

Will Take Over?

Over/Under

by John Dennis

The idea of stacking the left and right halves of a stereo pair on *top* of each other generally strikes most stereo enthusiasts as somewhere between needlessly complex and downright bizarre. Actually, there are some quite logical reasons for presenting stereo images in an over/under format—despite such obvious drawbacks as the impossibility of freeviewing them without major surgery.

Large *horizontal* stereo images (as are sometimes needed in book or magazine illustration) simply *fit* on the page better if printed as over/under pairs. (Size alone is not a factor, since large images can be fused with prism or mirror viewers regardless of whether they are beside or above each

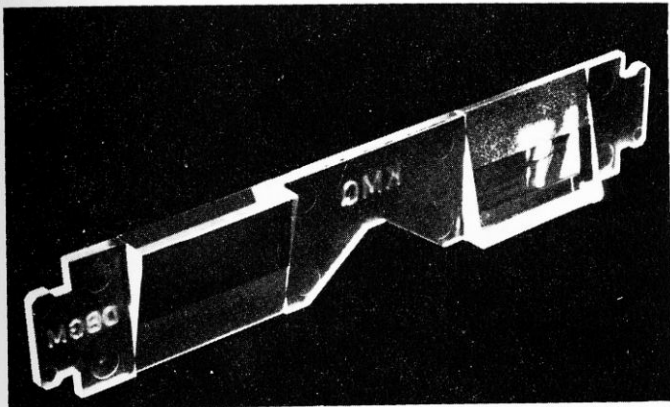
other.) Also favoring over/under fusion is the fact that our eyes have a tendency to resist their normal convergence being manipulated by the lenses, mirrors or prisms of side-by-side viewers. Over/under fusion requires no major adjustment by the eyes to forced convergence changes which may have no relation to their point of focus. The eyes remain focused *and* converged on a very nearly common point. The fact that one eye is actually looking a bit up and the other a bit down seems *less* distressing to the visual system—perhaps because such movement has no relation to our normal horizontal convergence mechanism.

Whatever the reasons, over/under viewing systems can work well if the images are properly presented. The German publishing company KMQ set out to make just that point in 1983 with their elegant book *Fascinating Nature*—filled with high quality over/under color stereographs. The often microscopic close-ups of insects, flowers and minerals fuse easily into stereo images that make the most experienced and cynical 3-D enthusiasts say "wow"—even through the simple plastic prism viewers provided by KMQ.

The book has sold out its first press run, and the similar calendars done by KMQ have become collector's items. The company has magazine features and other publications in the works, but *another* current aim is the perfection of an over/under system of 3-D television. A number of prism viewers, both fixed and adjustable, are in various stages of planning or production in order to make over/under viewing compatible between print and video images of any and all sizes.

A U.S. video production company, TVLI, has recently joined with KMQ to develop and distribute over/under 3-D for all media—especially television—under the LEAVISION trade mark. The first LEAVISION over/under videocassette is a 10 minute introduction to 3-D video titled *Summer Day*. The tape is a leisurely look at a park, a birdbath, and a young girl blowing bubbles—complete with music soundtrack but no narration or sales pitch.

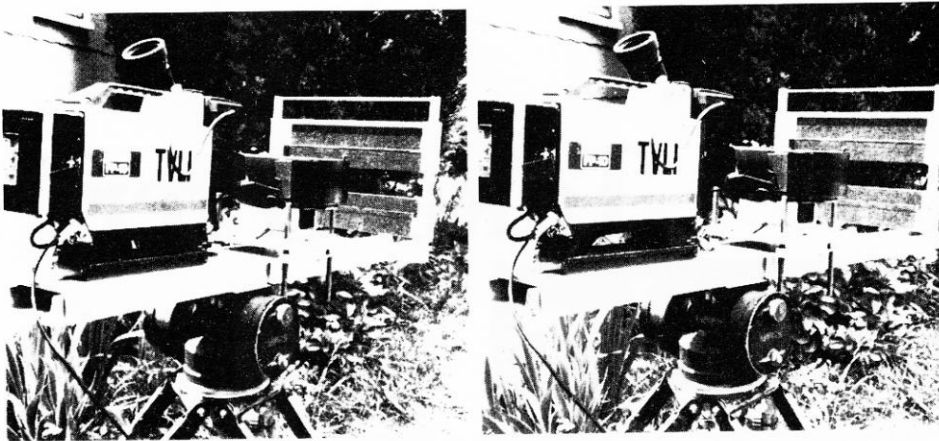
Aside from the obvious difference of the short, wide shape of the picture when fused (see photo) the first thing you notice is the lack of ghosting or flicker present in many other 3-D TV systems. The stereo image is as clear, bright and sharp as your TV screen is capable of producing—except that in exchange for seeing the full height of your screen, you get to see *into* it. The tape opens with a cross



The KMQ-1 plastic over/under viewer with frosted masking on prisms, designed for use with KMQ book and calendar projects in Germany.



Full screen shot from the over/under 3-D tape *SUMMER DAY*, plus side-by-side reproduction of the same left and right images. © 1986 TVLI, all rights reserved, *pat pend.* used by permission.



Camera rig used to shoot *SUMMER DAY* employs an over/under beam splitter designed for shooting 3-D movies. Added mask assembly in front limits image to narrow horizontal format. © 1986 TVLI, all rights reserved. pat pend. used by permission.

centered in the top (left) frame and a circle in the bottom frame. By adjusting your viewing distance from the screen while using the prism viewer, you can make the cross appear in the center of the circle. At that position, the images will be fused for stereo viewing.

Since the currently available KMQ viewers were designed for much closer viewing of book photos, only *one* of the prisms is used for the LEAVISION tape—leaving the other eye to view the screen directly. For more extended or frequent viewing of over/under TV, 6 and 8 diopter prisms mounted in eyeglass frames are available. *Adjustable* viewers are planned as well, allowing the screen to be viewed from almost any distance and allowing the same glasses to be used to fuse images printed in over/under publications.

One aspect of over/under viewing which bothers some people (especially at first) is the presence of vestigial flat images above and below the central stereo image. KMQ tried to solve this problem by "Frosting" a strip along the thin edge of the prisms in their original viewers. This can make using the viewer a bit like peeking through barely open Venetian blinds. For the vestigial images of over/under video, the KMQ-TVLI solution is somewhat more sophisticated. Polarizing filters are placed over the screen—covering the top half with one orientation, and the bottom with polarization in the *opposite* axis. When polarizers at matching angles are placed in front of the prisms in the viewer, vestigial images are suppressed without involving the polarizers in the actual fusion of the images.

A close look at the screen image reproduced here will reveal some apparent discrepancy in framing between the two images. (Her head looks closer to the top in the upper picture.) This is due to the cropping effect of the TV screen, which also introduces a contradictory curvature to the top of the left image and the bottom of the right image. TVLI president John Brumage has said that this will be corrected in the final release version of the tape by moving the top and bottom images closer at the center, allowing better masking all around fully visible images.

The inherent limitations of over/under TV (like the small image size and the somewhat restricted zone of good viewing directly in front of the screen) are all too easy to point out. (Prism viewers present problems of distortion and/or expense, but a light-weight adjustable *mirror* viewer could solve most of them.) But the overriding advantage of this system is that it can be seen with *any* reasonably healthy color or black & white TV using a simple passive viewing device. Without a viewer, the two pictures look redundant but not otherwise distorted, jumpy or tinted. The TVLI tape clearly shows, if nothing else, just how simple and in-

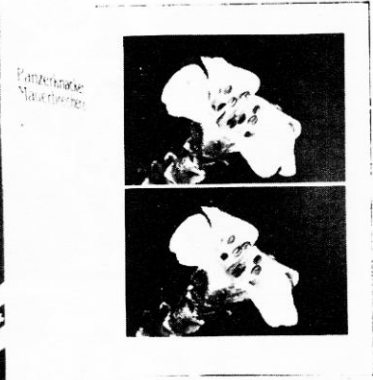
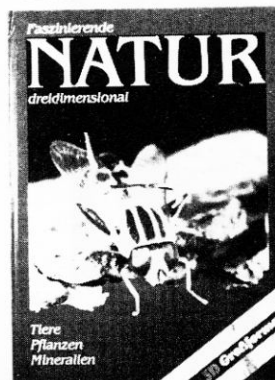
expensive 3-D TV can be and still present images better than a number of other recently promoted systems of far more cost and/or complexity.

According to John Brumage, "This first release is intended primarily for 3-D buffs and video professionals. The first mass market application will be for conversion of theatrical 3-D movies for cassette or television. In the long run, I feel that the biggest market will be network sports, especially football. We are working with a major optical company to develop a next-generation stereo lens system suitable for live television."

The LEAVISION tape with viewer and instructions is available in VHS or BETA for \$29.95 from TVLI. The company can also supply better viewers, custom made viewers, and polarizing filter kits. For complete price list and information, contact TVLI, 185 N. Clinton Ave., Lindenhurst, NY 11757.

Summer Day is hardly exciting video, but while watching it, all sorts of 3-D possibilities come to mind. The wide aspect ratio is similar to that of recent 3-D films—both 35mm and 70mm. With projection as poor as it was for the last flurry of 3-D movies, over/under tapes could provide thousands of people their only opportunity to see these films as they were intended to be seen. And even if the networks never catch John Brumage's enthusiasm, *Summer Day* prompts thoughts of 3-D home video cameras designed to stack the over/under images electronically (from paired lenses) rather than through bulky optical systems feeding a single lens and image tube.

Like so many other stereo imaging concepts, this one *could* work if a few of the right people (and corporations) latch on to it. Unlike the Nimslo, this one at least has the advantage of a basic simplicity on which investment and research could build.



The book published by KMQ, *FASCINATING NATURE* (1983) prompted much of the current interest in the over/under format and has now sold out. Other publications and magazine features are now in the works.