AVITECH

APPLIED TECHNOLOGY PAPER

ARE YOU PICKING THE RIGHT MONITORING DISPLAY FOR THE FUTURE?

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Future Proof Monitoring Solutions:

An essential part of transitioning from an analog to a digital infrastructure is not only limited to the core infrastructure of a facility. In the process of planning for the future, it is easy to remember to plan for cameras, routers, production switchers, servers and master control to be upgradeable or future proof to HDTV. However, peripheral equipment such as monitoring solutions is just as important, but often overlooked. This sometimes results in a fork-lift upgrade for the monitor wall. As TV stations and other video distribution facilities consider their future in digital video and even high definition, it is imperative to also look towards future proof and multi-channel monitoring solutions.

The quality of high definition monitoring is still a major concern for many broadcasters and production facilities. The struggle for many broadcasters is to decide whether to go with CRT or LCD with their next display solution. It is a well known fact that most of the major monitor/display manufacturers will no longer produce CRT products. LCD will be the future of monitoring. The biggest advantage to LCD monitors is their size and weight. LCD screens also tend to produce less eye fatigue to the user. The lower intensity of the LCD monitors coupled with their constant screen display of pixels either being on or off produces less fatigue for the user. Finally, LCD monitors are much more energy efficient compared to a CRT monitor. Most of the energy used by LCD displays is for the backlighting of the LCD screen. The amount of voltage required to maintain the state of the various pixels as on or off, is negligible when compared to that of the backlighting. CRT displays on the other hand use vast amounts of power to keep the electron beam constantly streaming across the screen.

However, while LCD monitors will be the future, the cost still remains high. In order to address this challenge, as part of their Media Command Center (MCC), Avitech has introduced the ***Universal Module***.

The MCC Universal Module:

The Avitech MCC Universal module can handle four simultaneous inputs ranging from composite video all the way to HD-SDI, and its output resolution can range from 800x600 to 1920x1080. This module not only provides a future proof solution for video, it can also display on screen VU meters by using audio inputs such as analog stereo, AES/EBU and embedded audio. When configured with the Avitech video controller (VCC-C1R), the MCC Universal module can also display UMD and tally information from router management systems. There is no need to have separate audio VU meters and UMDs that will only take up more space and consume more energy. If absolute redundancy and reliability is your major concern, the MCC Universal module can also be configured with the unique "standby modules"

*Read about Standby Modules" in Does Your Monitor Wall have a Single Point of Failure?

DCDi Technology:

In addition to flexibility, quality is a major goal of the MCC universal modules. The MCC universal module uses the latest DCDi™ technology from Faroudja to optimize it's full screen mode regardless of the input format. DCDi is a video mode algorithm that stands for **D**irectional **C**orrelation **D**e**i**nterlacing. It was designed for video based material like fast-paced sporting events. Its purpose is to eliminate jagged edges (jaggies) along diagonal lines caused by interpolation.

Typical motion video processing relies on something called *intra-field spatial interpolation* to generate the missing lines of video from interlaced sourced material. This approach successfully suppresses motion artifacts; however, moving images and diagonal edges (actually, all edges which are not strictly horizontal or vertical) create jagged edge artifacts. While missing lines are successfully generated, the information generated does not exactly match that of the edges of the object originally filmed.

DCDi™, by Faroudja, takes the idea of interpolation to a much higher level. It interpolates based on how objects are moving in a scene, basing its calculations on the "big picture" instead of relying on a limited mathematical model. More specifically, it identifies all of the moving edges in a scene while adjusting the angle of interpolation at each pixel so that the interpolation always follows the edge instead of crossing it.

Figure 1. The red square highlights the area that is prone to jaggies.

DCDi™ OFF DCDi™ ON

Figure 2. You can see how DCDi makes the Stars and Stripes much more dramatic, and it is really a terrific illustration of how powerful DCDi is. On the left is the original image. The flag is blowing in the wind, and this is a *very* tough image to show. On the right are enlargements of an area in the middle of the picture. At the top, right, is that enlarged area of the flag, with DCDi turned off. Notice the junctions of the red and white stripes. You can see jagged lines. With DCDi turned on (bottom, right), the jagged lines are gone, and the junctions between the red and white stripes are smooth. This is a *huge* technical accomplishment by Faroudja engineers.

The ensure image quality in an HDTV production environment the entire infrastructure is very important, from acquisition to distribution to playout. Monitoring solutions are no exception. Monitors not only need to display the HDTV signals passing through, it is also crucial to have the ability to automatically adjust for cable length and for the frequency-dependant cable loss. The MCC Universal module utilizes the best technology available for input equalization and reclocking for all standard rates 143 Mb/s to 1.5 Gb/s to ensure absolute image quality. The video source can be as far as 140 meters away for HD signals (1.485Gbit/s with Belden 1694A) and 400 meters away for SD (270 mbit/s with Belden 1694A)

Summary:

Flexibility, future proof and image quality are all equally important. It is imperative to plan for the future while maintaining both quality and flexibility. When designing the MCC Universal module, the Avitech product and engineering teams took all of the above important factors into consideration. And, as we all know, the future often gets here much sooner than we expect.