POST-MODERN LIGHTING CONTROL AT THE BBC

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How will lighting control systems develop in the nineties? Will they continue to sprout more and more knobs? Will numbers be replaced by icons, keypads give way to interactive mimics? Or will it be voice activation that ensures lights do what they are told? Technology has reached the point where we may have whatever we want pro-

vided that we can pay for it. (The only really unassailable frontier is that light travels in a straight line and generates heat.)

Perhaps we shall rediscover simplicity. History teaches that to move forward we should first look back: the lighting directors and engineers at BBC Television have done just that. In looking to the future they have

rediscovered some features of earlier, simpler lighting controls which made them faster and friendlier.

Twenty years ago, when memory became feasible, the BBC analysed studio control requirements and the result was Thorn Q-File. Although it is some years since Thorn ceased to be active in lighting control manufacture,

The Output and Preset stores have a 2000 channel capacity. The memory has 100 files. Separate colour columns of pushes select files for recording and recall. Files can be combined by using plus and minus keys. In the case of lamp failure, channels may be overridden in all files by the Take 99 amendment function. Crossfade time from 0.5 seconds to 2 minutes is set on up and down time faders, independently for incoming and outgoing channels. Fades can be manual using the mixed stores mode. Lamps may be preheated for a smoother start from cold.

the last Q-Files are only now being replaced as part of the Corporation's rolling programme of studio refurbishment. Meanwhile various off-the-shelf systems have been installed, replacing but not usurping Q-File in the larger studios.

Looking to the future, a survey of the market concluded that none of the current systems on offer was an ideal match for the operational requirement. Consequently a decision was taken to opt for in-house development. Initially three systems have been built: one has been lighting Wogan at the Television Theatre since September 1st and the others will be installed in due course at Television Centre.

Two cardinal requirements were identified:
- a need to control in excess of 1000 sockets.
- a desk with an operational philosophy whose simplicity would enable fast confident actions.

As John Farr, Head of Television Lighting, says: "It is important that our consoles can be operated as instinctively as possible in order that a quick, accurate response can be achieved under programme pressure." This is particularly vital at Television Centre where programme strands and operators move between studios.

John Farr, head of television lighting, who steered the project, stimulating the debate between operational requirements and engineering solutions.

The Q 2 Lighting Control System

The solution is a lighting console called **Q 2** and it is something of a born again Q-File. This is not to say that it is a clone but

that it adopts and refines appropriate proven features of Q-File philosophy and language. Access, both to channels and to memory files, is via illuminating numerical columns rather than calculator-style keypads. A selected channel level is set, indicated and modified by a motorised servo-fader which instantly (really instantly) jumps to its level point on the scale. This will either be its last used level or, if not previously used, an initial preset level. Four channel controllers, each assignable to either the preset store or the output store, simplify channel balancing and live/blind plotting. Since there may be times when the lighting director and operating assistant both have their 'hands-on', the priority if they select the same channel on separate controllers is normally left hand takes precedence but can be customised if required. A sub-master panel is under development as an alternative to one of the channel controllers and this will offer control of a further eight stores, giving more options for manual control and file balancing.

Separate colour-coded numerical columns for the preset and output stores control file selection for memorising and playing back. Plus and minus buttons allow files to be combined to produce complete scenes from basic compositional states. Separate up and down times are manually set (not recorded)

The **File Mimic** shows which files are in use in the output and preset stores. (Contents of stores can be displayed on a separate geographic mimic.)

Each channel controller can be routed, via bi-colour illuminated pushes, to output or preset store. Channel selection numbers are configured according to installation: this particular desk is configured to address up to 399 channels, each suffixed A, B, C or D. A touch-sensitive servo fader indicates the level of the selected channel and gives precise control. Manual control of a channel can be taken at any time, including during a crossfade, simply by touching the fader. Both on/off state and level are recorded for all channels. (An optional **submaster panel** can replace one of the Channel Controller panels, providing control of a further eight stores in addition to the output and preset stores.)

for crossfades initiated by an illuminated push. Fade progress is indicated by a dynamic light column display alongside the timers which, of course, offer the possibility of instant modification. Manual fades are possible using the 'mix store' mode whereby the preset store is fed directly to the studio output, bypassing the crossfader. There is a push, for optional preheat to a level preselected by thumbwheel. Performance modifications necessitated by lamp failures or knocked luminaires are handled by a **Take 99** amendment function similar to Q-File.

The desk is unique among current lighting controls in that it has no video display unit, either as an integral feature or as an option. Each push has its function clearly engraved and its status is immediately readable from its illumination and the colour of that illumination. A pair of **File Mimic** panels show which files are currently selected to the output and preset stores respectively. The channel content of each store can be displayed on a separate geographic **channel mimic**. (At the Television Theatre this mimic is mounted with the camera monitors and is the one from the original Q-File installation).

Q 2 is something of a triumph of self-display with all its control surfaces clearly indicating their function and status. With pushes dedicated to a single function (no 'shift') and active (no computer-style 'enter'), the cockpit drill is a model of crash limitation planning. Although the system has many happy operational details which are beyond the scope of this article, there is nothing superfluous: every function is likely to be in daily use.

There are no integral effects facilities. The BBC stock a selection of standard off-the-shelf portable effects desks and the most appropriate one for a particular programme can be patched in via the new 'Leopard' routing system.

In today's microprocessed world, some surprise may be occasioned by· the use in Q 2 of a high proportion of hard-wired logic rather than software programming. However, we should remember that the first ever fully software lighting control, Strand's DDM of 1970, was only computer based because its design engineer, Alan Payne, did not have a clear, unequivocal operational specification - his prototype was a test-bed for experimental ideas. The BBC's Q 2 spec, evolved by a team of highly experienced users, was absolutely precise and therefore the design engineers could plan to take advantage of faster responses than are possible when a computer has to keep reviewing its decisions. And ten cuts per second is fast: run your finger up a column of memories and see the reponse.
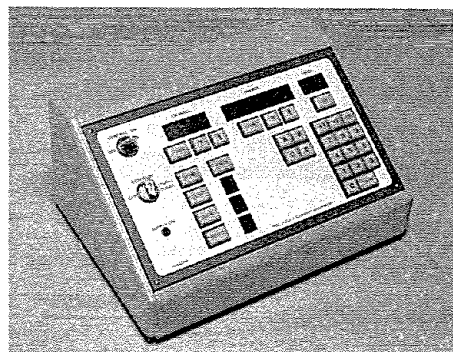
Leopard is an electronic patching system for dimmer control signals, allowing up to 240 control channels to be patched to more than 1500 dimmers. Up to 14 patch states can be held in the memory.

The Q 2 Team: (left to right) Rick Dines (project manager), David King (design team leader), Mick Manning (ex-operator recently promoted to lighting director), Ian McLeod and Dan Shaw (studio engineers responsible for the engineering architecture and prototype), John Astle (head of Control Sections Design group). (Leopard was developed by a second team from the Video Design Group, led by Simon Auty.)

Q 2 has 100 files and is capable of controlling up to 2000 channels. The channel selection buttons offer 000 to 999, with the option of including a suffix of A to D which allows each luminaire hoist to be given a number and its four circuits identified as A, B, C and D. System output protocol is the internationally recognised DMX 512 standard.

The Leopard Electronic Patching System

Developed in parallel with Q 2, **Leopard** enables any special desks required for specific programmes to be interfaced with the studio dimmers. It allows up to 240 control channels to be patched to more than 1500 dimmers, with each control channel simultaneously routed to any number of dimmers. Up to 14 patches can be stored and the one controlling the studio lights can be changed instantly. Patches can be edited live or blind. Outputs from two or more drives can be paralleled, with highest taking precedence: thus the output of Leopard can be combined with that of Q 2. Protocol is, of course, DMX 512.

The BBC is anxious that a suitable company be found to manufacture and market Q 2, Leopard and the associated multiplex/demultiplex and dimmer drive units under license. Since component quality is higher than has become normal in lighting controls, the system cannot be as cheap to make as most current off-the-shelf models. But fast and friendly daily running can justify a lot of capital outlay, even to accountants. Especially when comparing the relative costs and lengths of expected service of sound and lighting desks. John Farr does not envisage all future installations being Q 2: each refurbishment will be assessed on its own merits and in some situations Q 2 would not be appropriate.

Indications for Lighting Control's Future?

The immediate response of any lighting control user is likely to be a consideration. of, what the system would do for their own particular requirement. Since Q 2 is tailored to television in general and BBC practice in particular, there may be temptation to dismiss it as a special animal. However, with more memory capacity plus a VDU (for reference rather than operation) I, for one, would be

very happy to use it in theatre.

But, more importantly, I believe that Q 2 offers several indicators for a necessary debate about the future of lighting control as it emerges from the headlong 'Topsy' growth period it has enjoyed since electronic logic allowed knobs to be programmed to do anything. That anything has increasingly become everything, with engineers and marketeers only too happy to meet the challenge of user demand. The launch of any new system is the occasion for a frenzied search to find out what it will not do! Basic operation often gets swamped by functions which are there because they are possible rather than necessary.

At a time when we really need to discuss priorities, I would suggest that Q 2 offers some pointers for us all:

● As a lighting designer I now have to call for channels at a slower rate than I did with lever-per-channel or even with grandmaster. I realise that with today's number of channels there has to be a digital access, but linear columns are faster than conventional keypads.

● Controls which self-indicate their function and status surely assist operational speed and confidence. Numerical displays on video screens, as an integral part of operation rather than a secondary reference, come between operator and performance. The aim should be for head-up operators able to concentrate on looking at performers.

● I find it difficult to reconcile recorded time with live performance.

● Preheat is so useful. It was so easy on manual systems, yet on most of today's all singing all dancing computerised wurlitzers, I find myself having to plot warm-up levels into the previous cue.

Q 2 should provide serious thought for all concerned with the future of entertainment lighting control. Meanwhile my hunch is that for television it may well hit the user-friendly jackpot.