

ALL CHANGE

Graham Walne surveys Colour Changers

Regular readers of L+SI surveys will know that I usually begin by observing that there is very little that is genuinely new in technology, and most of our current equipment owes something to what went before. The history of theatre particularly is punctuated by the continuous development of ingenious devices, and in this respect colour changers are no exception.

Perhaps the earliest application of coloured stage lighting was described in Serlio's book 'Second Book of Architecture' which was published in 1545. Serlio describes how plano-convex glasses placed in front of the candles acted like lenses when filled with water, but the addition of coloured water projected coloured light. However in 1565 Leone di Somi's book 'Dialogues on Stage Affairs' suggested that the glasses were coloured not only to provide effects but also to reduce the amount of glare from the lights themselves.

In the eighteenth century, the footlights were mounted on a raise-and-lower system so that once below the stage, the oil and floating wicks could be replenished and the colours changed. The introduction of gas in the early nineteenth century enabled the lighting to become more sophisticated, and dimming made it possible to crossfade between colours which were initially provided from glass chimneys fitted over the gas burners. Another development was moving the colour frame which contained long glass panels, the slow operation of a lever producing crossfades to sunset or moonlight, not unlike the results of slowly moving scrollers today. Another link is provided by the invention in 1893 of what we would recognise as semaphore colour changers which were initially developed for the limelights. The colour wheel too is also not a modern invention since it has been recorded in use on magic lanterns at Drury Lane in 1820. Indeed the

1820s seem to have been a rich period for experiments with the new medium because Terence Rees' book *Theatre Lighting in the Age of Gas* (as usual my bible in these matters) is full of descriptions of the effects of changing colour on differently coloured backdrops, some of which were often translucent.

The moving colour frame remained in use when electricity was established towards the end of the nineteenth century but the glass was replaced by gelatine (hence 'gels' in common parlance still today). Later the bulbs themselves were dipped, a technique which remained in common use until comparatively recently although the gelatine remained in Strand Electric's catalogue until 1962. Of course the bible about the development of electric lighting is Fred Bentham's *Tabs*, one edition of which describes "the application of light using complementary colours to obtain effects . . . in fact he (Samoiloff, the inventor) could change



Top row: The Scroller (Wybron), Rainbow (Camelont), DMX Colour Wheel System (CCT). Middle Row: Color Call (Strand), Colour Mag, (Light & Sound Design/ Cerebrum), Colourscroll (Rosco). Right: Digital Light Curtain (DHA), Gel-Stream (Cerebrum/A. C. Lighting)

the whole scene, costumes, make-up and scenery." It caused a sensation in the papers and it was claimed that the lighting itself put up the takings at the London Hippodrome revue. Great care had to be taken with the artistes' make-up and each dressing room mirror has a small lantern over it so that the make-up could be matched to the changes of colour which would be used. Bentham accurately comments that it is interesting that pale colours were not introduced until 1938 despite the comparatively low power of the lamps. The 1930s were the heyday of colour mixing, notably in cinemas. Several manufacturers, including Strand, developed programmed controls as Bentham says "so that the inexperienced operator could put the pointer to lavender, for example and up it would come." The devices used motorised dimmers on three colours and the settings of the dimmers regulated the colours, not dissimilar to the ColorFader device described in the February 1993 edition of L+SI (see 'Bolshoi at the Hall').

Strand provided the venue for a more recent demonstration of colour changing when the Association of Lighting Designers asked production electrician Alistair Grant to demonstrate colour scrollers. Alistair's extensive experience highlighted a number of pitfalls for the unwary. For example, although some scrollers can run on analogue this would generally take up too many channels on a lighting desk and so DMX is preferable. Some scrollers only work on DMX which might involve extra cost converting the output of the desk. Alistair suggested the 'SAGE' converter which has a useful 'anti-jitter' function and can be set to follow the first instruction or the subsequent ones, just in case the first could be a fault caused by noise on the line. Analogue installations involve dedicated lines whereas DMX permits daisy chains (generally up to 12 scrollers can be connected in one ring) so cabling is kept to a minimum. The length of

cable also needs to be kept to a minimum otherwise voltage drops will cause scrollers to respond out of sync. Some scrollers do not need AC mains as well but others do, so it's worth checking.

Planning the order of the colours in a string is important as these cannot easily be changed on site, although this is not impossible - a metal template and high temperature tape are required. Colour filters stretch after time and on a long run this would involve tweaking sessions. Since polyester is less resistant to heat than polycarbonate it is thus more likely to stretch; some electricians suggest that colour ranges should not be mixed although there is not agreement on this. Heat shields can offer some protection and Alistair always recommends fitting these to 2ks, 5ks and short-nose Parcans. Small venues need to be aware that scrollers contain fans which could be obtrusive in quieter dramatic moments. Most fans have speed selections but since the purpose of the fan is to cool the colour there is an obvious drawback to reducing the speed.

Another drawback to scrollers is that their additional weight can cause some luminaires to lose their position and so yoke adjusters should be fitted where possible. Some Pars come with this as an option but I have occasionally 'borrowed' wire coat hangers from the wardrobe when no such formal arrangement has been possible! Scrollers will also accept attachments on their front face so that barndoors or top-hats can be added. Alistair even suggested that another scroller could be added - back to ColorFader again!

Scrollers provide better chases than those possible through dimmer action because of the

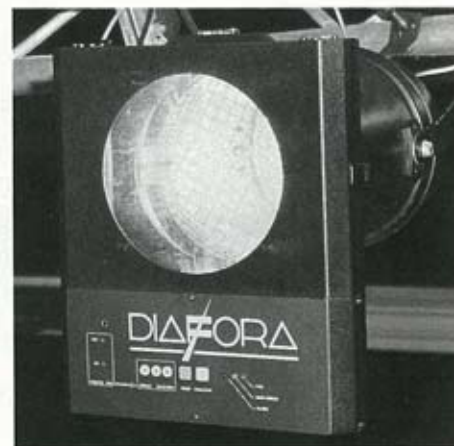
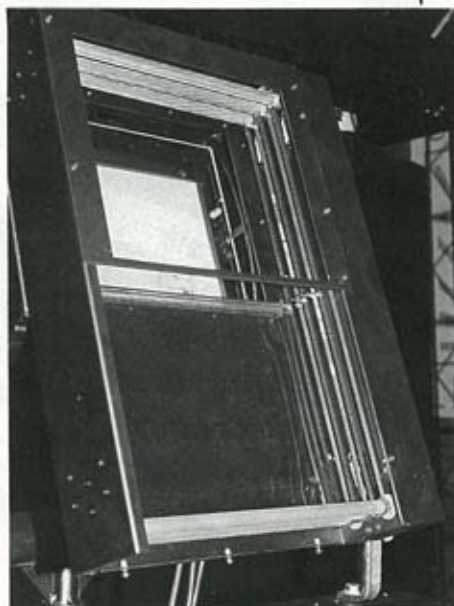
delay inherent in the lamp filament, and additionally some spectacular cross fading sunsets have been produced by the devices' ability to move very slowly. Split colours are also possible. It is clear that the refinement of these devices has enabled the size (and cost) of rigs to be reduced whilst extending the designer's palette. We are slowly moving closer to the day when the designer can spend more time experimenting in the theatre rather than planning in the office. Scrollers are one step in the right direction.

The Survey Itself

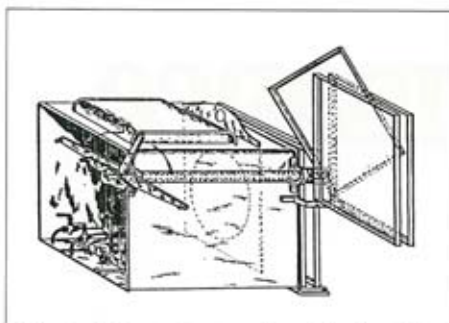
The following questions were circulated to manufacturers and agents and I suggest that readers use the list below to flesh out the abbreviated questions in the forms. As usual I have marked down the manufacturers' or agents' own replies and left spaces blank where questionnaires were not filled in. In some cases I have added information from manufacturers' own literature and this is printed in italics. The response was quite good, although one manufacturer commented that the questions were too open but not adding any additional clarification. By contrast two others commented that the questions were too specific!

The questions were . . .

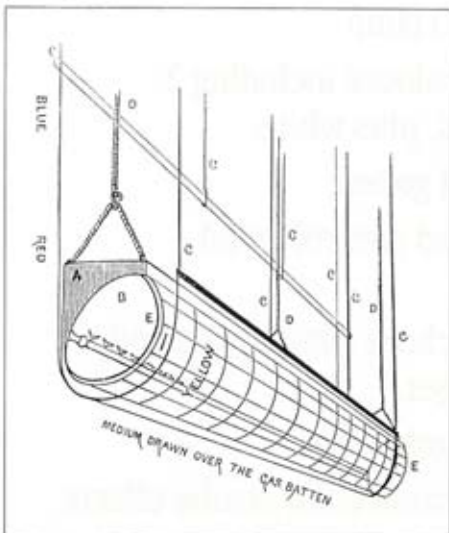
- A The name of your company as you want it to appear.
- B The name of your product as you want it to appear.
- C Are you the manufacturer or the agent man/agent?
- D If you are the agent, what is the country of origin of the product?
- E How long have you been offering this product in the UK?
- F Type of changer . . . scroller/semaphore/wheel other.
- G If answer to F above is 'other' please provide description of system.



Clockwise from top left - David Agar and Robert Achlimbari with Elite Systems' Microscroller, Teatro's Colourbox, the latest Diafora, Pan Command's ColorRanger, the Lightpaint from Oscar and ColorFader from Pan Command.



Patent rotating colour mediums for lime-light, by E. S. Cooper, British Patent no 18623 (1893).



Gas batten fitted with cloth mediums. F. Lloyd, Practical guide to scene painting . . . (London: 1875)

- H How many colours does the system deliver from one 'loading' of the palette?
- I What is the fastest time taken to change from one colour to another?
- J What is the slowest time taken to change from one colour to another?
- K What is the counting mechanism . . . i.e. stepper motor/optical/frame counter etc.
- L What is the system protocol ie DMX512/analogue 0-10 etc?
- M How many devices can be fed from one power supply (where applicable)?
- N Does the device require mains as well as

- control signal?
- O If a special controller is required what is its capacity?
- P What connectors are used between the device and the psu/controller etc?
- Q What is the maximum control cable length to psu/controller?
- R Please indicate the power requirements of the psu/controller.
- S Can your company provide and fit colours for your device - yes/no?
- T Is your product available for hire - yes from us/yes from others/no/not known?
- U Does the device contain a fan - yes/no?
- V If the answer to 'U' is yes can the fan speed be reduced - yes/no?
- W Can the device still permit barndoors etc to be mounted on the instrument?
- X What are the dimensions of the mounting plate?
- Y What is the weight of the unit?
- Z What is the UK list price of the unit and of the psu/controller?

Additionally readers should note that one of the Camelont Rainbow range is suitable for outdoor use because it is waterproof. Appropriately this device is called the 'Alfresco'. I have to admit that it did not occur to me to ask this question but with so many outdoor concerts this is obviously an important feature.

Worthy of note is the Teatro Colourbox which sounds a good rival to the Pan Command ColorFader. I will quote directly from Teatro's literature on this subject: "the possibility of 21 different colour combinations...Colourbox can go from one colour to another without scrolling through unwanted frames and can crossfade between consecutive sections. Three toothed drive shafts, each controlled by a high quality stepper motor, drive three separate toothed drive belts. Each drive belt carries two filters." Most manufacturers seem happy to talk about fitting their units to any size of suitable light and there are scrollers here to fit just about anything from the large 8-Lites to the small Birdies. Additionally, there is the DHA Light curtain. This device comes complete with lamps, tilt mechanism and is controlled from an Apple Macintosh; consequently some of the questions do not directly apply. DHA note that this device has the ability to change at very slow speeds and the accuracy to which the destination

colour or split colour can be specified. Gel Stream is advertised as "the world's only cartridge loading colour scroller - no de-rigging, simply snap-out the colour cartridge and snap in a new one. No tools required." It is also worth noting that Gel Stream's in-built power supply is included in the unit cost (as is the DMX for which some manufacturers make an additional charge). Consequently Gel Stream is very cost effective. It also comes with excellent literature showing connections and line-up information.

Latest news on the scroller front is that Wybron Inc of the USA, plan to open a London office for sales and gel-string assembly (see L+SI February). Of note too that the Diafora range is available in the UK from ESP (see also SIEL report this issue).

Finally, comes my customary comment that it is always possible that we have missed some scroller somewhere. If we have then we will be happy to include details in a future issue of L+SI. Happy scrolling!

Drawings reproduced from Terence Rees' 'Theatre Lighting in the Age of Gas' published by the Society for Theatre Research

Contacts

- AC Lighting (0494) 446000
- Camelont 071-284 2502
- CCT 081-770 3636
- Cerebrum 081-949 3171
- DHA Lighting 071-582 3600
- Elite 081-467 1777
- ESP (0462) 482411
- Roscolab 081-659 2300
- Pan Command 0101 408 297 7262
- Strand Lighting 081-560 3171
- Teatro 010 39 376 780702
- Wybron 0101 719 548 9774

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STILL GOING STRONG: STARLIGHT EXPRESS

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