

## Stereoscopic 3D channel branding for live events

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One of the biggest, if not the biggest, opportunity for stereoscopic 3D television is live events, such as sports and concerts. However, controlling 3D channel branding graphics in a live environment presents many challenges in order to avoid awkward perspective effects. For instance, operators need to decide where to place the 3D graphics in terms of the perspective, or Z-axis-positioning, for optimal viewing, and how to control the Z-axis-positioning of the graphics during the program to compensate for changes to the perspective.

## Getting the Z-depth right

To better explain this graphics positioning issue, it's worth considering a simple case of stereoscopic 3D logo insertion for a program with a changing 3D perspective. When the program has a Near Depth, with the 3D effect appearing to come out of the screen to the viewer, there's a requirement to have the logo positioned in front of the action to maintain a natural perspective. During a sequence with a flat perspective, or a Far Depth (with the perspective effect going into the distance), the branding graphics need to be much further back in order to remain in front of the action. Naturally, if the Z-axis-positioning of the graphic is incorrect at any point, the 3D effect may be impaired, or the graphic may interfere with the program itself.

To avoid these kinds of perspective errors, the Z-axis-positioning of a channel branding graphic can be changed to suit a program sequence by adjusting the horizontal separation of the left and right graphics, which are required to create a stereoscopic 3D graphic. This method of controlling the Z-axis-positioning is called Horizontal Image Translation, and it's essentially a pretty simple concept. When the right and

left images of a branding graphic are separated horizontally in one direction, the graphic will appear to come out of the screen. Conversely, when the left and right graphics are moved in the other direction, they will appear to move into the screen (see diagram 1).

Hence, one way to control Z-axis-positioning is to have multiple versions of a specific graphic, each with different left and right horizontal separations. This is not difficult to accomplish, as stereoscopic 3D graphics can be created using standard graphics tools like Adobe Premiere and After Effects, which are much easier to use than traditional 3D news graphics (non-stereoscopic).

However, an obvious problem with this approach is that it demands more complex media management to offer multiple different depth positions required for a logo. Therefore, this approach has not been widely adopted, and the focus has been towards controlling the Z-axis positioning by dynamically changing the separation of a single pair of left and right branding images.

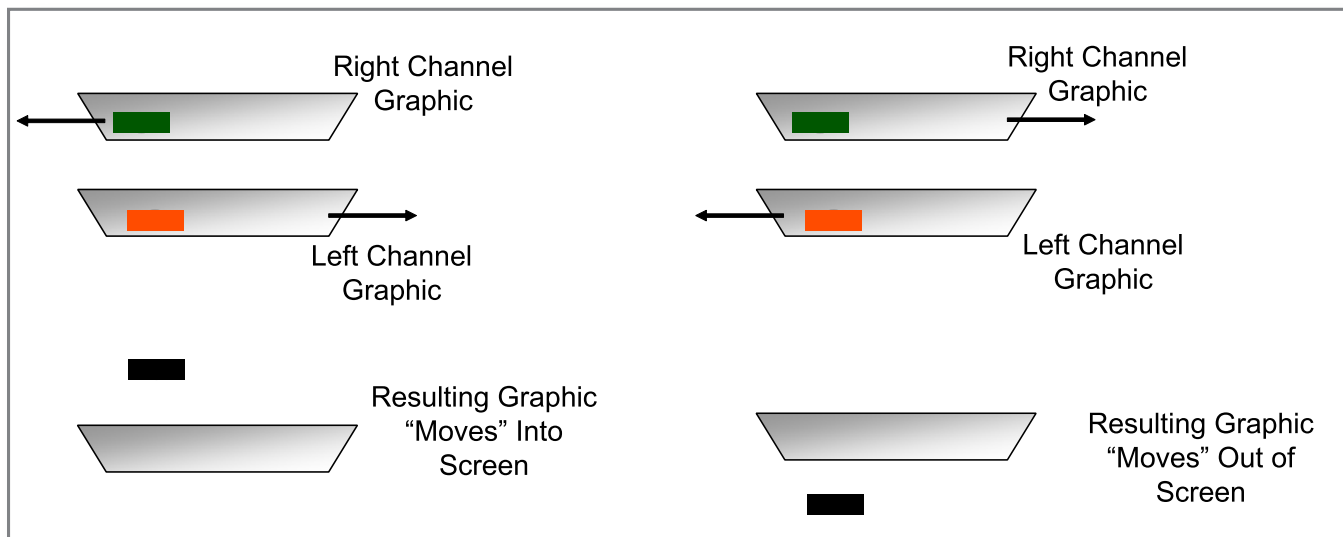


Diagram 1: The Z-axis-positioning of a channel branding graphic can be controlled by adjusting the horizontal separation of the left and right channel branding graphics.

## Using automation plus manual control

With live 3D event programming, playout automation can be used for loading 3D graphics, like bugs, on and off for different segments, just as with 2D television. However, playout automation can't easily be used for Z-axis positioning control due to the unpredictable nature of live programming, and the inability of the automation to respond to Z-axis positioning.

In view of this, it's often best to supplement the automated control of branding with manual Z-axis positioning control, using a branding control panel with depth presets (see picture 1). By using presets, a master control operator can quickly and easily rectify incorrect graphics Z-axis positioning issues, using smooth depth adjustment transitions.

Looking further ahead, it's anticipated that advances in 3D metadata playout will enable more sophisticated automated control. Channel branding processors will be able to read Z-axis positioning metadata, probably in a similar manner to reading AFD aspect ratio metadata, and automatically adjust the position of the channel branding to optimize the presentation.

Another related automated control option is dynamic measurement of the Z-axis positioning by the channel branding processor, or an associated signal processor, and performing on-the-fly adjustment of the branding graphics according to the depth data. This may represent a good back-up solution in the absence of Z-axis positioning metadata. However, both of these advanced automated control techniques are still in their formative stages, and are not fully proven to date.



Picture 1. Stereoscopic 3D branding control panel with Z-axis-positioning control presets.

## Conclusion

In summation, 3D channel branding is still significantly more demanding than traditional 2D television graphics, and especially so for live events. However, practical solutions exist right now, and a number of developments are on the horizon with respect to new technology and video standardization, which seem likely to further streamline processes considerably.

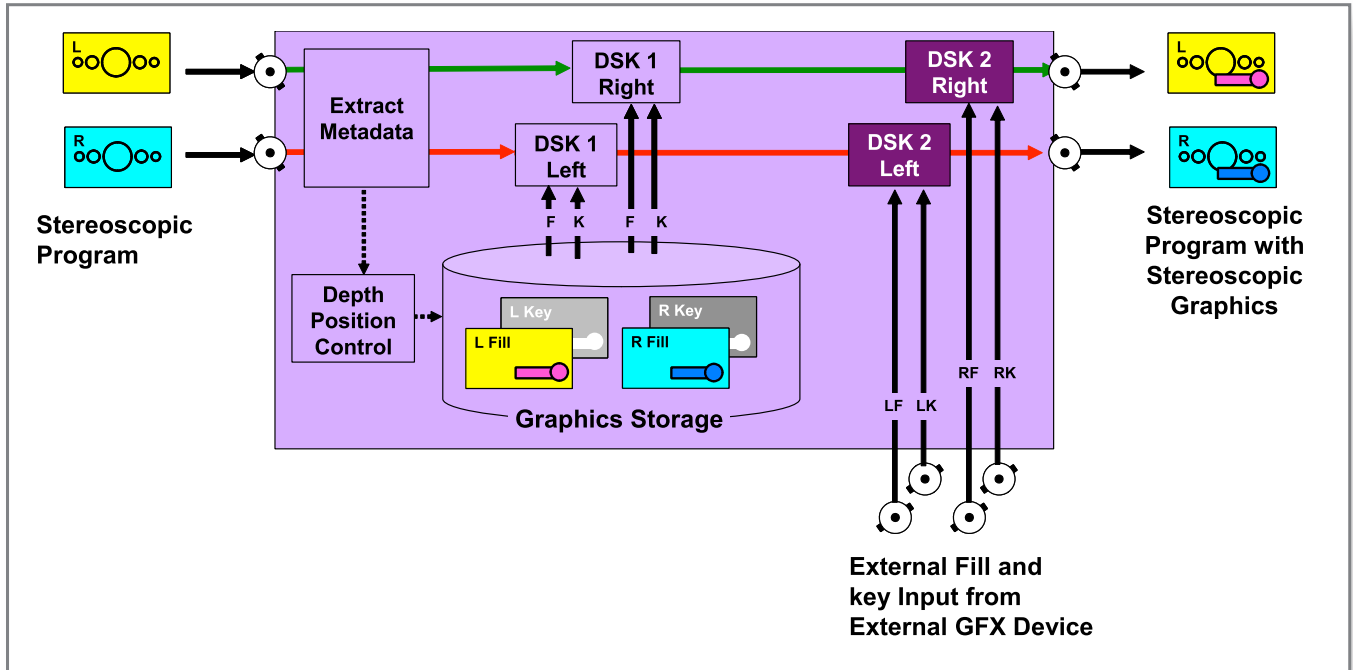


Diagram 2: By extracting stereoscopic 3D metadata, a channel branding processor can automatically adjust the Z-axis positioning of the graphics to optimize viewing.