



## Quantel helps “Hannah Montana” to 3D box office success

FotoKem deploys Quantel Genetic Engineering and stereo3D Pablos  
on record-breaking Disney movie



**Post production** of the “Hannah Montana & Miley Cyrus: Best of Both Worlds Concert” stereoscopic 3D film (“Hannah Montana” hereafter) set some of the stiffest technical, creative and timescale challenges imaginable for Burbank, LA digital film house FotoKem. “Hannah Montana” is the first full length live action stereo3D movie to be released.



### Great box office

The film was shot at two “Hannah Montana” concerts early in the tour in St Louis and Salt Lake City in late October 2007. Walt Disney Pictures, who commissioned the production, required the finished film to be released within days of the conclusion of the concert tour in order to capitalize on the huge interest the live events had generated, giving just 11 weeks for the entire post production process. In the event, the schedule was met and the film went straight to No. 1 at the US box office on the first weekend of its release, taking a record \$31.5 million in just three days despite only showing on less than 700 stereo3D-capable screens. This proved both the popularity and acceptability of the new generation of stereo3D with audiences, and that brand new post production techniques, skills and technologies had advanced sufficiently to make stereo3D post a viable creative and logistical possibility for the first time.

### Shooting on the move

The film was directed by Disney’s Bruce Hendricks. The original concert footage was shot under the expert guidance of stereo3D pioneer Vince Pace, using seven Pace stereo3D camera systems, which were mounted on cranes and constantly on the move for creative effect, not locked off – so making variable convergence a critical extra issue to be solved in post production.

The edit was performed by Michael Tronick using one ‘eye’ of the stereo imagery (ie shots were selected in 2D), working one song at a time after an initial trawl through all the footage to compile a ‘best of’ shot list. Because of the short timescale, the EDLs for each ‘song’ were then passed on to FotoKem one at a time for color grading and conforming of the stereo3D HDCAM-SR footage as soon as the edit selections were made.

To achieve maximum throughput, this was carried out on two of FotoKem’s Quantel Pablo 4K systems which were each equipped with Quantel’s developmental stereo3D software, successfully engineered to fit seamlessly into FotoKem’s digital pipeline by General Manager of Digital Film Services Bill Schulz.

Front cover and this page:  
Stills from “Hannah Montana”

Inside front:  
The FotoKem creative team  
(l-r): John Daro, John Nicolard,  
Bill Schultz, Walter Volpatto  
(seated)



It performed pretty much flawlessly

Bruce Hendricks, Walt Disney Pictures



### Flat out in 3D

Productivity was further boosted because the two Pablos were able to share media thanks to Quantel's Genetic Engineering technology, enabling different aspects of the same shot to be worked on simultaneously in two suites. This was the first time the newly launched Quantel stereo3D software had been used beyond demonstration jobs, and, according to Bruce Hendricks, "it performed pretty much flawlessly".

In practice, Michael Tronick was cutting an average of one 'song' a day in 2D, and FotoKem's team of DI supervisor John Nicolard and Pablo artists John Daro and Eric Wood would immediately work on digitizing to one Pablo from the original camera masters, conforming and sharing the data to another Pablo for a quick 3D convergence balancing pass as well addressing any glaring production issues. Review of this initial conform would often happen that night or early the next morning so Tronick and Hendricks could review the new song as quickly as possible. Changes were then made and additional conforms were immediately done.

### Doubling up

At this point it is worth remembering that a 74 minute stereo3D film actually contains 148 minutes of high resolution media. In addition to standard scene to scene color correction work, both eyes had to be matched to each other. This presented challenges when beam splitters were used on the 3D rigs. Pablo's ability to handle two high resolution media streams in real time helped expedite the right eye/left eye color matching process. FotoKem used the Pablo's extensive DI toolset to carry out a number of image repair functions. The majority involved subtleties such as removing a camera flag from one eye of a stereo pair and compositing the analogous information from the other eye. The precision required for such work multiplies in stereo3D as account has to be taken of image planes, and slight overlaps or inaccuracies, which would normally be unnoticed in 2D material, produce odd and very noticeable optical depth effects in stereo3D.

Text was also added to identify various people who appear in the film, and FotoKem employed the Pablo's stereo3D tools to dynamically converge the text, independent of the background plate, giving greater control over the title placement in 3D space – a big advantage in both time and creative terms.

Above: John Daro at the Pablo controls



### 3D challenges

Conforming, color correcting, image repair, effects work and adjusting edits with the director on 148 minutes of high resolution film footage within just 11 weeks would be an extremely impressive feat on its own. However, also successfully dealing with issues unique to stereo3D within that same timescale is by any standards a monumental achievement, which required all of FotoKem's very considerable experience and many of its frontline post production assets to be brought to bear on its execution.

Many extra considerations accompany stereo3D post production that are crucial in making the result comfortable to view for audiences – the very same problems that have halted successful large scale adoption of stereo3D until now. These include edge effects where objects in one eye disappear from the displayed frame earlier in one eye than in the other (these are uncomfortable to view, and are the result of the interocular distance between the two stereo cameras that reproduces the human eye viewing experience) and even more crucially, the avoidance of frequent changes in the point of stereo convergence. This makes unusual frequent focus change demands on the human eye which can rapidly lead to the 'queasy' feeling in the audience which has characterized so many stereo3D productions in the past and is cited by many as being a principal reason for its failure to become a mainstream medium.

### Interactive stereo

The Quantel Pablo is the first system available that is powerful enough to allow the editor and director to view both stereo streams simultaneously at full resolution and to make adjustments on the fly in real time, with the stereo3D results immediately reviewable on screen. Previously, work needed to be done one eye at a time and the stereo3D results were only viewable after the two eyes had been later processed together either in the lab or electronically.

The challenge set by the "Hannah Montana" 'flying' cameras with their inevitably varying convergence points, which is particularly evident across edit points, was addressed by putting the entire picture through an extensive balancing pass to tailor the use of 3D as part of the presentation. Quantel's developmental stereo3D software includes tools that enable the stereo strength and convergence to be adjusted in real time on the fly while working with and viewing full resolution stereo streams simultaneously. These were exploited to the full by FotoKem, allowing the Pablo artists to experiment interactively as well as sculpting the stereo3D including building to the key 3D moments in the picture.

Above: FotoKem's state-of-the-art Burbank headquarters

## At a glance

- FotoKem completes post production of Disney's "Hannah Montana & Miley Cyrus: Best of Both Worlds Concert" stereoscopic 3D movie using Genetic Engineering and Pablo color correction and finishing systems equipped with Quantel's new stereo3D technology.
- Post production of the 74 minute movie (equivalent to 148 minutes of 2D footage) is completed in just 11 weeks.
- Quantel's stereo3D technology performs "pretty much flawlessly".
- "If we had not had the Quantel 3D convergence capability we would never have been able to complete this on time."
- "Hannah Montana" breaks all-time Superbowl weekend box office takings in the USA.

## Complete success

Given the time pressures and the fact that this was the first true 'battle test' of Quantel's stereo3D technology, a few complications might have been expected, but the work proceeded virtually without a hitch and arguably one of the most ambitious deadlines ever set in movie production was met – with incredible results, as the huge box office success of "Hannah Montana" indicates. The penultimate word goes to John Nicolard, FotoKem's Head of Digital Production, who oversaw the entire post production process. "We worked unbelievable hours – but everybody was doing that. The sound people, the production staff, post production, editorial and the director were all working morning, noon and night. It was a wonderful collaborative effort... the new Quantel software worked extremely well. If we had not had the 3D convergence capability we would never have been able to complete this on time. Never."

The final word goes to Cinematical reviewer Kim Voynar, who took her three children to one of the shows: "True confession: I had more fun at the "Hannah Montana & Miley Cyrus: Best of Both Worlds Concert" than I've had in a long time at the movie theater. I think it's safe to say that we're seeing the beginning of a new wave in movie theaters; bringing concerts to fans in 3D in the comfort of a movie theater, for a fraction of the ticket prices of a live concert, is going to be the Next Big Thing – so long as it's done as well as Disney has pulled off the Hannah Montana concert."



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Cinematical reviewer Kim Voynar

