

H.P.S.E BRISTOL

Ann Gibbs

SPECIAL ELECTRONIC EFFECTS

AN INTRODUCTION FOR THE NON-TECHNICAL
by Leonard Chase

INTRODUCTION

These notes are offered as a summary of the essential information given in the Special Effects Demonstration tape.

The demonstrations were recorded under experimental conditions in TC-3 and TC-8, with very little to spend on artists and conventional production facilities, but with considerable support and guidance from:

Robert (Bob) Wright and Television Technical Operations
John Humphries and Television Engineering
David Myerscough-Jones and Television Design

Each member of the production team led the group in working out and recording his own experiments. Some worked well, others less well and a few were abandoned for lack of time.

The demonstrations were directed by:

| | | |
|---|---|--|
| John Symons | — | Off-Set Overlay, VT Build-Up, Colour Synthesis, 3 & 4-way splits |
| Brian Phillips | — | Quad Overlay |
| Leonard Chase | — | Photo-Decor and Foreground Mattes |
| A. J. ('Mitch') Mitchell & Dave Jervis | — | Overlaid shadows, glass, opening and closing Electronic captions |

They were also the Electronic Effects Operators for all the experiments.

NOTE: In the diagrams we have represented CSO blue as



Illustrations by John Affleck

COLOUR SEPARATION OVERLAY (CSO)

CSO is also known as CHROMAKEY
It works like this:

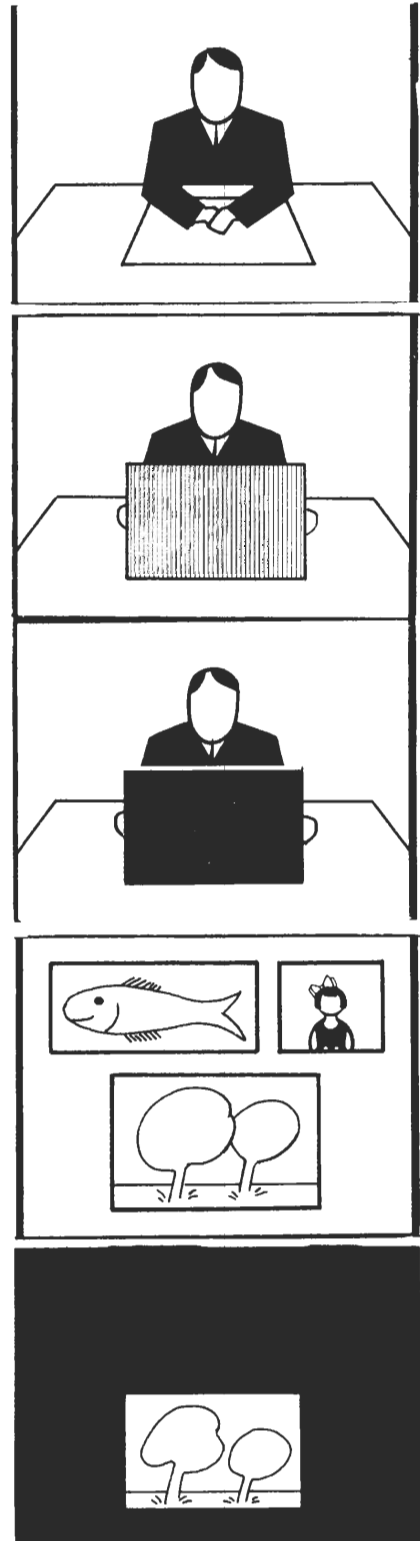
In normal circumstances, all the colours in a picture pass through the television system. But it is possible to introduce into the circuit a "switch" or "filter" that will block a given colour and stop it getting through.

For instance, if we hold up a blue card and introduce into the circuit a "switch" or "filter" that discriminates against that blue.....

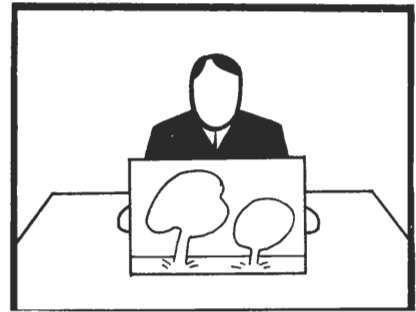
the rest of the picture will remain unaffected but, where the blue card was there will be a blank space.

What is more, if we have another television picture in the same system.....

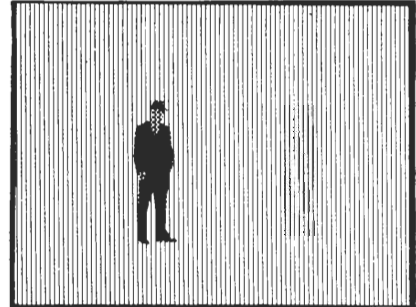
we can use the electronic switch that cut out the blue card to isolate a part of this other picture identical in size and position to the card itself.....



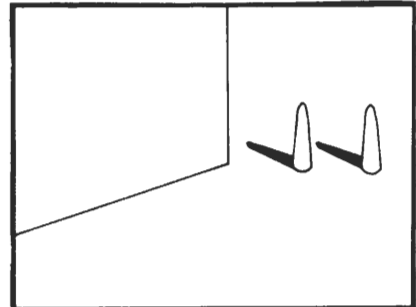
and whatever we choose to select from this picture can be dropped into the gap where the blue card was.....



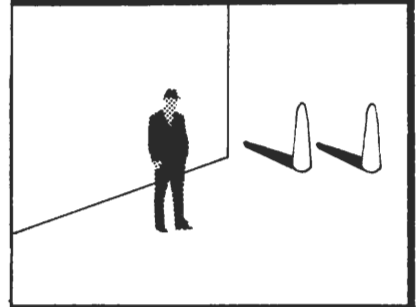
A simple application of this technique is where you have an artist on a CSO blue set on one camera.....



and a photograph of a background on another.....



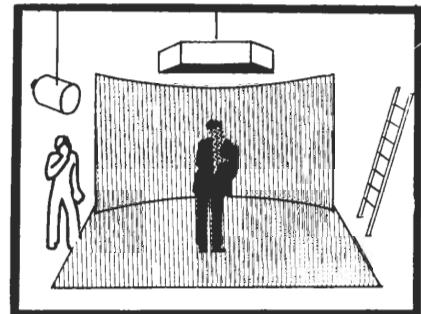
Combine the two and the artist will appear against the photographic background.



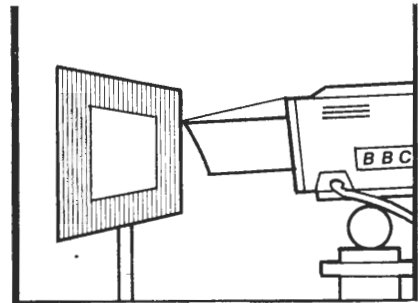
But note that in this example, there are shadows in the background while the artist appears shadowless. In both the above examples, the CSO colour used was blue. This is known as the **KEYING COLOUR**, and it doesn't have to be blue. Red, green, yellow are regularly used — blue and yellow are generally most convenient. As well as switching by colour (**CHROMINENCE**) you can also switch by lighting contrast (**LUMINANCE**) and it is possible to use more than one switch at a time.

There are two common ways of providing a CSO background. A white flat or cyclorama can be lit with coloured lights or alternatively the background can be painted with the appropriate keying colour. It is not always necessary to have a large CSO backing even for taking long shots.

In a situation like this where we are shooting off the CSO backing.....



we can simply place in front of the taking camera a cut-out mask or VIGNETTE, coloured to match the CSO backing.



This will effectively extend the backing and overcome the shooting off. It is also possible to produce the vignetting effect electronically in the gallery.

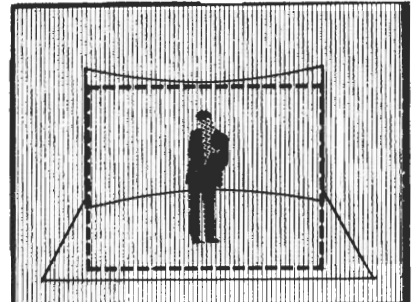
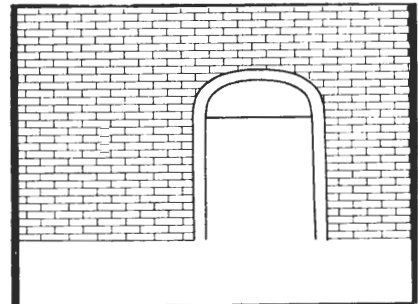
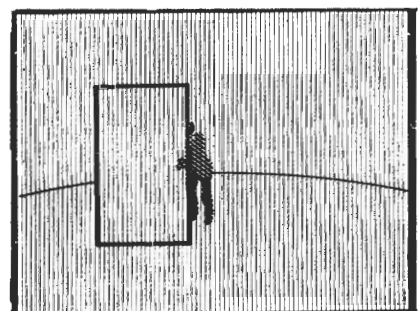


PHOTO-DECOR

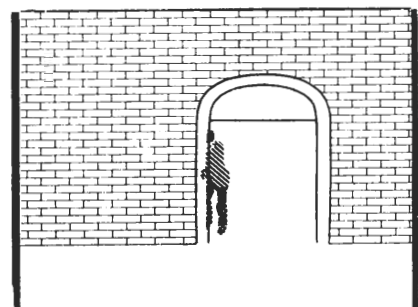
Added realism can be achieved by making it appear than an artist is moving behind parts of a photographic background. For example, if we want to show the artist coming out of the doorway in this photograph.....



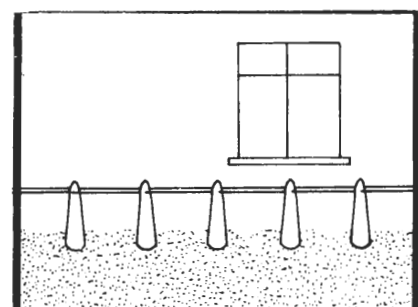
we merely have to place a CSO blue flat on the CSO blue set so that its right-hand edge coincides with the edge of the doorway.



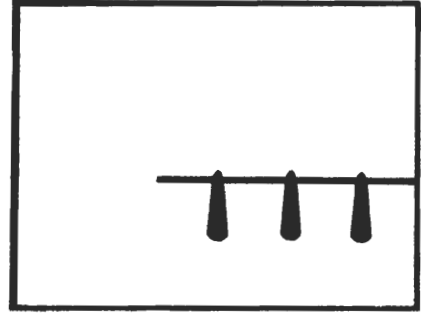
By combining the two shots, the artist will appear to walk through the doorway.



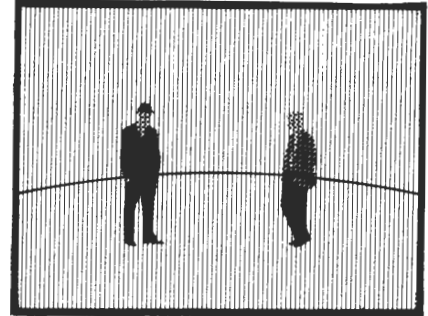
Much more complex effects can be produced by using a FOREGROUND MATTE. In this case we have a photograph of railings outside a building. We wish to make it appear that one artist is behind the railings on the right and the other is in front of the railings on the left.



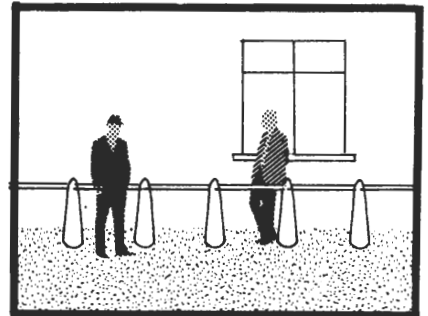
In order to achieve this effect, we make a foreground matte which coincides exactly with that part of the photograph behind which the artist is to appear.



The two artists take up their carefully marked positions on the CSO set.



and when the photograph, vignette and studio shot are combined, we get the desired effect.



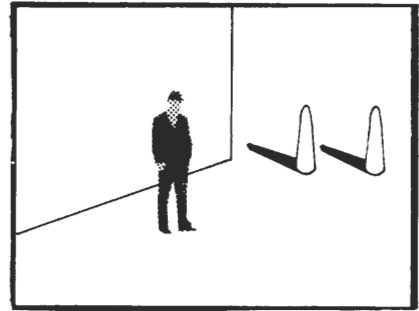
It is even possible to get an artist to walk round a piece of furniture in a photograph by switching the foreground matte in and out at the right time. The use of photographs as scenic settings can be further improved by the inclusion of real detail on the CSO set. For example, a real door (set in a CSO blue flat) can be juxtaposed into the photograph of a room so that artists can appear to enter the photographed room through the door. You can also cross cut dialogue between artists in a photo-setting. But when going into close-ups it is important to defocus the backing photographs in order to produce a sense of depth. The photo-settings used in the demonstration tape were simply selected at random from the photo library but in practice the photographs should be taken specially.

The following points should be born in mind by the photographer when taking them:

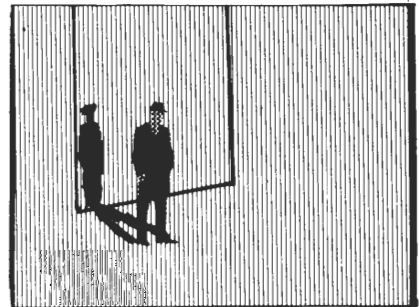
1. Make a note of the focal length of the lens.
2. Note the lens height and distance from the back wall if any.
3. Note the direction of the main light source if any.
4. Be sure that the photograph contains no detail that might be expected to move — grass, clouds, water, birds, candle-flames etc.
5. Keep the camera level (except for special high/low angle shots).

Even greater realism can be achieved where an artist 'walking about in a photograph' throws a shadow, not only on the ground, but on adjacent walls.

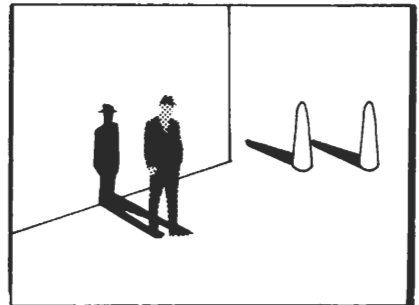
Here the artist is casting no shadow, while the bollards in the background are. The effect will be quite unreal.



On the CSO set we place a blue flat to coincide with that part of the wall where the shadow should fall.



By using a double-switching process, the shadow can be made to appear within the photograph.

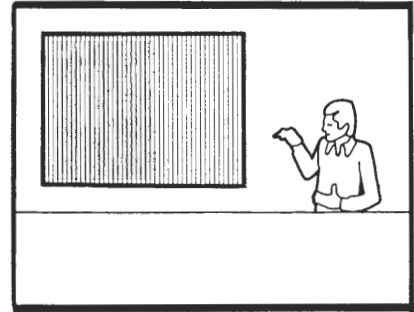


It should be stressed that the shadow is not appearing automatically and the production of shadows in this way demands a good deal of skill from the Electronic Effects Operators. Until recently it was practically impossible to include smoke, glass or shadows in overlay sequences but during the experimental period preceding this seminar, our two Effects Operators, 'Mitch' Mitchell and Dave Jervis, perfected the techniques they had been working on so that they could not only give us shadows, but also car windows and windscreens. This means that they can now overlay a moving telecine or videotape background onto a car without the windscreen and windows 'tearing' or vanishing. But do remember that the moving background should be shot out of focus as required in the finished shot.

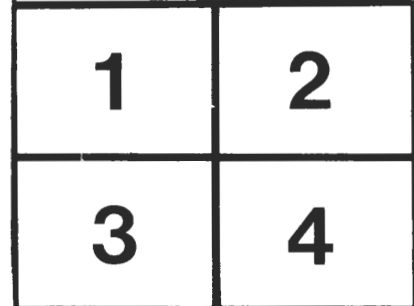
Photo-decor is at its best where you need an establishing shot involving elaborate setting, dressing and lighting or where the action is contained in a limited space like a 'phone box. If you think that photo-decor will answer your need, get in touch with your Designer and a Vision Manager or Vision Organiser to make sure that the technique is appropriate and will work.

OFF-SET OVERLAY

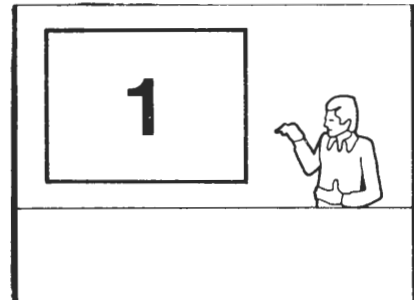
This technique is commonly used in presentation sets. Here is a typical arrangement.



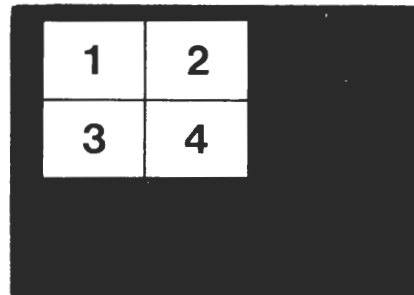
If you simply overlaid this shot.....



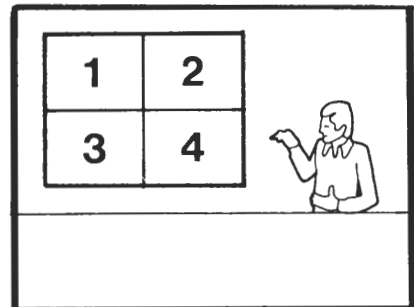
you would only get part of the overlaid picture in shot.



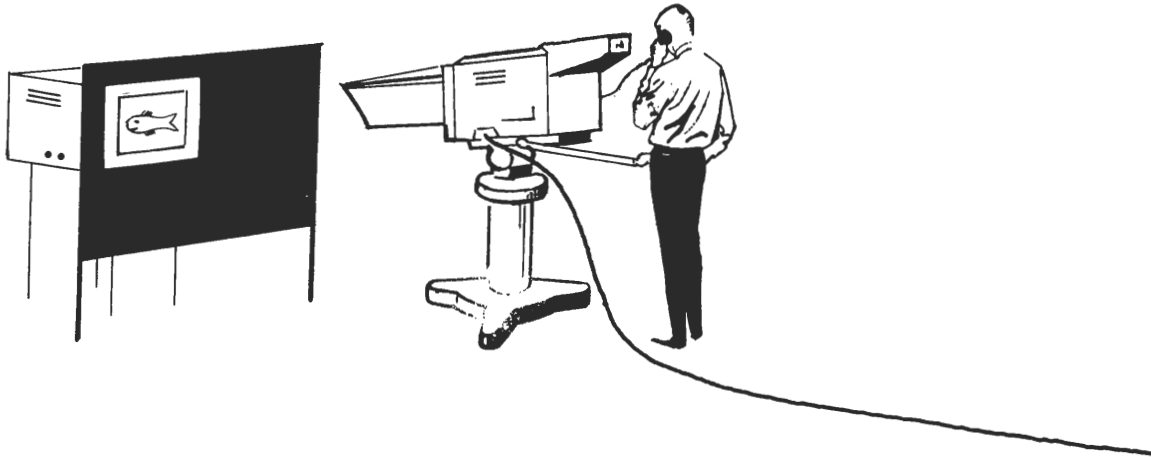
In order to include the whole caption, the cameraman — using a mixed-feed viewfinder (allowing him to see both shots at once) — should pull back and line up the caption in an off-set position.



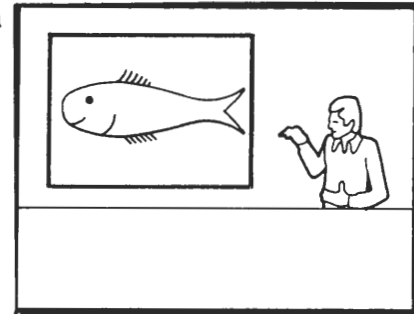
and it can then be overlaid in full.....



In order to overlay telecine, slide scanner or videotape recording, the source is fed into a BLACK MATRIX MONITOR (one which gives a specially clear picture) and this is usually surrounded by a light-masking frame.



Again using a mixed-feed viewfinder, the cameraman can off-set the picture which can be inserted thus:



When CSO is used in this way, it is worth remembering that the keying colour can originate in a number of ways. It can be a coloured flat or cloth in the studio or on location. It can be live, on film, photograph or videotape. All the picture sources must be synchronous and shots must be so composed that the position of the keying colour will coincide with that of the desired insert.

VT BUILD-UP

The most spectacular application of this technique is where one artist appears in several characters at once on the screen. The easiest way to achieve a double appearance is to put the artist on the left of the shot and, with the camera locked off, record the left hand side of the picture on videotape. The tape is then rewound and played back to the gallery while the artist (now on the right side of the shot) performs and records his other role. This is a straight forward split-screen technique and works perfectly well, particularly if you play the sound from the original recording back into the studio so that the artist can respond to his original lines.

More subtle than the split-screen technique is VT Build-Up using CSO. The build-up is achieved by a series of PASSES or recorded overlays. In the demonstration we showed, one actor played four parts. He was shown sitting beside himself on the front of a table — life size. Then, in both roles, he pulled out of his pocket a tiny replica of himself. Finally there were four versions of the same actor on the screen, each acting independently — two full size and two miniatures. The two full size characters were put side by side using the split-screen method described above. Now each full size character had to have a miniature version standing on his hand.

Here we come to a most important point to be remembered when using CSO. It applies to all that has been discussed before but is most clearly seen in the present situation. It is obviously quite essential that the tiny figures appear in the foreground — that is to say, in front of the two full size figures. If they were placed behind, they would be hidden from view. The question is which shot takes foreground precedence in an overlay situation? The answer is quite simple. The shot containing the keying colour is the foreground shot and if we put our actor against a CSO blue set and take the camera well back we will have a very long — and therefore very small — picture of him. His correct position on the CSO set can be determined by having a rehearsal playback of the previous recording or pass. We then record the miniature actor on the blue CSO set and overlay the master shot of the two full size figures.

It is important to remember that it is the shot containing the keying colour that becomes the foreground, while the overlaid shot (in spite of its name) will appear behind the pictorial content of the keying shot. But when you insert a foreground matte, the foreground/background position will be reversed in those areas co-situated with the matte.

The demonstration described above (and shown in the demonstration tape) would have worked better if the actor — in his life size roles — had anchored his hand to a table top or even to his knee. As it is, the hand wanders and loses registration with the miniature man who is meant to be standing on it. With each pass (or re-recording) a certain amount of quality is lost. But the more parts an artist plays, the more fantastic the situation and the greater the degrading you will get away with. Three or four passes are quite acceptable.

WIPES, MIXES, COLOUR SYNTHESIS

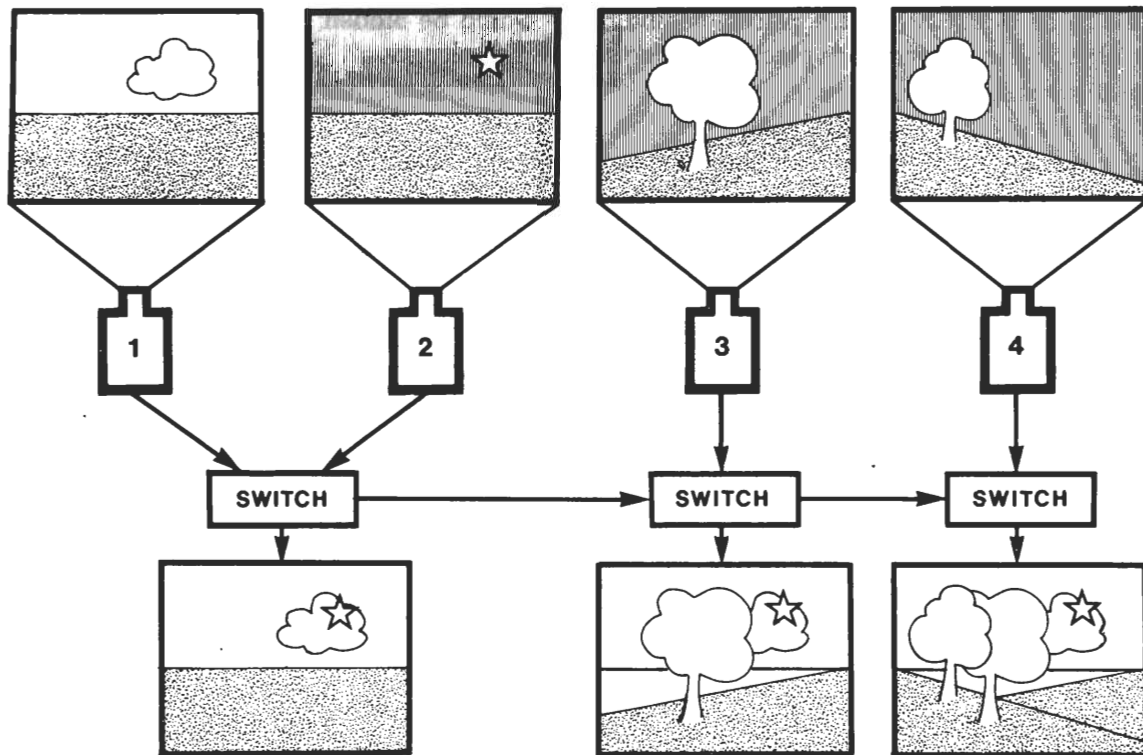
The standard vision mixing panel is capable of a number of elaborate wipes, mixes and split-screen effects. In addition to the built-in wipes, it is possible to select additional ones from a case of more than a hundred. Each wipe module can be simply plugged into the vision mixer and has an illustrated label explaining what it does.

It is possible on the new vision mixing panel to put up to four pictures on the screen at the same time by two-way, three-way, or four-way splits. All the pictures can be moving, but if you want to put a whole TK shot in one quarter of the screen, it will be necessary to work through the off-set, black matrix monitor described above. The split-screen effect can be had with hard or soft edges.

Another useful gallery device is the COLOUR SYNTHESIZER. This can be used to produce colour electronically. Monochrome film can be tinted sepia (or indeed any colour). Plain lettered captions can be given any colour and the letters can be given edges in black, white or any other contrasting colour. In some synthesizers, it is possible to add an extra wide edge or alternatively to add a low or high-relief (three dimensional) effect. It is also possible to have a background (eg. cyclorama) in, say, CSO blue and make it appear any colour by using the synthesizer.

QUAD OVERLAY

Whereas in conventional overlay the vision mixing desk is used to combine the various video components, QUAD OVERLAY can work independently of the vision mixer. The Electronic Effects Operator can build up complicated sequences and offer the finished electronic compilation to the vision mixer as a single source. Quad Overlay operates in several ways. For example, it can combine four pictures using one keying colour like this:



Reading from the left in the diagram, picture no. 1 is combined with picture no. 2, using a conventional overlay switch responding to blue in the foreground shot. The combination of cameras 1 and 2 is fed to the next switch together with the output of camera 3. Again the switch is driven by foreground blue. Finally, the combination of cameras 1, 2 and 3 is passed to the third switch together with the output of camera 4. Again the switch is driven by the blue in the foreground shot and the build-up is complete.

The single colour system described above would not work in a situation where you wanted four different video ingredients placed in a particular grouping on the screen. We have seen that it is possible to split the screen two, three or four-ways using the vision mixer. But this method will only work for simple symmetrical arrangements. For more complex patterns we can use (instead of the three blue-driven switches) three independent switches, each working on a different keying colour. This arrangement enabled us to produce a shot of a rotating cube, each side of which showed a different view of a dancing girl. The sides of the cube were painted with different keying colours and the shots of the girl were all first-generation.

| | | |
|--------------|---|---|
| QUAD OVERLAY | — | can be set up in most studios, so long as prior notice is given. It is a standard facility only in TC-8. |
| BANK OVERLAY | — | standard CSO facilities operated by the Vision Mixer with clipper under the control of the Vision Operator. |
| DESK OVERLAY | — | CSO operated by the Electronic Effects Operator. |

FINAL NOTE

All the special effects demonstrated and described have their limitations as well as their usefulness. Much progress has been made in recent years and several of the techniques demonstrated in the Effects Seminar are already being overtaken by further research. In the meantime, many of the old rules still apply:

1. Keep artists well away from the background so that they can be properly lit and so that the background keying colour doesn't spill onto them — they'll vanish if it does.
2. When overlaying one shot onto another, be sure that the lens angles, lens heights and camera attitudes are the same in the foreground and background shots.
3. Lock off foreground and background cameras.
4. Don't include in the foreground shot anything of a colour similar to the keying colour. because it will either 'tear' or 'break up' or vanish altogether. Remember the process is called Colour SEPARATION Overlay.
5. Avoid fine detail and gauzy clothes because the overlay switch may not be able to cope and the detail will tear. In many cases, blue fringing and 'tearing' can be suppressed by the FRINGE ELIMINATOR but it is better to rely on good planning (and consequent good lighting, design etc).

Special Effects are now taken for granted in Presentation, Pop-Music programmes and fantasy situations. But many Producers and Directors are nervous of depending on the system for the provision of realistic settings and locations or for the presentation of educational ideas. Techniques similar to the ones we have been describing were used in the cinema before most of us were born and processes similar to CSO have been taken for granted in the film industry for many years, mainly because they were applied with technical competence.

If you think that you may need to use electronic effects, contact your Designer and Bob Wright or Wally Stacey and discuss your ideas with them. If they are convinced that special effects should be used, they will alert all who need to be involved — TM, Engineering Co-Ordinator, Electronic Effects Operator, Vision Mixer, Graphics, Wardrobe, Make-Up. When your ideas have been outlined, the Electronic Effects Operator will make up a detailed storyboard and go on to make all preparations for your technical sequences. The further ahead you can plan, the better.

Advanced information on the allocation of Electronic Effects Operators and details of electronic facilities available in studios can be obtained from Wally Stacey — Vision Organiser, PABX 2064.

Advanced CSO planning and the allocation of Technical Managers from Bob Wright — Vision Manager — PABX 3038/3820.

ADDENDA

Page 5 The last sentence should now read:- "If you think that photo-decor will answer your need, get in touch with your Designer and T.M. to make sure that the technique is appropriate and will work.

Page 10 The last three paragraphs should now read:- "If you think that you may need to use electronic effects, contact your Designer and Technical Manager and discuss your ideas with them. If they are convinced that special effects should be used, they will alert all who need to be involved. When your ideas have been outlined, the Electronic Effects Operator will make up a detailed storyboard and go on to make all preparations for your technical sequences. The further ahead you can plan, the better.

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If your T.M. has not been allocated contact a Vision Manager - PABX 3038/3820.

