

## Overview:

Despite advances in LCD / DMD type technologies, CRT projectors remain the preferred technology for home theater video displays due to their ability to produce a smooth, natural image. A major problem with home theater installations is that the large screen sizes utilized accentuate the weakness of the image quality of standard definition TV signals (SDTV). Projecting any SDTV signal (NTSC, PAL or SECAM) will result in the display of dark horizontal scan lines since these are interlaced signals. To remove these scan lines and present a good quality image, the SDTV signal must be changed to a high resolution, progressive scan image.

Every CRT projector has a "sweet spot": this is the resolution at which the projector provides the brightest and sharpest image possible. It is important to realize that the sweet spot resolution is not necessarily the highest resolution that the projector is capable of displaying.

This TECHnique will describe how Deuce® Intelligent Video Scalers allow the user to match the sweet spot of any CRT projector to provide the optimum image in a home theater installation.

## Details:

CRT projectors have a wide range of input signal compatibility. However, the best quality image — the sharpest and brightest image possible — is achieved when the source signal matches the "sweet spot" resolution of the projector.

The sweet spot of a given projector is determined by a combination of the projector's CRT size (7,8, or 9 inch

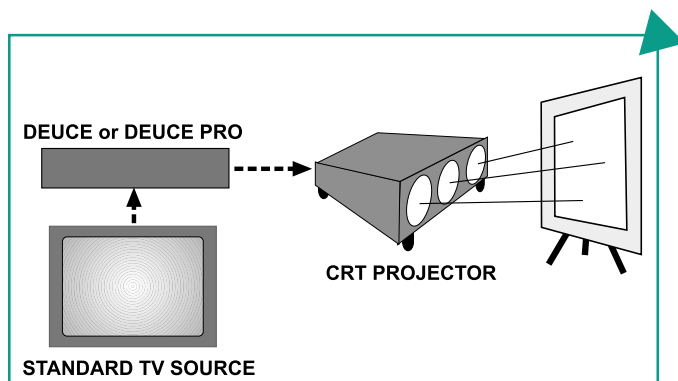
CRT) and the screen size. It is important to understand that the sweet spot of any given projector is different for various screen sizes. For example, a certain projector's sweet spot could be 800 x 600 for a 60 inch screen. For this same projector, the sweet spot for a 100 inch screen could be 1024 x 768.

Home theater installers attempt to optimize the screen dimensions for the size of the theater room and the capabilities of the specified projector (CRT size). Then, once the screen and projector are installed, they can determine the projector's sweet spot for that particular set-up.

Standard TV signals (SDTV) vary in detail around the world, but all the current standards — NTSC, PAL or SECAM — have main characteristics that need to be changed in order to match the sweet spot of any projector. Specifically, SDTV signals require de-interlacing and an increase in refresh rate and resolution.

So, what is the best method to convert these various SDTV signals to a suitable signal for the CRT projector? Video scaling. It's the superior method to convert SDTV signals to match the sweet spot of any CRT projector. Deuce® uses sophisticated processing algorithms to manipulate the image, thereby changing the resolution, refresh rate and aspect ratio to exactly match the native resolution of any given display. In addition, Deuce® provides advanced motion compensation to eliminate the distortions that result from the de-interlacing process.

Different Deuce models provide for a variety of output formats and resolutions. (Refer to the comparison chart for specifics.) Plus, Deuce® allows for the output of either 4:3 ratio images or full 16:9 ratio capability. Most home theaters are designed to project both the standard 4:3 and the 16:9 ratios.



## Suggestions:

Select the Deuce model that is best for you by comparing the native resolution of your intended display device with the output resolutions offered by the various Deuce models. Also, keep in mind whether you will ever want to output to a widescreen display device. All models except for Deuce SDQ output to both 4:3 and 16:9 ratios.

Each Deuce model is designed to offer certain performance advantages. Deuce MC offers the most control over

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the motion compensation algorithms applied to the image. Deuce HD offers output resolutions that match popular new HDTV formats. And Deuce SDQ offers the best value for the price. Deuce Pro, the most feature-rich model, offers custom output resolutions, multiple inputs, switchable stereo audio, H&V position and full video processing controls.

### Related TECHniques:

- Educational Guides: • *Intro to Video Scaling*  
• *Advanced Video Scaling*
- T-05 Using Deuce Video Scalers in Video Cube and Video Wall Applications
- T-07 Using Deuce Video Scalers in Videoconferencing Applications
- T-012 Using Deuce Video Scalers to Match the Native Resolution of a Display
- T-13 Using Deuce Pro Video Scaler as a System Switcher

### CSI Products Used In This TECHnique:

- Deuce MC, HD & SDQ .....2220, 2230, 2240
- Deuce Pro Video Scaler ..... 2210A