



## **Cables Matter:** 40 years of experience. Time for our say....

**Recently there have been discussions on television and the internet suggesting it's not worth upgrading to high quality digital audio and HDMI cables.**

QED has been a leading manufacturer of cables and accessories for more than 40 years, so we thought we might make a contribution to this debate by sharing some of the results we've found over those years. And for clarification, one of the reasons we are able to do this is because, at our cable assessment and design facility, we own some of the world's most advanced HDMI digital measurement equipment.

As well as using this equipment to develop QED cables, we also use it to evaluate other HDMI cables on the market.

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### **We agree. A lot of HDMI cables are the same!**

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We confess to sometimes being shocked by some of the cables we measure. On these occasions we find ourselves in agreement with our more sceptical journalist friends, because a number of the premium cables we have tested have proven to show little or no measurable improvement over lesser models from the same manufacturer.

It is worth bearing in mind, just because a cable looks flashier or is priced far higher than another cable, it is not necessarily better. It may just be standard cordage disguised with some 'bling'.

At QED we do things differently.

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### **Just ones and zeroes? YES, but there is a little more to it than that!**

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An HDMI data stream is not like the information sent to a printer by a computer - it is not sufficient for the 1s and 0s to merely arrive in the right order without error; they must also arrive at the right time. Any cable which conveys high speed data will cause variable delay in the rise and fall times between voltage levels corresponding to the 1s and 0s. This variation is called 'Jitter' and it has been shown to affect the perceived quality of the video and audio data when reproduced by a TV. Contrary to popular belief there is no error correction in the HDMI link. Basically once the TV has locked on it will display whatever comes down the cable complete with timing errors or actual bit errors.



Look at this lovely typewriter font. It's a bit like analogue music in that the meaning of the words is recorded correctly but there is loads of noise added from the worn out typeface and the ageing ribbon. It makes you feel nostalgic and the sound of the typewriter and the bell that rings at the end of the line makes it all seem much better.

Now compare this to the digital version stored and read from a compact disc which is completely free of noise and has a much greater contrast between the letters and the paper – so much clearer and perfect but somehow not quite the same font. It can be copied over and over again with no mistakes. If there are any **mistooks** they will be highlighted by the error correction algorithm and rectified later.

Now look at this sentence transmitted by HDMI or S/PDIF which suffers from timing errors caused by jitter of my thumb on the space bar. All the letters have arrived perfectly in the correct order but not at the right time so although the same dynamic range and noise immunity exists in the recording the timing has affected your enjoyment of the program material. Also this mistook caused by the jitter is transmitted uncorrected.

At QED, we firmly believe that the more 'Jitter' and timing errors in a signal, the worse the enjoyment of audio/visual content. That is why our QED HDMI cable hierarchy is differentiated by a scientifically measurable improvement in 'Jitter' performance as you go up the range from 'Profile HDMI' with 'low jitter' to 'Reference HDMI' with 'ultra low jitter'.



QED REFERENCE HDMI

Partner that with proprietary technologies that enable the transmission of High Speed HDMI over longer distances; up to and including 15m, and it means that, unlike those from many others, long length QED cables actually work with 3D and 4K signals.

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## Future Proofing.

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Future proofing also has a vital part to play when discussing HDMI. If newer technologies come along which require higher transmission speeds than the current High Speed standard; many HDMI cables will fail to properly convey that signal. The QED Reference 1m HDMI cable uses unique technologies to allow it to convey data at speeds up to double the High Speed standard as set out by the HDMI.org. So consumers can rest assured that if they purchase a QED Reference HDMI, with our Lifetime Guarantee, that it will, well.... last a lifetime.

So, are 'all HDMI cables are the same'? Well we know that many actually are, however, we can prove scientifically that QED cables do improve data transmission quality and by investing in one of our premium cables, you are getting an objectively measurable difference and improvement over our 'entry level' cables, and that's a FACT.