroshi Adachi, who has been running "Teradacho Fireloop," a live music venue in Osaka for the past 20 years, continues to challenge the evolution of live entertainment, including the creation of VR content using the BS1H. Adachi believes that there is value in uniqueness, whether it be in music or creativity.



"I want to deliver content to those who enjoy it so that they too can take pride in the fact that they are watching something great. I didn't want to settle for just an adequate level of quality because I didn't have the budget, so I chose the full-frame BS1H." Adachi advocates live video streaming and VR content as a new way to enjoy music. And eventually, he hopes that people who have only seen video content will say they want to see the real thing and visit live music venues as if they were making a pilgrimage to a sacred place.

## Habitual user of the successive generations of the GH series

Adachi has been a habitual user of the LUMIX GH series for some time. He looks back on those days, saying, "The GH1 had just the right amount of background blur, and it gave me the depth of field I was looking for." Around the time he was using the GH3, the COVID-19 pandemic began, resulting in the cancellation of all live events. Artists began to express their eagerness to live-stream without an audience. However, he had a strong desire not to produce images like an inferior version of TV music programs. He finally figured it out when he tried to stream fixed images with a single GH3. "There are no fancy switching or close-ups of the vocals or guitar solos using multiple cameras, but all the band members are shown from a bird's eye view. I felt that this style, which fans can enjoy from their own perspectives, had the same appeal as live music venues."

## Seeking uncompromising quality, he chose the BS1H

While continuing to stream images with a fixed camera, Adachi thought that full-frame cameras would improve the quality of the images even more, so he raised funds through crowdfunding to purchase the necessary equipment. "I didn't want the streamed images to be an inferior alternative version for those who couldn't come to the live show. I wanted to provide high quality live images that I could be proud of, using a camera that offered unparalleled performance." Using the funds he raised, the camera that he eventually chose after much deliberation was the BS1H. According to him, there was no other camera that could provide impressive images that surpassed the GH series in terms of color and texture expression.



"At the end of the day, LUMIX had the best color reproduction for blue LED lighting. The tonal gradations in dark areas were also excellent. The streaming is in Full-HD, but customers praised the fact that they could clearly see the fingertips of the performers and the strings of the guitar when viewed on a large TV." He added, "As live music venues are subject to vibration and temperature fluctuations, there were concerns about recording with full-frame cameras for extended periods of time, so the robust design and heat-dissipating fans were reassuring."

## I tried VR images, and they were amazing!

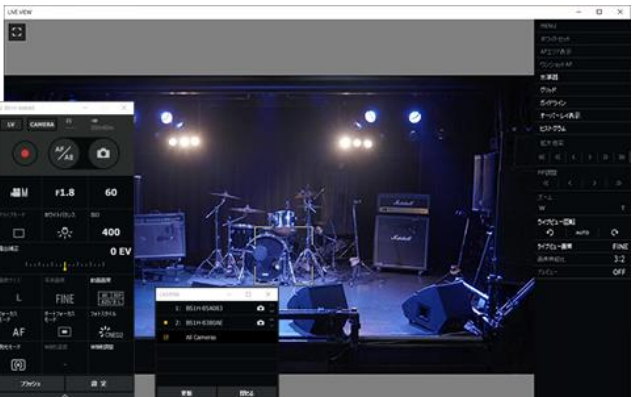
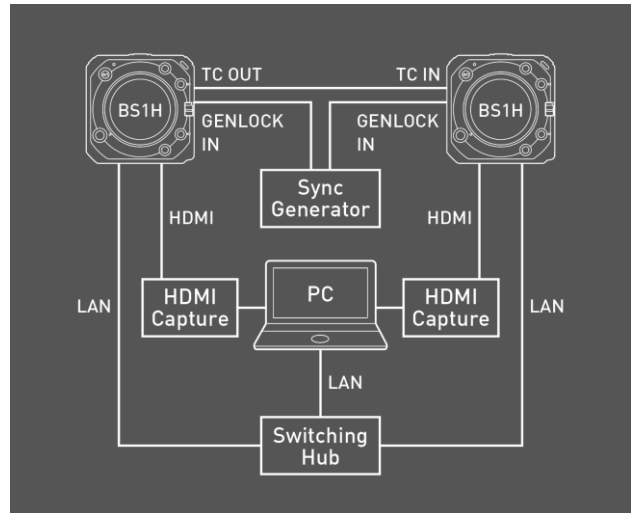
"After the GH3, I had been streaming for about a year using the GH4. I used the newly introduced BS1H as a streaming camera, so I tried shooting 3D images with the two extra GH4s and was able to capture some very cool images." However, he became concerned that the left and right images seemed to be slightly misaligned, and when he mentioned this to a Panasonic development staff member who came to inspect Fireloop, he learned that the BS1H had a feature that was perfect for this. By using LUMIX's first GENLOCK IN terminal, multiple cameras can be synchronized frame by frame, and when combined with time code, even more precise synchronization is possible.



Since then, Adachi considered various cameras equipped with GENLOCK IN. However, many cameras were large and expensive, and the BGH1 and BS1H were the only compact and realistically priced cameras that were equipped with GENLOCK IN. Thus, he made the decision to introduce two additional BS1H cameras. "Since VR images were generally pan-focused, I was very interested in 3D images with blurred backgrounds and foregrounds. It is difficult to know what parts to watch in live videos when everything, including the audience, is three-dimensional. I wanted to capture 3D images in which the surroundings were blurred and the stage stood out well, which led me to choose the full-frame BS1H."

## I want to add more and more VR content with a simple workflow

“First, I use HDMI Capture to import the left and right images to the PC, and then place them side by side in OBS to see if there are any problems. The shutter speed, ISO value, etc. can be set using LUMIX Tether, and the two cameras can be remotely controlled at the same time to start and stop recording by Tether. The two videos recorded on SD can then be combined into one VR image using editing software to complete it. The VR content is available on the XR platform Blinky (<https://blinky.jp>) operated by Alpha Code Inc.” Adachi believes that there is still very little content for VR, and that this issue will not be resolved unless VR is produced with a simple workflow that is as cost-effective as possible. “Taking into consideration the user’s viewing environment, we are now shooting in 4K30P MOV. If the communication environment evolves and we can make it in 60p, we should be able to shoot very realistic images.”



## High quality VR images with two BS1H cameras fully synchronized by GENLOCK

“Synchronization of GENLOCK and timecode made a huge difference in the 3D stereoscopic effect and texture compared to no synchronization. The human eye doesn’t misalign with the timing of the left and right eye, and if they are not synchronized even slightly, the human eye is sensitive to the sense of discomfort.” Adachi says that he did a lot of research on three-dimensional viewing mechanisms and shooting 3D images when creating VR content. “There is also the problem of eye strain caused by the distance between the lenses of the two cameras and the distance between the pupils, but in the end, what is important when converting images into content is deformation. I want to emphasize the joy and realism of seeing the performers on stage in three dimensions.”



## I tried many things, but in the end, Cinelike D2 was the best choice



"I used to use a Panasonic AG-DVX100B professional DV camera, but with 3CCD, the colors were impressive. Until I encountered the GH series, I thought I would have to give up on reproducing red and blue colors like that with a 1MOS system, but LUMIX did not disappoint my expectations for those colors." Adachi has been shooting with the Cinelike D Photo Style since he began using the GH4, and he continues to record with the BS1H using the Cinelike D2. The DVX100 was the world's first camcorder to support 24p shooting and was much talked about for its ability to produce cinematic-like video expression.

"Cinelike D" is the Cinelike Gamma that was also equipped on the DVX100, so it makes sense that he would choose this one. "I shot in LOG and tried different LUTs. 709 was too vivid to use in a live music venue. The lighting in live music venues is a mishmash of colors that do not exist in nature, and Cinelike D2 was able to depict this in a way that was most psychologically pleasing. I tried many things, but in the end, Cinelike D2 was the best, and there was hardly any need for post-processing."

Based on a clear picture-marking philosophy, LUMIX has a unified image quality design whether it is a full-frame or micro four-thirds camera, with particular emphasis on the subjective aspects that come from human sensitivity. Adachi's comment that "the color expression felt psychologically right" can be said to be the result of development focusing on image quality to reproduce the colors that people emotionally perceive and remember.

