Why MultiView Technology is Different

Magenta Research's MultiView product line is designed and optimized to function flawlessly under the rigorous demands of the commercial environment. Unlike other products in the marketplace, it's not a consumer level product masquerading as a commercial one.

All MultiView products begin life on the drawing board with the following design achievement criteria:

- **World class video image presentation quality**
- **Complete format agility – no limitations**
- **Accurate sync signal reproduction**
- **Electrical and mechanical ruggedness**
- **Resistance to sources of electrical interference**
- **Plug and play ease of installation**
- **Optimal balance of cost and value**
- **Long service life**

Transporting high resolution video signals over UTP cable is very different than transporting TV or composite type signals.

World class performance requires a broadband solution that provides excellent time domain behavior. Without this, objectionable and very visible artifacts become apparent and can cause viewers to experience visual fatigue and loss of desire to view the presented content.

Aperture distortion, soft edges, smearing and periodic loss of sync (or the entire signal) are effects that poorly designed equipment impart to the image and ultimately to the viewer's experience with your content.

Magenta has developed unique solutions to overcome the challenges of transporting broadband video signals over UTP cable. Two areas of consistent focus have been: 1). The development of very accurate cable loss compensation filters and; 2). The development of a unique sync signal subsystem (RepliSync™).

Magenta Research has carefully studied the impact of cable dynamics on video image quality. Our commitment to this course of study has grown out of our desire to remain at the technical forefront of UTP connectivity.

All transmission line cables, including UTP, impose losses on propagating signals. The types of losses include the following:

- Resistive
- Skin effect
- Dielectric
- Radiation

Each form of loss impacts the perceivable quality of a video signal in a particular way, and all of the losses increase with cable length.

An equalizing filter, with the appropriate transfer function, can reverse the effects of the losses imparted to the signal by the cable. For high resolution video, the equalizing filter must be very carefully designed and constructed. This is because even small errors in the equalization process result in artifacts that become visible in the presented image.

It is Magenta's technical assertion that:

> *For any given distance of UTP cable, there is only <u>one</u> ideal transfer function for the compensating filter.*

This is true regardless of the video signal's format or resolution properties.

On this basis Magenta Research has developed a Digitally Controlled, Complex State Variable Filter (CSVF). This proprietary filter (patent pending) is at the core of our high performance MultiView™ AK and APK Receivers. The filter compensates for any cable distance between zero and 1000 feet (AK1000) or zero and 1500 feet (AK1500) and zero to 2000 feet (soon to be announced APK2000). The approach used in the AK product range for cable length compensation is intended to provide the ultimate in intuitiveness. The adjustment is accomplished by turning a single control knob with infinite (not stepped) resolution. From a human perspective, this is the fastest, most accurate and understandable means for optimizing an image. Once the appropriate setting is visually determined by the user, the entire transfer function has been appropriately calculated by the CSVF.

Magenta's CVCS technology provides nearly constant bandwidth and very consistant step function behavior throughout the product's distance adjustment range as such, preserves video signal rise times. Video rise time relates directly to video image clarity. It is the measure of time needed for the system to transition from black to white and white to black. Poor rise times cause a form of video image distortion called aperture distortion, an increase of which results in a horizontally smeared image. Also, by providing constant bandwidth, Magenta's products are capable of providing consistently high resolution over any distance. Other equipment providers must resort to defining various distances for specific resolution settings. As an example, a competitor claims 1024 x 768 to 1000 feet but will only claim 1280 x 1024 to 200 feet. By contrast Magenta's AK1000/1500 provides any resolution up to 1600 x 1200, for the entire range of zero to 1000, 1500 or 2000 feet (depending on model).

Working in concert with our simple test pattern utility, the distance adjustment is accomplished with a simple knob-turn while watching the screen. The CSVF uses a 7-pole topology, compared to 1 or 2 pole versions commonly seen. The CSVF compensates simultaneously, with one adjustment for each of the cable loss factors. The result is one simple distance adjustment that optimizes system performance over 20 octaves of frequency domain!

“Peaking” filters, commonly used by other equipment manufacturers, often require multiple adjustments – for example, one for high-frequency and one for low-frequency bands. Some require three adjustments, including brightness. Using this inferior, though common approach, means that considerable efforts in adjustment can still yeild unsatisfactory results. Plus, it falls far short of the 1500 foot+ solution enabled by the CSVF and MultiView.

All MultiView equipment employs RepliSync, a technique used to sample and perfectly recreate sync information so any attached display equipment will respond to the MultiView signal exactly as it responds to the native signal. This is especially important in the dynamic commercial environment where the type of source and display equipment can be substituted at any time. Our approach assures plug and play performance today and the over long term.

As a historical reference, in 1886 John Carty, an engineer working for the Bell Telephone Company, invented the “phantom circuit”. The invention made it possible for the phone company to send three signals over two pairs of wires, saving them the cost of stringing additional wire pairs. This is the basis for “common-mode” sync transmission embraced by nearly all UTP video equipment manufacturers. While phantom circuits were once useful to reduce costs for telegraph and voice circuits they are not a reliable means for transmission of high speed video sync signals over UTP. The interpair impedance of UTP is neither specified nor controlled, making proper termination impossible. This results in inadequate signal transmission performance that yields sync timing errors and a much higher susceptibility to noise fields.

By contrast, Magenta’s products transport sync signals in-band along with the video so all of the signals are integrated and handled in a properly terminated, true balanced signal environment. Doing so maximizes noise immunity performance and because the sync signals are equalized in the receiver along with the video signals, timing problems, display-source-compatibility-issues and image shifting problems are eliminated.

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