Harmonic Video Timing (HVT)

Mark Stockfisch
Quantum Data, Elgin IL

ABSTRACT

Creating quality timing standards is not a trivial matter. Inexperience and lack of coordination have lead us to the point where we now have too many formats, testability nightmares, naming babel, frame rates that don't interoperate, distorted images, unsupported apertures, and the need for noisy high-resolution wide-band pixel frequency synthesizers.

This paper presents a new approach to timing standard design that yields a complete suite of timings for computer, medical, military, consumer, broadcast, and digital cinema markets. The suite is clocked from a single commonly-used low-jitter fixed-frequency clock, and supports 12 apertures, 2 orientations, 8 interoperable frame rates, NTSC tuning, anamorphic scope, letterbox, safe-title, at a wide variety of resolutions. Rather than use a simple equation-based algorithm for generating an endless variety of timings, for source generators and display devices, this approach uses a complex exhaustive search algorithm to mine for a complete set of the timing gems from an extremely wide field of carefully enumerated possibilities. The gems are then stored in a reasonably sized look-up-table for quick recall when needed. A format naming convention is also provided.