

Reference Series: Can you explain in detail how e-Shift works?

JVC e-shift was originally designed as a unique way to project images with 3840x2160 (4K) precision from a 2D HD video source. The latest projectors models now utilize the e-shift process to also project native 4K video sources. For this particular question we'll focus on the basic elements of e-shift as it relates to up-scaling 2K HD video sources. Please find the FAQ that explains of how e-shift functions to project native 4K video sources.

The e-Shift process does not simply double up the same 1920x1080 frame to create a 3840x2160 frame. It's got impressive sophistication and intelligence to the upscaling. The process involves evaluating each 1920x1080 video frame using a correlation detection algorithm and then creating a new 3840x2160 video frame internally. During this process it enhances edge transitions, increases contrast in detailed areas, and nearly eliminates aliasing and stair-stepping. This enhanced 3840x2160 frame is then separated into two new 1920x1080 sub-frames, which are then alternately projected to the screen at 120Hz. The e-Shift device shifts the two unique sub-frames $\frac{1}{2}$ pixel diagonally from each and the result is an image that has 3840x2160 (4K) precision. JVC e-Shift technology was co-developed with NHK Engineering Services. See the diagram below.

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