LIFE BEYOND DMX 512

Tony Gottelier chaired discussion panels held at the Plasa Light and Sound Show and at LDI on standardisation and the future of control protocols. Here he reports on the outcome of these deliberations and makes some hopeful long-term predictions

Top: Tony Gottelier (right) with Steve Terry, Charles Woods, David Bertenshaw, Francis Reid and Simon Temple at PLASA and in the lower picture at LDI in Orlando with (left to right) Charlie Richmond, Andy Meldrum, Matt Deakin, David Bertenshaw, Steve Terry, Anders Ekvall and Gordon Pearlman.

I suppose it is typical of a good argument that it takes some considerable time for the various sides to find out what it is they are really arguing about. Which, once established, may in itself provide a concensus, or at least a compromise.

Indeed, this seems to have been the case with the great DMX debate. No sooner had it been suggested that the USITT protocol might not be all that it was cracked up to be, than articles by myself, Steve Terry and others started appearing in the professional press pleading the case for retention and, or, extension, on the one hand, and total replacement on the other. Several thousand words and SMX later, (SMX is Strand's second generation protocol intended to offer an open alternative beyond DMX for the professional theatre and AV user), the discussion continued at a formal seminar at the PLASA Light & Sound Show in London at which the battle lines were well and truly drawn. It was only when the smoke had cleared from that session and we all arrived at LDI in Orlando for the sequel debate, that it became obvious where the real problems lay, and we were able to get down to finding some real solutions.

So let's have a brief reprise for those who aren't up to date with the history. (Don't worry, this will be non-technical in order not to lose the wider audience who will have, at least, a commercial interest in the subject.)

It was in 1986 that the USITT dimmer standards committee, chaired by Steve Terry, first grasped the digital nettle and gave us DMX512 as a universal protocol and digital alternative to the old analog 0-10 volts system. They recognised that a common standard in the relatively new language of microprocessors was essential in order to avoid mayhem in the market place. (Just imagine what life would have been like for the previous 15, or so, years if the manufacturers hadn't all gone down a very similar analog route, and of course there was no real reason for them not to do so.)

In the intervening period, from 1986 onwards, DMX512 has been widely adopted by board manufacturers for the control of dimmers as it provides a fast and economic method of dimmer control and direct soft patching of outputs at the desk. However, the speed with which events have overtaken the original requirement for a protocol only to control dimmers has been truly breathtaking, and this is what has led to the current controversy. For USITT intended the system to be good for dimmers only; they had not considered intelligent lighting. It was not part of their brief; nor at the time could they have seen it as necessary.

Nevertheless, in less than three years there was a veritable explosion of these devices coming on the market and all sorts of other peripheral equipment, such as colour scrollers, besides. Some designers, in their search for a quick fix, saw an unintended potential in DMX512 and used it successfully to control these peripherals, including driven lighting. (I am one of those and I have to say that I have not yet had any cause to regret it. But then my requirements are certainly quite different from those of a David Hersey, or an Andy Bridge.) Others, as the result of lack of information - many designers of digital equipment in Europe, at least, recruited from outside the industry, or working freelance, were unaware of the existence of DMX512 or for misplaced commercial reasons, or because, like Vari-Lite, they thought they needed something more, and went for their own dedicated protocols. The result, predictably, has been anarchy and probably only Vari-Lite, because of their astute and highly successful marketing policy, have really got away with it.

Picture the situation at companies like Strand and Coemar where, almost without realising it, they ended up with as many as three different dedicated protocols in-house — none of which was mutually compatible to the other! Mixing these products in the same scheme became a nightmare: control, at best inefficient, at worst, incomprehensible and future-protection zero. Imagine not being able to offer combined control to a single user wanting to integrate PALS, Parscan and Showchangers.

At the same time a parallel requirement came to light with all this new and highly sophisticated gear, and that is the need to centralise cueing via a master desk talking to various sub-boards where the specific programming is carried out on the individual boards and the combined show cues are called from a central desk. However, although I shall come back to it, we shall see that this requires a totally different solution

from the control of external peripherals, and this may have been one of the confusions which has tended to cloud the debate until now.

Nevertheless, no sooner had people started using the USITT interface for a purpose for which it was never intended, DMX512 was intentionally a lowest common denominator solution, than they started to find holes in it. The absence of error checking and consequent lack of security, insufficient precision for today's highly sophisticated moving luminaires, restricted bandwidth and lack of logical room on the data link, the absence of bi-directionality and intelligent message targeting, were all identified as weaknesses. I don't want to go into all the arguments and potential soutions here, as these were all well worn and fully aired at the Light and Sound Show seminar. It is sufficient to say that simple solutions have been provided for many of these problems by Zero 88's Richard Thornton-Brown, Oska's Mick Martin, Charles Woods and others, the problem in implementation being that effectively this could mean a new standard anyway, which is fine if it can be made compatible with the old one, but a disaster if it spawns yet another, but intermediate protocol. The modifiers are basically happy to retain DMX albeit in an improved form as far as error checking, mode byte definition, and so on, are concerned, but they are unlikely to see the need, nor to support the extra cost of bi-directionality or volume expansion.

These last items are exclusively the preserve of those designing instruments demanding a high degree of precision, for example resolution to one third of a degree, or two inches at 30 feet (solutions to this are also available to the ingenious within DMX, witness the 512-based Summa HTI system to be distributed by Celco in the UK, which claims a resolution of 0.0055°), and along with the designers of moving rigs, requiring constant monitoring of state and position. And those who envisage the necessity for as many as 2000 control channels. (Not so huge a number as it may seem in these days of mega rigs, if you calculate at ten control channels per instrument for articulating lights, thus 200 receivers as opposed to the 32 envisaged on a single line within DMX).

Clearly, there is resistance on all sides to expanding the DMX standards to embrace all these sophistications, as Steve Terry says, "I don't want DMX to be the last communication standard in our industry." So an additional new standard, not a replacement for DMX but an alternative protocol for the more sophisticated application, is required. Such a solution should solve everybody's problems while satisfying those, such as myself, who have argued for the retention and improvement, where practical, of the DMX standard and its use by those Europeans who could, because their demands do not exceed its limits, but don't at present for what they may perceive as the legitimate commercial reason of restricting compatibility to their own product range.

In an attempt to solve the problem within their own organisation, and to provide a solution for the demands of the more sophisticated user, Strand Lighting came up with their 'beyond DMX' protocol which they have opened for industry scrutiny and offered via USITT as a possible new standard, though it should be noted that it is unlikely to be accepted as such in its present form. Nevertheless this should be an encouragement to others, like Vari-Lite, to make a coherent contribution to the debate, instead of standing on the boundary shouting Ya, Boo, Sucks. For they certainly didn't get it right first time around and had to rewrite for Series 200.

SMX attempts to solve these problems by using the ISO (International Standards Organisation) open system interconnection structure, intended for the computer industry, which they have adapted to enable inter-desk communication and to talk to numerous receivers via a bus. However, for some it is, variously, intimidating, too complicated and too costly, notwithstanding the many animal epithets thrown about at LDI (dead duck, dog meat, 800lb gorilla, monster etc.). For others it doesn't go far enough. For example, though data-rates can be ten times faster than DMX, Strand had previously acquiesced to the result of a USITT deliberation, which suggested that rates of between 10 to 100 Mbaud might be necessary in a big installation where a fully integrated desk-to-desk-to-dimmers-to-driven-lights system would be highly desirable. When tackled about this at the LDI debate, David Bertenshaw, Strand's director of R&D, defended the decision on the grounds of cost, which raised a considerable gasp from the room as the prospect of yet another stop-gap low common denominator protocol sunk in.

But this was as nothing to the hubbub which erupted when he announced, seemingly out of the blue, that SMX wasn't cast in stone and that, not only were Strand prepared to be flexible, but version 1.1 was already on the way!

Initially most responded with shock as it had not been originally presented in quite that way, and pooh-poohed the announcement by asking how they could possibly treat it seriously in such circumstances. But when Bertenshaw made it clear that he was prepared to consider any variant, using SMX as a transporter, even a new and well received MIDI protocol for desk-to-desk which had been outlined by

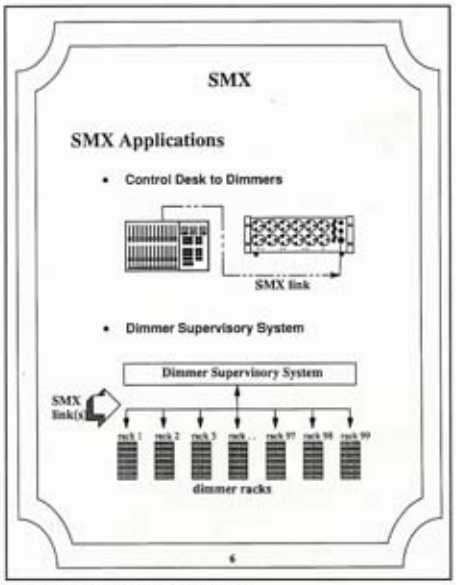
Statement from Charlie Richmond, chairman of the MMA Working Group and Midi Show Control

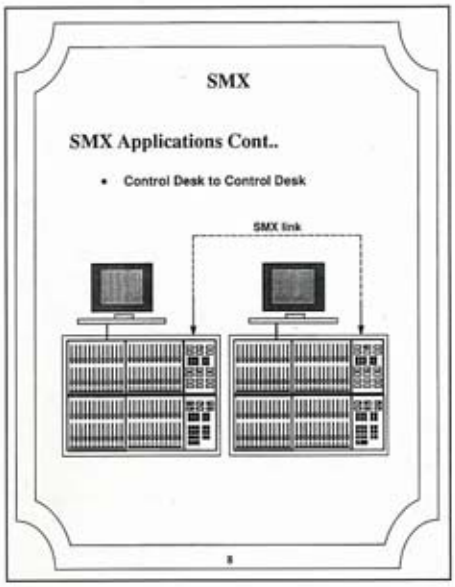
MIDI Show Control (MSC) is an extension of the MIDI protocol which is intended to work along with all existing MIDI messages on the same MIDI network without adversely interacting with them. This proposed standard is being developed by a wide cross section of theatrical, lighting, sound and show control systems manufacturers and represents a method by which the most complex live (or preprogrammed) performances of all types may be controlled via a unified protocol. It currently incorporates defined commands and responses for the following general categories (with specific sub-categories defined in all cases): Lighting, Sound, Machinery, Video, Projection, Process Control, Pyro. Beyond this, we cannot at the moment disclose but wish to assure the industry that we believe it will both address all the current and future needs (because it is expandable) as well as provide a uniform and easy-to-understand user interface for controlling all forms of entertainment technology. One final comment: this is not intended to provide an alternative to DMX512, SMX or any other console-to-device interface, nor will it ever become such.

Richard Thornton-Brown.

Steve Terry.

David Bertenshaw.





SMX: Above, the arguments for a new protocol, and right its various applications.

Charlie Richmond, who chairs an industry committee on the subject and which simply awaits ratification (see panel), that some light began to emerge at the end of the tunnel.

What first became clear, of course, was that inside an individual manufacturer was not the ideal forum to resolve these definitions but then, as has been pointed out, very few others have the funds of a Strand available to enable them to participate, nor the backing of a super-rich Super Group like Genesis. So there we go, at the end of the day maybe it all comes down to cash.

So how can that problem be resolved?

Well, it came to me in a blinding flash while the discussion was proceeding in Orlando that if no single manufacturer could devote sufficient resources, then several would need to be involved and so the most likely vehicle for doing this, as least in the UK, is PLASA. For, not only do they represent many of the interested parties, but they also collect subscriptions from them annually and, it should be said, from others outside the country indirectly via the annual London exhibition. OK, I accept that there might have to be a special tariff for those who indicate direct interest but that shouldn't be a problem.

All of this would enable the formation of a committee to implement the necessary studies and essential cross-border discussions with other comparable bodies abroad, such as USITT and MMA, which would be absolutely vital if such an initiative is to succeed. Indeed, I suspect that dear old DMX would have made far more rapid progress in Europe had USITT been able to cross refer it to such a body here, so why should not the reverse apply?

Anyway, typically, I didn't just think it, I said it out loud. And since nobody has come and castigated me from PLASA, or anywhere else for that matter, I assume it cannot be too bad a suggestion at that.

Furthermore, I was able to conclude the LDI panel with a positive summation: that DMX would remain the preferred universal protocol for most applications, possibly with some compatible improvements, (which I understand Steve Terry, USITT's ambassador at large, has subsequently agreed should be considered within the context that a new, more advanced protocol will still be required and that DMX will never be a cure-all); that a new high level standard will be required for advanced applications; that Strand are prepared to see their SMX system operate as a transport mechanism for other protocols, such as MIDI, and are still flexible and open to discussion and feed-back; that the proposed MIDI Show Control standard looks the most likely contender for inter-desk communication. If nothing else, MIDI is low cost and very available. We eagerly await the MIDI manufacturers Association's adoption and approval of the standard.

So, if something positive is now going to happen we should be addressing ourselves to what these various changes might be and encouraging the production of suggestions. I shall kick things off with some of the suggestions I have received from interested parties in the next issue of L+SI together with a report on the changes proposed in SMX 1.1 and would welcome suggestions from all concerned.

Meanwhile, PLASA it's up to you!

LIGHTING+SOUND International

CLIFF RICHARD AND LASERS 'FROM A DISTANCE'

- Wind in the Willows at the National
- Cliff Richard 'From A Distance'
- Tony Gottelier and Life Beyond DMX
- Ben Duncan Sounds Out the Eighties
- Venue reports from Melbourne, Malta and Windsor
- Company reports: Samuelson/ADB/Playlight

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