Waveform Monitors in a Digital Environment

Not surprisingly you can often get away without one.

Now the last thing we want is to receive emails, faxes and phone calls from test equipment suppliers but the assertion does contain a hint of truth.

The above conclusion arose during a chat around the “drink cooler”. It started out as a discussion on what had changed during the move from analog to digital television and in particular how well engineering people had made the transition.

The assertion was “you can pick engineers that have not 'got it' by the way they still install waveform monitors everywhere”.

To follow the logic lets start with a very contrived example: copying a file on your computer. Do you have a waveform monitor handy to check it on the way through? And if not, why not?

Of course its not sensible to contemplate such a plan. Keeping the connection difficulties to one side there is nothing to be gained by doing so.

Now for the next step in the argument: How does a pure transmission environment (ie. one that does not decode, encode, modify signals) differ from a “file copy” on your pc? The answer comes in a probably two main parts. Where the signals are:
1. Local (small distances – frequency wise) – not much difference at all.
2. Non local (large distance – frequency wise) – potentially significant differences.

Now finally the core of the argument:
In the analog days a waveform monitor examined two aspects of a signal: its “technical/control” parameters: h sync, v sync, burst, blanking, timing, rise times etc etc and the actual picture parameters: video level, chroma level, black level, chroma phase, etc etc.

In a pure transmission environment (like a file copy - one that does not mess with the signal itself) only the digital “packets” are at risk and need monitoring. If the packets become distorted (excessive jitter, rise times, levels, ringing etc etc) and cannot be decoded then the video (and embedded audio) will definitely suffer.

So, in a localised digital system (small distances – frequency wise) there are situations when a waveform monitor may not be much use.

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