FAIRLIGHT

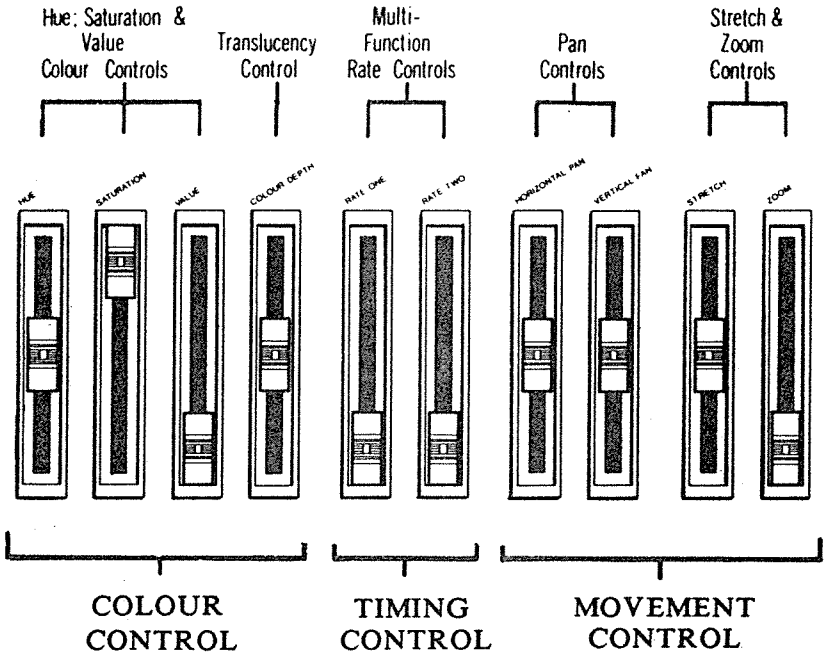
COMPUTER

VIDEO EFFECTS

MIXER

USER MANUAL

CVI Description 1



The slider controls form three groups:

Colour controls: Allow real-time control of colour, for both colour modification (*colourizing*) of live images, and painting. The colour selection method follows the Hue, Saturation, Value (H.S.V.) colour model. This colour model was selected as it is a preferred system for easy colour selection.

The four controls in this group are:

i) **HUE:** This selects the actual 'colour' from the spectrum. The slider is marked: RED YELLOW GREEN CYAN BLUE MAGENTA RED, being a full colour circle. It is a continuous scale, so positioning the slider between, say, RED and YELLOW will yield ORANGE.

ii) **SATURATION:** The saturation of a colour is its 'purity'. For instance, high saturation *red* is a bright red, decreasing saturation goes through various shades of pink, until at minimum saturation, the result is *white*. This slider may be regarded as adding 'whiteness' as the control is *decreased*.

iii) **VALUE:** This control affects the *brightness* of the colour. Full brightness occurs when the slider is at the top of its travel, and moving the control down will darken the colour, until at the bottom it will be *black*. With value at black, HUE and SATURATION sliders will have no effect, as you cannot perceive colour in total darkness.

iv) **COLOUR DEPTH:** This controls the degree in which the H.S.V. colour interacts with colour already on the screen. In simple terms it is like a translucency control, or 'thickness' of colour, but its actual effect depends on the selection made in the COLOUR TYPE menu (or COLOURIZE TYPE menu for colourizing).

SLIDER CONTROLS

Timing controls: These two sliders control the rate at which events occur in the CVI.

i) **RATE ONE:** This controls the rate of change of random colour and colourizing functions. (COLOUR CONTROL and COLOURIZE CONTROL menus).
ii) **RATE TWO:** This control determines the rate of glides (SCREEN CONTROL menu) and the rate of image 'grabbing', controlled by the FREEZE CONTROL menu.

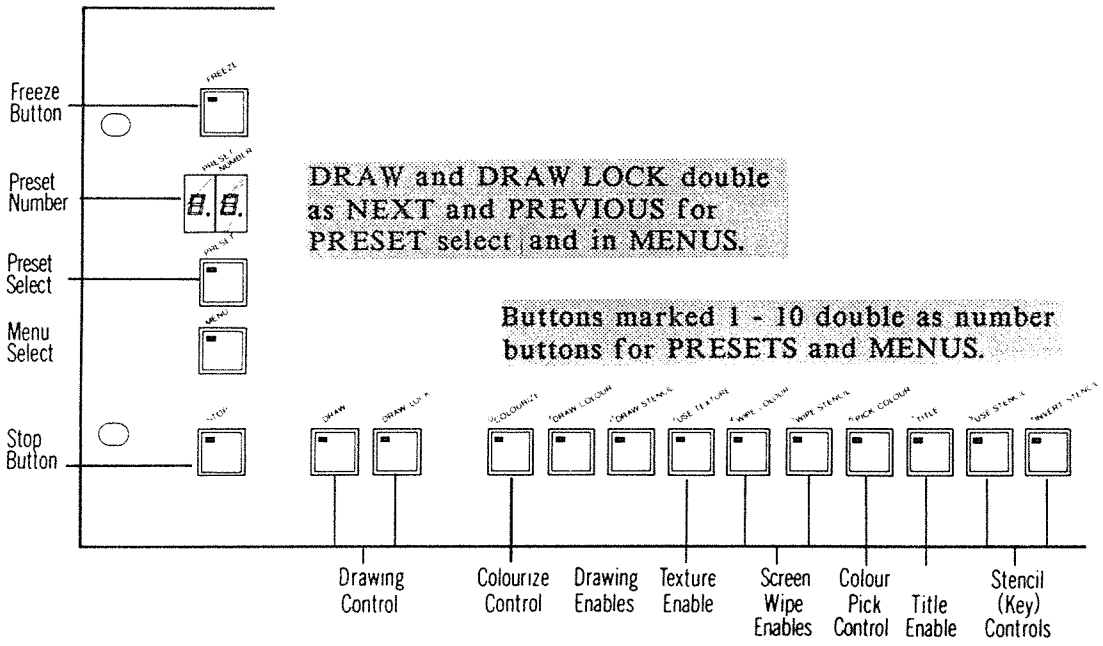
Movement controls: These four sliders control the movement of *digital* images on the screen. Their functions are affected by the **Glide**, **Slide** and **Pan:pen** selections in the SCREEN CONTROL menu.

The four controls in this group are:

i) **HORIZONTAL PAN:** Moves image horizontally.
ii) **VERTICAL PAN:** Moves image vertically.
iii) **STRETCH:** This control affects the *aspect ratio* (proportion of vertical size to horizontal size) of the pixels. (A pixel is a 'picture element', which is the smallest unit of colour that the image is composed of.) On a *still* image this control will stretch the picture, with a normal image occurring when the slider is at centre. Up from centre gives a vertical stretch. Down from centre gives a horizontal stretch. On a *live* image, this control will control the *mosaic* (pixelation) effect.
iv) **ZOOM:** This control expands the pixels. On a *still* image this control *zooms* the picture, giving a 'close-up' effect. Changing this control with a *live* digital image will result in the *mosaic* effect. The normal position for this control is at the bottom of its travel.

The push-buttons allow immediate control of a number of functions: There are buttons for starting a process, selecting presets, entering the menus system, and various other functions. All of the buttons feature a light, indicating the current status (on or off) of the function they control.

Ten buttons have the numerals 0 to 9 printed above them. These buttons are used as number buttons when selecting PRESETS or MENUS.



Colourize: push on/push off. Button number 0.
Will re-colour the whole digital image in the colourize type selected in the COLOURIZE TYPE menu. Colourizing is alterable by the HUE, SATURATION, VALUE, and COLOUR DEPTH sliders. See Section 3 - PAINT MENUS under COLOURIZE TYPE and COLOURIZE CONTROL.

Draw colour: push on/push off. Button number 1.
Enables you to use the stylus and GRAPHICS PAD to draw "on screen". Must be used in conjunction with DRAW or DRAW LOCK buttons.

Draw stencil: push on/push off. Button number 2.
Enables a stencil (matte or key) to be drawn on the stencil plane, with stylus and GRAPHICS PAD, provided that the DRAW or DRAW LOCK buttons are also on.

Use texture: push on/push off. Button number 3.
Enables the texture selected to be used for drawing and some Colour wipes. See Section 3 - PAINT MENUS under TEXTURE.

PUSH BUTTONS

Wipe colour: Push once to wipe. Button number 4.
Activates current **Colour wipe** selection. See Section 3 - PAINT MENUS under COLOUR WIPES.

Wipe stencil: Push once to wipe. Button number 5.
Activates current STENCIL WIPE selection. See Section 3 - PAINT MENUS under STENCIL WIPES.

Pick colour: Push once to pick colour. Button number 6.
Stylus and GRAPHICS PAD selects desired colour from colours already in the still image, allowing colour matching.

Title: Push once to title. Button number 7.
Enables you to display the title that you edited on the TITLE EDIT menu. See Section 3 - PAINT MENUS under TITLE EDIT menu.

Use stencil: Push on/push off. Button number 8.
Enables you to activate on screen whatever stencil is selected from the STENCIL SOURCE menu. See Section 3 - VIDEO MENUS under STENCIL SOURCE and DISPLAY CONTROL.

Invert stencil: Push once to invert. Button number 9.
Enables you to "flip" the stencil, so that areas where the stencil was *off* become *on*, and vice versa. Thus protected areas, and areas with differing display selections in the DISPLAY CONTROL menu, will be exchanged.
See Section 3 - VIDEO MENUS under DISPLAY CONTROL.

Draw: Hold down to draw.
This button enables the drawing of lines and shapes on the screen as long as it is pressed. Use in conjunction with the DRAW LOCK button. See Section 3 - PAINT MENUS under PAINT METHOD.
This button doubles as a *previous* MENU or PRESET selector when in MENU mode or PRESET select mode. You may thus step *backwards* through the PRESETS.

Draw lock: Push to lock DRAW on, push again to unlock.
This button enables *continuous* drawing of lines and shapes on the screen. Use in conjunction with the DRAW button. See Section 3 -

PAINT MENUS under PAINT METHOD.
This button doubles as a *next* MENU or PRESET selector when in MENU mode or PRESET select mode. You may thus step *forwards* through the PRESETS.

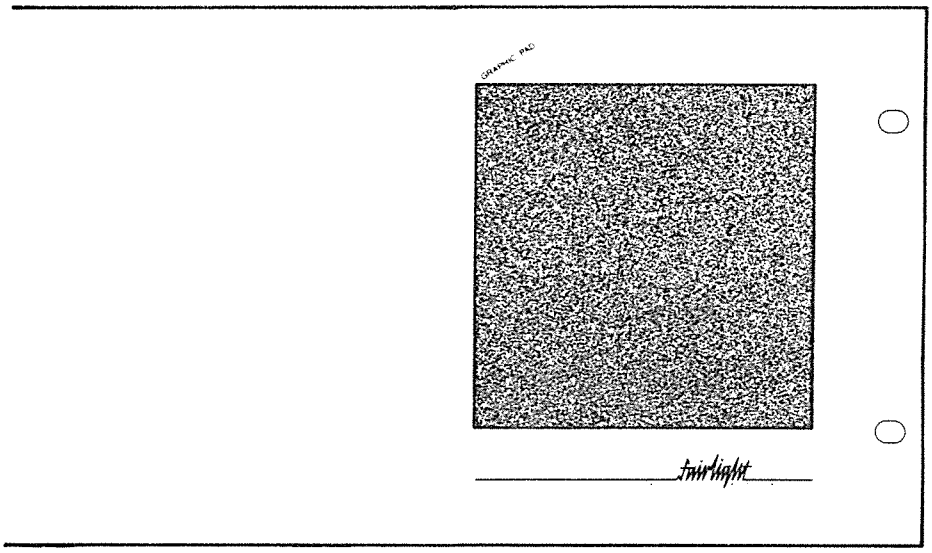
Stop: Push once to stop a process.
This button *stops* any special process from happening, and returns the CVI to a neutral condition. The STOP button will halt the following processes: **Colour Wipes, Stencil Wipes, Setup** selections and some **Paint Methods.**
If a MENU is displayed, STOP button will return you to the screen image.

Menu: Push to enter MENU mode.
When pushed, the last menu that was displayed will re-appear on the screen. Press the STOP button to return to screen image.
See section 1 - CVI DESCRIPTION under MENUS
The menu button also stops replaying of Sequences.

Preset: Push to enter PRESET selection mode.
This button enables the selection of PRESETS.
To select a particular PRESET, press PRESET button, then a two digit number (00 to 99) from the number buttons. If the required preset is numbered between 0 and 9, you may either press 0 then the required digit, or press the digit followed by the STOP button.
To select the *next* preset, press PRESET then the 'next' button (DRAW LOCK).
To select the *previous* preset, press PRESET followed by the 'previous' button (DRAW). The 'next' and 'previous' functions remain constant, even when MENUS are displayed.
A list of the **factory** PRESETS is at the end of Section 2.
To save the current control console setup as the current PRESET, press PRESET then FREEZE. See also Section 3 under PRESETS CONTROL menu.
If you press the PRESET button by mistake, press it again to cancel it.

Freeze: Push on, push off.
This button controls the FREEZE function in combination with the FREEZE CONTROL menu. If the button light is on, the live image will be frozen, if off, the image will respond to the Freeze Control selection. See Section 3 - VIDEO MENUS under FREEZE CONTROL.
Pressing PRESET then FREEZE will save the current control console setup and the current menu selections as the current PRESET.

GRAPHICS PAD



This is the "heart" of the CVI system.

The inbuilt GRAPHICS PAD is a touch sensitive pad which detects the position of a stylus (supplied 'pen') or fingernail on the surface. This position is used by the CVI for several functions: It allows easy selection of options in the menus, and allows the drawing of images and 'stencils' on the screen.

Before commencing to draw or paint an image you should make the appropriate selections in the PAINT menus, or select a PRESET which has the required facilities stored.

A **cursor** will appear on screen, in a position corresponding to the stylus' position on the GRAPHICS PAD. The form of this cursor varies with different functions.
For painting, the cursor will show the **Colour, Brush Shape**, and **Colour Type** currently selected. When the colour and position of cursor are determined, press either 'DRAW', or 'DRAW LOCK' and move the stylus on the pad to draw images.
See Section 3 - PAINT MENUS for details of painting options.

Drawing will occur when the stylus is held firmly on the GRAPHICS PAD. When you lift pressure the line or brush stroke you are doing will cease. Apply firm pressure and there is less chance of errors, in either drawing mode or menu mode.

NOTE: Do not use a pen or ballpoint pen with *ink* on the GRAPHICS PAD - indelible staining may occur. Also, do not use any object with a sharp point: the pad surface may be scratched.

What are they?

'Menus' are the screens full of words and symbols, in *white* lettering on a *blue* background, that appear when the MENU button is pressed.
The menus are a means of making selections within the system. They take the place of a large array of switches, buttons, knobs, and paraphernalia that would otherwise be necessary to control a machine with the scope of the CVI.

They are divided into two broad, and somewhat inter-related categories: PAINT menus and VIDEO menus.

1) PAINT menus are used primarily to select options in the generation and painting of still images, and stencils.

2) The VIDEO menus are primarily intended for the control of live video images coming from camera or video tape.

There is a considerable degree of overlap, as live and still images can be combined in a large number of ways, and there are a number of functions which are equally useful for both categories.

The menus are initially entered by pressing the MENU button. This will display the last menu that was used. Menus are blue and white "pages" that appear on the screen. For purposes of printing, they appear in black and white in this manual.

Most menus have the title at the very top of the display and a numbered list of items that may be selected.
There are *two* methods of selecting items within the menus, these are:

1) **The PEN and GRAPHICS PAD**
Apply firm pressure with stylus on GRAPHICS PAD and notice the *cursor* appear on menu. With the stylus, move cursor to item number that you wish to select.
Lift the stylus from the pad, with the cursor on the relevant number: a white square will appear around that number, signifying selection of the item.

2) **The PUSH BUTTONS**
Choose any item in the menu by pressing the respective numbered button on the CVI control console. A white square will appear around the item number that you have selected in the menu.
NOTE: The function of the numeric buttons changes when a menu is not displayed. For example, button 9 reverts to INVERT STENCIL.

MENUS

At the top of every menu is a long horizontal box with the name of the menu.

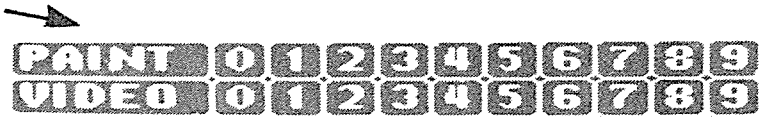
To the right of the name are three symbols. When these symbols are selected by the stylus, or their equivalent buttons pushed, the following will occur:

Exits MENU mode, and returns to the image. Same effect as pressing the STOP button while in MENU mode.

Returns to the *previously* displayed menu. Same effect as pressing the DRAW button while in MENU mode.

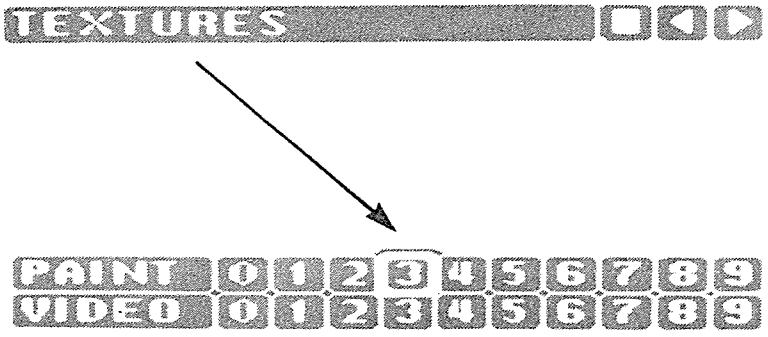
Goes to the *next* menu. Same effect as pressing DRAW LOCK button while in MENU mode.

Most menus also feature a quick selection bar at the bottom of the page.



This 'quick selection bar' enables you to gain instant access to any of the PAINT or VIDEO menus. Simply position the cursor over the number of the required menu (either PAINT 0-9 or VIDEO 0-9) and lift the stylus. If you can't remember the required number, position the cursor over either PAINT or VIDEO (depending on whether the required menu was a paint or real-time function), and lift the stylus. The PAINT MENUS or VIDEO MENUS selections will be displayed, which list the menus by name in both categories.

The number of the currently displayed menu is high-lighted by a thick wall box.



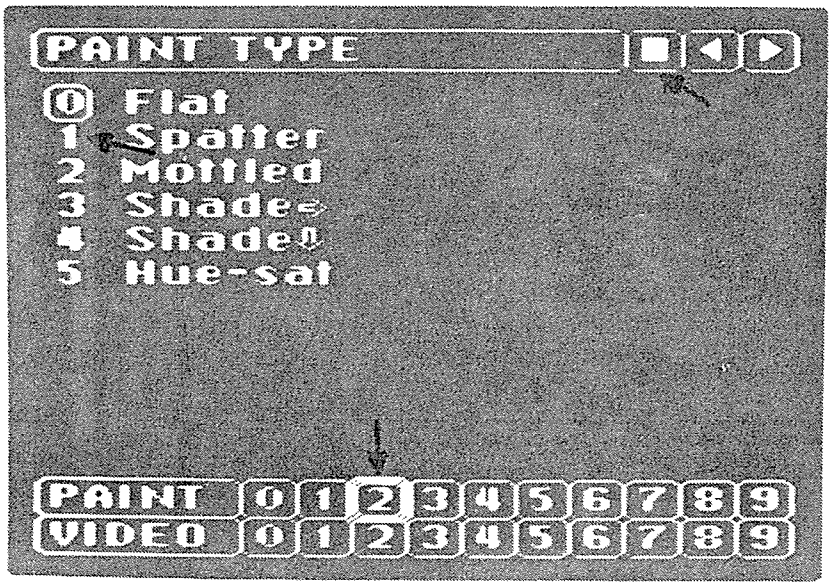
For example, if you have an image displayed and you want to select **Spatter** paint type to use on that image:

i) Press MENU button. If this is the first time you have used the menus since powering on the CVI, the following PAINT MENU will appear:

ii) To select PAINT TYPE move cursor to **Quick select** PAINT 2 or press **button number 2,** (DRAW STENCIL)

10 PAINT menus
10 VIDEO menus

iii) We now have displayed the PAINT TYPE menu.



to return to screen image move cursor *here* or press STOP button

to select **Spatter** move cursor *here* or press button 1 (DRAW COLOUR)

Paint Menu 2 displayed

STENCILS

What are they?

A stencil is a way of dividing the screen into two regions: the region where the stencil is **On** and the region where it is **Off**. This division allows operations to be made on one region of the image without affecting the other. A stencil is similar in concept to a matte or key.

A stencil can be used to *display* two different types of picture on the screen at the same time: one in the **On** area and one in the **Off** area. The stencil itself is not displayed, but it is used to determine *where* on the screen the two types of picture are shown.

A stencil can also be used to protect a region in the field store. Once again, the stencil is not displayed but rather used as a mask to protect a region in the field store either from drawing on the GRAPHICS PAD or from freezing of an incoming live picture.

The CVI has an *internal* stencil which is stored alongside the colours of the field store. The internal stencil may be turned **On** or **Off** at each pixel location. You can *draw* into the stencil plane using the GRAPHICS PAD, or you can *wipe* or change the contents of the stencil plane using the WIPE STENCIL button and the options in the STENCIL WIPES menu (See Section 3 - Paint Menu **8**).

Any change that you make to the stencil will appear on the screen as changes in the areas where the two types of picture are displayed. For example, assume that you have selected to display the live analog video input where the stencil is **On**, and the still contents of the field store where the stencil is **Off**. (See Section 3 - DISPLAY CONTROL menu). If the internal stencil is initially clear (that is, **Off** at every pixel on the screen) then the CVI will display the still image from the field store across the whole screen. If you start to turn the stencil **On**, either by *drawing* or *wiping* the stencil plane, then the live input will be displayed on top of the field store picture in the areas where you have turned the stencil on. If you *invert* the stencil by pressing the INVERT STENCIL button, then the **On** and the **Off** areas will swap. The still picture will now be displayed in the areas previously occupied by the live input, and vice versa.

Note that the USE STENCIL button must be pressed for a stencil to be active. If it is not pressed then just the selection for stencil Off will be displayed everywhere. In this example invert the stencil and just the stencil On selection will be shown.

The **Internal** stencil zooms, stretches and pans along with the frame store pixels. This allows you to zoom up on a stencilled area, or move it around.

The CVI can generate a "live" stencil using the **Chromakey** feature. (See Section 3 - STENCIL SOURCE menu). The chromakey stencil is generated continuously from the incoming video signal, and is turned **On** where the picture is *blue* and **Off** in all other areas. The "on" and "off" areas from the chromakey stencil can be used to display two different pictures as with the internal stencil. For example, if the incoming picture is of a person dancing in front of a blue wall then the chromakey stencil can be used to replace the "blue wall" areas of the picture with some other image, such as a picture from the field store. The person then appears to be dancing against a background from the field store.

The chromakey stencil is not stored in the CVI, but rather used continuously for live stencil effects. The size, position and shape of the chromakey stencil are determined entirely from the incoming video signal - they are *not affected* by PAN, ZOOM or STRETCH. This allows the background to a chromakeyed figure to be manipulated independently of the foreground.

The **Internal** and **Chromakey** stencils can be used simultaneously to generate a multi-plane effect known as **Under-over**. The CVI can also use a stencil generated by an **External** source, or a stencil **Cascaded** from a second CVI. (See Section 3 - STENCIL SOURCE menu for details.)

The shape of the stencil can be displayed at any time simply by selecting **Stencil show** in the menus. (See Section 3 - Paint Menu 4). When the DRAW STENCIL button is pressed the areas where the stencil is turned *on* will be illuminated. This allows you to see the shape of the stencil area before you use it or as you draw it.

PRESETS

What are they?

One of the notable things about the CVI is the use of PRESETS. What are these beasts?

Well, a PRESET is something like a 'snapshot' of the CVI at a particular instant. A PRESET contains information about the position of the ten SLIDER controls, the sixteen PUSH BUTTONS, and most of the MENU settings. When the CVI is first turned on, 100 PRESETS (00 to 99) contain *control* information corresponding to the PRESETS described in Section 2 - PRESETS SELECTION. This same condition can be reproduced by you simply by selecting the appropriate PRESET.

Note that a PRESET does not contain any *pictorial* information. The resultant screen image will be the same *process* used to generate the photo in the PRESETS QUICK SELECTOR section, but applied to whatever video image is presented to the CVI's inputs.

The PRESETS have several functions:

1) To make it very *easy* to achieve advanced effects which otherwise would require a series of MENU selections.
2) To allow changing of effects *without* having to select items in the MENUS. This is essential to live performance, as the sudden appearance of a blue MENU image would generally be an undesirable interruption.
3) To facilitate *fast* and *accurate* control of the CVI in demanding situations, and even situations which are not so demanding.
4) To allow the *recording* of MENU selections and control positions that create an effect that you may like and wish to repeat at some later stage.

This last point brings us to the next feature of PRESETS: although the PRESETS start out containing 100 selected effects, these PRESETS can be changed or replaced with your own creations at any time. (See Section 3 - PRESETS CONTROL menu.) The CVI will then remember your PRESET until instructed otherwise. You can re-create the effect simply by selecting the PRESET that you stored it in.

The CVI will even remember your effect if you turn the power off. So you can create an effect, store it as a PRESET, and come back a month later - it will still be there. The original PRESETS, as shown in Section 2, can be regained at any time. (See Section 3 - PRESETS CONTROL menu.) However, your PRESET will be overwritten, unless you either copy your PRESET to a different PRESET number, or save it to video-tape/video-cassette. (See Section 3 - SAVE AND RECALL menu.)

It is also easy to create a series of PRESETS that follow on from one-another. This is useful in live shows and post-production work, where a co-ordinated transition from one situation to another may be required. (See Section 3 - PRESETS CONTROL menu under **Program mode**.)

What is it?

The CVI's SEQUENCER records a *history* of actions, and allows accurate repetition of these. It also allows 'editing' or modification of this history, permitting you to hone a 'sequence' of effects to perfection. The SEQUENCER also records a history of any 'painting' motions made. Thus, if some uncorrectable mistake is made in the process of 'painting' an image, the sequence can be replayed up till the point that the mistake was made, and the painting continued from there. This recording of a painting in progress is also useful as a form of animation.

The SEQUENCER does not record actual images, but rather the *process* of making the image. If the image is a modification of an image acquired via the video input, this original image will have to be duplicated for indentical results. The first action in a sequence should be the clearing of the screen in some way (usually a **Colour wipe**, or **Recall** of a digital image from video-tape: see COLOUR WIPES menu and SAVE AND RECALL menu). If this is not done, replaying the sequence will result in the building of the new image on top of the old.

When a sequence is recorded, the CVI will remember it until it is changed, or a new sequence is recorded. The CVI will even remember it after the power is switched off. If, however, you desire to record a new sequence, but still be able to regain the old one later, the old sequence should be digitally saved onto video-tape/cassette using the SAVE AND RECALL menu. (See Section 3 - SAVE and RECALL menu.)

Full details on how to operate the CVI's SEQUENCER are given in Section 3 - SEQUENCER menu.

THE CURSOR

How to use it

When operating the CVI, one of the most frequently used controls is the cursor. It is a versatile tool that is used for a variety of different operational functions. As a result it differs in appearance for each of these. The cursor is utilised through the stylus and GRAPHICS PAD, and allows you to determine the *position* and *colour* of the various screen functions.

With the exception of the menu selection ◍, **stencil=>** and **title** cursors, all cursors are used with the PAINT METHODS.

Brush-shaped cursors are used with **Draw** or **Dots** PAINT METHOD with the DRAW and DRAW LOCK buttons on. You can position the **Brush shape** and determine its **Colour** prior to painting, using the stylus and GRAPHICS PAD and the colour controls.

Word and *pulsing-line* cursors also allow positioning and colour selection prior to using specific PAINT METHODS such as **circle=>**, **rect=>**, **fill=>**, etc. The tip of the arrow points to the pixel where painting will take place. Position is determined by lifting the stylus off the GRAPHICS PAD at the desired point.

In certain examples, dependent on the PAINT METHOD being used, *pulsing-line* cursors are then used to determine the *size* and *position* of shapes such as circles, ellipses, lines and rectangles. The shape is drawn when the stylus is, again, lifted from the pad.

Note that some PAINT METHODS require multiple operations of the stylus and GRAPHICS PAD to determine position and size, and to paint shapes. To abort a PAINT METHOD, press the STOP button before lifting the stylus from the pad.

The cursor can be used to position the desired starting point before any painting begins. The cursor can be a *brush shape*, a *word* or a *pulsing line* and will have the colour and translucency characteristics set by the colour controls.

It is possible to zoom in for very accurate work when using the cursor.

The CVI is capable of generating visual effects ranging from simple painted images to complex, three-dimensional PAINT and VIDEO combinations. Within the CVI there are effectively four planes of information.

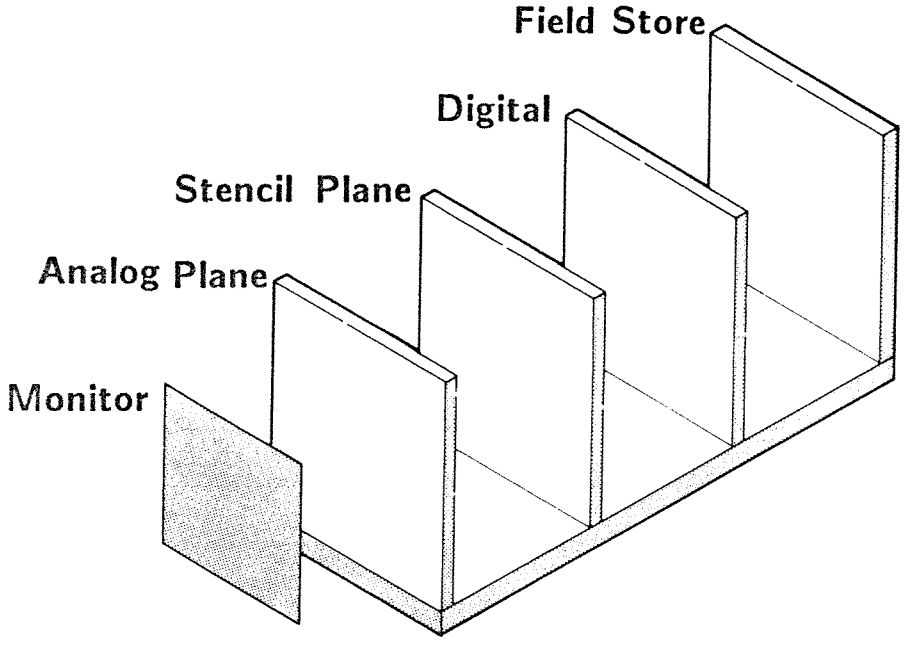
These will be referred to as:
ANALOG - incoming video information not processed by the CVI.
DIGITAL - incoming video information converted to digital form.
FIELD STORE - digital information that can update at one field intervals.
STENCIL - a plane that has a "keying" and protection function.

The FIELD STORE has two ways of receiving its images. It can be constantly updated by incoming live video, which can then be digitally controlled to create effects, or it can be painted on by the use of COLOUR WIPES or by using the GRAPHICS PAD. Painted images can also be digitally controlled to give effects.

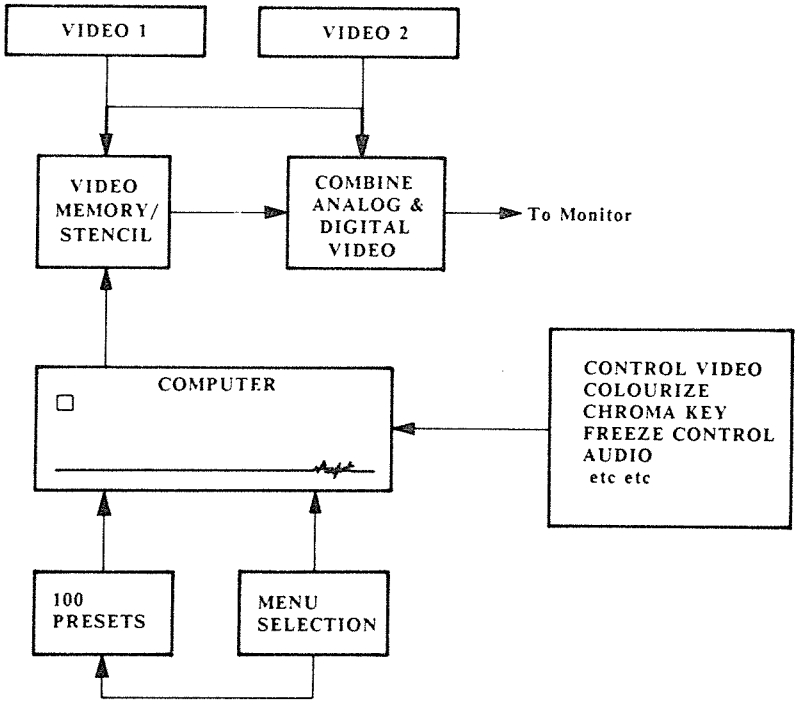
The STENCIL can be used as a *keying* and *protection* device with both painted and live video images. If a wipe of half picture area is created on the STENCIL plane, this "half picture area" stencil can be used to achieve combinations of any two images from the ANALOGUE, DIGITAL or FIELD STORE planes.

This stencil can also be used to protect an area of the FIELD STORE from updating. If using the FIELD STORE with live video, the STENCIL plane can be used to protect an area from updating as determined by the FREEZE CONTROL menu. Similarly, if using the FIELD STORE when painting, the STENCIL plane can be used to protect painted areas from updating in the form of further PAINT functions.

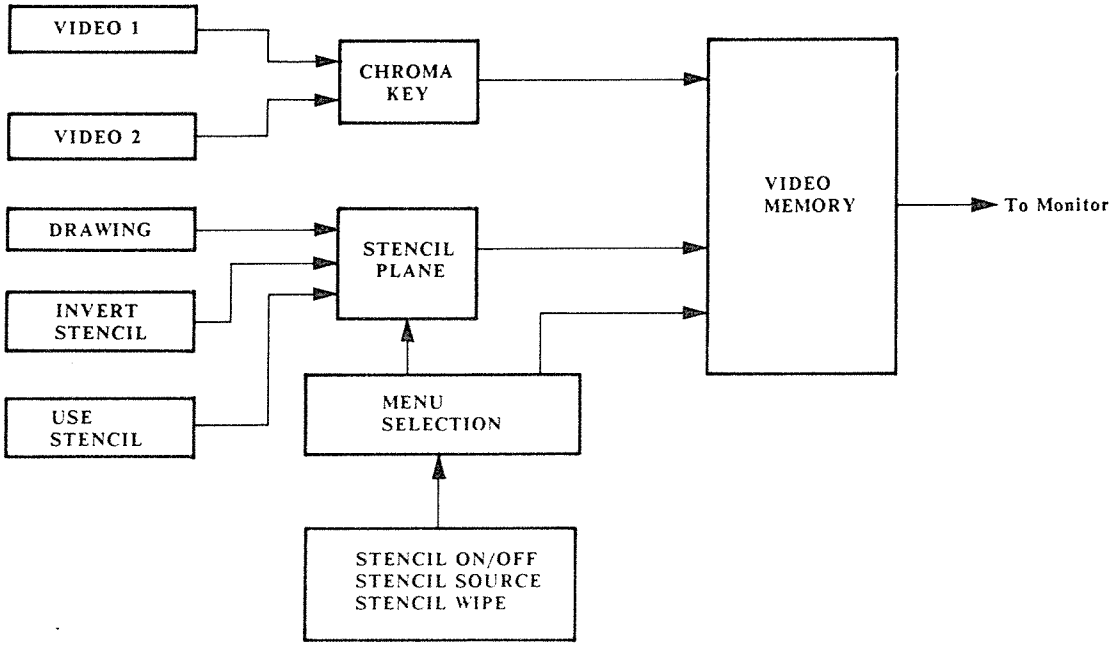
STENCIL areas can be activated by using the USE STENCIL button and inverted by selecting the INVERT STENCIL button.



Video Layout

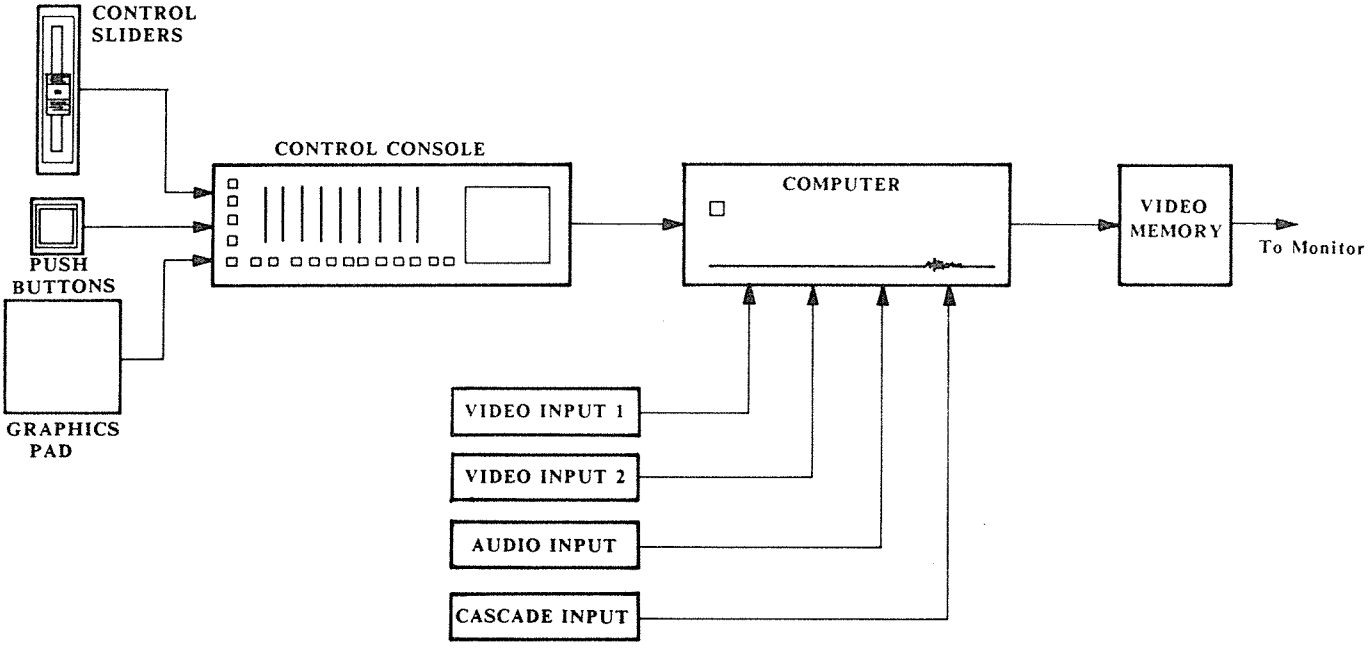


Stencil Layout

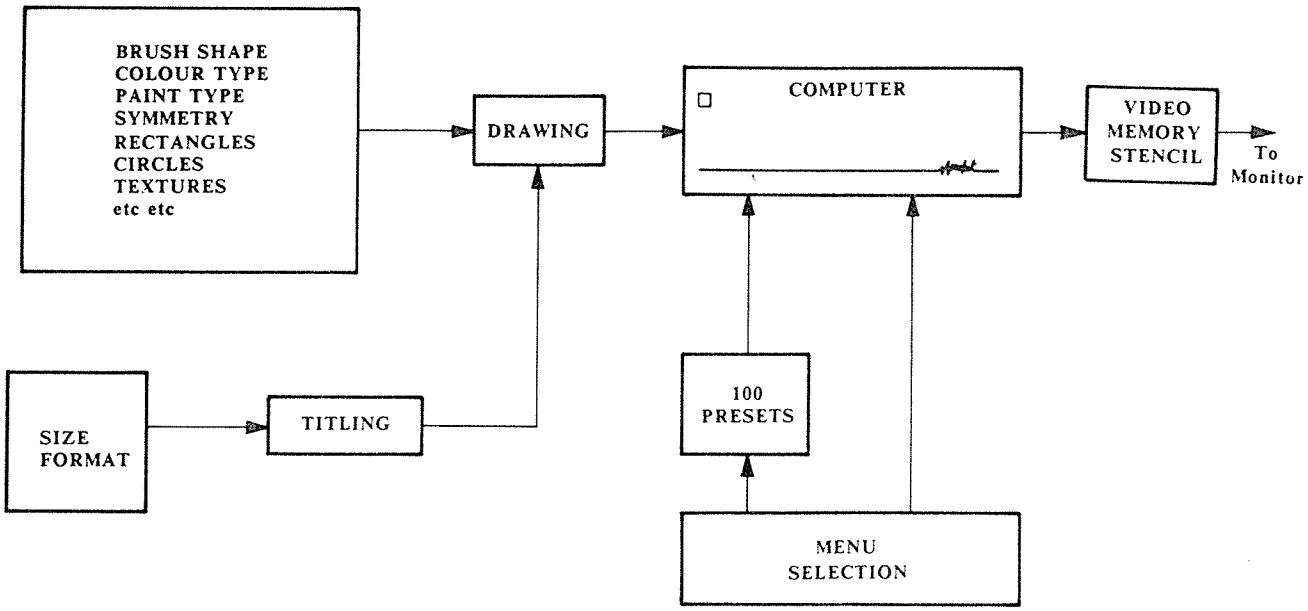


The following block diagrams show main aspects of the CVI. For simplicity, functions, and their destinations are shown only on the most general level as an overview to system operation.
NOTE: All layout diagrams have areas of overlap, enhancing system capabilities.

Physical Layout



Paint Layout



CONNECTING THE CVI

When you receive your CVI, it should have the following items:

1 CVI ELECTRONICS UNIT
1 CVI CONTROL CONSOLE WITH 2 METRE CONNECTING CABLE
1 STYLUS
1 MANUAL
1 POWER CORD

There is also available optional connecting cable extender in lengths of 5, 10 and 20 metre lengths. Contact your distributor.

The CVI has been designed to be compatible with a wide range of video configurations, from home video equipment through low band U-matic to broadcast compatible high-band situations. It can be used for post-production effects generation, live effects during videotaping, fully live operation at concerts, or for still image generation and modification.

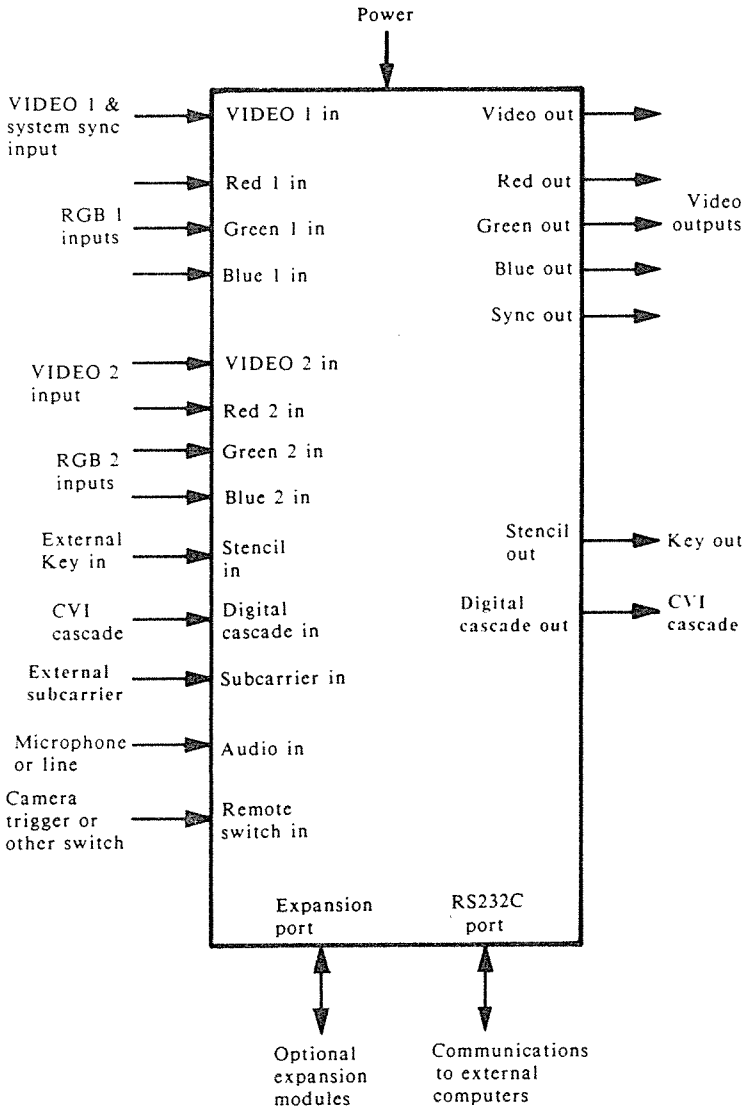
To accomodate the wide range of applications there are a large number of connectors on the back of the CVI. For simpler applications, most of these can be ignored. Select the configuration which most suits your requirements from the connection diagrams in this section.

The CVI synchronizes to VIDEO 1 input, which should either be a normal composite video signal, or colour black. The CVI does not act as a time-base corrector, but neither does it require one. The output will be in sync with the VIDEO 1 input, and the input to VIDEO 2 must be externally gen-locked where used.

NOTE: The Internal PAL/NTSC coder is *not* Broadcast rated. To use the CVI in a broadcast situation, an external Coder and SPG must be used, in combination with the CVI's RGB outputs. A suggested configuration is given in this section.

NOTE - RGB MONITORS: The CVI can be used with RGB monitors for optimum picture quality. Ensure that the monitor accepts analog RGB inputs as there are a number of RGB monitors for personal computers with digital RGB inputs. These monitors can only display eight colours and so are not compatible with the CVI.

EXTERNAL CONNECTIONS

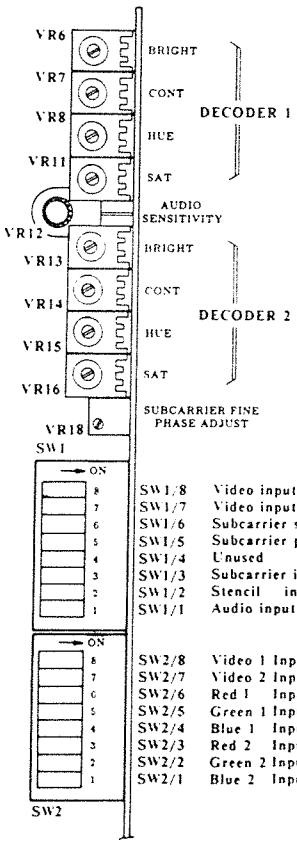


OPTIONS AND AJUSTMENTS

There are a number of options switches and adjustments available. In the Rack mount model (CVI-R) these can be accessed by unclipping the front panel of the ELECTRONICS UNIT (turn the 4 screws on the front a quarter turn anti-clockwise). The adjustments are along the edge of the **Analog board.**

When the CVI leaves the factory, it will be set for composite video on VIDEO 1 and VIDEO 2 inputs. Change switches SW1/7 AND SW1/8 to use RGB inputs.
All inputs will initially have 75 Ohm termination selected: It is not necessary to use termination plugs. If you wish to loop-through on any input, turn off the appropriate termination switch.

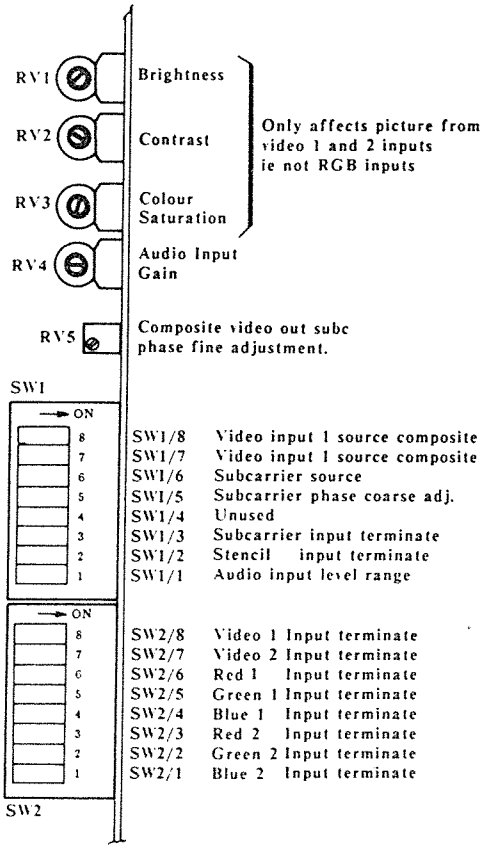
NTSC



		OFF	ON
SW1/8	Video input 1 source composite	RGB 1	Video 1
SW1/7	Video input 1 source composite	RGB 2	Video 2
SW1/6	Subcarrier source	Ext subc I/P	Internal (1)
SW1/5	Subcarrier phase coarse adj.	0 Degrees	180 deg (2)
SW1/4	Unused	-	
SW1/3	Subcarrier input terminate	-	75 ohms
SW1/2	Stencil input terminate	-	75 ohms
SW1/1	Audio input level range	Low	High

SW2/8	Video 1 Input terminate	-	75 ohms
SW2/7	Video 2 Input terminate	-	75 ohms
SW2/6	Red 1 Input terminate	-	75 ohms
SW2/5	Green 1 Input terminate	-	75 ohms
SW2/4	Blue 1 Input terminate	-	75 ohms
SW2/3	Red 2 Input terminate	-	75 ohms
SW2/2	Green 2 Input terminate	-	75 ohms
SW2/1	Blue 2 Input terminate	-	75 ohms

PAL

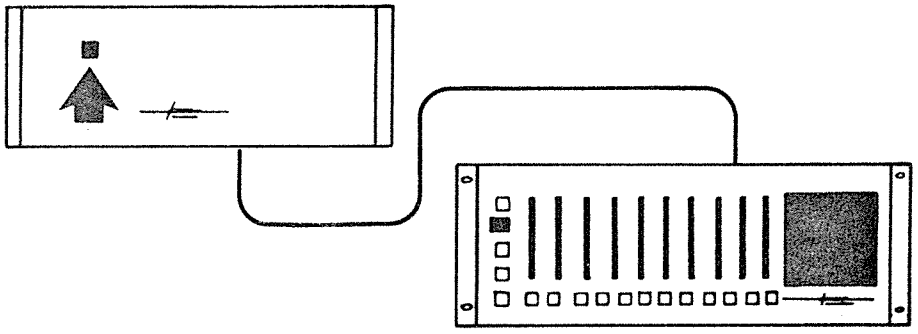


		OFF	ON
SW1/8	Video input 1 source composite	RGB 1	Video 1
SW1/7	Video input 1 source composite	RGB 2	Video 2
SW1/6	Subcarrier source	Ext subc I/P	Internal (1)
SW1/5	Subcarrier phase coarse adj.	0 Degrees	180 deg (2)
SW1/4	Unused	-	
SW1/3	Subcarrier input terminate	-	75 ohms
SW1/2	Stencil input terminate	-	75 ohms
SW1/1	Audio input level range	Low	High

SW2/8	Video 1 Input terminate	-	75 ohms
SW2/7	Video 2 Input terminate	-	75 ohms
SW2/6	Red 1 Input terminate	-	75 ohms
SW2/5	Green 1 Input terminate	-	75 ohms
SW2/4	Blue 1 Input terminate	-	75 ohms
SW2/3	Red 2 Input terminate	-	75 ohms
SW2/2	Green 2 Input terminate	-	75 ohms
SW2/1	Blue 2 Input terminate	-	75 ohms

If this is the first time your CVI has been used, and it is not yet connected, then you should refer Section 1 - CONNECTING THE CVI. Once connected, it may be turned on. This is one of the simpler procedures in the CVI, and consists of turning on the power switch.

On the CVI, the power switch is located on the left-hand side of the front of the ELECTRONICS UNIT. The electronics unit may be installed in a different room than the CONTROL CONSOLE.



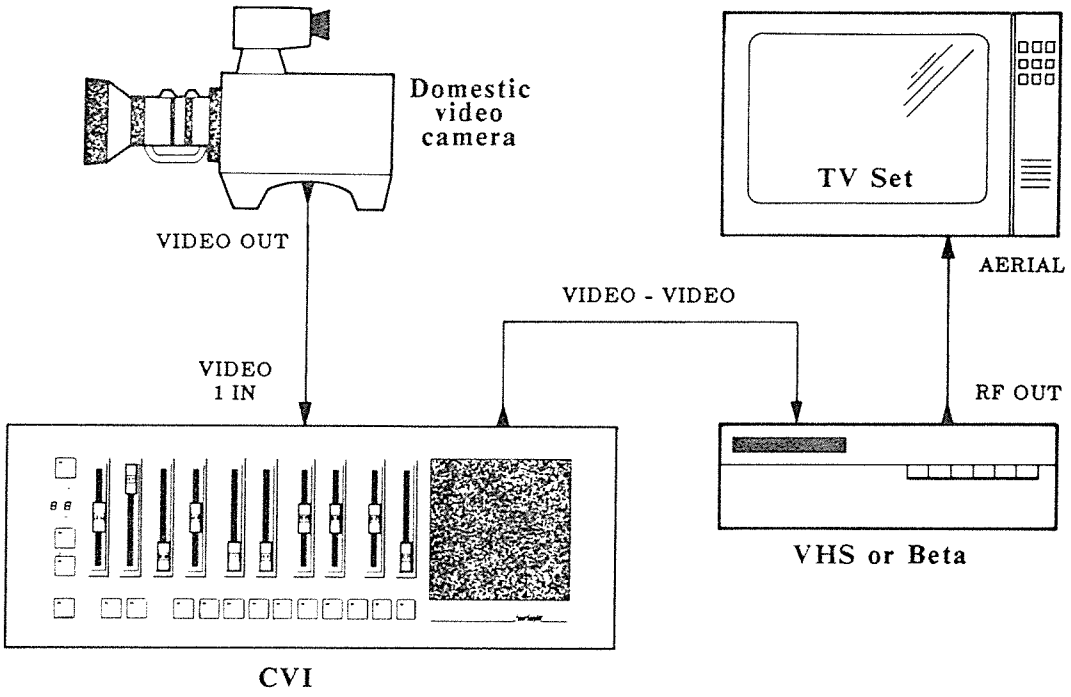
When the power is turned on the CONTROL CONSOLE will light up. The PRESET NUMBER indicator will read **00**, and lights in the BUTTONS and SLIDERS will come on. The image on the screen will be the Fairlight logo overlayed on the incoming video signal (or black, if there is no signal input). This is **factory** PRESET **00**. See Section 2 - PRESETS SELECTION.

The CVI will remember PRESETS and SEQUENCER information when the power is turned off. These will be as they were when the power was on, with the exception of PRESET **00**, which will always turn on in the 'logo' condition.

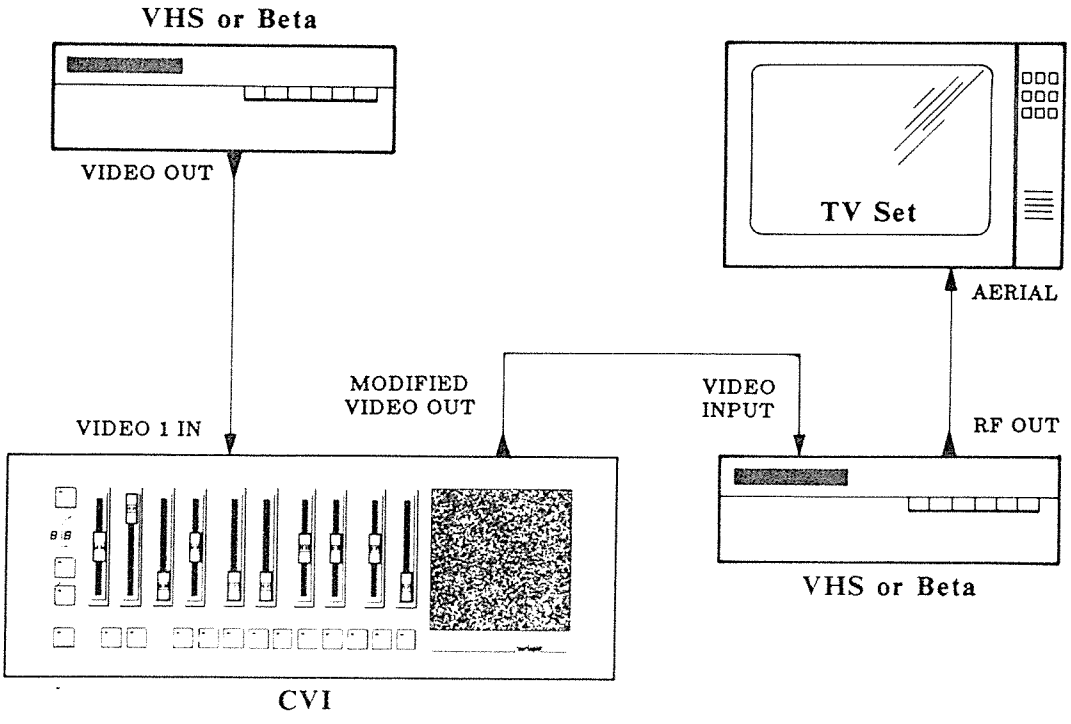
The CVI will not remember actual picture information when power is off. If you wish to keep a still image for later work, the CVI may be left on as power consumption is only 40 watts. Alternatively, the image may be saved digitally onto video-tape or video-cassette. See Section 3 - SAVE AND RECALL.

CONFIGURATION DIAGRAMS

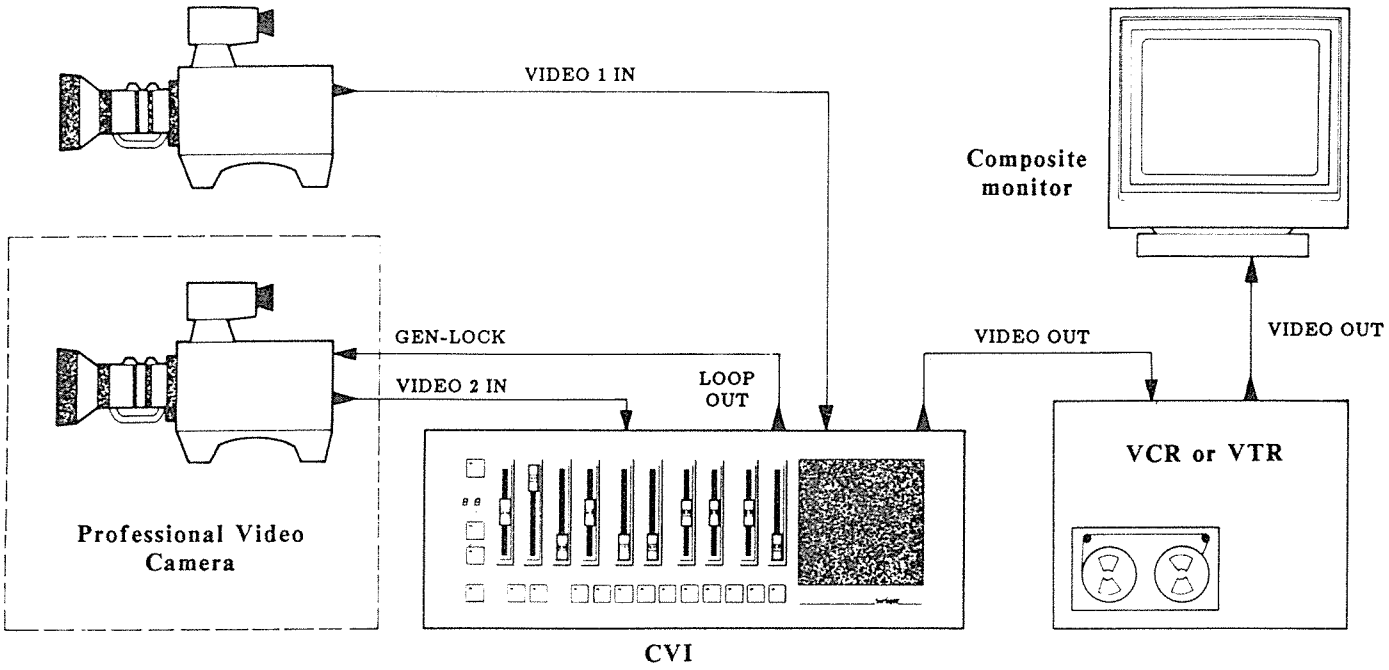
Use with domecstic video equipment



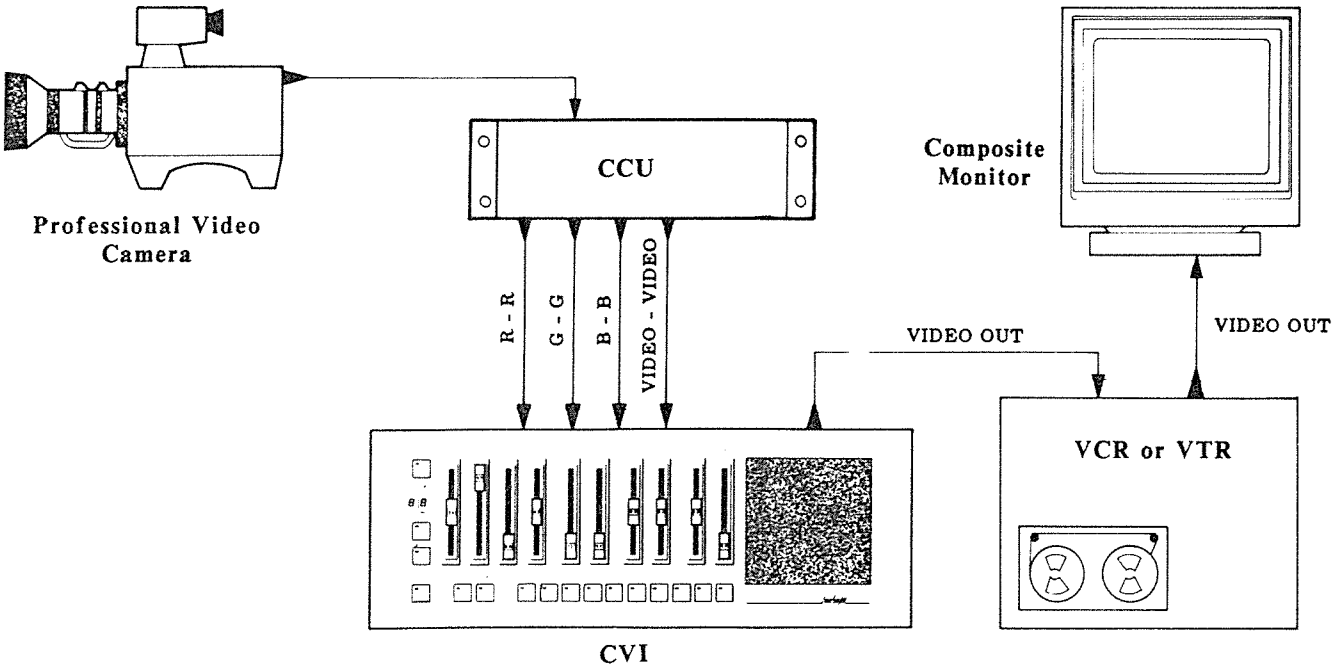
Tape to tape dub with CVI processing



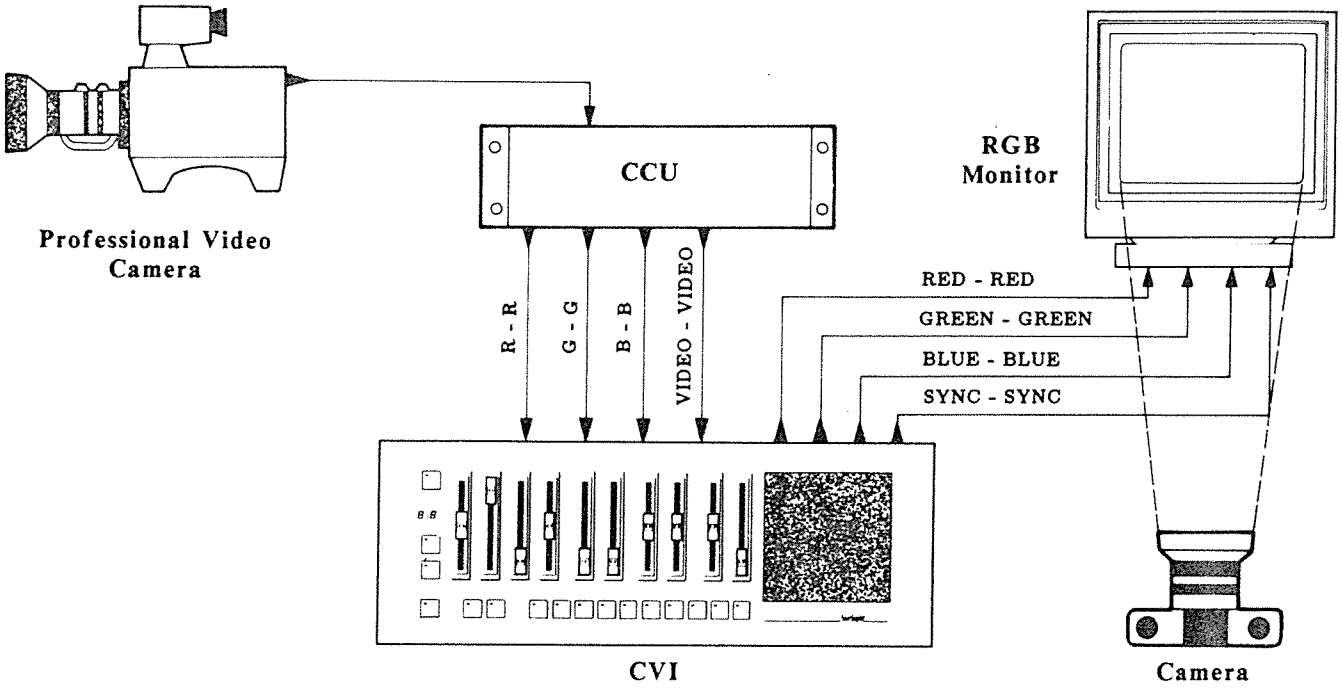
Low-band live studio use



Low-band live field operation

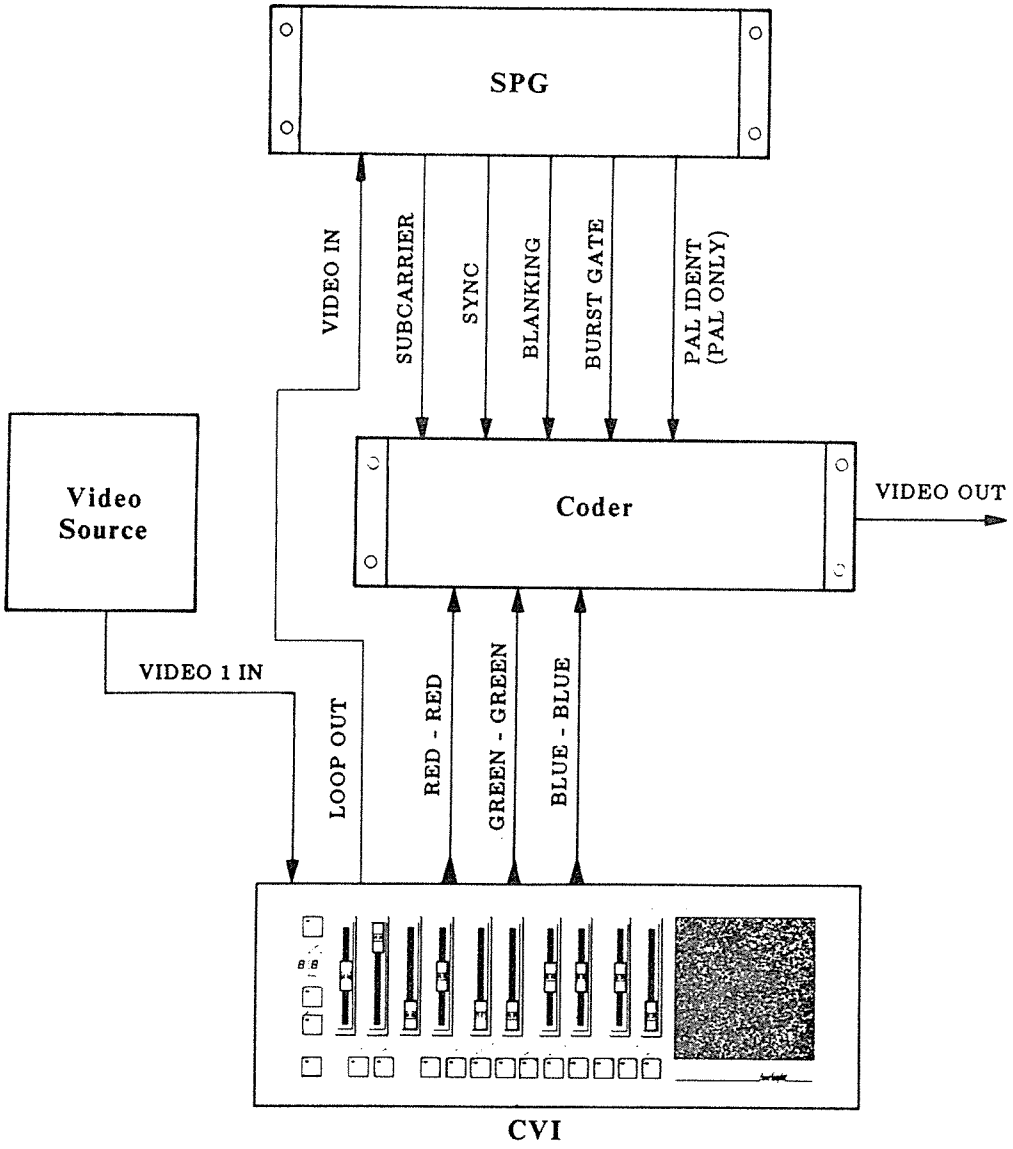


Recommended configuration for slide creation



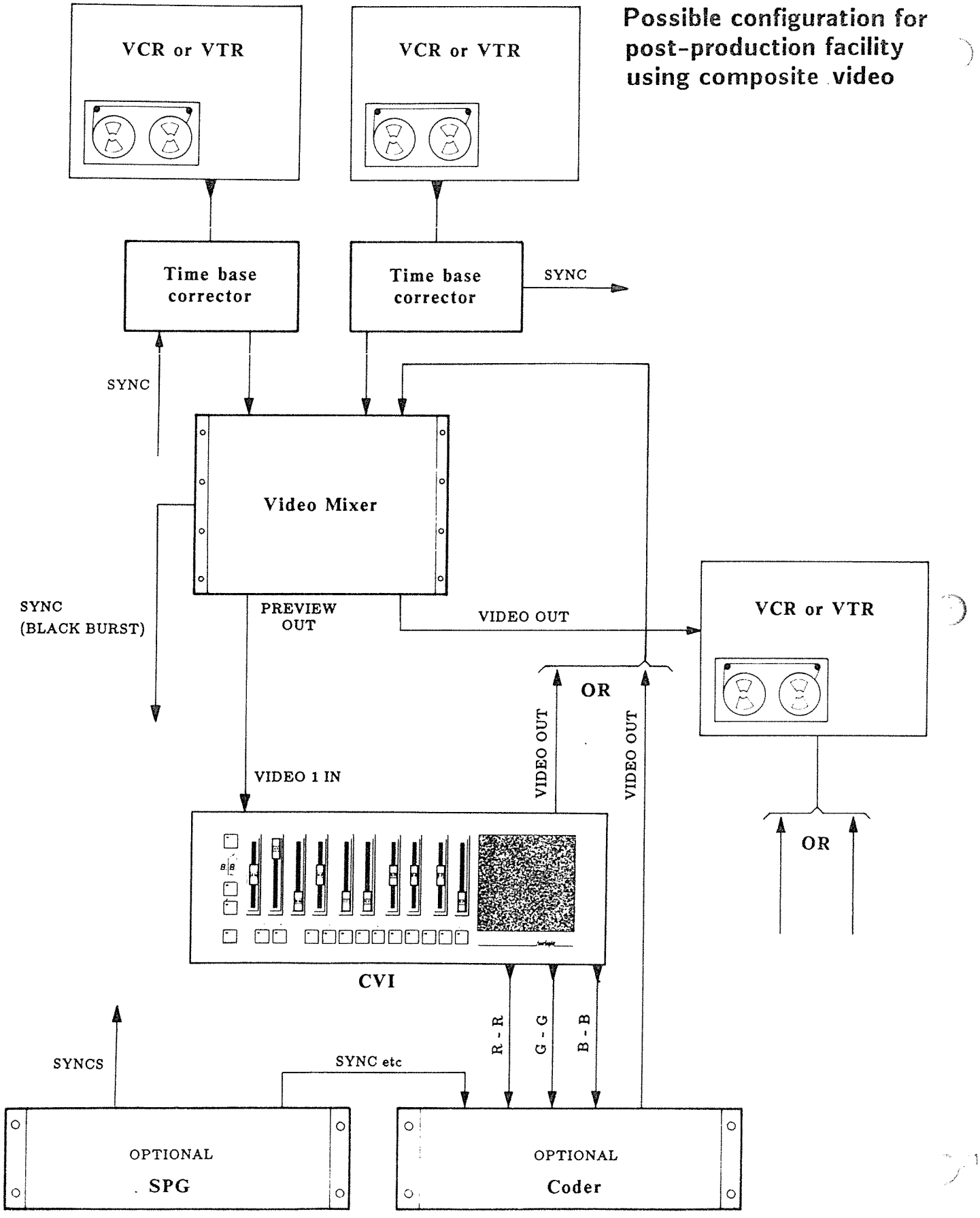
All screen images in this manual were taken using this configuration. Better results may be obtained using a film recorder where available, but ensure that the recorder handles at least 4096 colours, and that it is compatible with standard RGB video.

Output configuration for broadcast compatible applications

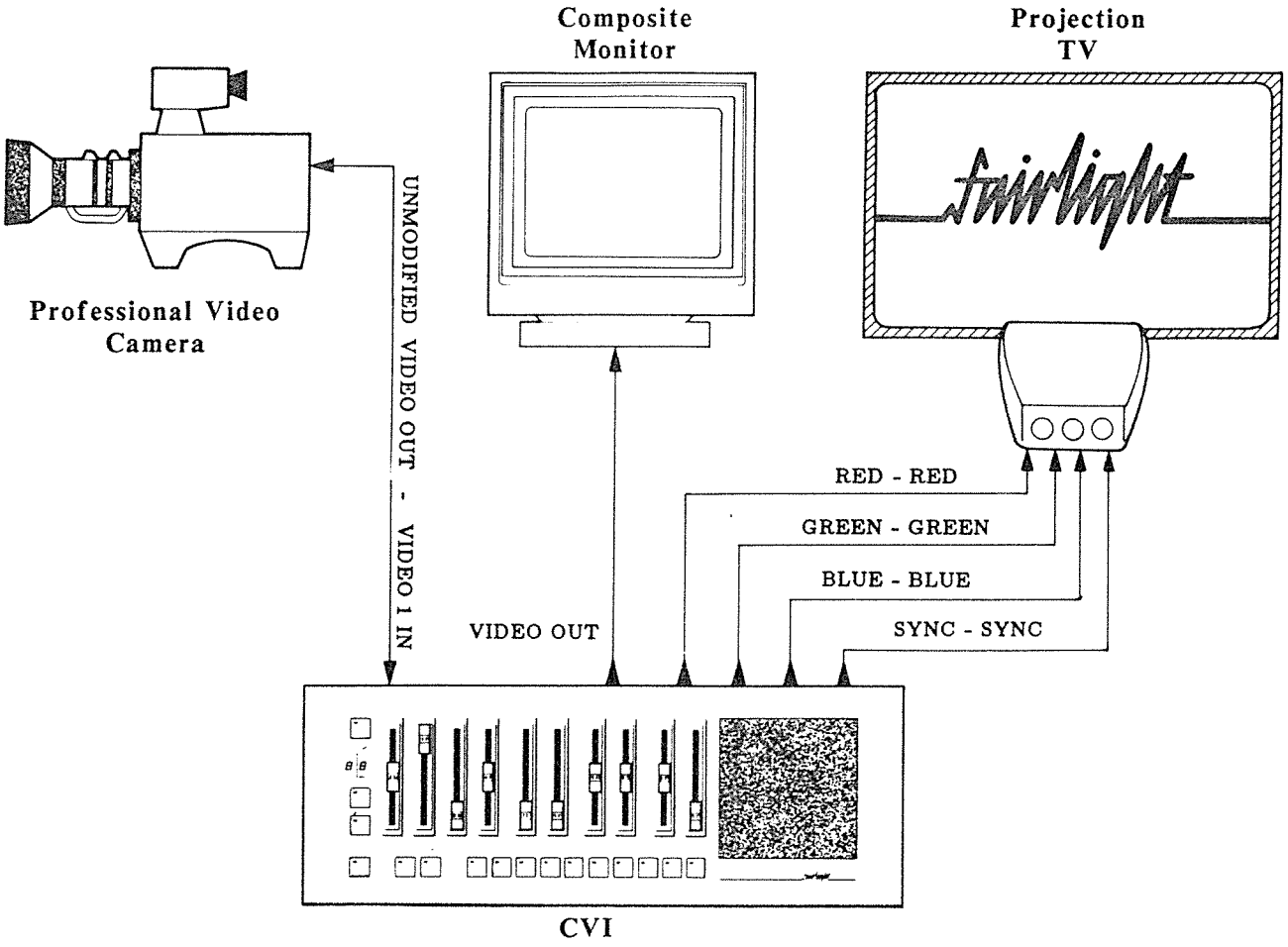


CONFIGURATION DIAGRAMS

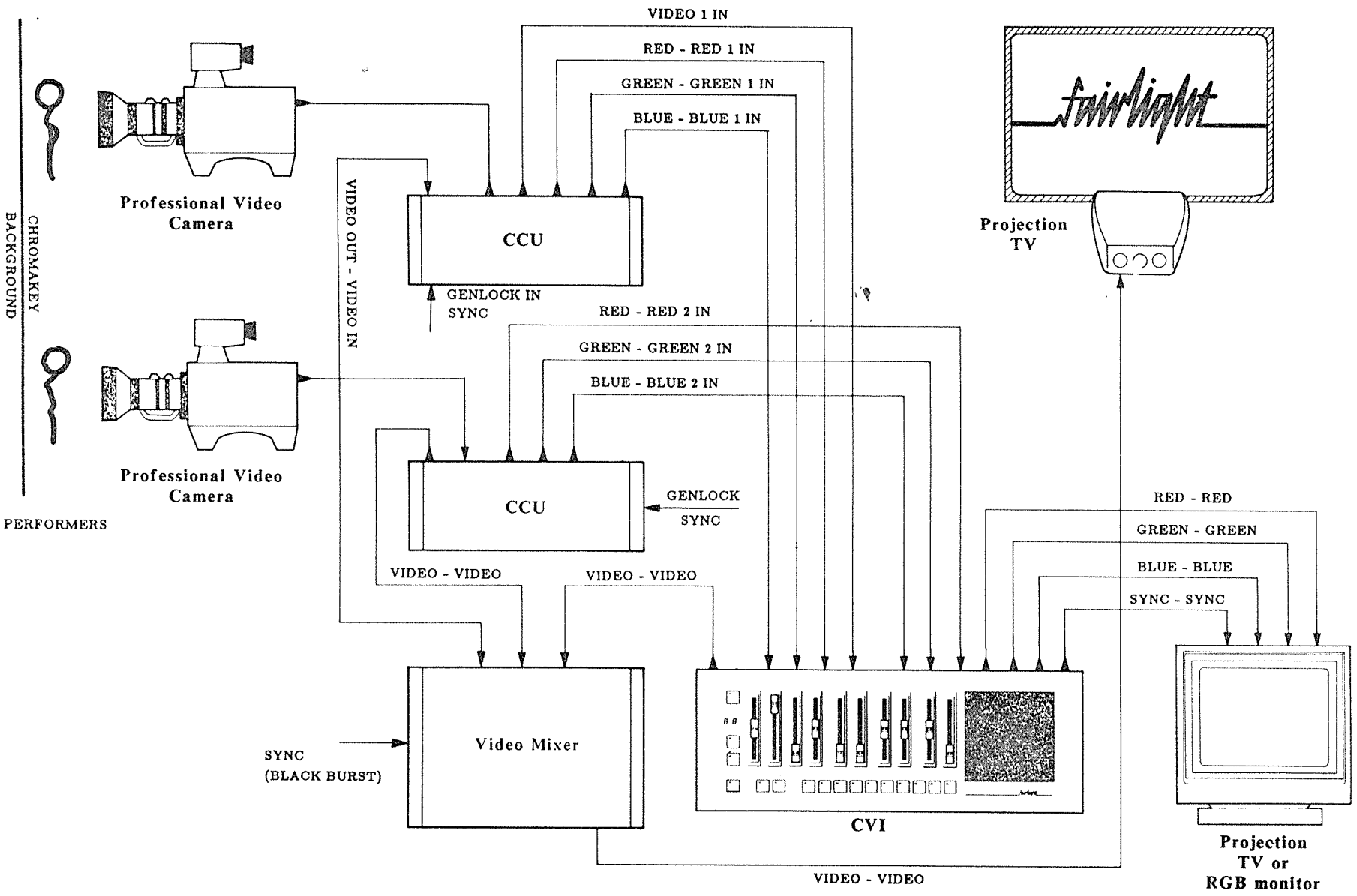
Possible configuration for post-production facility using composite video



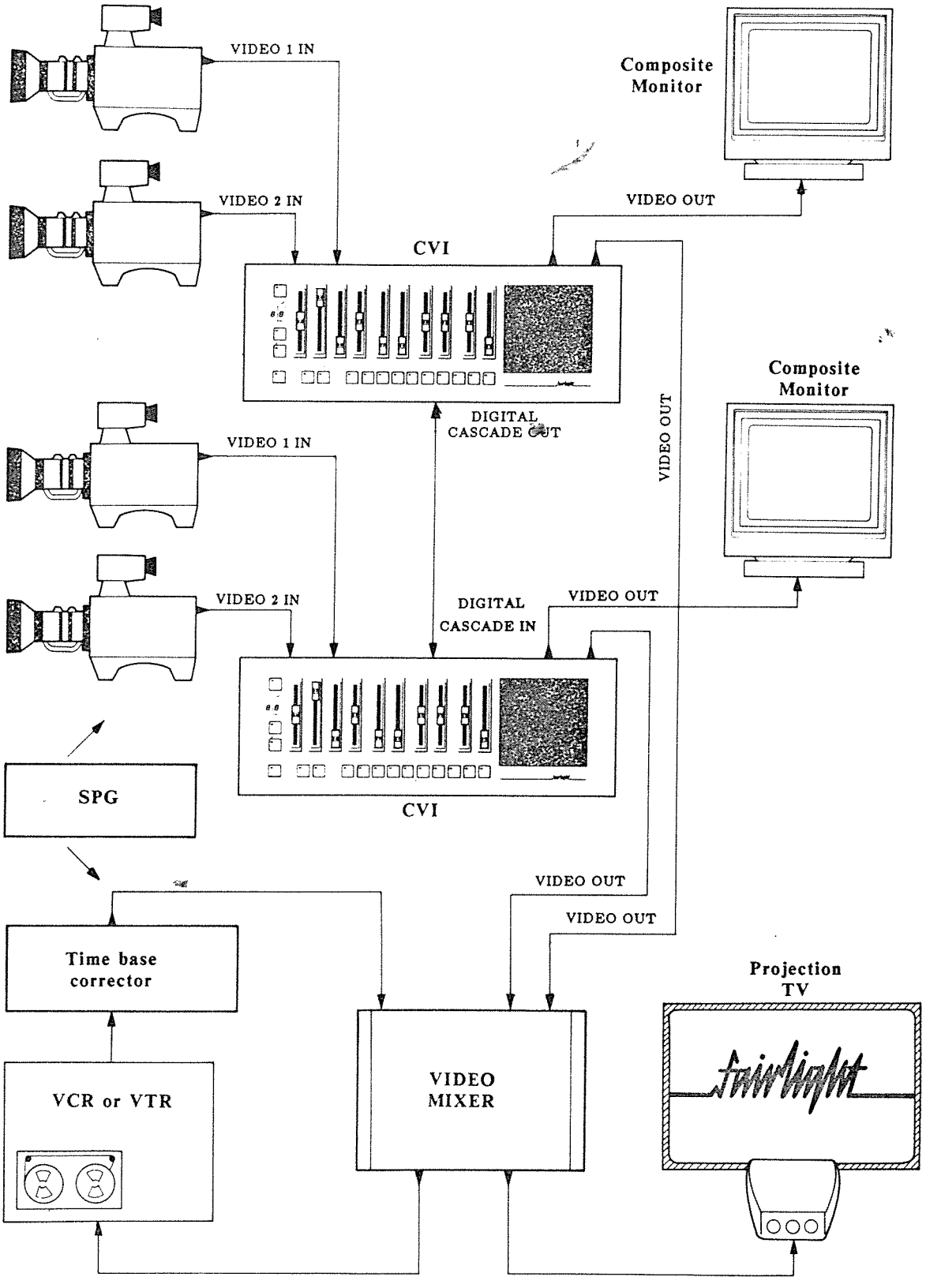
Live operation at concerts: minimum system



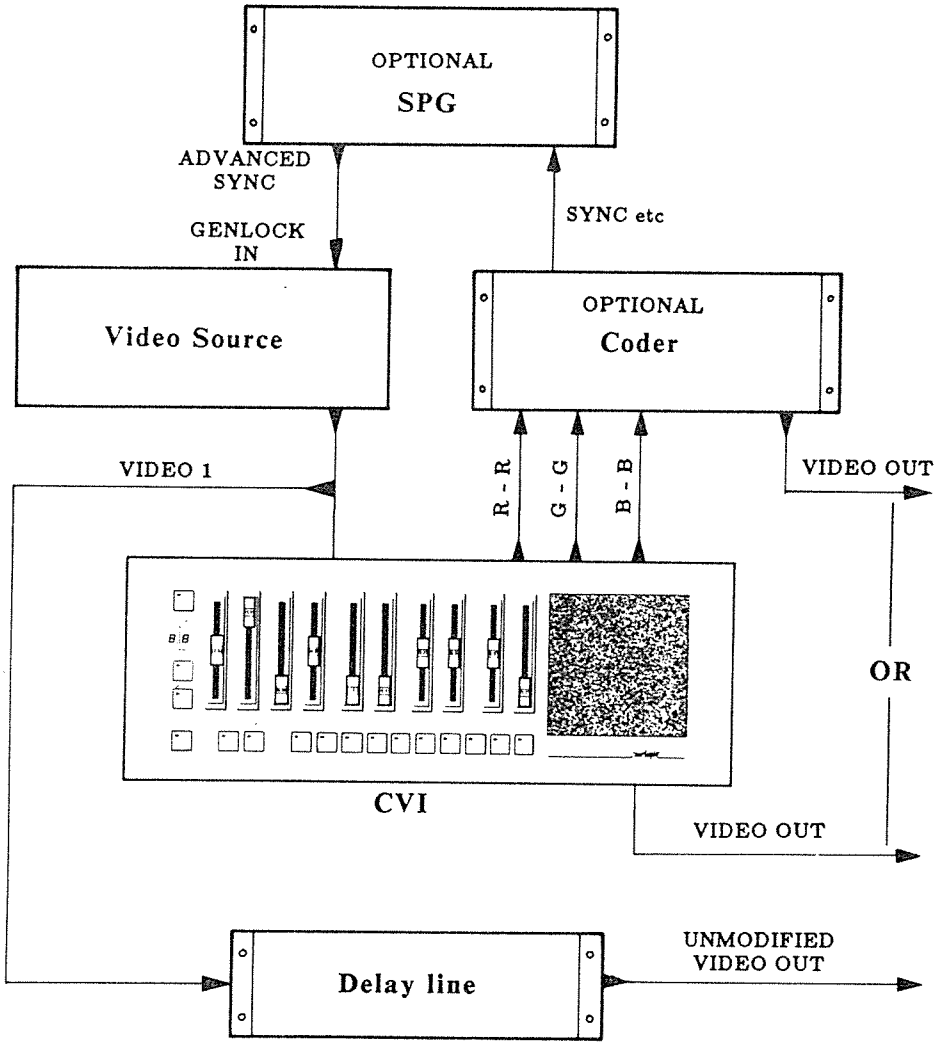
Possible configuration for larger scale live performance



Example of live configuration using the CVI's allowing cascade operation and live mixing between effects'



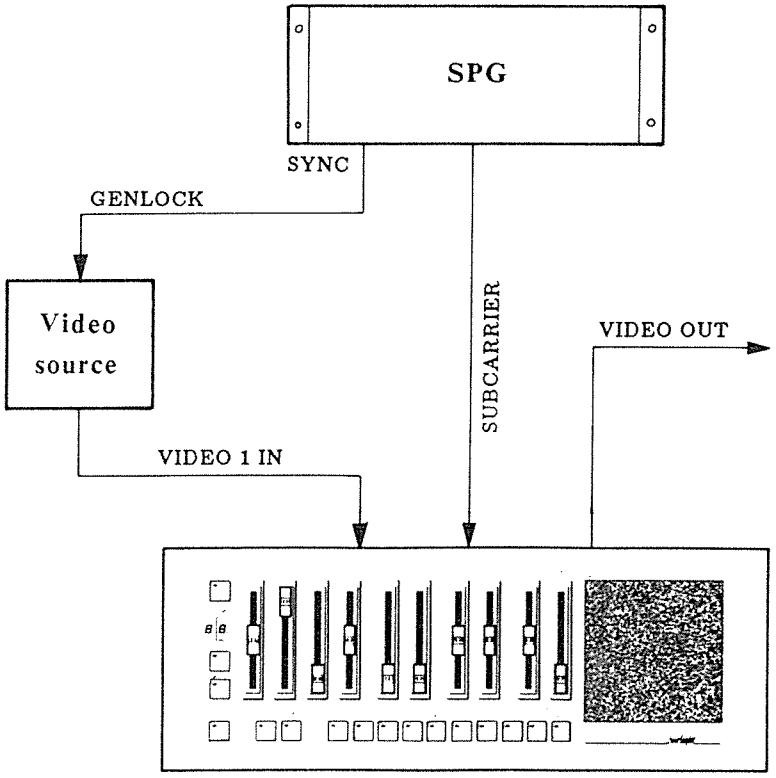
Use of advanced sync with external coder to match video picture position



The delay is approximately 0.7 microseconds for RGB to RGB, and 1.3 microseconds for Composite to Composite video. A tunable delay line is recommended.

A delay of one field is also present for some effects. Compensating for this is not recommended, as the field delay is not preset in all effects.

Use of the external subcarrier input

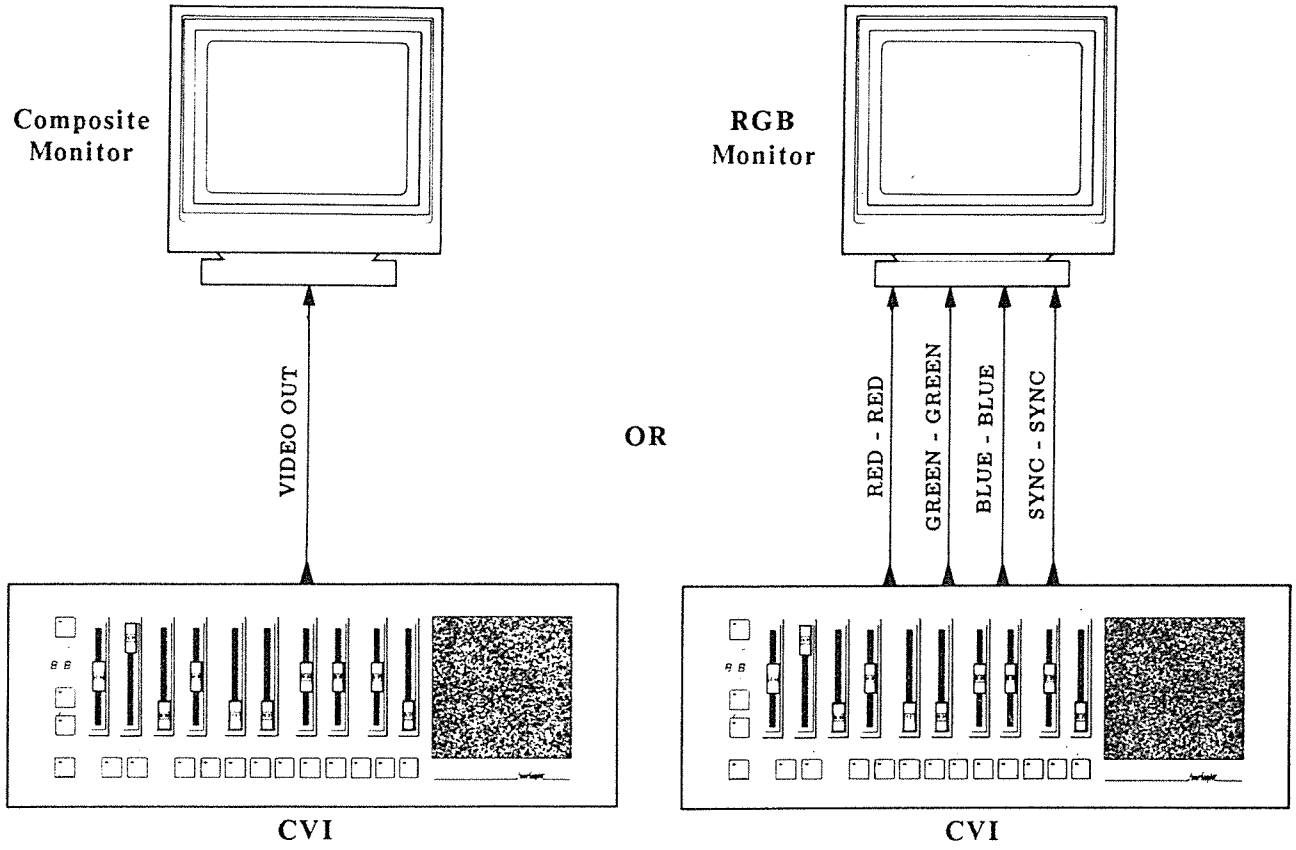


An EXTERNAL SUBCARRIER input is provided for those users wishing to use the CVI's internal **Coder** in a post-production environment. This allows the adjustment of subcarrier phase, and therefore matching of colour when used with a composite video mixer. Coarse and fine phase adjustments are available, covering 360 degrees. See the OPTION SWITCH section at the beginning of this chapter.

NOTE: For broadcast compatible aplications, an external broadcast rated Coder and SPG must be used.

CONFIGURATION DIAGRAMS

Stand alone mode



The CVI may be used without video inputs. In this mode, only the PAINT facilities are available.

Getting Started 2

This section is designed to take you quickly through some of the CVI PAINT facilities. It is intended to introduce the range of possibilities that the CVI offers in the PAINT mode. For a precise description of *all* paint facilities, see Section 3 - PAINT MENUS. It is necessary at this point to have a CVI connected and ready to use. For connection details, see Section 1 - CONNECTING THE CVI.

Functions may be combined in numerous ways to produce new and unique effects and it is beyond the scope of this manual to show all possibilities. However this section should give you a general aquaintance with PAINT. The enquiring mind will soon discover how to creatively combine the available functions. Please read the text closely and follow the instructions.

PAINT EXERCISES

1) With the power **Off**, move the following control console sliders:
   i) HUE, SATURATION and VALUE *up* to maximum
   ii) HORIZONTAL PAN, VERTICAL PAN to *mid-position*
   iii) STRETCH to *mid-way* position
   iv) ZOOM *down* to minimum.

2) Turn the power **On**. On left-hand side of console panel, PRESET number will be 00. Observe the monitor screen. You should see the rainbow-coloured Fairlight logo. Behind this is a live image from camera (if you have connected a video camera).

3) Move the following sliders: HORIZONTAL PAN, VERTICAL PAN, STRETCH and ZOOM. See how the Fairlight logo moves and changes in shape. These are the *movement* controls. Return the controls to their neutral positions (listed in 1 above) to stop the motion.

4) With your fingernail or the stylus provided, draw on the GRAPHICS PAD. A bright orange line should appear on the screen responding to your movements. While drawing, move the HUE slider. All colours from the spectrum should be seen. Move the PAN and ZOOM sliders. See how it is possible to colour the smallest areas (pixels). Return the PAN sliders to their central positions to stop sliding movements.

5) The DRAW and DRAW LOCK button should be lit. Press the DRAW LOCK button. The DRAW and DRAW LOCK lights should extinguish, and drawing will stop. Instead, a **Cursor** in the shape of the brush will appear. While still drawing on the pad, *hold down* the DRAW button. Drawing will appear on the screen for as long as you hold down the DRAW button. This method allows you to re-position the cursor without messing up your drawing. Press the DRAW LOCK button. DRAW and DRAW LOCK buttons should light and drawing will be continuous.

6) Continue drawing and move the SATURATION slider. This adds whiteness to the colour selected by the HUE slider. If HUE is on *red*, then moving SATURATION will gradually change the colour from red to pink to white. Adding whiteness gives the softer, pastel colours. Push SATURATION slider back up to top.

7) Move the VALUE slider. This adds blackness to the colour selected by the HUE slider. If HUE is on *green*, then moving SATURATION will gradually change colour from green to khaki to black. Adding blackness gives more earthy, tertiary colours.

8) By now, your screen is probably full of experimental squiggles. To clear the screen, select the next preset, PRESET 01. To do this,

i) press PRESET button
ii) press DRAW LOCK button (doubles as *next* PRESET selector)

The screen should be completely black ready for more drawing and preset number should show **01**.

If you wanted to return to the *previous* preset, **00**,

i) press PRESET button
ii) press DRAW button (doubles as *previous* PRESET selector)

We will stay with PRESET 01 for the moment. The PRESETS change selections in the MENUS and console controls. PRESETS do this for you instantly and accurately for any possible combination of menu selections. It is not necessary to display any menu, as long as you know the effect of the PRESET. There are 100 **factory PRESETS** stored in the CVI and a list of them appears at the end of this section.

9) Drawing now will produce random coloured car shapes. Rate of randomness is set by the RATE 1 slider. At minimum setting, colour will change slowly as you continue drawing. Notice that by drawing fast, the car shapes are not joined. This is the **Dots** Paint Method and simulates tapping rapidly on the GRAPHICS PAD. The car is the current *Brush shape*.

Try a different *Brush shape*.
Press MENU button.
The blue and white menu is displayed. This particular menu should be the PAINT MENU, the main menu for paint effects. If some other menu has already been selected, press the MENU button until the PAINT MENU is displayed. Touching the GRAPHICS PAD now produces a little round ball. This is the **Cursor** and can be moved around to make selections.

Move the cursor onto the number **1** opposite **Brush shape** and lift your stylus **Off** the GRAPHICS PAD. Display will change to the BRUSH SHAPE menu. Here are 54 different **Brush shapes** to choose from. Position the cursor over the **Brush shape** desired and lift the stylus from the GRAPHICS PAD.

Chosen **Brush shape** will appear in large box in top left-hand corner.

Press STOP button
The MENU will be replaced by the previous drawn image and any new drawing will be with the new **Brush shape**
To clear all drawing press PRESET then STOP. This re-selects the current PRESET, in this case **01**.

10) Select PRESET **04**. To do this:
i) press PRESET button
ii) press button number **0** (doubles as COLOURIZE)
iii) press button number **4** (doubles as WIPE COLOUR)

This method means any PRESET number may be chosen in any order.
Wipe the screen to **White** by pressing the WIPE COLOUR button.
PRESET 04 uses a thin **Brush shape** and **Opaque** colour type.
We're going to use a **Translucent** colour type instead of **Opaque.**
Press MENU button.
Along the bottom of the screen are two rows of numbers.
These are quick menu selectors and correspond to the 10 paint menus and 10 video menus.
Move cursor onto the upper number **0** and lift the stylus. This will select the COLOUR TYPE menu. Select **Translucent** by moving the cursor to the number **2** and lifting. Easy, isn't it?

Push STOP button to return to image.

Push SATURATION and VALUE sliders up to top position.
Push COLOUR DEPTH slider to slightly above the midway notch position and draw. Notice how transparent drawing becomes and how, if you draw over the same spot repeatedly, the area becomes darker. The HUE, SATURATION and VALUE sliders change the colour of the **Translucent** paint. If COLOUR DEPTH is set to **0** then the paint becomes totally transparent and no drawing is visible. As COLOUR DEPTH slider is moved toward the **+** sign, colour drawn is more solid until it finally becomes opaque.

11) We'll draw connecting straight lines by selecting **Rubber band** in the PAINT METHOD menu. Press the MENU button.
Move cursor onto quick select Paint Menu **0.**

When PAINT METHOD menu is displayed, select **Rubber band** by moving cursor onto the number **2** opposite **Rubber band**, and lift the stylus. Press the STOP button to return to drawn image.

i) Position cursor to the point where you want the straight line to start. Lift the stylus. This is the starting point.

ii) Press the stylus on the GRAPHICS PAD again. A thin pulsating line will join the two points. Move the cursor around. The thin line will follow your movements, like a stretched rubber band.

iii) Lift the stylus. A straight line will be drawn using the programmed **Brush shape**. The end of that line will be the starting point of the next line, if you draw again.

iv) To set a new starting point, press the STOP button.

v) You may notice that some diagonal lines have somewhat jagged edges. These can be smoothed out. Return to the PAINT METHOD menu and move the cursor to the

DEJAG box, which should light up. Return to the image by pressing STOP. Repeat steps i) to iv) again. The edges of the lines will be blended into the background, giving a much smoother appearance. Note that the lines are drawn more slowly when **DEJAG** is active.

12) Another paint method is **Rectangle**, whereby a rectangle of any size may be drawn. Return to menu (press MENU button). PAINT METHOD menu should be displayed, as it was the last menu used. Select **Rectangle**.

i) Press stylus on GRAPHICS PAD. A cursor saying **rect.=>** will appear and follow your stylus movements. Position the arrow tip where you want a corner of the rectangle to appear. Lift the stylus.

ii) Press stylus on GRAPHICS PAD again. A pulsating dotted rectangle will appear, varying in length and width as the stylus is moved.

iii) Lift the stylus. A rectangle will be drawn. This process may be repeated continually. Good for rapidly constructing bar graphs, etc.

13) Let's cover (wipe) the screen with a repeating pattern, a *texture*.

i) Press MENU button. Using the quick select bar at the bottom of the screen, move cursor onto Paint Menu 7 - COLOUR WIPES, that is, here.

ii) We should now see the COLOUR WIPES menu. This menu chooses which method will "wipe" the display. Move cursor onto the number 2 opposite **Texture** and lift the stylus. This selects **Texture** as a colour wipe. Which texture?

iii) Using the quick select bar at the bottom of the screen, move cursor onto Paint Menu 3 - TEXTURES

iv) The TEXTURES menu has 54 **Textures** from which to choose. Position the cursor over texture desired and lift the stylus from the GRAPHICS PAD. Chosen **Texture** will appear in large box in top left-hand corner.

v) Press STOP button to re-display screen image. Now press WIPE COLOUR button. Chosen **Texture** will wipe the screen from left to right. Move the HUE, SATURATION and VALUE sliders as the wipe progresses for different colour shades. Press the STOP button to stop the wipe.

14) Various areas of the screen may be defined as being different to normal drawn areas. These areas are known as **stencils** and are useful if you want protect an area of screen, for instance to change the background but not the stencilled area. Another possibility is to copy one stencilled area to a different part of the screen. The CVI will allow live video to be seen through a stencilled area surrounded by still image. Also, chroma-keyed areas may be used as a stencil.
Stencils can be defined in several ways but the one we will use is the **Internal** stencil source where you *draw* the stencilled area.
Whenever the DRAW STENCIL button is lit, you are drawing on the stencil plane. To wipe the stencil, press the WIPE STENCIL button.

15) We are now going to copy one part of an image to another.

i) Press the WIPE STENCIL button. The screen display will not change.

ii) Ensure DRAW STENCIL button is lit. If it is not, press it, and it will light. Drawing now will define a shape in the stencil plane as well as painting into the field store.

iii) Draw a small, identifiable object in one corner of the screen. Select PRESET **06** as in step 10 previously. The effect you now observe is called a **Colour wipe** and is useful for creating backgrounds. Move the HUE, SATURATION and VALUE sliders for banding effect.

iv) Notice how your drawing remains intact. This is because it is drawn both into the stencil plane and the field store. The stencil protects your drawing from the **Colour wipe**. Press the WIPE COLOUR button again for another wipe. See COLOUR WIPES Menu in Section 3.

v) Now select PRESET **07**. The area that is stencilled becomes brighter.

vi) Press stylus on GRAPHICS PAD. A cursor saying **from=>** appears. Position **from=>** with the stylus such that the arrow tip points *into* your previously drawn stencilled object. Lift stylus.

vii) Press stylus on GRAPHICS PAD again. A cursor saying **to=>** appears. Position **to=>** with stylus such that the arrow tip points to another part of screen. Lift stylus.

viii) Drawn object will be copied to new position.

ix) Repeat steps vi) to viii) to make further copies of the original object.

16) Finally, we can title our masterpiece.

i) Press MENU button and select Paint Menu **9** - TITLE EDIT.

ii) An alphanumeric style keyboard should now be seen. Move cursor onto any of the 63 characters and lift stylus. Chosen character will appear in the titling area. It may be necessary to *clear* the title area. Just hit the **CLEAR** box *twice* on the screen. Notice that lower and upper case letters are available via **SHIFT** and **LOCK**.

iii) When titling is finished, press STOP button to return to display.

iv) Press TITLE button. Now press stylus on GRAPHICS PAD. A cursor saying **title** will appear. Move the word where you want the title to appear. Lift the stylus. Your title will be printed on the image.

There are many other PAINT facilities available. For a full description of each of these, see Section 3 under PAINT MENUS.

VIDEO EXERCISES

If you have read the previous section - PAINT EXERCISES - then you're ready for VIDEO EXERCISES. We will work through some examples, and see how PAINT and VIDEO overlap. The ability to select PRESETS and MENUS is assumed.

A camera or other source of video image must be connected to the CVI for the video effects. It is also desirable to have a chroma-key blue background, to enhance many live effects. In fact, all references to live image in this section assume the use of chroma-key. The CVI can be used to establish chroma-key levels by using PRESET 99. See Section 3 - SETUP Menu. If you intend using chroma key, the following may be helpful.

Chroma-Key Setup Suggestions

Have the artist's model in front of a medium blue flat, non-reflective background (usually a wall or screen).

Ensure adequate lighting, such that no shadows fall on the background. This would require at least two floodlights either side of the subject. However, too much floodlighting can result in "hot spots" on the chroma key background. These areas cannot be keyed out, so the floodlights would have to be re-arranged.

The subject should not wear any blue clothing as they will "disappear" on screen. However, this may be desirable.

Use PRESET 99 and the HUE, SATURATION and VALUE sliders on the control console to "key-out" blue background. See Section 3 - SETUP Menu.

Several video effects require the video image to be moving, in order to see the effect.

General Overview

The CVI can accept up to two video inputs, the cascaded output and stencil output of another CVI, audio input for music control of effects, and remote control trigger. Therefore, many permutations of live CVI effects exist which are not covered in this section. However, enough effects will be discussed here to enable you to discover new things to do with the CVI which even we haven't thought of yet.

Basic live video effects include:

* freezing and strobing of live images
* real-time colourizing from subtle to extreme
* image mirroring and overlap
* live image behind, in front or between still images
* multiple video feedback-type images (feedback is not used)
* chroma-key effects and inversions
* combinations of digital and unaffected analog images
* multiple exposure, mosaic, ghost, shatter, slow scan, smear, texture, trailing effects
* key, wipe, disintegrate between video 1 and video 2
* music controlled colours, colourizing, strobing
* instant PRESET switching between combinations of effects
* cascading of two or more CVI's for multiplying effects
* SEQUENCER for controlled effects switching
* control by another computer

Please read the text closely and follow the instructions.

1) When the CVI is first switched on, the Fairlight logo appears on the stencil plane with live video behind it. Press the WIPE STENCIL button. This should leave just live analog video.

2) Select PRESET **30**. This effect on live video is called *pixelation* or the mosaic effect. Try the ZOOM and STRETCH sliders.

3) Now press the FREEZE button. The live video image should be frozen. It can now be treated with PAINT effects such colouring, cut-and-paste etc. ZOOM and STRETCH now work in a different way.

4) Select PRESET **38**. This is a strobe effect, an extension of the FREEZE button effect.

Adjust the RATE 2 slider and see the strobe rate change.

Press the MENU button and select Video Menu **3** - FREEZE CONTROL, on the quick select menu bar.

Observe that **Strobe** has been selected (by PRESET 38).

If you have an audio source connected to the **Audio input** of the CVI, then select **Music** control and press STOP button to leave menu. The live image is frozen. Image will strobe in time with strong pulses in the input audio signal. You may need to adjust the audio sensitivity. See Section 1 under OPTIONS and ADJUSTMENTS.

5) An extensive range of *colourizings* can be used on live images. Select any PRESET number between **25** and **29** and move the HUE, SATURATION and VALUE sliders. Press the COLOURIZE button repeatedly to switch between normal and colourized image. The COLOUR DEPTH slider determines the degree of colourizing. If the COLOUR DEPTH slider is set to a central position the image is unaffected. Video Menu **5** selects COLOURIZE TYPE.

6) Images may be reflected about the horizontal and vertical axes. Select PRESET **33** and adjust HORIZONTAL and VERTICAL PAN sliders. Observe how axes of reflection may be adjusted on the screen. Video Menu **2** - SCREEN CONTROL selects mirrors.

7) Select PRESET **34**. This is a slow scan or smear from left to right which slowly freezes the image across the screen. The video image should be moving for this effect to be noticeable. Paint Menu **8** - STENCIL WIPES determines **Horizontal** or **Vertical** wipe.

8) Select PRESET **39** and draw. Still image is unchanged except drawn areas are "brighter". This is the stencil being shown. Notice DRAW COLOUR button is not lit. We are just drawing a stencil without affecting the field store. Press INVERT STENCIL button. This flips stencilled area (brighter) with non-stencilled area. You can now "undraw" parts of the previous stencil. Draw a large stencil area for the next step.

9) Select PRESET **40**. Notice the INVERT STENCIL button flashing. The stencil is being swapped with live image at a rate determined by RATE 2 slider setting. To carry this effect further, press MENU button and select Paint Menu **3** - TEXTURES. Select any **Texture**. Select Paint Menu **8** - STENCIL WIPES. Choose **Texture**. Return to image by pressing STOP. Now press WIPE STENCIL. Textured stencil image now follows live image movements. If RATE 2 slider is near fastest rate, we see a live image which is normal if still, and textured if moving. PRESET **41** does the same thing.

10) Select PRESET **44**. A grid-type texture wipes the screen. This is a mixture of live digitized, colourized video in the stencil area (the grid texture) and live analog video between the grid. Analog video is totally unaffected by the CVI, however stencils can be put in front of it. Go to Video Menu **0** - DISPLAY CONTROL. Here are *twenty* named boxes, each of which selects a particular screen display setup of the CVI. Each box selection will choose one image plane (live analog, live digital or field store) to be displayed in the **Stencil on** areas of the screen and one image plane to be displayed in the **Stencil off** areas. In PRESET 44, this menu is set to **Dig./Analog**, which selects live digital video (which can be colourized) for **stencil On** and live analog video (not colourized) for **stencil Off**. The INVERT STENCIL button, if lit, swaps the **On** and **Off** stencil areas. See Section 3 - DISPLAY CONTROL Menu for more information.

The ZOOM control can expand the stencil areas without affecting the analog areas. The RATE 2 slider controls ZOOM speed. If RATE 2 is at minimum, ZOOM has no effect. Press INVERT STENCIL to swap analog and digital.

11) Select PRESET **45**, colourized flip. The live image is flipping between unaffected analog video and colourized digital video at a rate set by the RATE 2 slider.

12) Select PRESET **50**. Just a frozen image (in the field store) appears, but something's behind it. Draw a hole and there is analog video. Press INVERT STENCIL and you can "undraw" the hole. ZOOM up on the drawn hole.

13) Select PRESET **51**. The digital image will gradually freeze in a mosaic of dots. Slight movement gives a blurred effect. Press the WIPE COLOUR button. Random dots of colour will be drawn until you press the STOP button. The HUE, SATURATION and VALUE sliders and COLOURIZE button can change the colour of new dots. These disintegrate functions are found in the STENCIL WIPE and COLOUR WIPE Paint Menus respectively.

NOTE:The following video effects require a blue chromakey background to the camera model. Also the chromakey levels must be set correctly. See the Chromakey Setup Suggestions at the start of this Section.

VIDEO EXERCISES

14) Select PRESET **55**. Note that chroma key is required. As the colour wipes down the screen, move the HUE, SATURATION and VALUE sliders for colour bands. This PRESET displays a live analog image in front of still background. Move the ZOOM and STRETCH controls to change background, leaving live image unaffected. Press COLOURIZE button and move HUE, SATURATION and VALUE sliders for arresting colour changes. Press INVERT STENCIL for the "invisible man" effect.

15) Select PRESET **58**. Initially, there is just live image. Press the FREEZE button. Now a frozen image appears behind live image. This utilizes **Single freeze** in Video Menu 3 - FREEZE CONTROL. Preset **59** takes this further by *continually* freezing behind the live image, resulting in a trailing effect. PRESET **60** continually freezes at a rate set by RATE 2 slider.

16) Select PRESET **61**. This carries on from PRESET 60 and uses **Slide** in Video Menu **2** - SCREEN CONTROL. **Slide** allows continuous panning of the continually frozen image, so that the image "wraps around" the screen. HORIZONTAL and VERTICAL PAN sliders work differently when **Slide** is on. Rather than just pan, they control the *rate of change* of pan. Mid-position of these sliders has a small dead-spot to help stop the image moving. Panning can be very slow, or fast enough to give the impression of stopping, much like the wagon wheels in old cowboy films. Try moving the ZOOM slider for a big effect. PRESETS **62** and **63** selected in succession take this slide/pan/zoom combination to new levels.

17) Select PRESET **74** for a good ghostly illusion. RATE 2 slider determines the rate of **Strobe**, selected in Video Menu 3 - FREEZE CONTROL. The ghost image is a result of having **Ghost** selected in Video Menu **0** - DISPLAY CONTROL for both the **Stencil on** area and the **Stencil off** area, that is the whole screen. **Ghost** gives a double-exposure between the live analog image and the field store. Also, a **Solarize** colourizing is selected in Video Menu **5** - COLOURIZE TYPE.

18) Select PRESET **83**. This is the **Colour tunnel** of music behind live video. An external audio input will trigger the colour tunnel. Colours respond to pitch and volume of sound.

19) PRESETS **84** to **93** require *two* video inputs and allow a variety of screen juxtapositions for both video sources. If VIDEO INPUT 2 is not connected, black will show up on the screen where VIDEO 2 is selected.

20) PRESET **91** wipes from left to right from VIDEO INPUT **1** to VIDEO INPUT **2**. PRESET **92** wipes from top to bottom from VIDEO INPUT **2** to VIDEO INPUT **1**. PRESET **93** disintegrates dot-wise from VIDEO INPUT **1** to VIDEO INPUT **2**. These are useful transitions between video inputs.

21) See the beginning of this section for suggestions on physical setup of chroma-key. Select PRESET **99** for setting up CVI internal chroma-key levels. Normal setup of sliders is HUE around mid-position, SATURATION around 1/3 from top, and VALUE around mid-position. Adjust sliders finely until the blue background becomes pale orange but the subject is unaffected. See the descriptions of PRESETS **98** and **99** in the following pages.

PRESETS

The following is a description of the characteristics of each factory (ROM) PRESET, including live VIDEO and PAINT responses, if applicable.

PRESET 00: DRAWING ON LIVE VIDEO

Note: This PRESET is used for the 'sign-on' message when you first turn the power ON, and any changes made to this PRESET *will not* be retained if you turn the power *off*.

This PRESET allows drawing over a live analog video image. This setup can be used as a consistent reference point if PRESETS have been changed, as the original contents are always restored when the power is turned on. When the power is first turned **On**, the Fairlight logo is drawn opaque. The rainbow-type colour is called **Hue-Sat**.

Video input to VIDEO 1 or RGB 1 inputs. Drawing on GRAPHICS PAD uses a flat paint, opaque colour, and a medium round brush. Change the H.S.V. sliders to alter colour.

Both the logo and the red CVI lettering are on the stencil plane and the field store.

Press USE STENCIL button to either display or not display the stencilled painted areas.

Press INVERT STENCIL button to either have the logo and lettering as the stencil or everything except the logo and the lettering as the stencil.

Press WIPE COLOUR button to wipe the field store to white. The areas of the field store shown by the stencil go from coloured to white.

Press WIPE STENCIL to erase stencil. ZOOM slider will zoom drawing.

PRESET 01: DRAWING CARS, NEGATIVE COLOURIZE

Screen is instantly cleared to white, but because negative colourize is used, screen appears black. Drawing produces random coloured cars. These have a negative, solarized colourization and shaded brush.

Rate of colour randomness is governed by RATE 1 slider. Press COLOURIZE button to get positive colourized cars on a white background. Move PAN sliders to move cars. Press WIPE COLOUR button to clear drawing from screen. Press FREEZE button to get live digital image. Press FREEZE button again to freeze image into field store.

PRESET 02:
TITLE ON LIVE VIDEO

Title is written to stencil and field store over live image. Of course, a title must be present in the TITLE EDIT Menu - Paint Menu 9. Use the cursor and GRAPHICS PAD to position the title on the screen. Press TITLE button to repeat titling. Press WIPE COLOUR and WIPE STENCIL to erase title and any drawing.

PRESET 03:
INSTANT WIPE TO COLOUR

Instantly clears the screen to blue. The colour can be changed by altering the H.S.V. sliders and pressing WIPE COLOUR button. Drawing on GRAPHICS PAD produces random coloured **Dots**. Press FREEZE button to get live digital image. Press FREEZE button again to freeze image into field store.

PRESET 04:
SMALL BRUSH

Drawing with a small brush on the field store. Colour is initially brown, but may be altered using the H.S.V. sliders. Turn off the DRAW LOCK button, and use the DRAW button for greater positioning control. The stencil is drawn at the same time, therefore defining the area drawn for further operations.

PRESET 05:
FOLIAGE

Drawing is with a flat paint, using a spikey brush shape, good for simulating foliage. Drawing is put into the field store. The stencil is drawn at the same time, therefore defining the drawn area for further operations.

PRESET 06:
COLOUR WIPE USING STENCIL

Wipes the background to flat colours, leaving any stencilled area unchanged. In the previous PRESET, drawing was on the stencil. This PRESET uses a **Wipe** ⇓ colour wipe, which takes approximately three seconds to complete. This allows the colours to be changed during the wipe, giving colour graduations. The initial colour is blue. Move the SATURATION slider slowly down during the wipe, to give a graduation to white.

PRESET 07:
COPY

Copies of a stencilled area can be made. The stencil may be composed of unconnected areas, and be as complex as required. Stencilled area is highlighted as being brighter than background. Area pointed to by **from=>** cursor is copied to **to=>** cursor. See **Copy** in the PAINT METHOD menu for futher information. Note that if **from=>** cursor points to a stencil **On** area, then the picture in that stencilled area is copied. If **from=>** cursor points to background, then background is copied instead. So, take care in positioning cursor.
To see stencilled area **Stencil show** must be selected in COLOUR CONTROL, Paint Menu 4. Press DRAW STENCIL button to see stencilled areas stand out. Stencilled area will be highlighted

PRESET 08:
UNDER-OVER

Slices chroma-keyed live video between the foreground (stencil **On**) and the background (stencil **Off**). Live video must be chroma-keyed for this PRESET. Set up chroma-key using PRESET 99. Also, a stencil must be drawn.

PRESET 09:
UNDER-OVER SLIDE COLOURIZE

Similar to PRESET 08, but slices live action between a slowly sliding, colourized, foreground and background. Live action must be chroma-keyed for this PRESET. Move H.S.V. and COLOUR DEPTH sliders to alter colourizing. Change PAN sliders to alter slide rate. Press COLOURIZE button to return to normal colours.

PRESET 10:
STARS WITH PAINT CRAWL ON LIVE VIDEO

Instantly clears the stencil, then allows drawing of stars, with **Paint crawl**, over live video input. Analog video from VIDEO 1 input passes unchanged to the output but with the addition of coloured stars. The stencil is drawn at the same time as colour, defining the stars to be "in front of" the live video.
Independantly move the H.S.V. sliders smoothly from top to bottom and back for changes in **Paint crawl** colours. Move PAN, STRETCH and ZOOM sliders for more effect.

PRESET 11:
RECTANGLES, HUE-SAT.

Rectangles are drawn with a large rectangular **Brush shape** using the **Hue-Sat** paint type. Video input is seen if FREEZE button pressed.

PRESET 12:
CUT AND PASTE

Large round **Brush shape** copies one area to another. Small images may be built up, or correct colour may be restored to an area. Best to use a large brush. To copy larger areas, use the **Copy** function in the PAINT METHOD menu. Move the brush over the area to be copied. Lift the stylus from GRAPHICS PAD. The brush now contains the cut-out image and it can be pasted elsewhere. Move the cursor to appropriate position. Area is copied when stylus is lifted from GRAPHICS PAD. Tap on GRAPHICS PAD for a series of pastes. To select a new area to be copied, press STOP button, and re-position cursor. Change **Brush shape** for other effects. Build up an image from overlapping cuts and pastes.

PRESETS 13 to 17 are part of a graph drawing routine.

PRESET 13:
WIPE DOWN

This PRESET performs a **Colour wipe** downwards. Good for a background. Move H.S.V. sliders as wipe proceeds to get different colours. Press STOP button to stop wipe at any time.

PRESET 14:
GRID TEXTURE WIPE

A grid texture in red is wiped across the field store. Move H.S.V. SLIDERS as wipe proceeds to change colours.

PRESET 15:
RECTANGLE

A rectangle can be drawn in bright green with a medium square **Brush shape**. Position cursor to appropriate area for rectangle. This will be the surround for the graph to be drawn in PRESETS 16 and 17. Press STOP button to re-position rectangle axes before drawing.

PRESET 16:
RUBBER BANDING

Lines can be drawn, connected together such that the end of one line joins up with the start of next line. This PRESET forms the basis of the graph lines. Press STOP button to define a new starting point.

PRESET 17:
UNDER-OVER, COLOURIZED

Live analog video is inserted between stencilled foreground and field store background. Image is then colourized with **Solarize** type. Chroma key for VIDEO 1 must be correctly setup or field store background will be blanked out by video. Select **Chroma key** from STENCIL SOURCE - Video Menu 1 to put live video in front of field store.

PRESET 18:
RECTANGLES WITH PAINT CRAWL ON LIVE VIDEO

Screen is cleared to white and rectangles are drawn in with a thick brush and **Paint crawl**. Move H.S.V. sliders for changes in **Paint crawl** colours. Moove PAN, STRETCH and ZOOM sliders for more effect. Press FREEZE button to get rectangles over live digital image. Press FREEZE again to put digital image into field store.

PRESET 19:
CIRCLES, MOTTLED

Screen is cleared to white, **Circles** are drawn in medium blue, with a **Mottled** paint type and medium round **Brush shape**. Press WIPE COLOUR to clear screen.

PRESET 20:
CHROMA KEY OVER SLIDING STILL

Live chroma keyed analog image is in front of field store sliding image. Press FREEZE button to continuously freeze live image into the background. Press FREEZE again to stop it. This destroys original background. Press INVERT STENCIL button for the original "invisible man" (or woman) effect. Move HORIZONTAL and VERTICAL PAN sliders to stop or change sliding.

PRESET 21:
ZOOM UP - RANDOM COLOUR

This PRESET is a precursor to PRESET 22. **Random** colours are generated while zooming up. If FREEZE button is pressed, then ZOOM slider is moved right down to smallest size, shrinking rectangles can be seen. For best effect, wait until PRESET zooming is finished before going to next PRESET. H.S.V. sliders have no effect since **Random** colour is used. Move RATE 1 slider to change rate of **Random** colour. Move RATE 2 slider to change rate of zoom.

PRESET 22:
BOILING BACKGROUND

This PRESET is meaningless if not preceded by PRESET 21. Random coloured solid rectangles continuously expand from the background, with live analog video in front. Press INVERT STENCIL button to have expanding rectangles coming from the video image. Move the ZOOM and STRETCH sliders for different size rectangles. Move HORIZONTAL and VERTICAL PAN sliders to mid-position to stop the sliding. Actual content of background can now be seen.

PRESET 23:
FILLING GRID WITH RANDOM COLOUR

Wait until **Wipe stencil** and **Wipe colour** functions are completed. Using GRAPHICS PAD place arrow tip on **fill=>** cursor between grid lines. Lift stylus from pad and area selected will fill with randomly selected colour. Go to COLOUR CONTROL - Paint Menu **4** and change selection from **Random** to **Hue, Sat., Value.** Now fill grid with colours of your own choice, using H.S.V. sliders.

PRESET 24:
KEYED IMAGE OVER COLOUR FILLED GRID

Chroma keyed image appears in front of colour filled grid created in PRESET 23. **Title** the image using TITLE button. If there is no title in TITLE EDIT - Paint Menu **9**, then "No Title" will appear. Drawing on GRAPHICS PAD produces arrows with **Paint crawl.**

Presets 25 to 29 are colourizations.

PRESET 25:
COLOURIZE - SPECTRUM

Colourizes the live image with the **Spectrum** selection. Move H.S.V. and COLOUR DEPTH sliders to alter colourizing. COLOUR DEPTH moved toward + results in more extreme positive colourization. COLOUR DEPTH moved toward - has a more extreme negative colourization. COLOUR DEPTH in mid-position returns to normal colours (no colourization). Press COLOURIZE to return to normal colours.

PRESET 26:
COLOURIZE - NUCLEAR ATTACK

Contour colourizing. The H.S.V. sliders determine the amount of posterizing (colour removal) in the corresponding colours in the video image. If COLOUR DEPTH is set midway to zero, there is no colourizing because there is no depth. Press FREEZE to freeze the image. Press COLOURIZE to return to normal colours.

PRESET 27:
COLOURIZE - SEPIA TONE

Monochrome colourizing remniscent of old photos. H.S.V. sliders control which colour is monochromed. Saturation slider on minimum results in straight black and white.

PRESET 28:
COLOURIZE - POSTERIZE

Uses the **Contour** Colourize Type, removing some colour content and accentuating slight colour changes of image.

PRESET 29:
COLOURIZE - NEGATIVE

Uses the **Solarize** Colourize Type, and performs a straight colour negative on the image.

PRESET 30:
PIXELATION

Live digital image is pixelated by the ZOOM slider. STRETCH slider can pixelate the horizontal or vertical aspects of the image. Press FREEZE button and DRAW LOCK button to draw on frozen image.

PRESET 31:
HORIZONTAL MIRROR

HORIZONTAL PAN slider controls axis of reflection. Image may be frozen, zoomed, stretched, colourized, etc.

PRESET 32:
VERTICAL MIRROR

Same as PRESET 31 except VERTICAL PAN slider controls axis of reflection.

PRESET 33:
QUAD MIRROR

Horizontal and vertical mirrors simultaneously. PAN sliders control position.

PRESET 34:
SLOW SCAN ACROSS

This one grabs a vertical line of image at a preset rate across the screen and stores it. Press STOP button to terminate scan.

PRESET 35:
SLOW SCAN DOWN

Same as PRESET 34 except down the screen.

PRESET 36:
ZOOM OUT IMAGES

Precursor to PRESET 37. Live image is grabbed as it zooms out. Move ZOOM slider to see grabbed images. These are delayed 1,2,3 ... video fields behind the original. For best results, have live image move as PRESET is zooming.

PRESET 37:
BOILING IMAGES

PRESET 36 images are continuously panned across screen at a preset rate, giving the impression of movement. This PRESET is meaningless if not preceded by PRESET 36. Move HORIZONTAL and VERTICAL PAN sliders to midway position to stop movement and see actual still grabbed images.

PRESET 38:
STROBE

This strobes the live image at a rate determined by the RATE 2 slider. Freeze the image permanently by pressing the FREEZE button. Press FREEZE again to return to strobe effect.

PRESET 39:
SINGLE FREEZE, STENCIL DRAWING

This PRESET is associated with PRESET 40. Press FREEZE button to update the live image. Drawing on the stencil is shown as a brightened area. This doesn't affect the image. Press DRAW STENCIL button to not show stencil. Turn DRAW LOCK button Off to accurately position cursor before drawing. Press INVERT STENCIL button to "undraw" stencil.

PRESET 40:
SHATTER - DRAWN STENCIL

Image is grabbed at a rate set by RATE 2 slider. Observe the INVERT STENCIL button. The stencilled area drawn in PRESET 39 is flipped with the non-stencilled area at a rate set by RATE 2 slider. Zooming makes the stencilled area bigger.

PRESET 41:
SLIDE SHATTER - TEXTURE

A **Texture** is on the stencil plane. RATE 2 slider controls delay between live digital image and stencilled image. Live image must move for noticeable effect. Change **Texture**, Paint Menu 3 and return to image by pressing STOP button. Press WIPE STENCIL button to implement texture change.

PRESET 42:
SLIDE SHATTER - CHECKERBOARD

Same principle as PRESET 41, but with live analog image, checkered texture stencil image and a horizontal slide. Move HORIZONTAL PAN to change slide rate. Move ZOOM slider for more effect.

PRESET 43:
SEPIA TONED PHOTO TAKING

Live analog image is frozen and colourized sepia. Rate of photo taking is controlled by RATE 2 slider. Move ZOOM and STRETCH sliders for pixelation effects. Ensure RATE 2 slider is not on minimum, or ZOOM and STRETCH will not function. Pressing FREEZE button will stop updating sepia photo.

PRESET 44:
PARTIAL COLOURIZE - GRID

Grid lines over live video. Wherever the grid occurs, the live image is colourized to the negative. Move ZOOM and STRETCH for different effects. WIPE STENCIL will re-draw the grid. INVERT will flip between the normal and colourized areas.

PRESET 45:
COLOURIZE FLIP

Shatter between live image and colourized image. RATE 2 sets shatter rate. FREEZE leaves colourized image un-updated.

PRESET 46:
PARTIAL COLOURIZE - HEARTS

Heart shaped brush draws a negative colourization of the live image. ZOOM expands drawn area. INVERT STENCIL flips colourized area with normal area. FREEZE will freeze live video in drawn area. Press WIPE STENCIL to clear drawn area.

PRESET 47:
SLAPSTICK

Press FREEZE to grab live video image. RATE 2 slider controls rate of change. Image alternates between grabbed still image and live, analog image.

PRESET 48:
PARTIAL COLOURIZE - CHECKERBOARD

Sliding texture on the stencil colourizes live image in a checkerboard pattern. Use ZOOM, STRETCH, WIPE STENCIL, INVERT STENCIL, USE STENCIL. FREEZE will capture image to field store.

PRESET 49:
PARTIAL COLOURIZE - DIAGONALS

Sliding diagonal texture colourizes live image to a red negative. STRETCH changes angle of diagonal. HORIZONTAL and VERTICAL PAN sliders determine direction and rate of slide. H.S.V. sliders change colourizing.

PRESET 50:
HOLE - DRAWN STENCIL

Live video is seen through wherever you draw. INVERT STENCIL flips images. Press WIPE STENCIL to start again.

PRESET 51:
SLOW FREEZE AND DISINTEGRATE

Live digital image freezes slowly into a disintegrated image.

PRESET 52:
SLIDE STILL IMAGE TO VIDEO

Still image slides slowly to left. VIDEO 1 input appears behind.

PRESET 53:
COLOUR BACKGROUND

Puts a flat colour behind live image. Ensure chroma key levels are set up correctly. Move H.S.V. sliders for other colours.

PRESET 54:
PIXELATE FLIP

Alternates between pixelated digital and non-pixelated analog image. RATE 2 slider controls alternation rate. Use ZOOM and STRETCH to alter pixelation. Press FREEZE to capture pixelated image.

PRESET 55:
IMAGE OVER COLOUR WIPE

Colour wipe down the screen behind live analog image. Ensure correct chroma key levels. Move H.S.V. sliders for a gradual colour change as wipe procedes. Press COLOUR WIPE for another background wipe. Press INVERT STENCIL for the invisible person. Press USE STENCIL to un-display (but not clear) background.

PRESET 56:
UNDER/OVER STENCIL DRAWING

Contents of background is drawn to foreground, in front of live image. Press FREEZE. Live image is frozen to background, and the same stencil uses frozen image as foreground. Pressing INVERT STENCIL reverses this situation and lets you undraw the stencil.

PRESET 57:
UNDER/OVER CATCH UP

Background is updated with live video at a rate determined by the RATE 2 slider. Live image must move for effect to be seen. Drawing puts background (which follows live image) to foreground with live image sliced in between. Press COLOURIZE for a colourized image catching up to the normal image. Press INVERT STENCIL for normal background following invisible live image. Use ZOOM and STRETCH to advantage. Press FREEZE to capture digital image. Normal analog image still comes through.

PRESET 58:
PUSH TO FREEZE

Pressing FREEZE grabs the current chroma keyed image and stores it into the background. Each subsequent press of FREEZE stores another live image. Press WIPE COLOUR to clear background. ZOOM and STRETCH work well here.

PRESET 59:
TRAIL

Current chroma keyed image is continually and rapidly grabbed or frozen as in PRESET 58. This results in a trail of images. A rapidly moving live image shows this effect well. Pressing FREEZE stops the trail. Pressing it again starts the trail. ZOOM and STRETCH complement this PRESET.

PRESET 60:
TRAIL - STROBE

Same as PRESET 59, but grab rate is set by the RATE 2 slider. This results in a strobed trail of images. A rapidly moving live image shows this effect well. Pressing FREEZE stops the trail. Pressing it again starts the trail. ZOOM and STRETCH.

PRESET 61:
TRAIL - SLIDE

Same as PRESET 60 except slide is maximum, spreading out frozen images. Each image is one field behind the actual live image. Adjust HORIZONTAL and VERTICAL PAN sliders for sliding. Try ZOOMING up, pressing FREEZE, and ZOOMING back. The trail records the zooming.

PRESET 62:
TRAIL - SLIDE,ZOOM

This is a precursor for PRESET 63. Grabs images as in PRESETS 60 and 61 but automatically. Captures around one half second of live video. For best effect, have live image moving and wait until PRESET zoom is finished before going to PRESET 63.

PRESET 63:
BOILING KEYED IMAGES

This PRESET needs PRESET 62 as a prerequisite. Multi-grabs of zoomed live image are sliding at a certain rate set by HORIZONTAL and VERTICAL PAN. Move these sliders to mid-position to stop sliding and see actual still image "grabs". By sliding at a set rate, these grabs superimpose and animate. ZOOM, STRETCH and COLOURIZE are useful here too.

PRESET 64:
OVERLAP MIRROR

Similar to PRESET 31, but live analog is in front of reflections. HORIZONTAL PAN slider positions right mirror. Press FREEZE to capture reflections and see left mirror.

PRESET 65:
OVERLAP MIRROR WITH TRAIL AND STROBE

Same as PRESET 64 except image is continuously frozen and stored. RATE 2 controls how fast strobing occurs. FREEZE stops all updating.

PRESET 66:
COLOUR TRAIL

Chroma keyed image is frozen and stored to background as a random colour, hence the H.S.V. sliders have no effect. Rate of colour change is controlled by RATE 1. If at minimum, change is very slight. Select **Hue,sat.,value** in the COLOUR CONTROL menu, and live image will wipe the background with colour selected by the H.S.V. sliders. Use ZOOM, STRETCH and COLOURIZE for more effect.

PRESET 67:
COLOUR MIRRORS, TRAIL

Similar to PRESET 66. Live chroma keyed image is not displayed, only trailing random colours. All this is mirrored. FREEZE will stop the image updating. Select **Music** from the COLOUR CONTROL menu and try the audio input.

PRESET 68:
OVERLAP MIRROR - NEGATIVE COLOURIZE

Similar to PRESET 64, but colourized.

PRESET 69:
DOPPELGANGER

Live analog image is keyed over shifted live digital image. Digital image can be positioned with the PAN sliders. ZOOM and STRETCH.

PRESET 70:
TRAIL CRAWL

Current chroma keyed image is continually frozen as in PRESET 59, but the trail is composed of crawling colour. Move H.S.V. sliders for changes in colour. Press FREEZE once to stop update of trail. Press FREEZE again to continually update.

PRESET 71:
CATCH-UP

Live analog image chroma keyed over strobed digital image. Digital image is always 'catching up' to the analog image. RATE 2 slider sets how fast the catch-up is. FREEZE will halt the catch-up. INVERT STENCIL will show digital image through the stencil created by the analog image.

PRESET 72:
CATCH-UP COLOURIZE

Same as PRESET 71, but using a **Range** colourization.

PRESET 73:
GHOST - SINGLE FREEZE

Double exposure between frozen digital image and live video. Press FREEZE to update frozen image. ZOOM, STRETCH and COLOURIZE.

PRESET 74:
PERSISTENCE OF VISION

Similar to PRESET 73, but digital image is continually frozen at a rate set by RATE 2. Digital image is also **Solarize** colourized, with negative COLOUR DEPTH. Press FREEZE to see still digital image. This PRESET characterizes the human eye effect of vision persistence.

PRESET 75:
SOFT PIXELS

A double exposure between live and digital image, with ZOOM slider set to around 1/4 from full zoom. Similar to looking through a patterned glass window. STRETCH controls pixels too. COLOURIZE and FREEZE.

PRESETS 76 to 80 are the presets used to duplicate the scene on the CVI demonstration video tape with the ballerina dancing between frozen images of herself and a blue and white checkered background. A blue chroma key background and correct chroma key levels are essential for this.

PRESET 76:
DIGITAL IMAGE

Press FREEZE to capture image. This will be used to generate a stencil. Press PRESET button followed by DRAW LOCK for next PRESET. PRESET 76 is also good for drawing "crawling worms" over digital image.

PRESET 77:
COLOUR DETECT

Previously frozen image will be stencilled out from the blue background. Press on GRAPHICS PAD. The **stencil=>** cursor will appear. Position cursor to blue area and lift from pad. A stencil wipe will commence across the screen taking about 6 seconds. Everywhere that is blue-ish will be have the stencil turned **Off**. Thus, the frozen image will be cut out and put in the **Stencil on** area. Due to the **Under-over** selection in the STENCIL SOURCE menu, the cut out stencil will be over (in front of) live analog image.

PRESET 78:
CLEAN UP STENCIL

If lighting levels are not set up adequately, or some parts of the image are indistinct (eg., hair strands), break-through of blue may occur. Some touching up of the stencil may be necessary. This PRESET lets you clean up and draw out the stencil. Firstly, move HORIZONTAL PAN to mid position (to stop slide). Now, just draw wherever stencil needs it. Turn DRAW LOCK off to assist in positioning cursor before drawing, then press DRAW for temporary drawing. Use the smallest **Brush shape** for fine detail. PAN and ZOOM sliders can facilitate stencil clean up too. Also try the **Stencil Draw/Erase** selector in Paint Menu 4

PRESET 79:
UNDER/OVER BACKGROUND WIPE

Stencil image slides in front of live image and a background colour wipe down the screen occurs. Move the H.S.V. sliders while wipe is progressing for different colours.

PRESET 80:
UNDER/OVER TEXTURE WIPE

A checkered texture is added to the background. Move ZOOM and STRETCH sliders for additional control. You can draw in the background with random coloured arrow **Brush shape**, using a **Spin** symmetry. Press DRAW STENCIL to put arrows onto the stencil, in front of the live image.

PRESET 81:
MUSIC STROBE

Sound controlled strobe effect freezes the live image. Thus an image can be continually frozen in time with music beats or pulses. Adjust the AUDIO SENSITIVITY control in the electronics unit for optimum results.

PRESET 82:
MUSIC TRAIL CRAWL

Similar to PRESET 70, except colour is derived from audio input as a mixture of bass (RED), middle (GREEN) and treble (BLUE) frequencies. Adjust AUDIO SENSITIVITY. Press FREEZE to freeze **Trail crawl**. ZOOM and STRETCH.

PRESET 83:
MUSIC COLOUR TUNNEL

Music controlled **Colour tunnel** emanating from centre screen, behind live image. ZOOM and STRETCH give different impressions. INVERT STENCIL makes **Colour tunnel** come through chroma keyed image. Press USE STENCIL then INVERT STENCIL to get rid of live video.

The following PRESETS require live chroma keyed video for VIDEO 2 input.

PRESET 84:
INTERNAL KEY - VIDEO 1 AND 2

Area drawn on stencil plane defines what is VIDEO 1 and what is VIDEO 2. Initially, VIDEO 1 is displayed as analog video. Now draw on the GRAPHICS PAD. VIDEO 2 should start to appear. Press INVERT STENCIL to flip one with the other. See STENCIL SOURCE menu, **Digital** and **Analog** path. HORIZONTAL and VERTICAL PAN can adjust position of stencil.

PRESET 85:
CHROMA KEY - VIDEO 1 OVER 2

VIDEO 1 takes the digital path, VIDEO 2 the analog. Adjust chroma key levels correctly. INVERT STENCIL only allows VIDEO 2 through where VIDEO 1 is chroma keyed.

PRESET 86:
CHROMA KEY - VIDEO 2 OVER 1

Same as PRESET 85 except video paths are reversed, and hence the source of chroma key is Video 2.

PRESET 87:
CHROMA KEY - 1 OVER 2, COLOURIZED

Same as PRESET 85 except chroma keyed VIDEO 1 is **Monochrome** colourized. Press COLOURIZE for normal colours.

PRESET 88:
CHROMA KEY - 1 OVER 2, MOSAIC

Same as PRESET 85 except VIDEO 1 is zoomed up, giving a mosiac effect. Use ZOOM and STRETCH.

PRESET 89:
VIDEO 1/2 FLIP

Alternately displays VIDEO 1 and VIDEO 2 at a rate set by the RATE 2 slider. Equivalent to PRESET 84 and continuously pressing the INVERT STENCIL button. If the two images are similar (eg., faces) then at a certain flip rate, the images tend to merge.

PRESET 90:
DOUBLE EXPOSURE

A video mix between VIDEO 1 (analog path) and VIDEO 2 (digital path). Press INVERT STENCIL to display VIDEO 1 only.

PRESET 91:
WIPE ACROSS, 1 TO 2

A **Stencil wipe** across the screen from VIDEO 1 (digital) to VIDEO 2 (analog). Press WIPE STENCIL for another wipe. Regain VIDEO 1 by pressing INVERT STENCIL. Wipe may be stopped at any time by pressing STOP. Re-position stencil with HORIZONTAL PAN.

PRESET 92:
WIPE DOWN, 2 TO 1

Stencil wipe down the screen from VIDEO 2 (digital) to VIDEO 1 (analog). Press WIPE STENCIL for another wipe. Regain VIDEO 2 by pressing INVERT STENCIL. Wipe may be stopped at any time by pressing STOP. Re-position stencil with VERTICAL PAN.

PRESET 93:
DISINTEGRATE, 1 TO 2

VIDEO 1 (digital) disintegrates pixel by pixel to VIDEO 2 (analog). Press WIPE STENCIL to do it again. Press STOP to halt disintegration. Regain VIDEO 1 by pressing INVERT STENCIL.

PRESET 94:
TEST PATTERN
Allows correct alignment of video monitor.

PRESET 95:
VIDEO 2 THROUGH
VIDEO 2 straight through analog and digital paths for setting up levels. Initial image is analog. Press INVERT STENCIL to see digital image.

PRESET 96:
VIDEO 1 THROUGH
VIDEO 1 straight through analog and digital paths for setting up levels. Initial image is analog. Press INVERT STENCIL to see digital image.

PRESET 97:
COLOUR BARS
Allows correct colour alignment of video monitor and CVI.

PRESET 98:
CHROMA KEY SETUP, VIDEO 2
Set up correct chroma key levels for VIDEO 2 input. Chroma key levels for VIDEO 2 are independent of VIDEO 1.

To set levels, use H.S.V. sliders. These sliders change function here and control red, green and blue content of chroma key respectively. When levels are set correctly, blue background will appear in the complement of blue, a pinky-orange colour. If keying a face, for example, set H.S.V. sliders to mid-position. Adjust HUE (red content) so that face (skin tone) is normal colour without chroma key speckles. Next adjust VALUE (blue content) so that all of blue background just turns pink-orange. Don't position fader any more than necessary for this. Adjust SATURATION (green content) so that all of background still just stays pink-orange.

It may be necessary to repeat these steps a few times to fine-tune the chroma key levels. Once levels are set, you may forget about them, unless lighting conditions change, or the CVI is turned off.

PRESET 99:
CHROMA KEY SETUP, VIDEO 1
Set up correct chroma key levels for VIDEO 1 input. Chroma key levels for VIDEO 1 are independent of VIDEO 2.

See the setup steps for PRESET 98.

Each PRESET has a number and a short description. A more complete description of the characteristics of each preset is given in Section 2 - PRESETS.

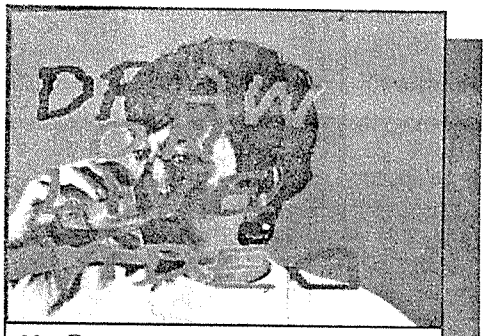
00: DRAWING ON LIVE VIDEO
01: DRAWING CARS: COLOURIZED NEGATIVE
02: TITLE ON LIVE VIDEO
03: INSTANT WIPE TO COLOUR
04: SMALL BRUSH
05: FOLIAGE
06: COLOUR WIPE USING STENCIL
07: COPY
08: UNDER-OVER
09: UNDER-OVER SLIDE COLOURIZE
10: STARS WITH PAINT CRAWL ON LIVE VIDEO
11: RECTANGLES, HUE-SAT.
12: CUT and PASTE
13: WIPE DOWN
14: TEXTURE WIPE-GRID
15: RECTANGLE
16: RUBBER BANDING
17: UNDER/OVER, COLOURIZED
18: RECTANGLES WITH PAINT CRAWL
19: CIRCLES, MOTTLED
20: CHROMA KEY OVER SLIDING STILL
21: ZOOM OUT, COLOUR RECTANGLES
22: BOILING BACKGROUND
23: FILLING GRID WITH RANDOM COLOUR
24: CHROMA KEYED IMAGE OVER COLOUR FILLED GRID
25: COLOURIZE - SPECTRUM
26: COLOURIZE - NUCLEAR ATTACK
27: COLOURIZE - SEPIA TONED
28: COLOURIZE - POSTERIZED
29: COLOURIZE - NEGATIVE

QUICK SELECTION PRESETS

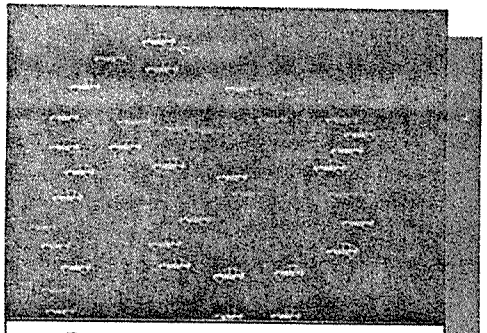
30: PIXELATION
31: HORIZONTAL MIRROR
32: VERTICAL MIRROR
33: QUAD MIRROR
34: SLOW SCAN ACROSS
35: SLOW SCAN DOWN
36: ZOOM OUT IMAGES
37: BOILING IMAGES
38: STROBE
39: SINGLE FREEZE STENCIL DRAWING
40: SHATTER - DRAWN STENCIL
41: SLIDE SHATTER - TEXTURE
42: SLIDE SHATTER - CHECKERBOARD
43: SEPIA TONED PHOTO TAKING
44: PARTIAL COLOURIZE - GRID
45: COLOURIZE FLIP
46: PARTIAL COLOURIZE - HEARTS
47: SLAPSTICK
48: PARTIAL COLOURIZE - CHECKERBOARD
49: PARTIAL COLOURIZE - DIAGONALS
50: HOLE - DRAWN STENCIL
51: SLOW FREEZE AND DISINTEGRATE
52: SLIDE STILL IMAGE
53: COLOUR BACKGROUND
54: PIXELATE FLIP
55: IMAGE OVER COLOUR WIPE
56: UNDER/OVER STENCIL
57: UNDER/OVER CATCH UP
58: PUSH TO FREEZE
59: TRAIL
60: TRAIL - STROBE
61: TRAIL - SLIDE
62: TRAIL - SLIDE,ZOOM
63: BOILING KEYED IMAGE
64: OVERLAP MIRROR
65: OVERLAP MIRROR WITH TRAIL AND STROBE
66: COLOUR TRAIL
67: COLOUR MIRRORS, TRAIL
68: OVERLAP MIRROR - NEGATIVE COLOURIZE
69: DOPPELGANGER

70: TRAIL CRAWL
71: CATCH-UP
72: CATCH-UP COLOURIZE
73: GHOST - SINGLE FREEZE
74: PERSISTANCE OF VISION
75: SOFT PIXELS
76: DIGITAL IMAGE
77: COLOUR DETECT
78: CLEAN UP STENCIL
79: UNDER/OVER BACKGROUND WIPE
80: UNDER/OVER TEXTURE WIPE
81: MUSIC STROBE
82: MUSIC TRAIL CRAWL
83: MUSIC COLOUR TUNNEL
84: INTERNAL KEY - VIDEO 1 AND 2
85: CHROMA KEY - VIDEO 1 OVER 2
86: CHROMA KEY - VIDEO 2 OVER 1
87: CHROMA KEY - 1 OVER 2, COLOURIZED
88: CHROMA KEY - 1 OVER 2, MOSAIC
89: VIDEO 1/2 FLIP
90: DOUBLE EXPOSURE
91: WIPE ACROSS, 1 TO 2
92: WIPE DOWN, 2 TO 1
93: DISINTEGRATE, 1 TO 2
94: TEST PATTERN
95: VIDEO 2 THROUGH
96: VIDEO 1 THROUGH
97: COLOUR BARS
98: CHROMA KEY SETUP, VIDEO 2
99: CHROMA KEY SETUP, VIDEO 1

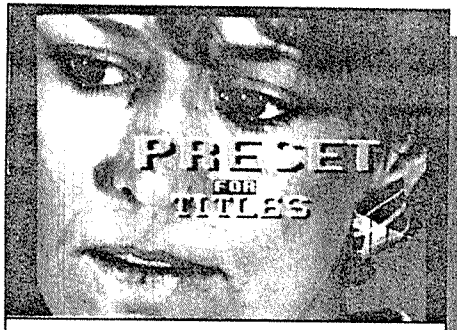
NOTES



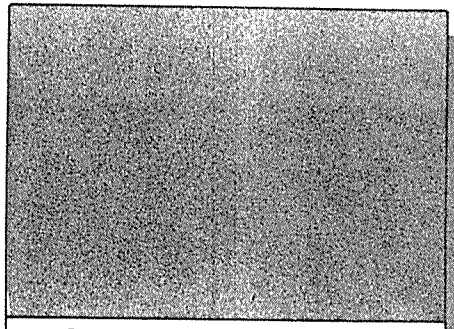
00 Drawing on live video



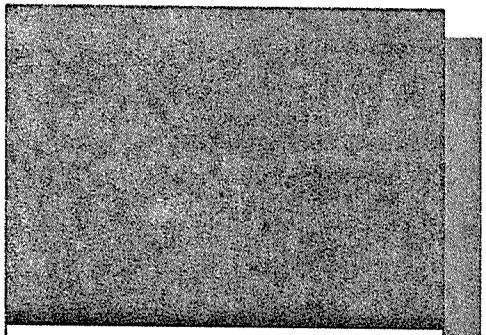
01 Drawing cars: colourized negative



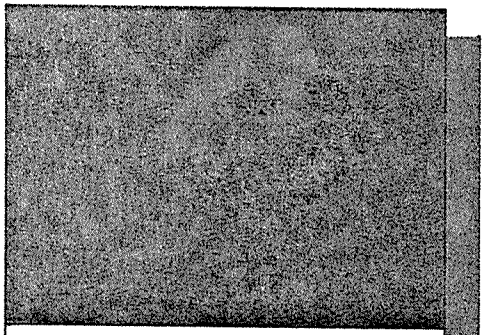
02 Title on live video



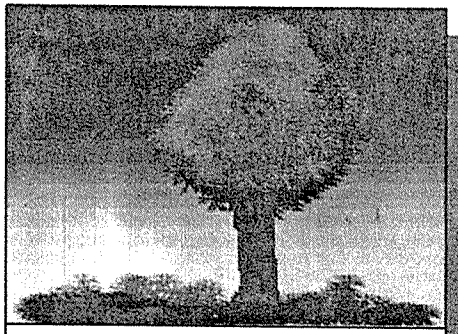
03 Instant wipe to colour



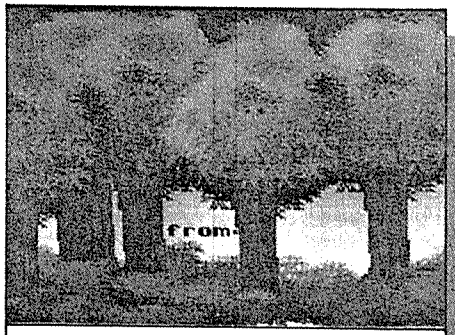
04 Small brush



05 Foliage



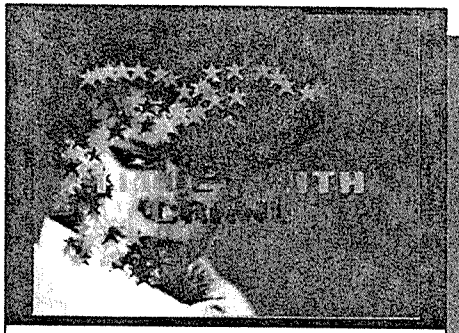
06 Colour wipe using stencil



07 Copy

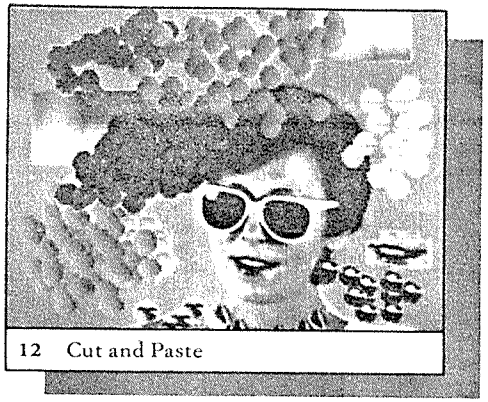
08 Under/over

09 Under/over slide colourize

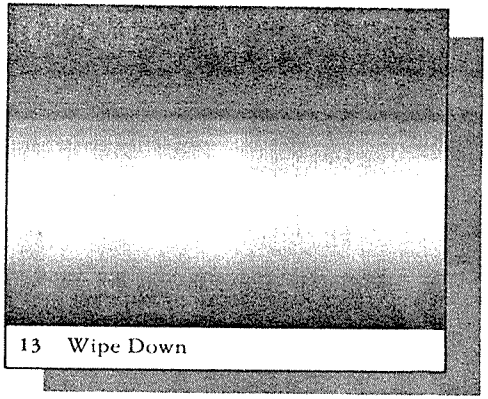


10 Stars with paint crawl on live video

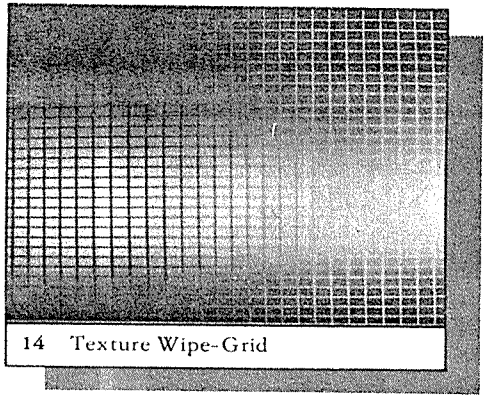
11 Rectangles, Hue-Sat.



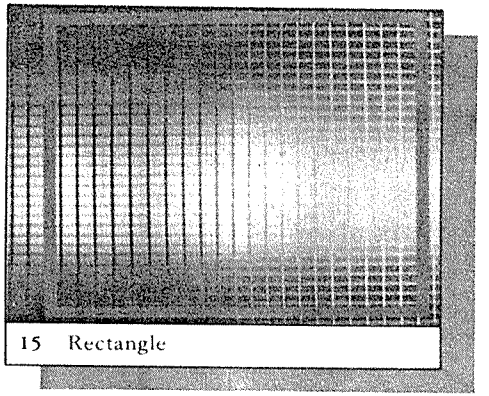
12 Cut and Paste



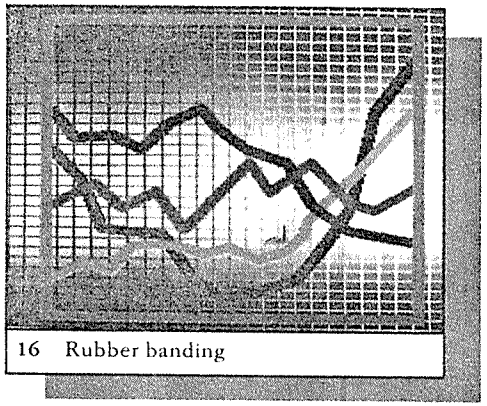
13 Wipe Down



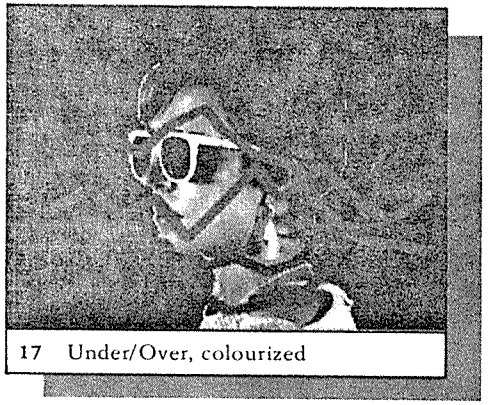
14 Texture Wipe-Grid



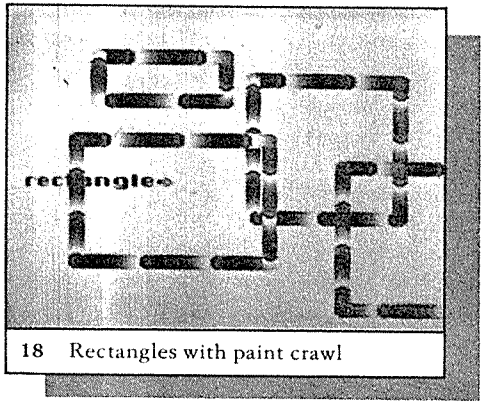
15 Rectangle



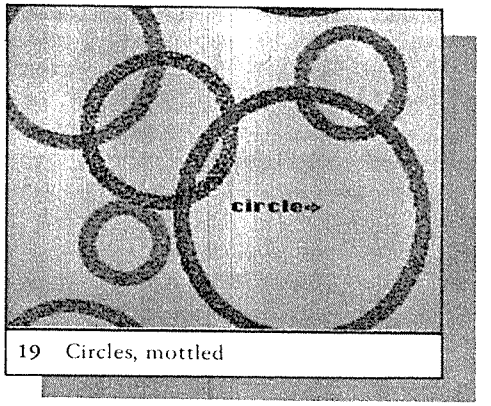
16 Rubber banding



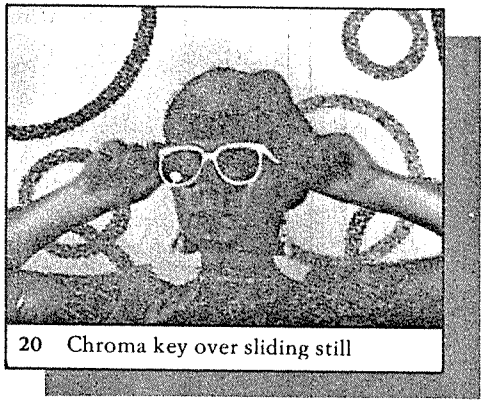
17 Under/Over, colourized



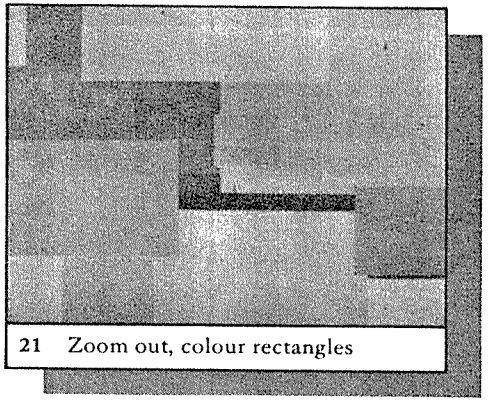
18 Rectangles with paint crawl



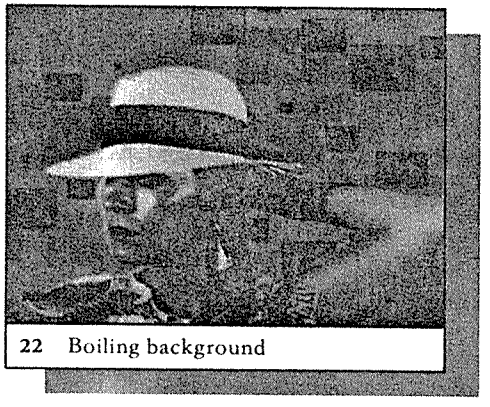
19 Circles, mottled



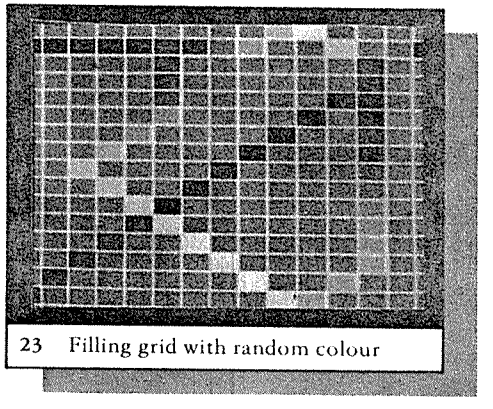
20 Chroma key over sliding still



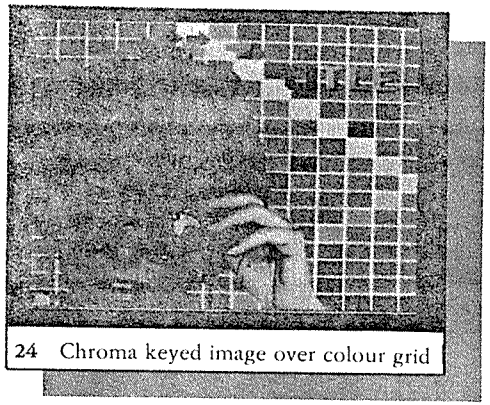
21 Zoom out, colour rectangles



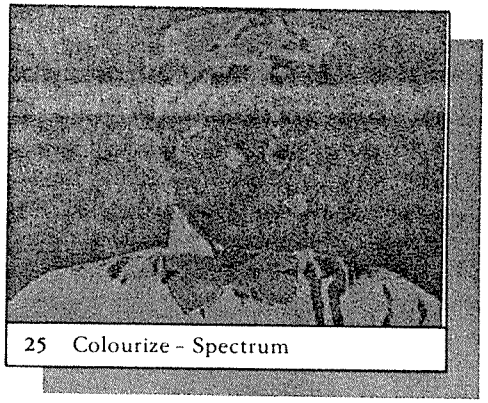
22 Boiling background



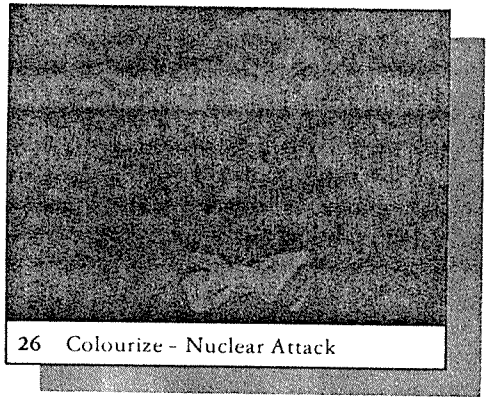
23 Filling grid with random colour



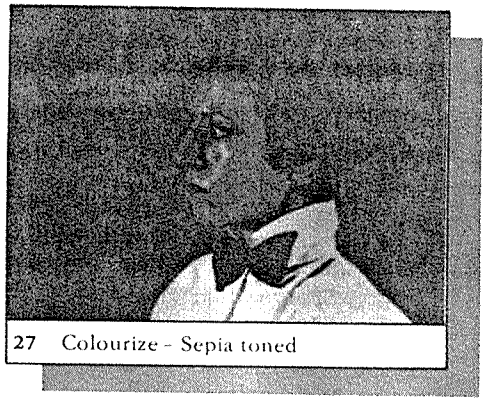
24 Chroma keyed image over colour grid



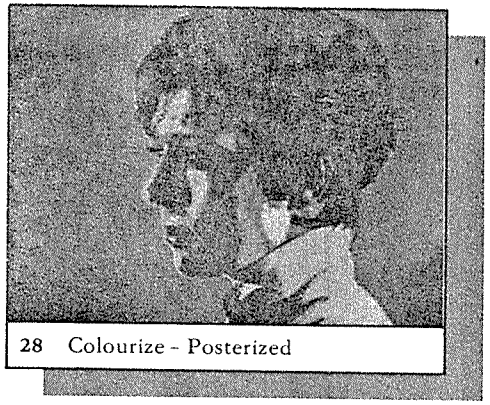
25 Colourize - Spectrum



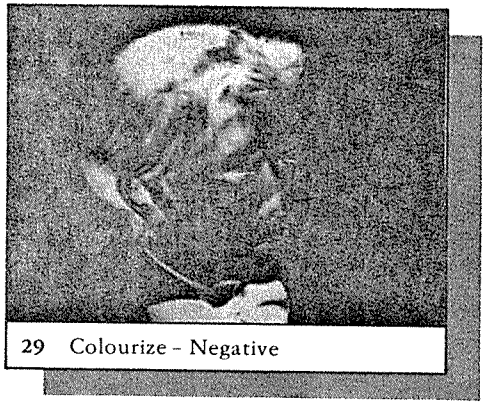
26 Colourize - Nuclear Attack



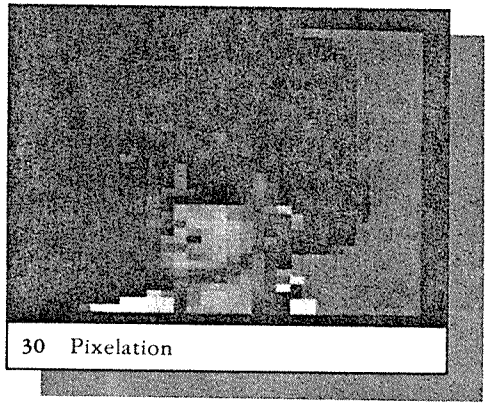
27 Colourize - Sepia toned



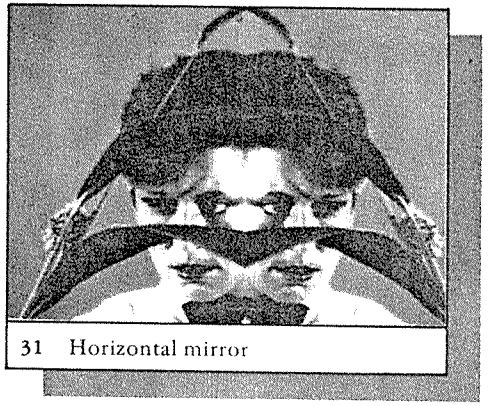
28 Colourize - Posterized



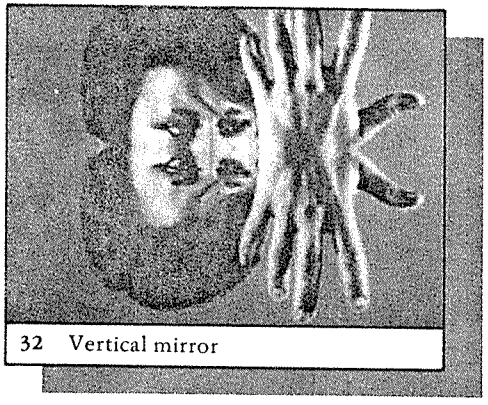
29 Colourize - Negative



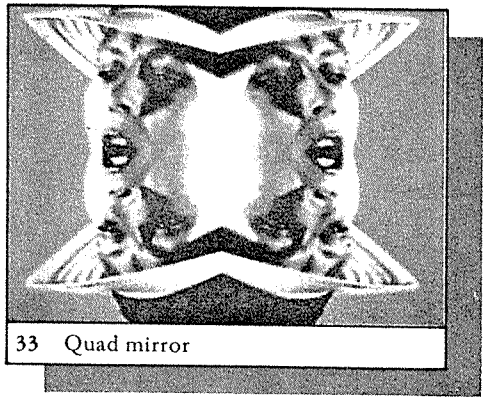
30 Pixelation



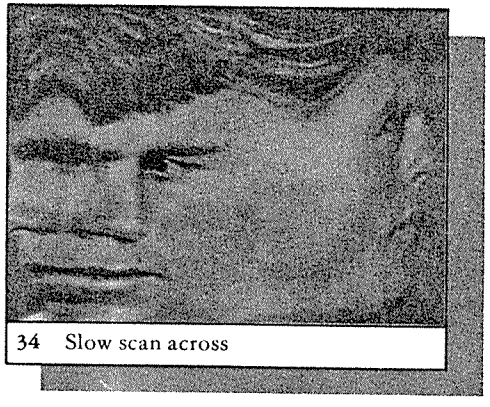
31 Horizontal mirror



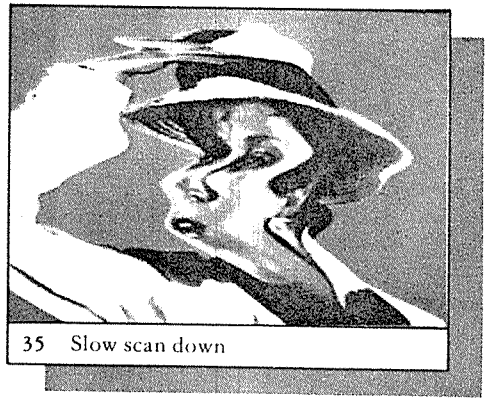
32 Vertical mirror



33 Quad mirror

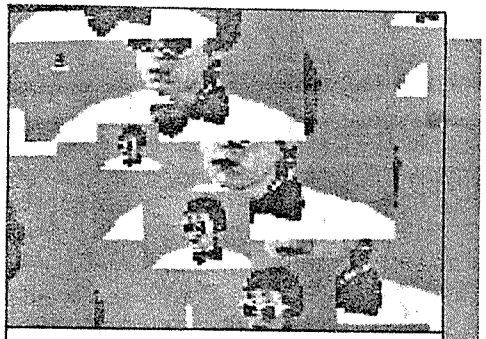


34 Slow scan across

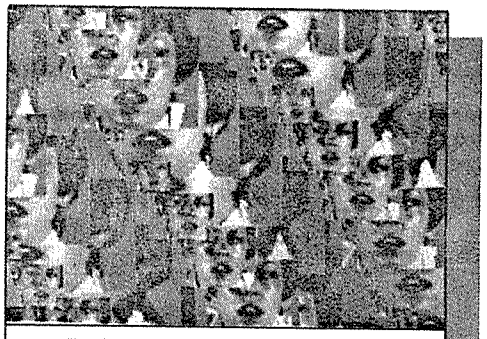


35 Slow scan down

fairlight



36 Zoom out images

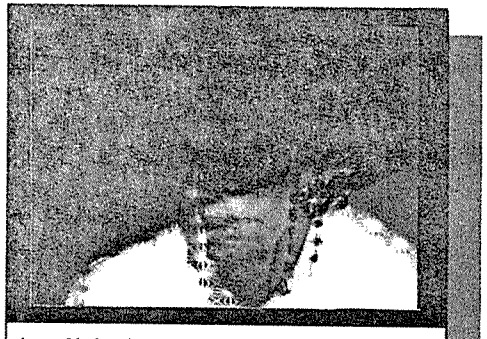


37 Boiling images

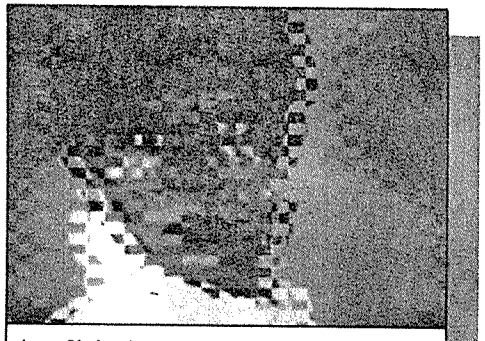
38 Strobe

39 Single freeze stencil drawing

40 Shatter - Drawn stencil

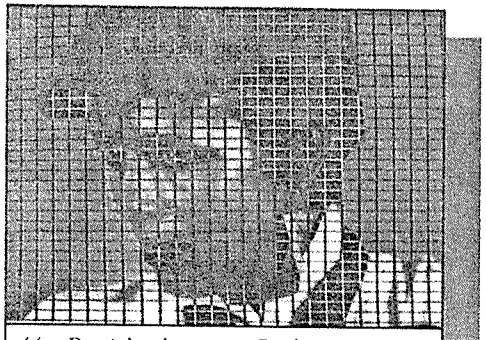


41 Slide shatter - Texture

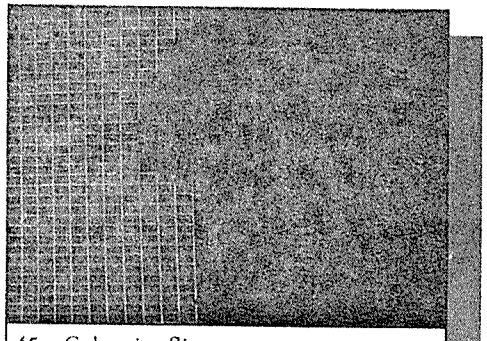


42 Slide shatter - Checkerboard

43 Sepia toned photo taking

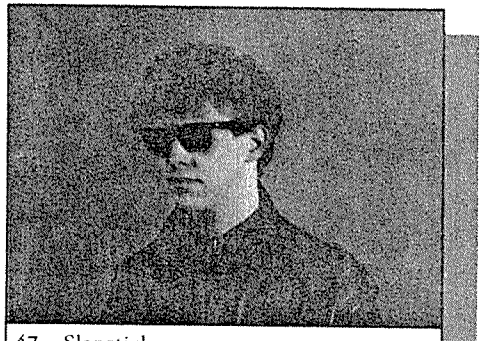


44 Partial colourize - Grid

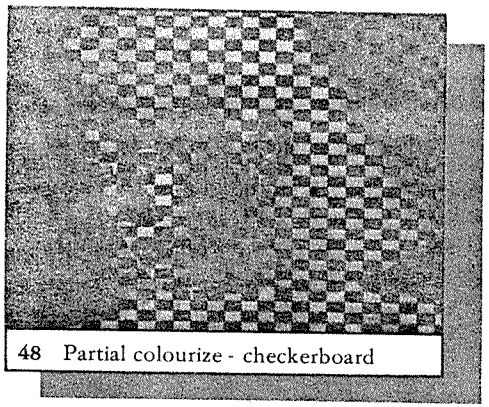


45 Colourize flip

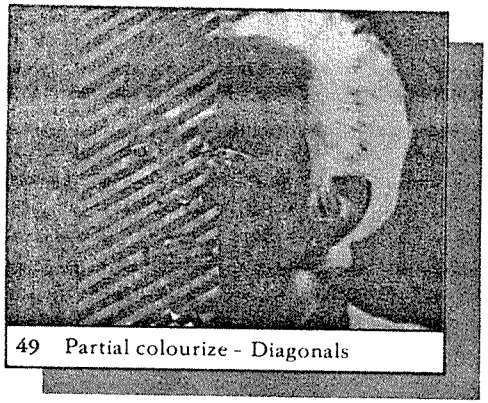
46 Partial colourize - Hearts



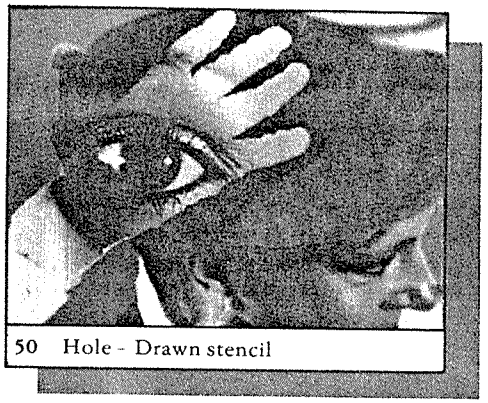
47 Slapstick



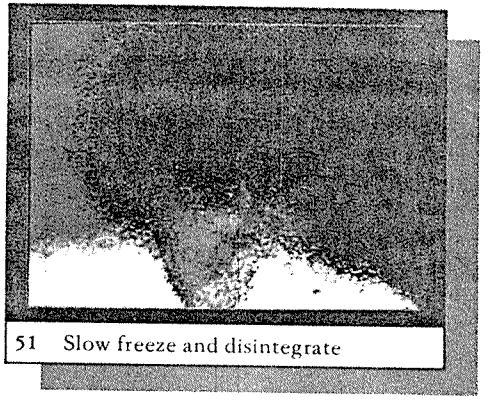
48 Partial colourize - checkerboard



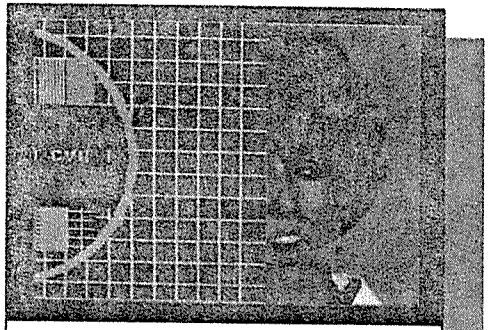
49 Partial colourize - Diagonals



50 Hole - Drawn stencil

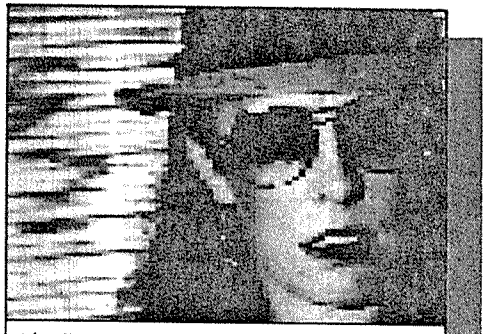


51 Slow freeze and disintegrate



52 Slide still image

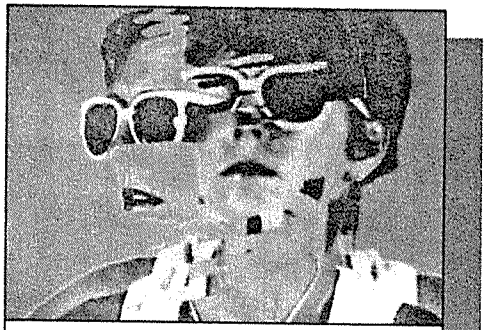
53 Colour background



54 Pixelate flip

55 Image over colour wipe

56 Under/over stencil

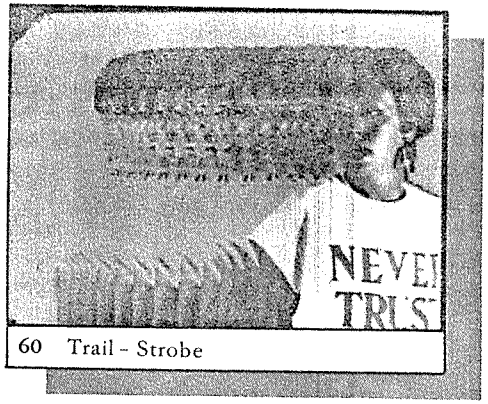


57 Under/over catch up

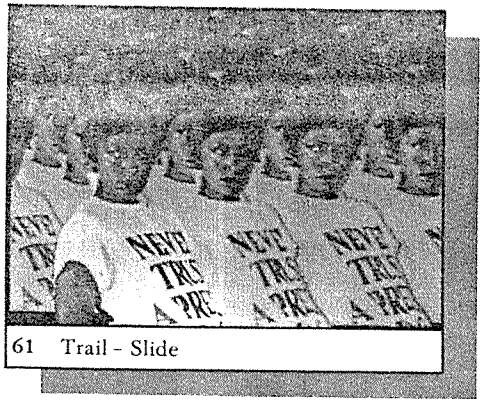
58 Push to freeze

59 Trail

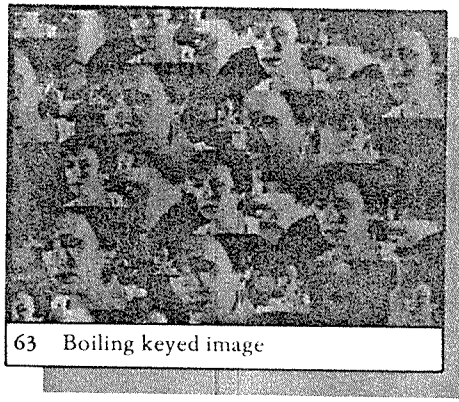
fairlight

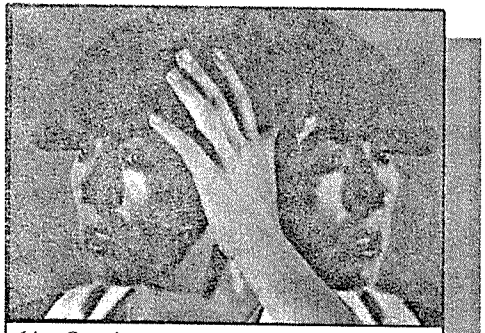


60 Trail - Strobe


61 Trail - Slide

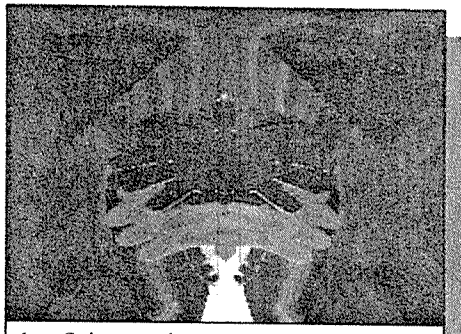

62 Trail - Slide, zoom


63 Boiling keyed image

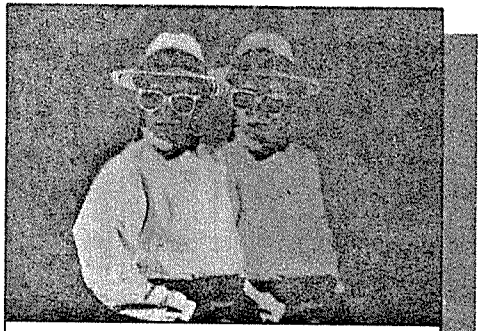

64 Overlap mirror


65 Overlap mirror with trail and strobe


66 Colour trail

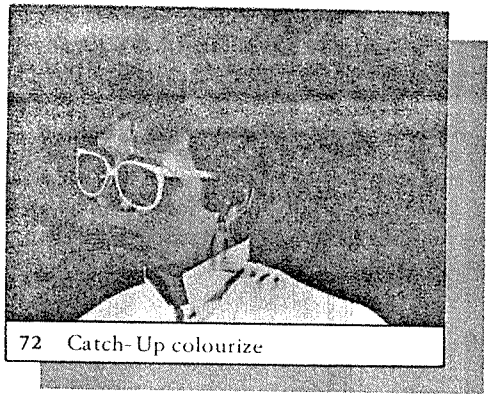

67 Colour trail, image


68 Overlap mirror - Negative colourize


69 Doppelganger

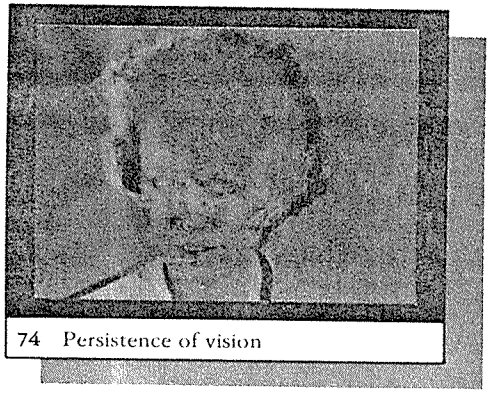

70 Trail crawl


71 Catch-Up

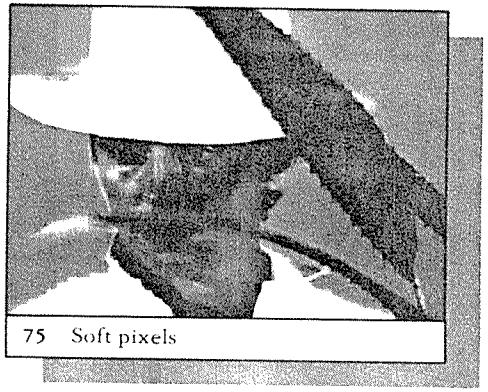


72 Catch-Up colourize

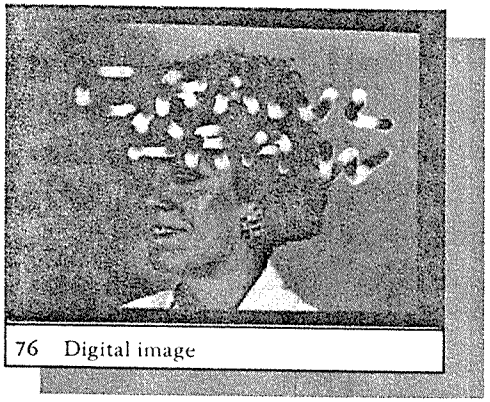
73 Ghost - Single freeze



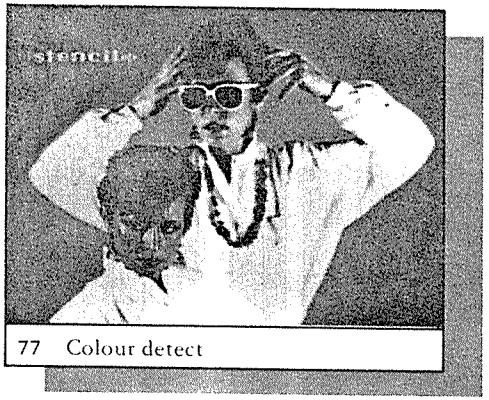
74 Persistence of vision



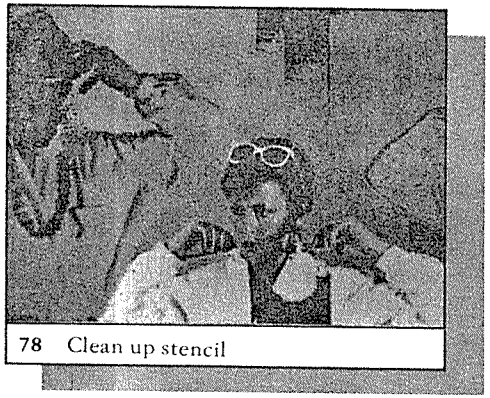
75 Soft pixels



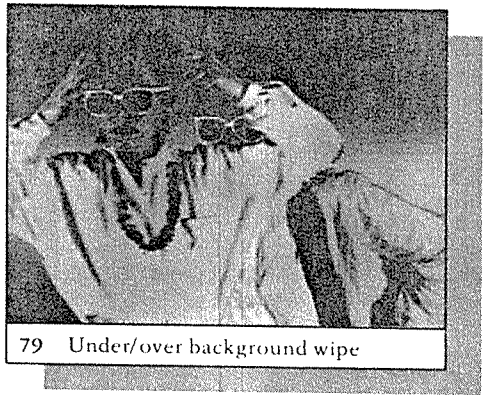
76 Digital image



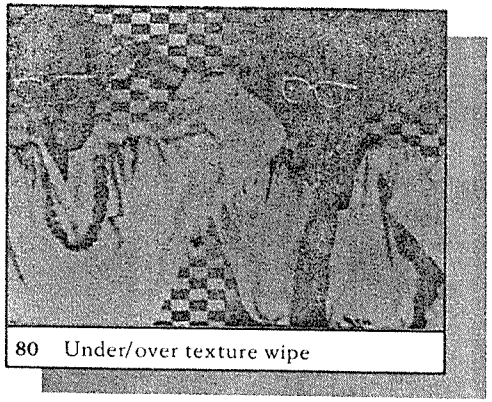
77 Colour detect



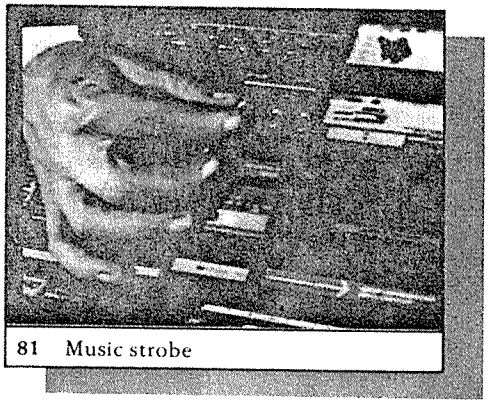
78 Clean up stencil



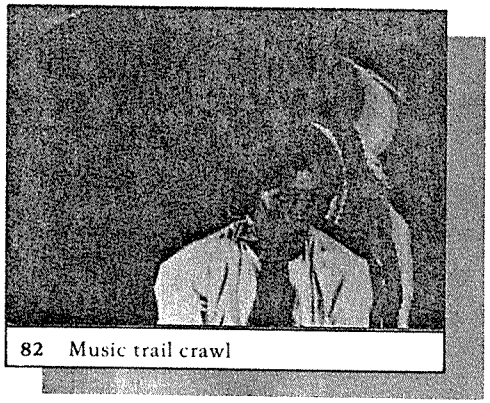
79 Under/over background wipe



80 Under/over texture wipe



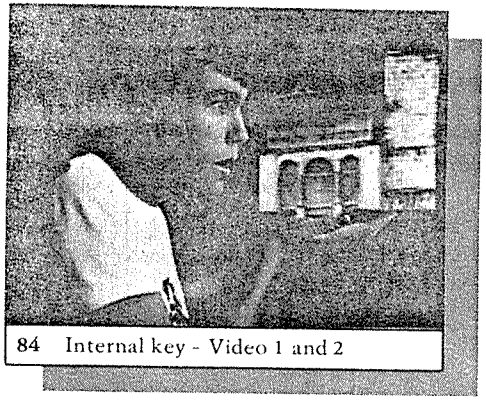
81 Music strobe



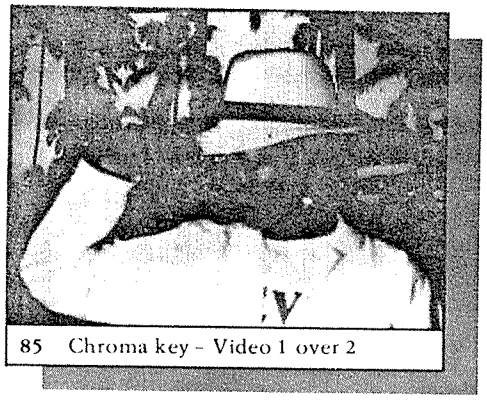
82 Music trail crawl

83 Music colour tunnel

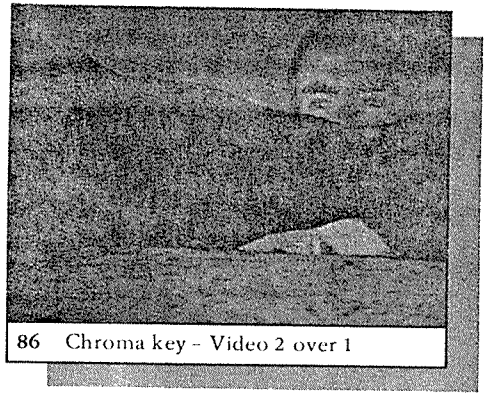
twilight



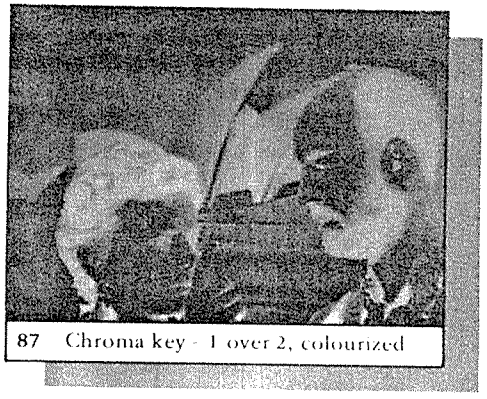
84 Internal key - Video 1 and 2



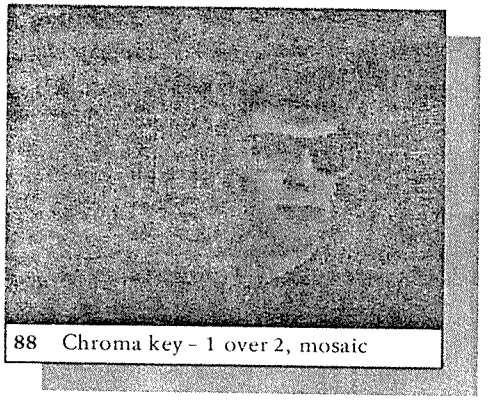
85 Chroma key - Video 1 over 2



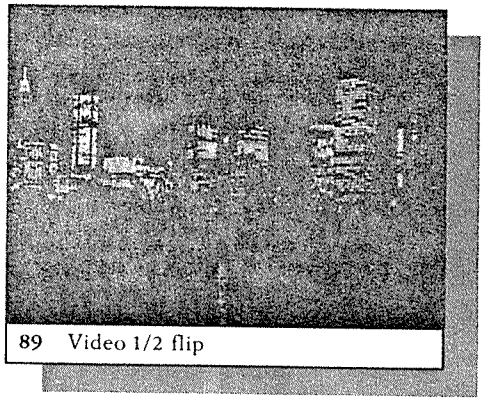
86 Chroma key - Video 2 over 1



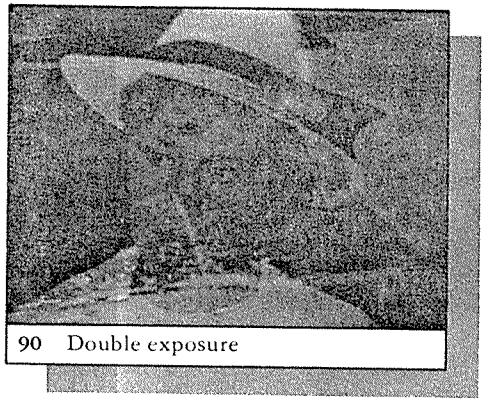
87 Chroma key - 1 over 2, colourized



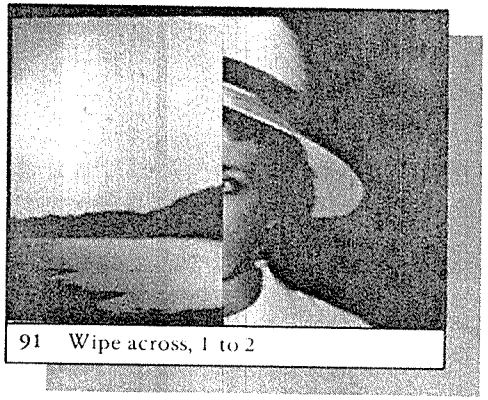
88 Chroma key - 1 over 2, mosaic



89 Video 1/2 flip

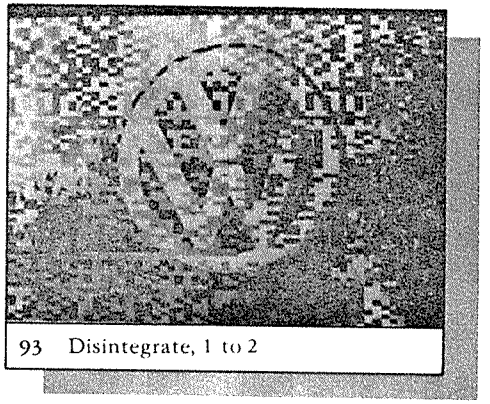


90 Double exposure

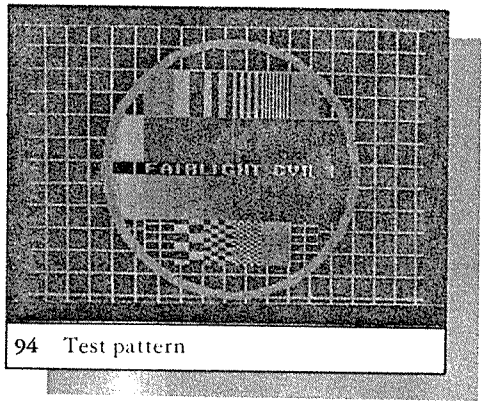


91 Wipe across, 1 to 2

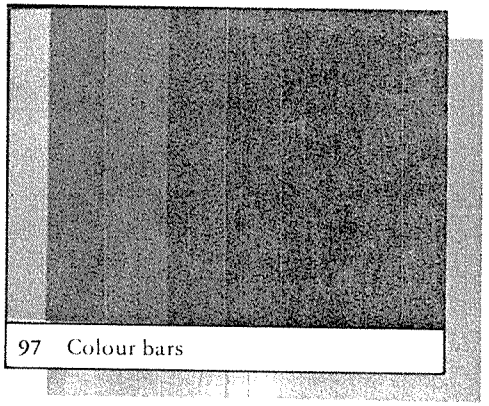
92 Wipe down, 2 to 1



93 Disintegrate, 1 to 2



94 Test pattern



97 Colour bars

fairlight

Paint & Video Menus 3

PAINT MENU

VIDEO MENU

The PAINT MENUS menu is a list of the available menus in the paint category. These menus can be selected by the means outlined in Section 1 under 'MENUS - What are they?'.

0) Paint Method: Defines how the stylus movements on the GRAPHICS PAD are interpreted into lines and shapes on the screen.

1) Brush Shape: Defines the shape and size of brush you draw with. Brush shapes apply to both the stencil and field stores.

2) Paint Type: Selects the simulation of the type of 'paint' you use. For example, **Flat** is equivalent to using opaque acrylic paints, **Shade=>** simulates an airbrush effect, and so on. Specifically, **Paint type** controls the way in which **colour depth** varies over the brush surface.

3) Textures: Defines visual texture to be used in different ways on the screen, by either drawing with it, filling areas, or wiping the whole screen with the texture. Textures may be used on both the stencil and field stores.

4) Colour Control: Defines *what* is controlling the colour specified.

5) Colour Type: Selects the *way* in which the colour you **draw** or **wipe** with affects the colour already on the screen.

6) Symmetry: Selects a symmetry which is used for drawing, on both stencil and field stores. Symmetry occurs as the image is drawn.

7) Colour Wipes: Defines changes to the field store which occur over the entire screen.

8) Stencil Wipes: Defines changes to the stencil plane which occur over the entire screen.

9) Title Edit: Enables you to edit a title or caption. It includes an on-screen alpha numeric keyboard with various character sizes and formats. Titles apply to both the stencil and field stores.

This menu controls the way in which the movement of the stylus on the GRAPHICS PAD results in lines or forms on the screen.
The DRAW COLOUR button must be on if you wish to draw on the field store, and the DRAW STENCIL must be on to draw the stencil. Both DRAW COLOUR and DRAW STENCIL may be on. COLOUR TYPE, BRUSH SHAPE, PAINT TYPE, COLOUR CONTROL, and SYMMETRY menu selections will all affect the drawing process.
If the USE TEXTURE button is on, then the TEXTURES menu also has an effect.

Dejag: This option removes the jagged edges from lines drawn into the field store. This is done by blending the colour of the line edges with the colour already in the field store. If DEJAG is selected then the dejag process will be applied to the **Draw**, **Rubber band**, **Circle**, **Ellipse** and **Rays** paint methods.
The DEJAG selection is not always desirable. For example, when drawing over live video, the edges of a dejagged line will blend with the contents of the field store, which may be unrelated to the live video. This will produce an unusual border on the drawn line. There may also be unusual effects when DEJAG is used in conjunction with the **Fill** and **Copy** functions, as the stencil drawn with a dejagged line reaches right to the blended edge. Hence, DEJAG should be turned **on** or **off** as required. The DEJAG selection is saved with each PRESET in the usual way. (See Section 3 - PRESETS CONTROL menu).

PAINT METHOD MENU

PAINT METHOD

0) Draw: A line follows the stylus around on screen, in the **Brush shape** selected.

How it is done

a) Select **Draw** from PAINT METHOD menu.
b) Turn **off** DRAW LOCK button. A cursor in the current brush shape and colour will appear and follow the movement of the stylus.
c) Position the cursor, then press DRAW or DRAW LOCK button.
d) A continuous line will be drawn, following the stylus on the GRAPHICS PAD. For large **Brush shapes**, the response will be slower than for smaller ones.
e) Steps b) to d) may be repeated for more lines. It is not necessary to turn off DRAW LOCK between lines, as lifting the stylus from the pad will stop the drawing. However, if DRAW LOCK is **on** then drawing will begin *as soon as* the stylus touches the GRAPHICS PAD.

1) Dots: The image of the **brush shape** follows the stylus as a series of disjointed dots.

How it is done

a) Select **Dots** from PAINT METHOD menu.
b) Turn **off** DRAW LOCK button. A cursor in the current brush shape and colour will appear and follow the movement of the stylus.
c) Position the cursor, then press DRAW or DRAW LOCK button.
d) If the stylus is moved quickly you achieve a series of unconnected **brush shapes**; if moved slowly you achieve a build up of the **brush shape** areas. This can be very effective with **Translucent** or **Tint** colour types with a low COLOUR DEPTH (or low VALUE for **Tint**) as a slowly drawn line will 'pool' colour.
e) Steps b) to d) may be repeated to start another stream of **Dots**

PAINT METHOD

2) Rubber Band: Provides an accurate control over the drawing and position of **straight lines**

How it is done

a) Select **Rubber Band** from PAINT METHOD menu.
b) Return to image.
c) Put the stylus to the pad. A cursor in the current **Brush shape** will appear on the screen. Move the arrow tip to the beginning of the lines that you wish to draw, and lift the stylus. This defines the start of a series of lines.
d) Put stylus to pad again.
e) A single pixel-width line will appear to define the line. This will follow the stylus movements around the screen, going from the last defined point to the current stylus position.
f) Lift the stylus: The line will be drawn in your paint selections.

Steps d) to f) may be repeated as often as desired. If you press STOP, or turn off DRAW/DRAW LOCK, you will return to step c), defining a new starting point.

How it is done

3) Circle: For drawing circles on the screen - the circle is drawn with **Brush shape** and **Textures** and any other selections made.

a) Select **Circle** from PAINT METHOD menu.
b) Return to image.
c) Put the stylus to the pad. A cursor saying **circle=>** will appear on the screen. Move the arrow tip to the centre of the circle that you wish to draw, and lift the stylus.
d) Put stylus to pad again.
e) A series of dots will appear to define the circle. Move the stylus to define the desired radius, and the circle of dots will follow the stylus.
f) Lift the stylus: A circle will be drawn in your paint selections.

Steps c) to f) may be repeated as often as desired. If you press STOP, or turn off DRAW/DRAW LOCK, before step f) the circle will not be drawn.

PAINT METHOD

4) Ellipse: For drawing ellipses on the screen - the ellipse is drawn with **Brush shape** and **Textures** and any other selections made. You may define the ellipse as being narrow, wide, short, long, or anywhere in-between, with any orientation and size.

How it is done

a) Select **Ellipse** from PAINT METHOD menu.
b) Return to image.
c) Put the stylus to the pad. A cursor saying **ellipse=>** will appear on the screen. Move the arrow tip to the centre of the ellipse that you wish to draw, and lift the stylus.
d) Put stylus to pad again.
e) A series of dots will appear, defining a circle. Move the stylus to the define the radius, such that the circle will fit just inside (or around) the desired ellipse. Lift the stylus.
f) Put stylus to pad again, and an ellipse of dots will appear on screen, and will follow the stylus movements on the pad. The current stylus position will stretch or squash the previously defined circle into an ellipse with any desired orientation and ratio of major to minor diameters.
g) Lift the stylus: An ellipse will be drawn in your paint selections.

Steps c) to g) may be repeated as often as desired. If you press STOP, or turn off DRAW/DRAW LOCK, before step g), the ellipse will not be drawn.

5) Rectangle: For drawing rectangles on the screen - the rectangle is drawn with **Brush shape** and **Textures** and any other selections made. It can be of any aspect ratio and size, but will be aligned horizontally and vertically. Use the **Rubber band** selection to draw non-aligned rectangles.

How it is done

a) Select **Rectangle** from PAINT METHOD menu.
b) Return to image.
c) Put the stylus to the pad. A cursor saying **rect.=>** will appear on the screen. Move the arrow tip to any corner of the rectangle that you wish to draw, and lift the stylus.
d) Put stylus to pad again.
e) A series of dots will appear to define the rectangle. Move the stylus to define the opposite corner of the rectangle.
f) Lift the stylus: A rectangle will be drawn in your paint selections.

Steps c) to f) may be repeated as often as desired. If you press STOP, or turn off DRAW/DRAW LOCK, before step f) the rectangle will not be drawn.

PAINT METHOD

6) Rays: For drawing lines radiating from a point. The rays are drawn with **Brush shape** and **Textures** and any other selections made.

How it is done

a) Select **Rays** from PAINT METHOD menu.
b) Return to image.
c) Put the stylus to the pad. A cursor saying **rays=>** will appear on the screen. Move the cursor to the centre of the rays that you wish to draw, and lift the stylus.
d) Put stylus to pad again.
e) A series of lines using the current paint selections will appear joining the rays centre with the current stylus position.

Steps c) to e) may be repeated to create rays with different centres. Changes in H.S.V. and COLOUR

DEPTH sliders while drawing rays will change the ray colour.

7) Cut & Paste: Enables you to "pick up" an area defined by the **Brush shape** and copy that area again somewhere else on the screen as many times as you want. If you want to copy arbitrary areas, use the **Copy** paint method.

How it is done

a) Select **Cut & Paste** from PAINT METHOD menu.
b) Select or define the required **Brush shape** in the BRUSH SHAPE menu.
c) Return to image.
d) Put stylus to pad, a cursor having the brush shape will appear.
e) Position the brush shape over the area you wish to "cut out".
f) Lift stylus.
g) Stylus to pad. The brush shape will appear containing the image that you have "cut out".
h) Move brush shape to desired position. The cut out image will be copied to the position where you lift the stylus. Steps g) and h) may be repeated until STOP is pressed, or you turn off DRAW/DRAW LOCK, in which case the CVI returns to step d), and allows the definition of another area for copying.

PAINT METHOD MENU

PAINT METHOD

8) Fill: Fill an area of the image. This paint method enables you to fill an area on the screen with colour, texture or colour modification. The area to be filled is specified on the stencil plane, and must be created *before* the **Fill** function is started. The boundary of the area to be filled must be continuous; if there are any 'leaks' the filling process will continue until the next boundary. To terminate **Fill** before it is complete, press the STOP button.

How it is done

a) Select **Fill** from PAINT METHOD menu.
b) Return to image.
c) Put the stylus to the pad. The stencil will be illuminated and a cursor saying **fill=>** will appear on the screen. If you wish to fill the stencil plane only, turn off the DRAW COLOUR button at this point.
d) Keeping the stylus down, alter the H.S.V. sliders to desired colour. Move the cursor to a point *inside* the area of stencil that you wish to fill.
e) Lift the stylus. The stencilled area will be filled. The time taken to fill an area is dependent on the size and complexity of the area. This area may be of either stencil polarity.

Repeat steps c) to e) to fill other stencil areas.

1) As the stencil is filled in during the **Fill** function, a given area may be filled once only. Use the **Stencil Show** function to observe the filling of the stencil.
2) The area to be filled is defined by the stencil, irrespective of the contents of the field store.

9) Copy: This is a cut and paste function that is quite versatile, enabling you to juxtapose elements in an image to create multiple repetition. It is slower than the **Cut & Paste** function, but allows arbitrary stencil areas to be copied. **Copy** may be stopped at any stage by pressing the STOP button.

How it is done

a) Select **Copy** from PAINT METHOD menu.
b) If required, select a symmetry pattern from the SYMMETRY menu.
c) Define the area to be copied by using the **Stencil Draw/Erase** and/or STENCIL WIPE functions. To see the stencil as it is being drawn, enable the **Stencil Show** selection in the Paint Menu 4.
d) Return to image.
e) Put stylus to pad. A cursor saying **from=>** will appear, and the stencil area will be illuminated.

How it is done

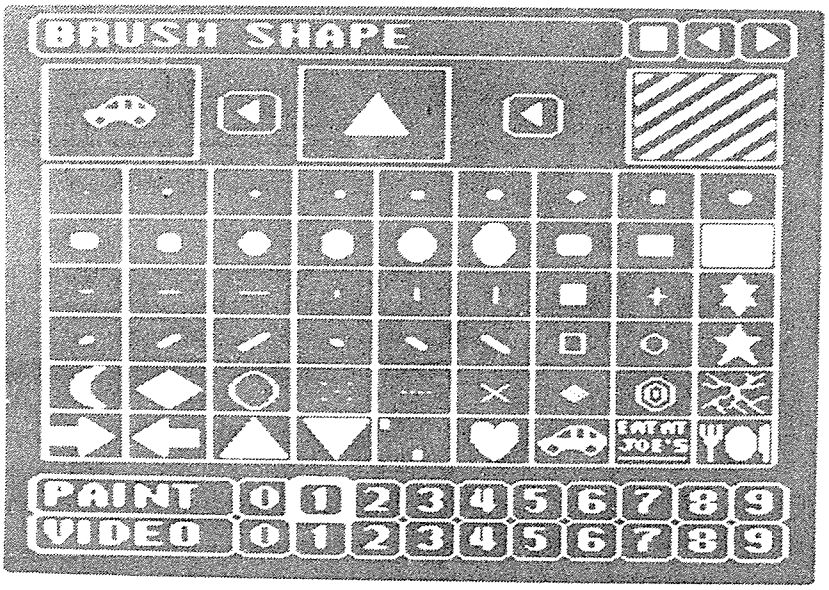
f) Move the tip of the cursor to a point within the area to be copied (either stencil **On** or stencil **Off**). This is the critical step: ensure that the cursor tip is within the correct region, or the background will be copied!
g) Lift the stylus from the GRAPHICS PAD.
h) Put stylus to pad again. Another cursor appears on screen saying **to=>**. Move the cursor to the position to which you wish to copy the stencilled image.
i) Lift the stylus from pad in preferred position. The **to=>** cursor will disappear and the copy function will commence. It takes approximately 5 seconds to complete.

Repeat steps e) to i) to make multiple copies of the original image.

1) If the USE TEXTURE button is on, the copied image will be textured.
2) As with all Paint Methods, if the COLOUR TYPE menu selection is other than **Opaque**, the image copy will not be a 'solid' image. For instance, if **Translucent** colour type is used with the COLOUR DEPTH slider midway between + and 0, the copied image will be similar in effect to a photographic double exposure.
3) If a symmetry other than **Off** is selected, the copied image will be drawn with that symmetry.
4) The initial image - that is, the original stencilled area, is protected from being copied over. If the copy is intended to overlap the initial image, cancel the protective stencil by turning off USE STENCIL between the **from=>** and **to=>** cursors.
5) All of the stencilled areas of the polarity selected by the **from=>** cursor will be copied. They do not have to be connected.

Experiment: it's a lot easier than it sounds!

BRUSH SHAPE MENU



This menu allows you to select from a choice of 54 predefined **Brush shapes**. As well, you may create your own **Brush shape**, or use any of the **Texture** shapes from the TEXTURE menu (Paint Menu 3) as a brush.

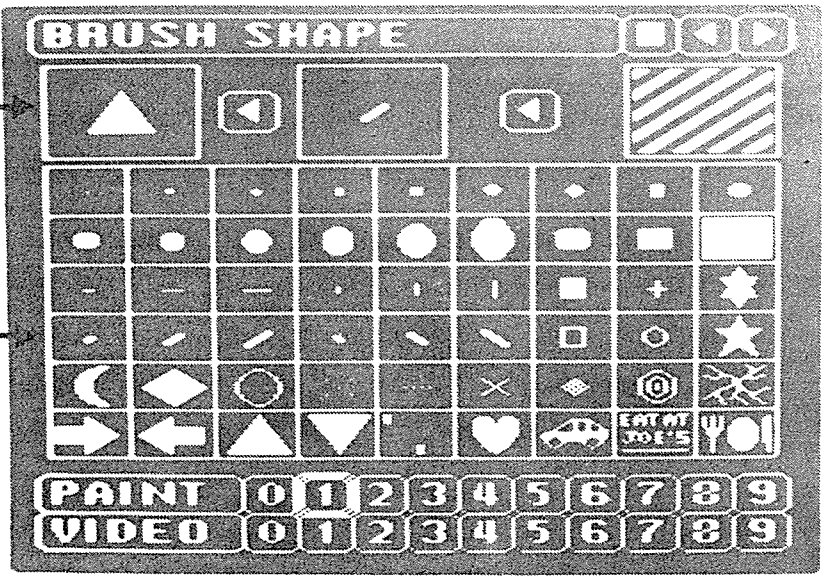
These 'brushes' can be used to paint in a variety of ways, either on the field store or the stencil plane. Drawing will remain in the **Brush shape** specified until changed.

Note that BRUSH SHAPE menu is connected to TEXTURES menu via the large top right hand box. This means that you may use any of the 54 **Textures** as a **Brush shape**. A similar facility exists in the TEXTURES menu, allowing any **Brush shape** to be used as a **Texture**.

To select a predefined Brush shape ...

selected **Brush shape** appears here

move cursor to any of these shapes and lift stylus

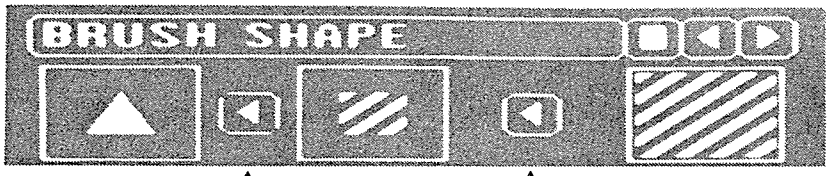


Further Brush shapes are selected in the following way ...

selected **Brush shape** for drawing

current *user-defined* **Brush shape**

currently selected **Texture** from TEXTURE menu

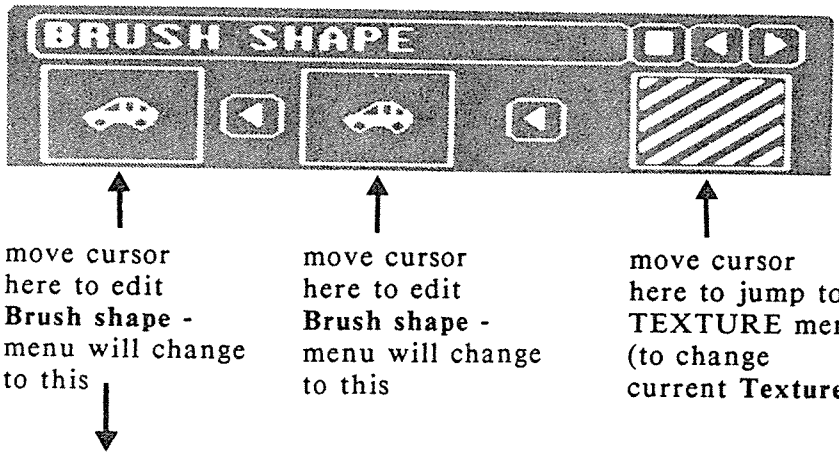


moves *user-defined* **Brush shape** into *selected* **Brush shape**

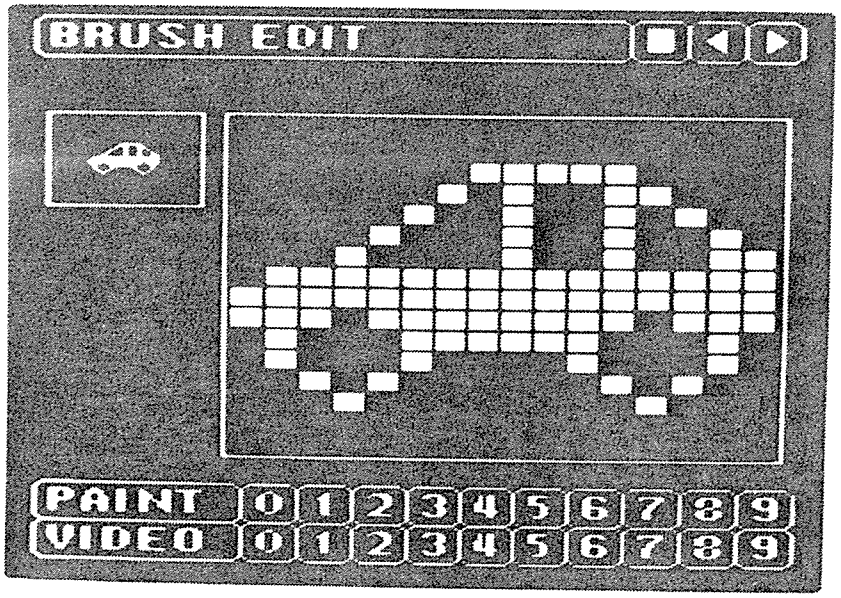
moves **Texture** into *user-defined* **Brush shape** and *selected* **Brush shape**

BRUSH SHAPE

Further functions of the BRUSH SHAPE menu are ...



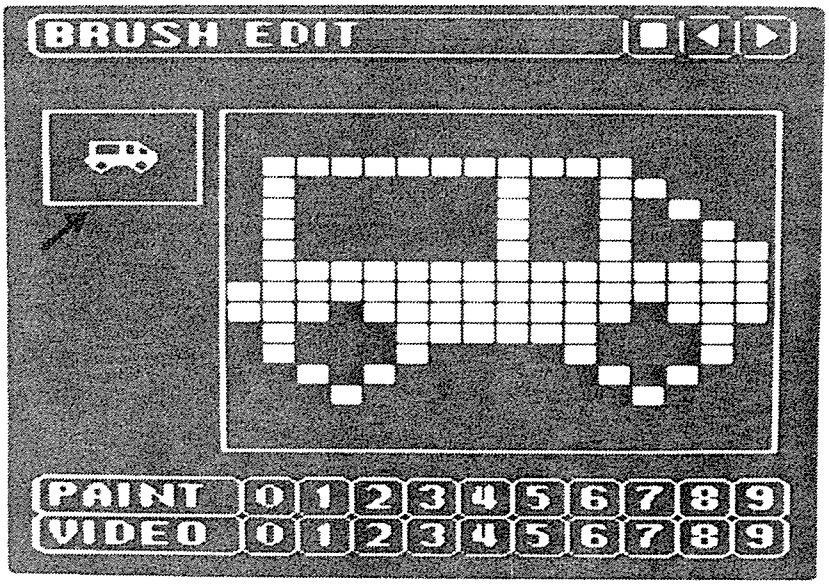
BRUSH SHAPE EDITOR ...



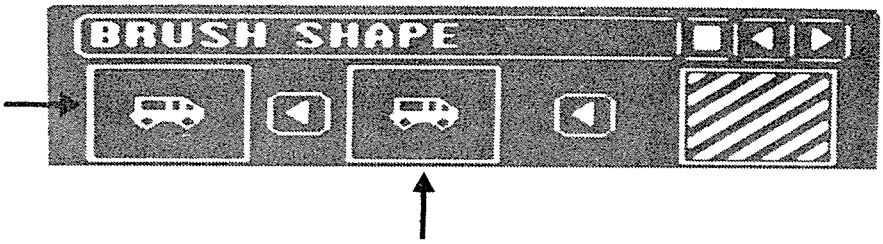
Position cursor anywhere in this area and lift stylus. A dot will either appear or disappear. Build up a new **Texture** The new **Texture** will apeear here in actual size, as you build it.

A new **Brush shape** has been built up.

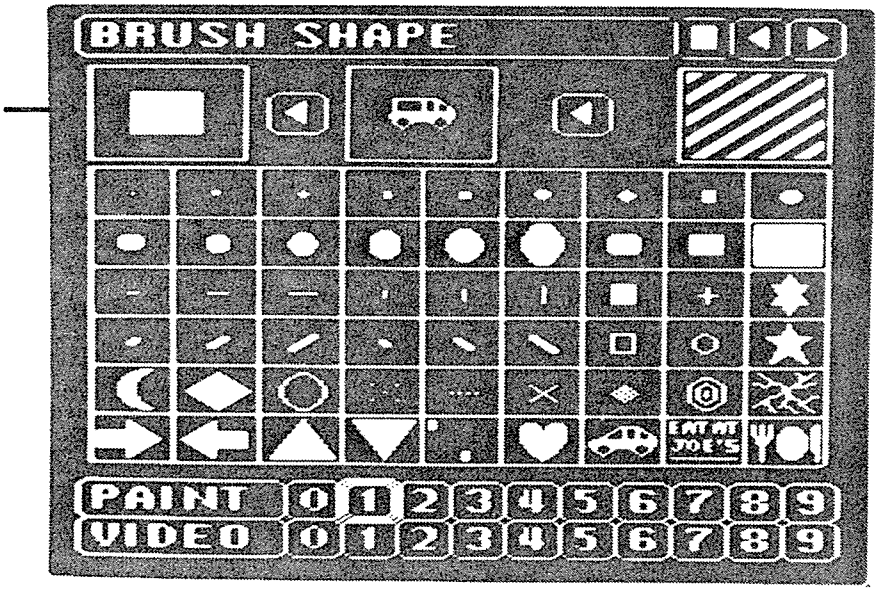
To return to *previous* menu, move cursor to ▢ or to here, or press **DRAW** button (doubles as **PREVIOUS menu button).**



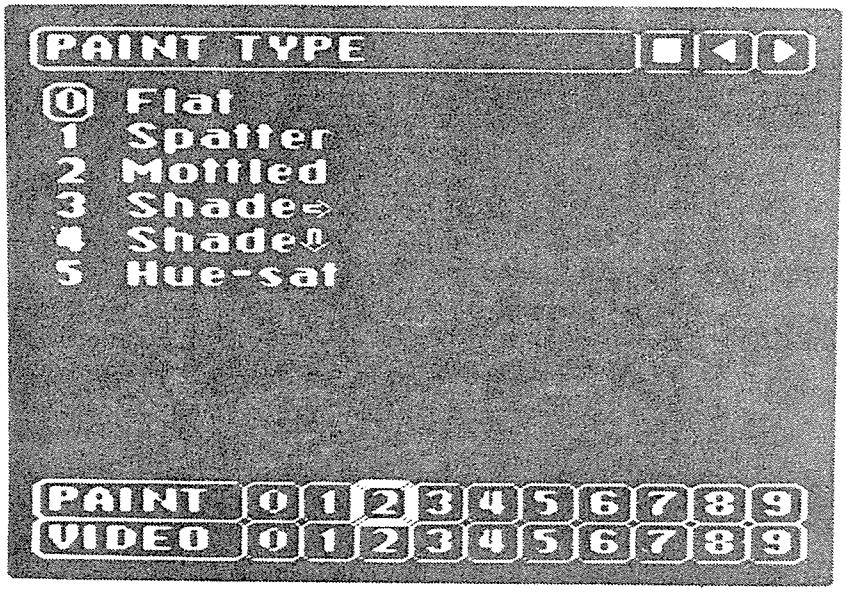
New **Brush shape** is displayed in *selected* **Brush shape** area and *user-defined* **Brush shape** area.



Here another **Brush shape** has been selected for drawing. Note that *user-defined* **Brush shape** is still available for use. Just move it into the *selected* **Brush shape** area by moving cursor here.



PAINT TYPE MENU



This menu selects how the **colour depth** or **transparency** varies across the surface of the **Brush shape** as it is drawn. This gives approximate simulations of different types of painting media as flat acrylics (**Flat**), crayons (**Mottled**), and airbrushes (**Shade**).

0) Flat: The simplest paint type. All of the area covered by brush movement will have consistent colour depth, that which is specified by the COLOUR DEPTH slider.

1) Spatter: This selection will leave a spattering of random dots in the drawn areas.

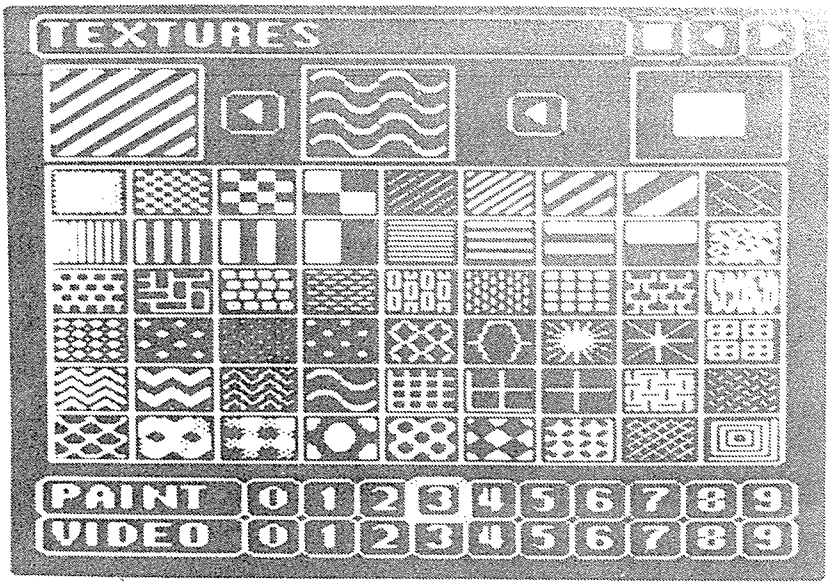
2) Mottled: Provides a mottled effect: the lines drawn will have random colour depth variations over the width of the brush, providing an irregular appearance.

3) Shade→: The left hand side of the brush will have full intensity colour, which will decrease across the **Brush shape** to the right hand side, which will have minimum intensity.

4) Shade↓: The top of the brush will have full intensity colour, which will decrease down the **Brush shape** to the bottom, which will have minimum intensity.

5) Hue-Sat: This paint type is different from the others, in that it ignores any colour specified by the HUE, SATURATION and VALUE sliders, and replaces it with a colour which is dependent upon the position of the point drawn to the screen. The replaced colour is of varying hue and saturation, but always has full value (brightness). COLOUR TYPES are still active, which can further modify the colour that **Hue-sat** selects. The FAIRLIGHT logo that appears when the CVI is first switched on is an example of the **Hue-sat** paint type.

TEXTURE MENU



The TEXTURE menu allows you to select from a choice of 54 **Textures**. As well, you may create your own **Texture**, or use any of the **Brush shapes** from the BRUSH SHAPE menu (Paint Menu 1) as a **Texture**.

To use a texture while drawing, press the USE TEXTURE button. This applies to drawing on the field store (press DRAW COLOUR button) or drawing on the stencil (press DRAW STENCIL button) or both. Textures may be 'wiped' over all or part of the screen by selecting **Texture** in the COLOUR WIPES menu. Likewise, **Texture** can be selected in STENCIL WIPES to cover the stencil plane with a pattern.

Note that the TEXTURE menu is connected to the BRUSH SHAPE menu via the large top right hand box. This means that you may use any of the 54 **Brush shapes** as a **Texture**. A similar facility exists in the BRUSH SHAPE menu, allowing any **Texture** to be used as a **Brush shape**.

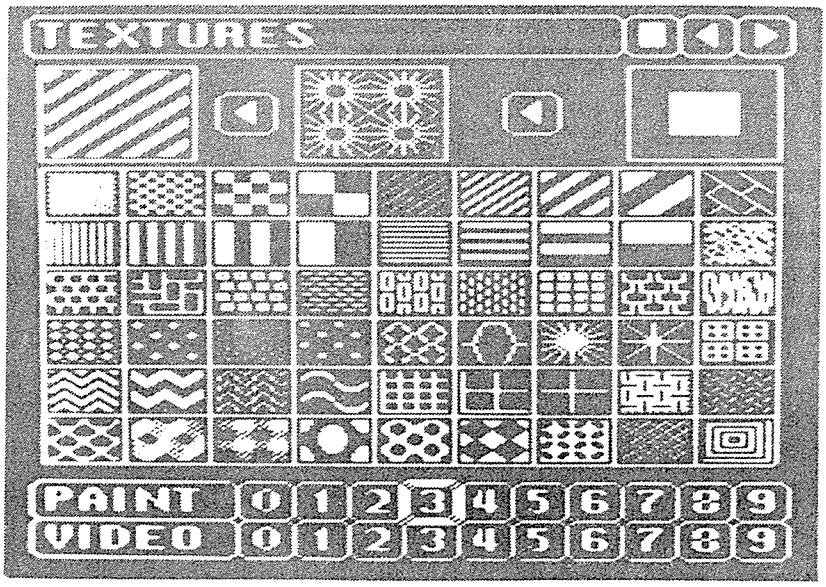
NOTE:

1) When wishing to draw or paint with **Texture** ensure that USE TEXTURE button is **On**.
2) If drawing with **Texture** (or without texture) DRAW or DRAW LOCK must also be **On**.
3) To wipe the field store with a texture, **Texture** must be selected on COLOUR WIPES Menu. Press WIPE COLOUR button.
4) To wipe the stencil plane with a texture, **Texture** must be selected on STENCIL WIPES Menu. Press WIPE STENCIL button.

TEXTURE MENU

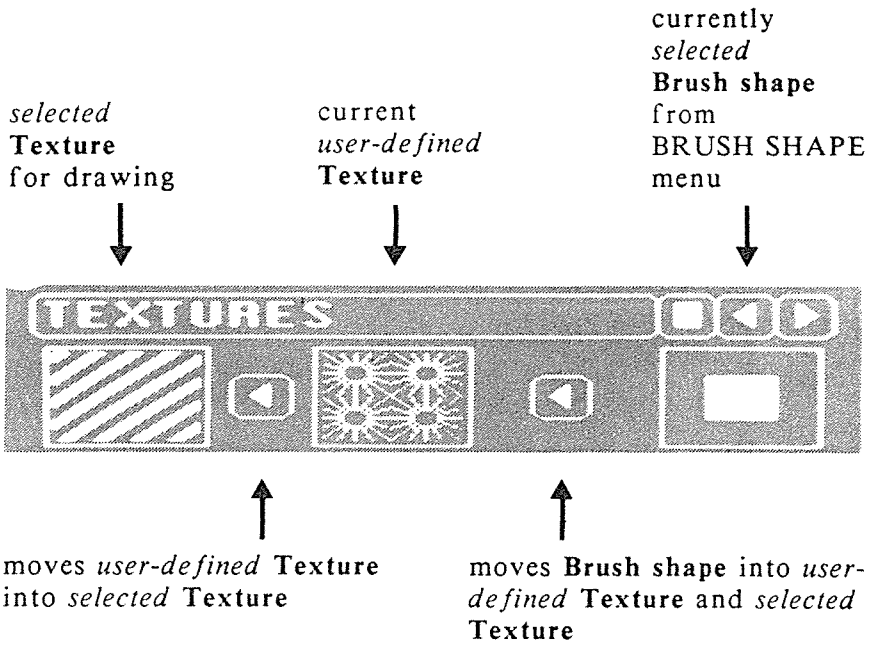
To select a predefined Texture ...

selected **Texture** appears here

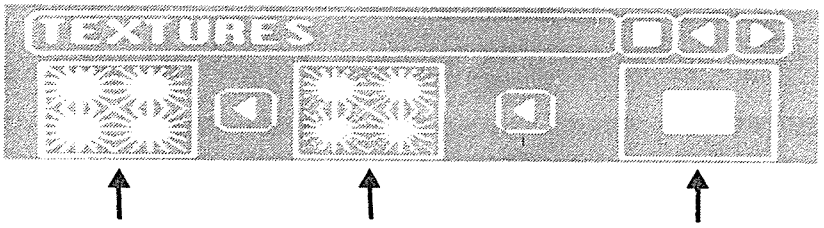


move cursor to any of these patterns and lift stylus

Further Textures are selected in the following way ...



Further functions of the TEXTURE menu are ...

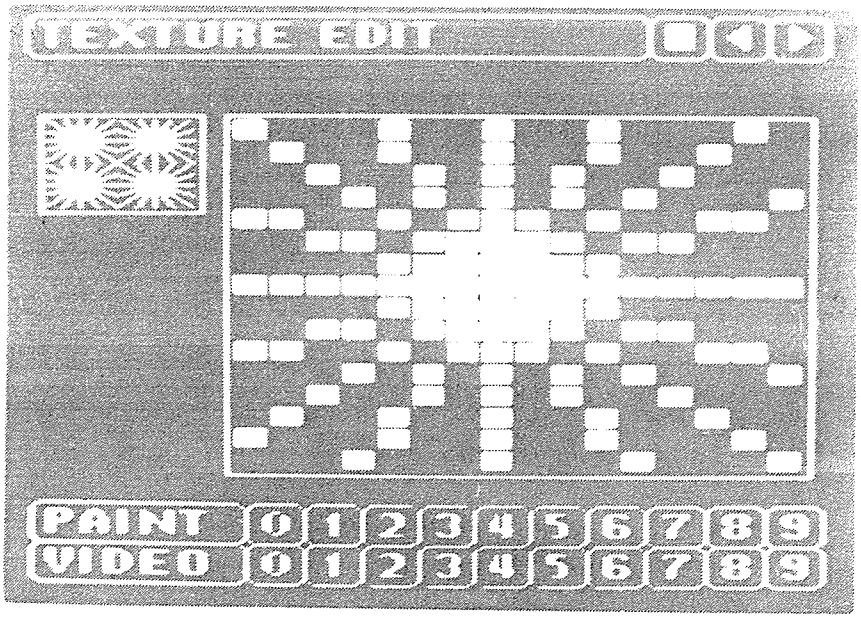


move cursor here to edit **Texture** - menu will change to this

move cursor here to edit **Texture** - menu will change to this

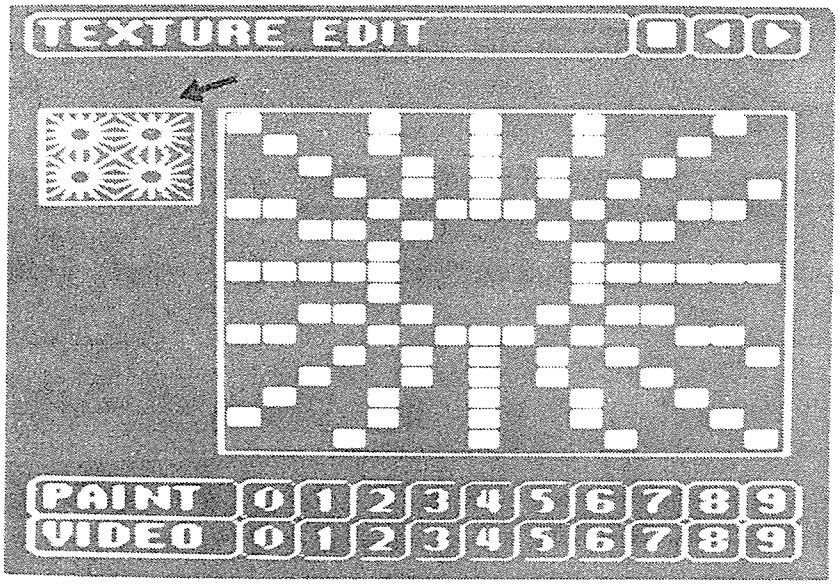
move cursor here to jump to BRUSH SHAPE menu (to change current brush)

Position cursor anywhere in this area and lift stylus. A dot will either appear or disappear. Build up a new **Texture shape** for painting. The new **Texture shape** will appear here in actual size, as you build it.

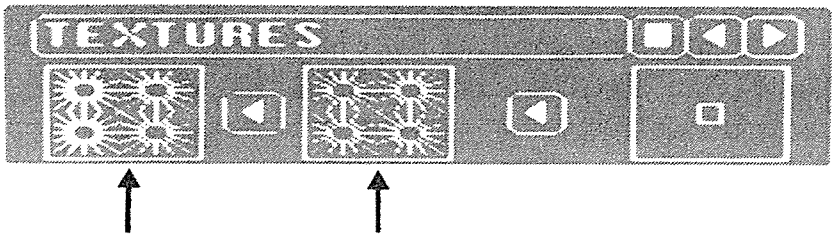


TEXTURE MENU

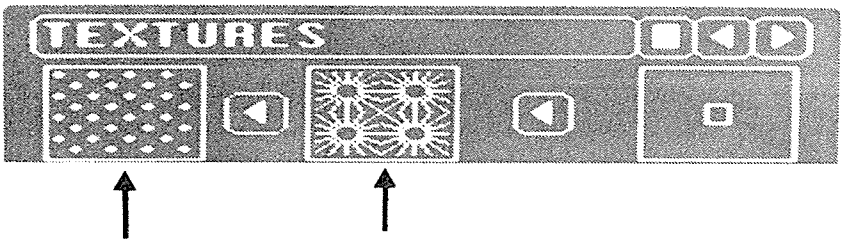
A new **Texture**
has been built up.



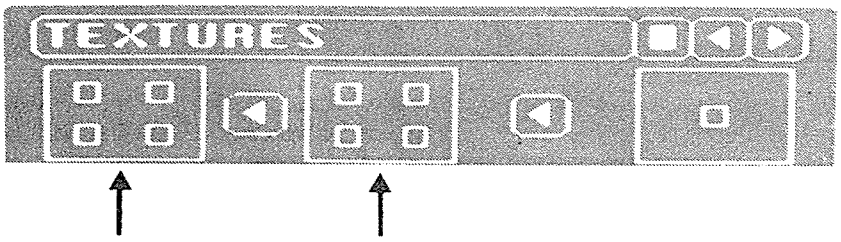
To return to *previous* menu
move cursor to ◀
or to here
or press DRAW button
(doubles as PREVIOUS menu
button).



New **Texture** is displayed in *selected* **Texture** area and *user-defined* **Texture** area.



Here another **Texture** has been selected. Note that *user-defined* **Texture** is still available for use. Just move it into the *selected* **Texture** area by moving cursor here.



In this example the current **Brush shape** has been moved into *selected* and *user-defined* **Texture area.**

COLOUR CONTROL

The COLOUR CONTROL menu determines what controls the colour that you draw with or use for **Colour wipes.**

0) Hue, Sat., Value: The standard selection for COLOUR CONTROL. The colours you use and see are controlled by the H.S.V. slider controls in the normal fashion.

1) Music: Colour is controlled by music (audio input required). This selection overrides the H.S.V. sliders.

2) Random: Colour is controlled by an internal fluctuating program. This would be equivalent to randomly moving the H.S.V. sliders around. The RATE 1 slider on the control console controls the *rate* of fluctuation. Note that this selection overrides the H.S.V. sliders.

3) Random B & W: Same effect as **Random** but the result is in black and white.

This section of the menu enables various selections with regard to the use of **stencils** in addition to a selection which enables the use of the BEEPER.

Stencil Draw/Erase: This selection enables the drawing of an internal stencil. If **Stencil Draw** is selected and the DRAW STENCIL button is activated, an internal stencil can be created by drawing on the GRAPHICS PAD or by using one of the **Stencil wipes.**

If **Stencil Erase** is selected, areas of a stencil already created can be erased, either by use of the GRAPHICS PAD or a STENCIL WIPES menu selection.

The **Stencil Draw/Erase** selections are used in conjunction with the DRAW STENCIL, USE STENCIL and INVERT STENCIL buttons and the STENCIL WIPES menu.

Stencil Hide/Show: If **Stencil Hide** is selected any internal stencil will not be seen. There may be circumstances when you require this stencil *indicator* to be **Off**, for instance, if you are recording an effect which involves the actual process of stencil drawing.

Alternatively if the **Stencil Show** selection is made then the areas where the stencil is **On** become brighter than those areas where it is **Off**, provided that the DRAW STENCIL button is activated. This indicator should normally be **On** whenever you wish to draw on the stencil plane, otherwise it will be difficult to determine what you are drawing.

Draw Over/Under: The **Draw Over** will not activate stencils as protected areas. This selection may be useful if, for example, a stencil area is activated with the USE STENCIL button while using the **Paint/Analog** selection in the DISPLAY CONTROL menu. Where the stencil is activated to determine paint and video areas within one image, the stencil activated paint display can be updated with further painting actions, even though USE STENCIL is **On**.

Beeper Off/On: If this selection is **On**, the CVI's inbuilt BEEPER will sound to signify that a function is complete or that a cue point has been reached in the **Sequencer**.

COLOUR TYPE MENU

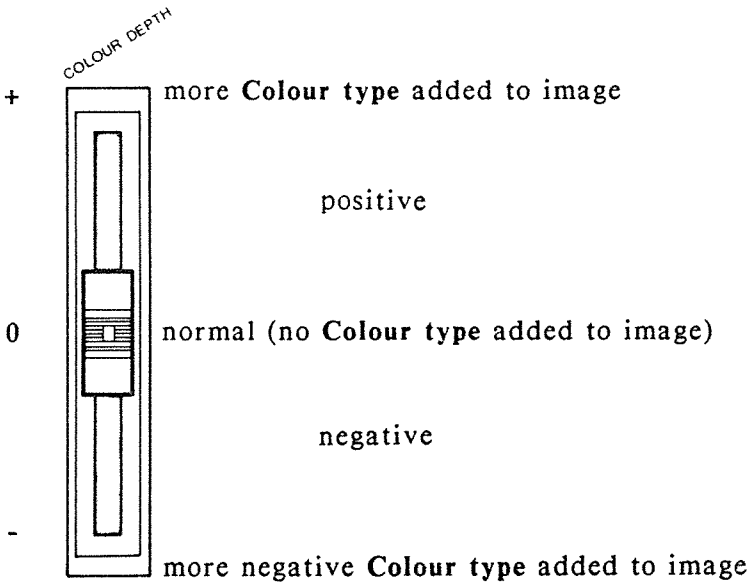
This menu defines the way that the colour you draw with affects or *combines with* the colour on the screen. This is like specifying whether paint is to be **Opaque** or **Translucent**, except that this menu allows an extra range of options beyond those encountered in traditional media. Interactions between the 'paint' and the existing image that cannot readily be described in words are easily achieved. For this reason, experimentation is probably the best method to find out what the **Colour Types** do.

This menu allows you to make one selection at any one time. **Colour type** selections are closely related to **Colourize type** selections. See Section 3 - COLOURIZE TYPE menu. **Colourize types** affect the whole digital image in real time. **Colour types**, however, apply only to still images in the field store, and occur as you draw on the screen or wipe the screen with certain **Colour Wipes**.

Any combination of **Colour types** may be used in a single image (though one at a time), in differing or overlaying areas of the screen. The effect of various **Colour types** on a drawn line or filled area can be explored by using the corresponding **Colourize type** to colourize the entire image without making a permanent change (a colourized image reverts to the original if the COLOURIZE button is turned **off**.)

COLOUR TYPE MENU

NOTE: The COLOUR DEPTH slider will affect the amount of COLOUR TYPE that is added to the image as shown below. Set at the middle (zero) position will be no effect on the image.



0) Opaque: Specified colour replaces the colour on the screen. This is the only colour type which is unaffected by the COLOUR DEPTH slider.

1) Tint: The colour you draw with is added to, or subtracted from the colour you are drawing over, to the extent specified by the COLOUR DEPTH slider. This gives an effect somewhat similar to transparent inks. This is the most subtle of the colour types, and very fine control of colour is available.

2) Translucent: The colour you draw with is mixed with the existing screen colour to the extent that you specify with the COLOUR DEPTH slider. This colour type is similar in effect to watercolours, e.g. Red over yellow yields an orange mix.

3) Shade: This colour type is related to **Tint**, in that the colour you draw with is subtracted from the screen colour.

4) Range: Line drawing on screen specifies the maximum brightness possible, for example:
a) If drawing with the H.S.V. and COLOUR DEPTH sliders on bright red (all three H.S.V. at top) only the *red* component of the colour that was already on screen would remain *after* the line drawing.
b) If drawing with a *white* line the line will have no effect.
c) If drawing with *black*, all you draw will be black, because black is the "brightest" colour that will remain.
d) If drawing with *yellow* - the yellow component of what is on screen will remain after the line is drawn.

5) Solarize: This colour type is somewhat similar to **Shade**, but the colour changes are somewhat more complex, and usually more aesthetic. See the note at the end of this section.

6) Monochrome: Whatever you draw will be monochromatically tinted by the colour you specify with the H.S.V. sliders. The hue component of the existing picture is removed and only the *tonal* value (black, grey and white) information is used. This tonal value is then tinted by the selected colour.

7) Contour: This colour type is basically a form of posterizing. The component (red, green and blue) colours of the HUE, SATURATION, VALUE selection will determine the degree of posterizing in the corresponding component colours of the resultant image. See the note at the end of this section.

8) Spectrum: This colour type converts the *intensity* of the original image into the *hue* of the result. This hue is offset by the HUE specified by the H.S.V. sliders, the SATURATION slider makes the result pastel, if down from maximum, and the VALUE slider affects the variety of colours on the screen. The COLOUR DEPTH slider affects the degree in which the original image is changed. See the note below.

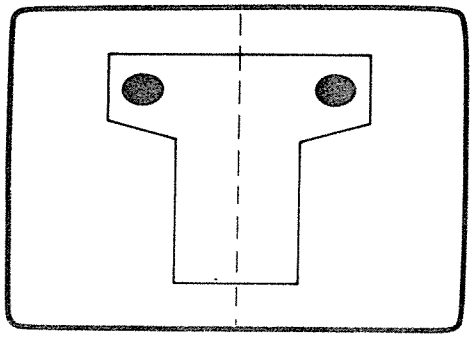
NOTE:Colour types Solarize, Range, Monochrome, Contour and Spectrum are best put to advantage when used in conjunction with the colour wipes Wipe→, Wipe ↓ or Fill, with an appropriate masking pattern on the stencil plane.
A Colour wipe will effectively be the same as colourizing the portion of the screen image that you have specified with the stencil, with the Colour type that you choose. See the COLOURIZE TYPE menu section for more information.

SYMMETRY MENU

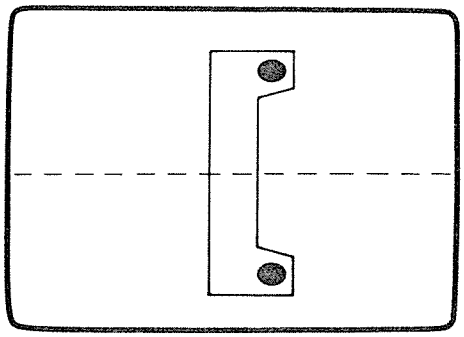
This menu enables you to specify symmetries for use with the drawing facilities. These symmetries are generated as the line is drawn to the screen. Every point drawn will simultaneously appear in the selected rotations or reflections. The axis of reflection or centre of rotation is always at centre screen, irrespective of pan position. This enables you to create an image with multiple centres of rotation and reflection, by panning the image so that a new point is at centre screen. The SYMMETRY menu does not apply to real-time images: for live symmetries see **Vertical** and **Horizontal mirror** in the SCREEN CONTROL menu.

0) Off: No symmetry axis used - draws directly at the stylus position. This is the normal selection.

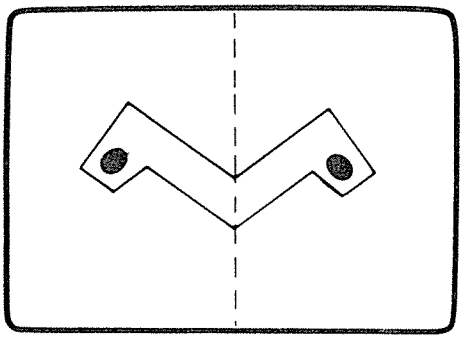
I) Horizontal: Reflection in a vertical 'mirror', creating two images as one is drawn.



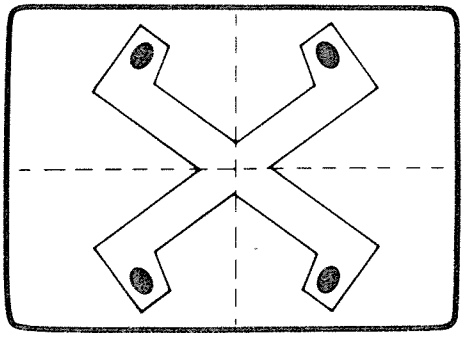
2) Vertical: Reflection in a horizontal 'mirror', creating two images as one is drawn.



3) Flip: Reversal around the vertical centre line. Note that the original line position is not drawn, only the 'reflected' line. This can make it a little confusing to draw with. This selection is more applicable to the **Copy** Paint Method, and the **Change** Colour Wipe, giving a single reversed copy.

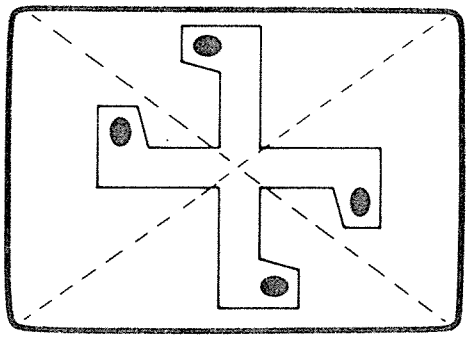


4) Cross: A combination of horizontal and vertical reflections, giving four images as one is drawn.

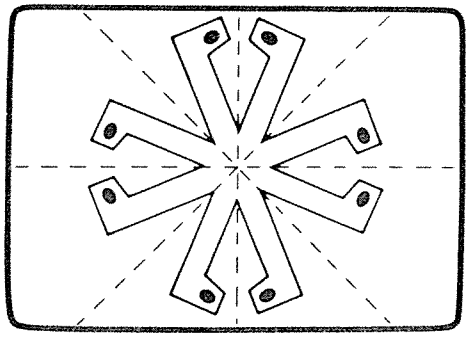


SYMMETRY MENU

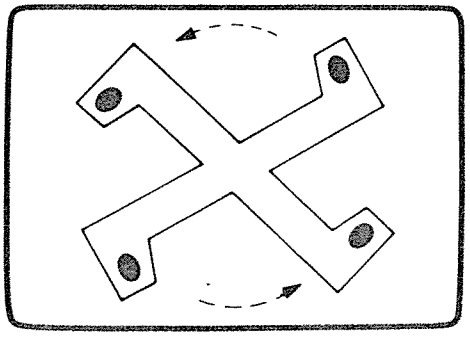
5) Diagonal: Reflection in both screen diagonals, giving four images, with a diagonal skew.



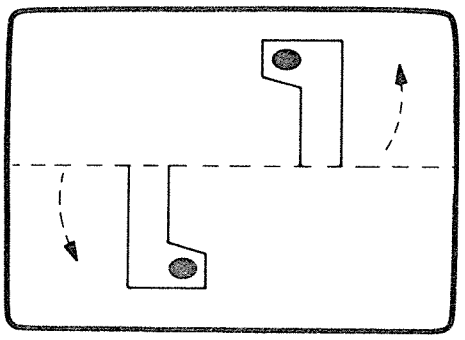
6) Kaleidoscope: A combination of cross and diagonal symmetries, giving a total of eight copies of each drawn point. Note that this symmetry in particular may be very slow, especially when used with large **brush shapes**.



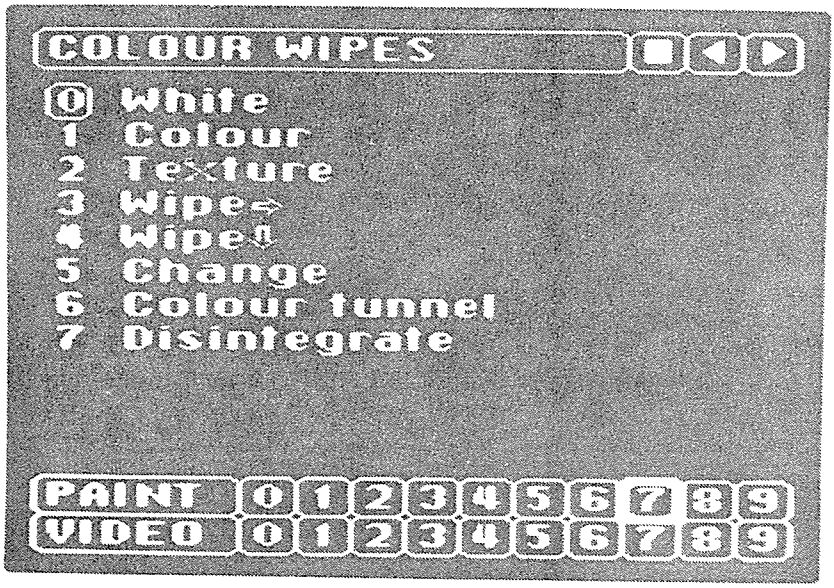
7) Rotary: 90 degree rotation around the current screen centre, giving four images.



8) Spin: 180 degree rotation around the current screen centre, giving two images.



COLOUR WIPES



Colour wipes are processes that affect the contents of the field store. Pressing the WIPE COLOUR button when an image is displayed on the screen will activate the selected colour wipe function. The light in the WIPE COLOUR button will go out as soon as the colour wipe is completed. You may cancel the wipe before it finishes by pressing the STOP button.

COLOUR WIPE

0) White: Clears the screen instantly to a blank white image.

How it is done

a) Select **White** in COLOUR WIPES menu.
b) Return to image.
c) Press WIPE COLOUR button.
d) The screen will be instantly cleared to white.

COLOUR WIPE

1) Colour: Clears the entire screen instantly to the colour specified by the H.S.V. sliders.

How it is done

a) Select **Colour** in COLOUR WIPES menu.
b) Return to image.
c) Press the WIPE COLOUR button.
d) The screen will be instantly cleared to the colour specified by the H.S.V. sliders.
e) Adjust the H.S.V. sliders and press the WIPE COLOUR button again to obtain the desired colour.

NOTE: The screen colour and the drawing colour will now be the same. The cursor and any lines drawn will not be visible (as they will be the same colour as the background) unless the colour is changed.

2) Texture: Wipes the screen using the **Texture** selected on the TEXTURES menu. The colour is specified by the H.S.V. sliders, and the selected **Colour type** is also used. If the USE STENCIL button is **on** and the **Draw Under** selection is made in Paint Menu 4, then only the area unprotected by the stencil is wiped. Altering the H.S.V. sliders during the wipe will change the colour of the texture written, giving a blended effect. The wipe moves across the screen from left to right and takes about four seconds to complete, depending on which **Colour type** and **Texture** functions are used.

a) Select **Texture** in COLOUR WIPES menu.
b) Select the desired **Texture** in the TEXTURES menu.
c) Return to image.
d) Press WIPE COLOUR button.
e) The texture will be wiped over the screen.

COLOUR WIPES

COLOUR WIPE

3) Wipe→: Wipes the screen from left to right. The colour is controlled by the H.S.V. and COLOUR DEPTH sliders. Altering the H.S.V. sliders during the wipe will result in a colour blend, with vertically orientated bands of colour. The **Colour type** selection is used, so the colour wipe is not necessarily opaque, but may subtly or drastically alter the existing image on the screen.
Wipe→ can be applied to only a portion of the screen if desired, by using the stencil to protect the areas you wish unchanged.

How it is done

a) Select **Wipe→** in COLOUR WIPES menu.
b) If only a portion of the screen is to be cleared, first generate the stencil using DRAW STENCIL and/or STENCIL WIPES. Ensure that the USE STENCIL button is on, and that **Draw Under** is selected in Paint Menu **4.**
c) Return to image.
d) Press WIPE COLOUR button.
e) The screen will be wiped with the specified **Colour** and **Colour type.**
f) You may change the colour as it is being wiped.

4) Wipe ↓: This function is identical to **Wipe→** except the direction of the colour wipe is from top to bottom of screen, resulting in horizontal bands of changing colours if the H.S.V. and COLOUR DEPTH sliders are altered during the wipe process.
This wipe is useful for backgrounds - the horizontal banding evident with moving the H.S.V. and COLOUR DEPTH sliders, creates a basis for landscapes and abstract visuals.

Same as **Wipe→** above.

5) Change: Reads the screen colour and writes it back to the screen during the wipe, replacing it with new information depending on which **Colour type, Colour depth, Texture, Symmetry** or **Stencil** is used. You may have an image that you like, but wish to change it into a new image based on the old one. You may adapt it, using this colour wipe. Time taken to complete a **Change** wipe depends upon the symmetry chosen, and varies from 6 to 60 seconds.

NOTE: The H.S.V. sliders are not used for this wipe. COLOUR DEPTH may be adjusted, however, to control the colour mixing on the screen.

a) Select **Change** in COLOUR WIPES menu.
b) Select the desired **Symmetry** and **Colour type** from the menus.
c) Return to image.
d) Press WIPE COLOUR button.
e) The wipe will commence. The wipe may be stopped at any time by the STOP button.

COLOUR WIPE

How it is done

6) Colour Tunnel: Provides a continually changing background that 'radiates' out from screen centre.

a) Select **Colour Tunnel** in the COLOUR WIPES menu.
b) Return to image.
c) Press WIPE COLOUR button.
d) A pattern will be written into the field store. This will take approximately 3 seconds to complete. After this, the current colours, as determined by the COLOUR CONTROL menu, will begin 'radiating' out from the centre of the screen.
e) Press STOP to terminate the process.
f) The PAN, ZOOM and STRETCH sliders will adjust the **Colour Tunnel** on the screen.

7) Disintegrate: This selection writes random dots to the field store continually, until the STOP button is pressed. The dots are written in the current colour, which may be changed during the wipe by changing the H.S.V. and COLOUR DEPTH sliders. The COLOUR TYPE menu determines the way the random dots interact with the colours already present on the screen. Subtle mottlings can be achieved by using **Translucent** or **Tint** colour types with a low setting on the COLOUR DEPTH slider. Portions of the screen can be protected from 'disintegration' by using the stencil in the normal fashion.

a) Select **Disintegrate** in COLOUR WIPES menu.
b) Return to image.
c) Press WIPE COLOUR button.
d) Random dots will appear on the image in the **Colour, Colour type,** and **Colour depth** selected.
e) Press STOP to terminate the process.

STENCIL WIPES

Stencil wipes alter what is on the **stencil plane**. The stencil plane is an internal digital control image (equivalent to a 'key' or 'matte' in some applications) with multiple uses. The **Stencil wipes** are similar to the **Colour wipes**, in that they affect the entire screen, with the difference that the stencil wipes are applied to the **internal stencil plane** instead of the **field store**.

Whatever is selected on the above menu is implemented when the WIPE STENCIL button is pushed. The light in the WIPE STENCIL button will go **On** when the button is pressed, and will go **Off** when the stencil wipe is complete. For the wipe to have an observable effect, the STENCIL SOURCE menu must be set to either **Internal** or **Under-over**, and the USE STENCIL button must be on. The wipe may be stopped at any stage by pushing the STOP button.

The **Stencil Draw/Erase** selection in Paint Menu **4** is very important to the stencil wipes. If this is set to **Draw**, a stencil wipe will usually clear the stencil instantly to **Off**, then turn the stencil **On** as required. If it is set to **Erase**, a stencil wipe will usually clear the stencil to **On** then erase the stencil as required. If the INVERT STENCIL button is on, the stencil polarity will flip. The details are given for each wipe below.

The functions of the various stencil wipes selections are easily examined by enabling the **Stencil Show** selection in Paint Menu **4**.

STENCIL WIPE	How it is done
0) Clear: Instantly clears the stencil plane to the polarity specified by the **Stencil Draw/Erase** menu selection.	a) Select **Clear** in STENCIL WIPES menu. b) Return to image. c) Press WIPE STENCIL button. d) The entire stencil plane will be instantly cleared to either **Off** or **On**, corresponding to **Stencil Draw** or **Stencil Erase** in Paint Menu **4**.
1) Texture: Will place whatever texture is selected on the TEXTURE menu over the entire stencil plane from the left to the right. Takes approximately 5 seconds to complete.	a) Select **Texture** in STENCIL WIPES menu. b) Select the desired **Texture** in the TEXTURES menu. c) Return to image. d) Press WIPE STENCIL button. e) The **Texture** will be wiped over the stencil from left to right, taking about 5 seconds. The polarity of the textured stencil depends on the **Stencil Draw/Erase** selection in Paint Menu **4**.
2) Wipe →: First clears the stencil plane instantly, and then performs a slow (4 second) Stencil Wipe from left to right. The stencil advances exactly one line every field, so may be used for slow-scan effects or for horizontal wipes between two images.	a) Select **Wipe→** in STENCIL WIPES menu. b) Return to image. c) Press WIPE STENCIL button. d) The stencil will be cleared in the display area, then turned **On** or **Off** (depending on the **Stencil Draw/Erase** selection), progressing from left to right.
3) Wipe ↓: This stencil wipe is identical to **Wipe→**, except that the stencil wipe is from top to bottom of the screen.	Same as **Wipe→**.

STENCIL WIPES

STENCIL WIPE

How it is done

4) Invert: This wipe inverts the internal stencil. It takes approximately 8 seconds to complete, and wipes from left to right. This wipe is useful in conjunction with **Under-over** effects (see STENCIL SOURCE menu), as it allows inversion of only the internal stencil portion of a combined **Internal** and **Chroma-key (Under-over)** stencil. It can also be used in similar ways to **Wipe➡**.

a) Select **Invert** in STENCIL WIPES menu.
b) Return to image.
c) Press WIPE STENCIL button.
d) The wipe will progress from left to right.

5) Edge Detect: This stencil wipe enables you to detect any significant change in colour or intensity in the image. Wherever a change in colour over the screen occurs, the stencil is turned on, producing an 'edge'. This can delineate objects in a frozen or drawn image, and ease the task of defining areas for copying, filling, protection, and so forth. The existing stencil is first cleared instantly.

a) Select **Edge detect** in STENCIL WIPES menu.
b) Return to image.
c) Press WIPE STENCIL button.
d) Edge detection will occur over about 5 seconds, from left to right. The stencil will be turned **On** or **Off** where an edge is detected, depending on the **Stencil Draw/Erase** selection in Paint Menu **4**.

6) Colour Detect: This wipe enables you to select a narrow range of colours to be stencilled, centered around the colour that you specify with the stylus.

a) Select **Colour detect** in STENCIL WIPES menu.
b) Return to image.
c) Press WIPE STENCIL button.
d) The stencil will be cleared.
e) Stylus on GRAPHICS PAD: a cursor displaying **stencil=>** will appear on screen.
f) Move the cursor arrow tip to the colour that you want detected on screen.
g) Lift the stylus: all occurrences of this colour and similar colours will be detected, and the stencil will be turned **On** or **Off** in these areas (depending on the **Stencil Draw/Erase** selection in Paint Menu **4**). This wipe takes approximately 6 seconds to complete.

How it is done

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DISPLAY
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a) Select **Disintegrate** in STENCIL WIPES menu.
b) Return to image.
c) Press WIPE STENCIL button.
d) The stencil is wiped in the display area, then random dots will gradually fill the stencil plane. The polarity of the dots is determined by the **Stencil Draw/Erase** selection in Paint Menu **4**.

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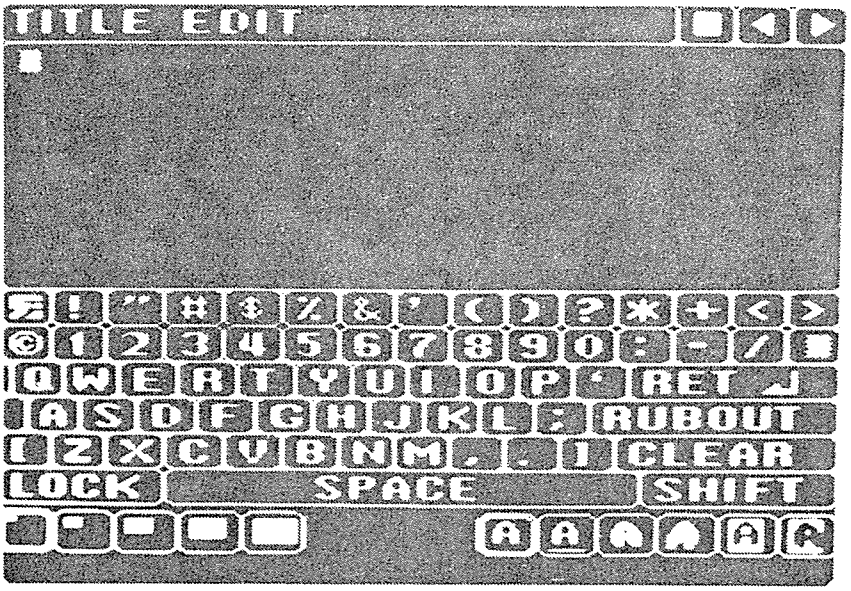
each
Window stencil

a) Select **Window** in STENCIL WIPES menu.
b) Return to image.
c) Use the PAN, ZOOM and STRETCH sliders to select the area or **Window** in which the stencil is to be wiped.
d) Press WIPE STENCIL button.
e) The stencil in the area selected in step c) is cleared instantly to **On** or **Off**, depending on the **Stencil Draw/Erase** selection in Paint Menu **4**.

TITLE EDIT MENU



This menu allows titling, with up to 7 lines of text, with both upper and lower case. It features a *"QWERTY"* alpha-numeric keyboard layout on screen.

Other features of TITLE EDIT include five character sizes, character underline, two types of drop shadow, background and background with drop shadow.

Select characters from the on-screen keyboard by moving the cursor over the desired character and lifting the stylus. The character will appear in the large box above the 'keyboard'.

Text will appear in lower case unless **SHIFT** (or **SHIFT LOCK**) is selected prior to character choice.

- if **LOCK** is on, all subsequent characters will remain in upper case, until **LOCK** is turned off again.
- if **SHIFT** is on, the first character chosen will be in upper case, and subsequent characters will be in lower case.

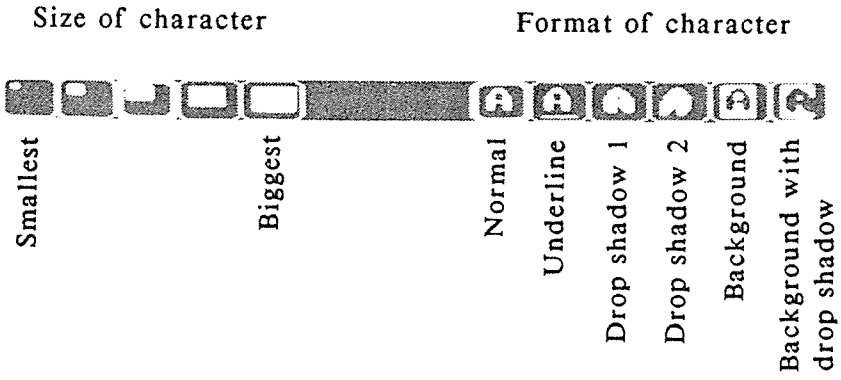
Some other functions are:
SPACE BAR Inserts a space in the text.

RUBOUT Deletes the last character (including carriage returns).

RET Returns 'carriage' to the start of the next line.

CLEAR Erases the whole title so you may start afresh. CLEAR must be selected *twice*: first time illuminates the CLEAR box, second time actually clears the title. This is to prevent accidental erasure.

The bottom row of boxes affect characters in the following way:



Characters may be mixed in any combination of size and format.

Points to note with **Character size** are:

i) a big size character will not appear in the titling if there is not enough space left for it, even though a smaller character will fit.

ii) a big size character can be partially overwritten by the next line of text. This may be desirable. However, to prevent this, insert enough **RET**s (carriage returns) so that the next line of text is lower than the previous line.

Points to note with **Format** selection are:

i) **Underline** will continue until de-selected (select normal)

ii) **Drop shadow** puts a black shadow behind the character

iii) **Background** puts a block behind the character in the complement of the colour of the title (for example, a green character will have a purple background)

iv) **Background with drop shadow** combines features of ii) and iii) above.

v) All titles can appear with **paint crawl** by selecting **Crawl**, **Trail Crawl** or **Crawl/Analog** in DISPLAY CONTROL menu, before implementing title.

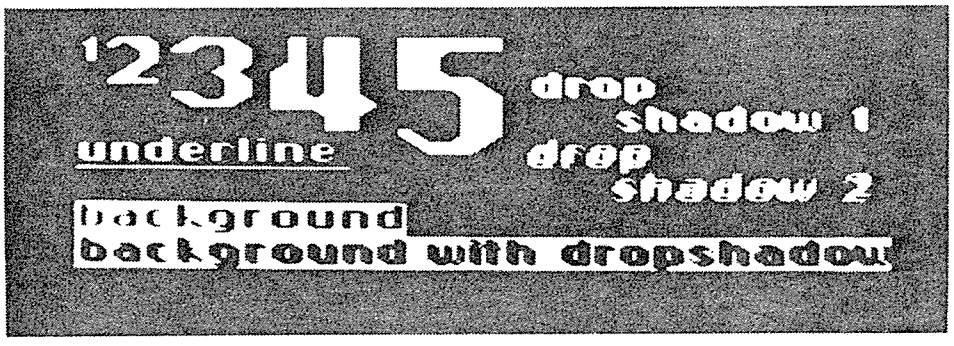
TITLE EDIT MENU

Procedure for titling:

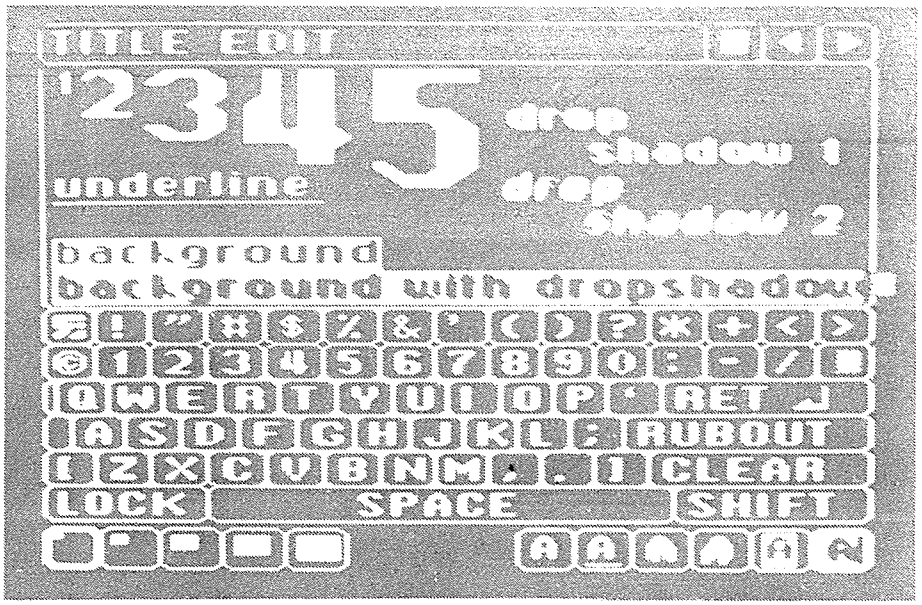
a) Create the text using the TITLE EDIT lower case menu.
b) Return to screen image by pressing STOP button.
c) Press the TITLE button.
d) Press stylus on the GRAPHICS PAD - the word **title** will appear as the cursor on the screen. The top left-hand corner of this word is where the titling will start. Move the **title** cursor to design position. H.S.V. sliders may be adjusted at this stage. The cursor will show selected colour.
e) Lift stylus from the GRAPHICS PAD. Your titling will appear on the image.

1) The title function automatically turns on the DRAW COLOUR button. If you wish to draw only to the stencil plane, and not to the field store, turn **Off** DRAW COLOUR and ensure DRAW STENCIL is **On**. The DRAW STENCIL button controls whether the title is written to the stencil plane. A title can be written to both planes simultaneously. If neither button is on, the title will not appear.
2) As the title is written to the digital field store, if the field store is not being displayed the title will not be seen. This can happen for various display selections (see DISPLAY CONTROL menu). Titles can be displayed over live video (analog or digital) by writing the title to the stencil plane as well as the field store and making an appropriate selection in the DISPLAY CONTROL menu. See the PRESETS section for more information.

Here's how the various sizes and formats look ...



This example
uses everything.
The sequence for
creating it was ...



Select SIZE 1
"1"
Select SIZE 2
"2"
Select SIZE 3
"3"
Select SIZE 4
"4"
Select SIZE 5
"5"

RET
SPACE BAR 5 times
Change to SIZE 1
SPACE BAR once
Select DROP-SHADOW 1
"drop"
RET

SPACE BAR 24 times
"shadow"
SPACE BAR
"1"
RET

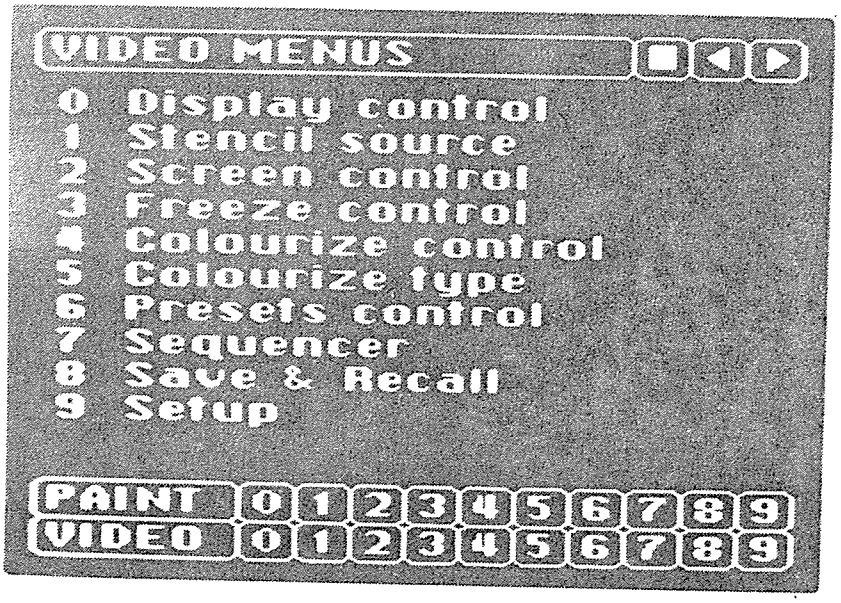
Select UNDERLINE
"underline"
Select DROP-SHADOW 2
SPACE BAR 9 times
"drop"
RET

SPACE BAR 25 times
"shadow"
SPACE BAR
"2"
RET

Select BACKGROUND
"background"
RET

Select BACKGROUND with DROP-SHADOW
"background"
SPACE BAR
"with"
SPACE BAR
"dropshadow"

VIDEO MENUS



The VIDEO MENUS control aspects of live video. It is thus essential to have at least one video input connected. For best results use RGB (Red-Green-Blue) inputs and outputs. We also recommend the use of a chroma-key blue backdrop in the studio, as many CVI effects require it. (See Section 1 - CONNECTING THE CVI.)

The VIDEO MENUS menu is a list of the available menus in the live video control category. There are some areas where a VIDEO menu has a direct equivalent in the PAINT menus, for example COLOURIZE TYPE (VIDEO) and COLOUR TYPE (PAINT).

These menus can be selected by the means outlined in Section 1 under 'MENUS - What are they?'.

VIDEO MENUS

0) Display Control: Defines what is displayed in regions where the stencil is either **On** or **Off**.

1) Stencil Source: Defines what source the stencil is coming from - that is, selects what is defining the stencil. This menu also includes VIDEO SOURCE which selects the combination of VIDEO 1 input and VIDEO 2 input that is used.

2) Screen Control: Defines movements and basic changes on the screen, including **Mirrors, Wipes**, Stencil inversion (**Shatter**), and **Pan:Pen, Slide** and **Glide**.

3) Freeze Control: Controls the picture freeze facility.

4) Colourize Control: Determines what is controlling the colour for colourizing. Very similar in concept to the COLOUR CONTROL menu, except that instead of controlling the colour for painting, this menu controls the colour for real-time colourizing.

5) Colourize Type: Defines *how* the colours of the digitized or drawn areas will appear on the screen.

6) Presets Control: Allows the setting, resetting, control and display of PRESETS.

7) Sequencer: Controls the recording, editing and replay of control actions (including PRESET changes, menu selections, drawing functions, and controls changes) so that a series of events may be controlled, refined, and reproduced at will.

8) Save and Recall: Controls the digital storage and retrieval of picture and CVI setup information onto video tape or video cassette.

9) Setup: Allows the setup of chroma key parameters as well as external monitors. It contains test patterns and colour bars, as well as RS232C port setup. Covers test and setup functions.

DISPLAY CONTROL MENU

The video image you see on the monitor screen may be sliced up into areas that are either *stencilled* or *not stencilled*. When a part of the image is stencilled, it may be treated differently to a non-stencilled area. This allows some rather unique features. For instance, you may protect a stencilled area from being painted over, live video may be directed just to the stencilled area, or the chroma-key facility may be used as a live, moving stencil. The INVERT STENCIL button reverses the sense of which areas are stencilled and which are not. For more information on stencils, see Section 1 under STENCILS - What are they?

The DISPLAY CONTROL menu looks quite different from the other menus. This is because it is a very important menu, determining *what* types of video images appear on the screen. It lets you control which aspects of video are displayed where the stencil is **On** or **Off**. It also determines whether the video input to the Digital Path of the CVI is allowed to update the field store in the stencil **On** or **Off** regions. Of course, you must have a stencil first before this menu will work, so see Section 3 - Paint Menu **8** under STENCIL WIPES and Video Menu **1** under STENCIL SOURCE.

DISPLAY CONTROL has twenty boxes, each with a descriptive name. Each of these boxes selects one type of video image to be displayed where the stencil is **On** and another to be displayed where the stencil is **Off**. Each box also selects whether the video input to the Digital Path updates the field store where the stencil is **On**, where the stencil is **Off** or *both*. (See Section 3 - Video Menu **1** under VIDEO SOURCE, and also Video Menu **3**, FREEZE CONTROL). In addition, some of the boxes in the DISPLAY CONTROL Menu enable some special display functions, such as Colour Crawl and Digital Cascade. These are described below. The current DISPLAY CONTROL selection is illuminated. Only one box may be selected at a time.

Whether the stencil is **Off** or **On** can be determined by enabling the **Stencil Hide/Show** selection in Paint Menu **4**. When you return to the image, areas where the stencil is **On** will be displayed brighter. Areas where the stencil is **Off** will appear normal. References to the Stencil on areas in this description *always* refer to the brightened areas.

Note that the Stencil on and Stencil off regions can be reversed simply by pushing the INVERT STENCIL button. This actually changes the status of the stencil and hence swaps the video displays between the Stencil on and Stencil off areas.

There are three basic image planes which can be displayed in the stencil **On and Off** regions. These are *live analog*, *live digital* and *field store*. The *live analog* video is the video input to the Analog Path of the CVI. This is *not modified* by the CVI at all. The *live digital* video is the digitised video input to the Digital Path. This may be colourized by the CVI. The *field store* is the store in which all painting, freezing, zooming, etc. take place. The field store can be used in a number of ways to give different appearances. For example, live digital video can continually update the field store to give effects such as pixelation or live mirrors; or the field store may be filled, wiped or painted with colour to create a background. See Section 1 - Conceptual Overview for a full description of these three planes.

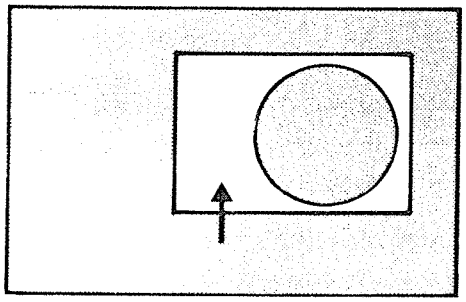
The name in each box gives an indication of what sort of display results ON THE SCREEN. For example, if you select the box called **Paint**, the display will show the *field store* for both stencil **Off** and stencil **On**. Updating of the field store by the incoming video is disabled. Hence **Paint** gives an ideal setup of the CVI for painting or modifying images in the field store, without having to worry about your painting being destroyed by incoming updating video.

As another example, if **Paint/Analog** is selected, then *live analog* video is displayed where the stencil is **Off** and the contents of the field store is displayed where the stencil is **On**. So if you select **Paint/Analog** and draw on the GRAPHICS PAD with both DRAW COLOUR and DRAW STENCIL buttons on, then the stencil that you draw will cause the corresponding parts of the field store to be displayed. This gives the effect of painting over live analog video, as in PRESET **00**.

The display formats and freezing functions associated with each of the boxes in the DISPLAY CONTROL menu are described in detail below. For each selection, a description and some possible uses are given on the left, and the precise details of what is displayed and what updates the field store for the stencil **On** and **Off** areas is given on the right. The suggestions given are by no means the only ways in which you may use the DISPLAY CONTROL selections. The factory PRESETS of the CVI give some further examples. Experimentation with this menu in conjunction with the STENCIL SOURCE, VIDEO SOURCE, SCREEN CONTROL and FREEZE CONTROL menus will yield a huge range of possibilities.

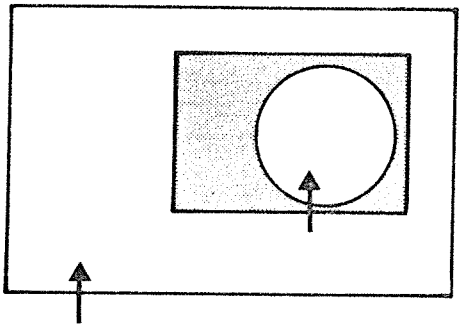
DISPLAY CONTROL MENU

NORMAL STENCIL



STENCIL ON REGION (brighter)
'ON' selection displayed

INVERTED STENCIL



STENCIL OFF REGION (normal)
'OFF' selection displayed

DISPLAY CONTROL functions only take notice of what is on the stencil plane if the USE STENCIL button is **On**. If USE STENCIL is **Off**, then a selection will appear across the entire screen. If the INVERT STENCIL button is **Off** this will be the selection normally displayed in the **Stencil off** regions. If INVERT STENCIL is **On** then the selection for **stencil off** is displayed across the entire screen.

KEY

Analog - Unmodified video from the Analog Path is displayed.
Digital - Digitised video from the Digital Path is displayed. It may be colourized, but not pixelated.
Mix - A 50% mix between the field store and the live video from the Analog Path is displayed.
Cascade - The cascaded output from another CVI.
Store - The field store is displayed. The actual image will depend very much on what source, if any, updates the field store. See under the heading **Update** for each selection.

Image - The video input to the Digital Path updates the field store.
Colour - Flat colour, varied via the COLOUR CONTROL Menu, updates the field store.

NOTE: The field store is updated under the control of the FREEZE CONTROL menu Also, if the FREEZE button is turned **On** the updating of the field store will stop. See Video Menu 3 - FREEZE CONTROL.

DISPLAY CONTROL MENU

Paint: Useful for painting and modifying still or frozen images in the field store. FREEZE, USE STENCIL and INVERT STENCIL will not alter the display. USE STENCIL and INVERT STENCIL will affect the stencil protection function for painting.

Paint/Analog: With **Internal** stencil selected in the STENCIL SOURCE menu, this can be used for painting over analog video. With a **Chromakey** stencil, the keyed image will be superimposed over the field store image. With **Under-over** stencil, a keyed analog image is inserted *into* the field store image using a drawn internal stencil.

Paint/Digital: Digital image is frozen into the field store in the stencil **Off** areas. Can be used effectively with the **Shatter** selection in the SCREEN CONTROL menu to rapidly invert the stencil. Can be used for fully colourized trails.

Trail: Useful with **Chromakey** stencil. If **Digital Path** and **Analog Path** come from the same video source, then the chromakeyed object is frozen into the field store. If the object moves, a sequence of frozen keyed images will cause a trail.

Dig./Analog: The Analog and Digital video paths are displayed in the stencil **Off** and **On** regions of the screen. Field store is updated only in the digital areas. Can be used for partial colourizing of an image.

Colour: **Stencil off** areas of the field store are filled with a colour. When used with **Chromakey** this gives an unusual trail effect. See PRESET 67. With **Internal** stencil it is possible to paint over a changing coloured background.

Display	Update	Display	Update
Store	Off	Store	Off
Store	Off	Analog	Off
Store	Off	Digital	Image
Store	Off	Analog	Image
Digital	Image	Analog	Off
Store	Off	Store	Colour

DISPLAY CONTROL MENU

Store: Digital video updates the field store. On **Continuous** FREEZE CONTROL, the field store may be zoomed to pixelate live images. Draw with stencil to paint over pixelation. Using **Chromakey** gives pixelated trails.

Col./Analog: An analog image can be chromakeyed over a field store filled with colour.

Store/Analog: This allows pixelated and straight Analog video on the same screen. Used with **Strobe** and **Chromakey**, you can produce the "catch-up" effects of PRESET 71. Interesting possibilities with two video sources.

Colour trail: The same principle as **Trail** above is used, except that a splash of the current colour is frozen into the field store behind the keyed analog image. Try various COLOUR CONTROL selections.

Acquire: This may be used with various FREEZE CONTROL selections and **Chromakey** to generate a variety of effects.

Ghost: A double-exposure effect. Use **Chromakey, Strobe** and colourize for a variety of ghostly trails. Turn **Off** USE STENCIL for straight field store and analog video double exposure.

Protect: Here a digital image can be displayed with a field store image without the field store being updated. The field store is protected. Similar in many ways to **Paint/Analog** above, with Digital live image instead of Analog.

Display	Update	Display	Update
Store	Off	Store	Image
Store	Colour	Analog	Colour
Store	Image	Analog	Image
Store	Off	Analog	Colour
Store	Image	Analog	Off
Store	Off	Mix	Image
Store	Off	Digital	Off

Mix: A combination of live analog video with an analog/field store double exposure. Many interesting possibilities for soft pixelation effects.

Live combo: Similar to **Paint/Digital** above, except that the field store cannot be affected. Useful for non-destructive partial colourizations and two-camera effects.

Crawl: The display and stencil setup are exactly the same as for **Paint** above. The difference is that paintings made with the **Crawl** selection will not have constant colour but rather will have colours running continually along the lines. This is called *Colour Crawl.* Colour Crawl can be used on all Paint Methods and with titles. The range of colours which move along the lines can be varied by moving the HUE, SATURATION and VALUE sliders, or by using any of the selections in the COLOUR CONTROL menu. A single painting may contain both *normal* and *Colour Crawl* sections, simply by swapping between **Crawl** and **Paint** in this menu while painting. When **Crawl** is selected only those parts of the image drawn with *Colour Crawl* will crawl.

Crawl/Analog: Exactly the same as **Paint/Analog** above, except that all paintings made under this selection will have *Colour Crawl* active. See under **Crawl** for a description of *Colour Crawl.*

Trail crawl: Exactly the same as **Colour trail** above except that the trail of colour behind the analog chromakeyed image will not simply be stationary, but rather will pulsate with *Colour Crawl.* See under **Crawl** above for a details of controlling *Colour Crawl.*

Display	Update	Display	Update
Analog	Image	Mix	Image
Digital	Off	Analog	Off
Store	Off	Store	Off
Store	Off	Analog	Off
Store	Off	Digital	Image

DISPLAY CONTROL MENU

Cascade: This selection requires the CASCADE OUT of a second CVI to be connected to the CASCADE IN port on the back of this CVI. Where the stencil is **Off**, the digital Cascade output of the second CVI will update the field store and be displayed. Using **Internal** stencil, you may paint over the cascaded image from the second CVI. With **Chromakey** and **Under-over** stencils a variety of complex multi-plane and trail effects can be created. **Cascade** stencil uses the stencil from the second CVI. Note that only the *digital* information is trasmitted via the Cascade connection. Any *analog* component of the image in the second CVI will not be transmitted.

Cas./Analog: The digital Cascade output of a second CVI can be combined with the Analog Path of this CVI. A variety of combinations is possible in conjunction with the STENCIL SOURCE menu. See **Cascade** above for more information on the Cascade function.

Display	Update	Display	Update
Store	Off	Store	Cascade
Cascade	Off	Analog	Off

STENCIL SOURCE MENU

This menu contains two sets of selections.

The top half - STENCIL SOURCE - allows you to select where the stencil comes from.

The bottom half - VIDEO SOURCE - selects which of the two inputs (VIDEO 1 or VIDEO 2) is to be used for digital and analog functions. As well, a BLANKING option for PAL-type CVI's allows suppression of extra lines at the top and bottom of screen.

0) Internal: The normal, internally generated stencil - it is the **Stencil plane** that can be drawn on and wiped. It bears a fixed spacial relationship to the stored digital image in the field store. In other words, there is a pixel to pixel relationship between the field store and the stencil plane, and if the image is panned or zoomed, the stencil will move with it.

1) Cascade: The stencil coming from a second CVI in **Cascade** mode. Instead of using the **Internal** stencil of the CVI, the stencil **Output** from a second CVI (plugged into the CASCADE IN connector of the first) will be used. This selection also enables the external 'key' that may be fed into the STENCIL INPUT to be used.

2) Chroma key: This selects a stencil from the internal chroma key mechanism of the CVI. This means that the stencil is not fixed. It moves with the chroma-keyed image. See Section 2 - VIDEO EXERCISES and PRESETS for information on the applications of the **Chroma key** selection. See Section 3 - SETUP menu for information on adjusting the chroma key colour and threshold levels.

3) Under-over: This selection combines the **Internal** and the Chroma key stencils so that the stencil is determined to be **On** only where *both* the internal and the chroma key stencils are **On**. This allows an external video source to be effectively inserted right into any still image that may be in the field store. This gives a three level *multi-plane* effect within the one CVI. This is one of the most powerful features of the CVI.

NOTE: As this selection uses the chroma key facility, the SETUP menu section should be consulted. Since two stencil sources are combined in **Under-over**, the INVERT STENCIL button will invert the *combined* stencil. If you find that you have drawn the internal stencil in the wrong polarity, it can be inverted in isolation by using the **Invert** selection in the STENCIL WIPES menu.

VIDEO SOURCE

This section of the menu selects which of the two video inputs will be used in the two main video signal paths of the CVI.

The **Digital path** digitizes video input. Therefore, this path may be used to colourize, store, pixelate, etc., the live image. The digital path also includes the **Chroma-key** function, so chroma-keying will be based on the input selected for the **Digital path**.

The **Analog path** is the direct, un-modified video pathway from input to output.

The numbers **1** and **2** correspond to VIDEO INPUTS 1 and 2. Thus either video input may be directed through the **Digital path** or the **Analog path** or both. If the selections made for the analog and digital paths are different, then the resultant image can be a combination of the two video inputs. Some examples of this appear in the PRESETS.

BLANKING

Blanking applies to PAL-type versions of the CVI *only*. Choosing **Extended** will blank out a few lines at the top and bottom of the screen, to suit some applications of the PAL configuration. Extended blanking is not a pre-requisite for using a PAL-type CVI. **Extended** or **Normal** may be selected according to the aesthetic or technical requirements of the configuration. The **Blanking** selection is stored with each PRESET.

SCREEN CONTROL MENU

This menu defines movements and basic changes on the screen, including **Mirrors**, **Wipes**, **Pan:Pen**, **Slide** and **Glide** functions.

In this menu you are able to make more than one selection at a time, enabling any combinations of the eight SCREEN CONTROL functions. Complex interactions can result.

0) Vertical Mirror: Enables a vertical mirror on screen at a position controlled by the HORIZONTAL PAN slider. It is a reflection around a vertical axis. Live action is mirrored around this axis. The HORIZONTAL PAN slider must be away from the minimum position. If you wish to centralize the axis on screen, ensure that the HORIZONTAL PAN slider is at midway.
The mirror function will only mirror images in the **field store**; that is frozen or drawn images, or continually updating field store images. By combining these images with others which are not mirrored, effects such as overlapping mirrors can be achieved (see Section 3 - DISPLAY CONTROL Menu).
A mirror positioned less than half way across the screen (from the left) will result in part of the frozen field store image being displayed to the right.

1) Horizontal Mirror: Enables a horizontal mirror on screen at a position controlled by the VERTICAL PAN slider. It is a reflection around a horizontal axis. The VERTICAL PAN slider must be away from the minimum position. If you wish to centralize the axis on screen, ensure that the VERTICAL PAN slider is at midway. This function behaves identically to **Vertical Mirror**, and both may be selected to give **Quad** mirror effects.

2) Horizontal Wipe: This enables a horizontal wipe between the field store image and a live digital image. The wipe position is controlled by the HORIZONTAL PAN slider. If **Glide** is on in this menu, the wipe speed is controlled by the RATE 2 slider.

3) Vertical Wipe : This enables a vertical wipe between the field store image and a live digital image. The wipe position is controlled by the VERTICAL PAN slider. If **Glide** is on in this menu, the wipe speed is controlled by the RATE 2 control.

4) Shatter: This function is directly equivalent to pressing the INVERT STENCIL button **On** and **Off** repeatedly, except that it can be much faster than the manual operation of the button. If the RATE 2 slider is at maximum, the stencil will be inverted and normalized at every video field. See the PRESETS section for examples of how this control can be used to create effects.

NOTE: The USE STENCIL button must be **On** for **Shatter** to work, although a stencil need not necessarily be drawn.

5) Pan:pen: This selection transfers control of HORIZONTAL and VERTICAL PAN from the slider controls, to the GRAPHICS PAD. This enables you to move objects around the screen by drawing on the pad. This is a relative position control, so the image will not suddenly jump to the position that you touch the pad, but will respond to the *movements* made on the pad. This function can be used in conjunction with **Glide** and **Slide** below, in the same fashion as the PAN control sliders.

NOTE: If the DRAW COLOUR or DRAW STENCIL buttons are **On** then the stylus will paint as well as controlling pan. If painting is not desired, then these buttons should be turned **Off**.

6) Glide: This selection limits the rate or speed that the PAN, ZOOM and STRETCH sliders change the image position. It gives a smoother movement. It is controlled by the RATE 2 slider.
If RATE 2 slider is on maximum the movement will be very fast.
If RATE 2 slider is on minimum the image will not respond to the PAN, ZOOM or STRETCH sliders.
If RATE 2 slider is up a little from minimum, the image will shift in the direction specified by the PAN/ZOOM/STRETCH sliders - with a very smooth action (one pixel width per field scan). The image comes to rest when it reaches the new position of the HORIZONTAL & VERTICAL PAN sliders, or the ZOOM or STRETCH sliders, whichever has been changed.
It is useful to have this selection **On** in most circumstances.

7) Slide: This selection allows continuous, never-ending smooth panning of the field store image. When **Slide** is selected the function of the PAN sliders changes from controlling the *position* of the image to controlling the *rate of movement* of the image. The HORIZONTAL PAN and VERTICAL PAN sliders adjust the rate of sliding of the image in the horizontal and vertical directions respectively. If the PAN sliders are centred, the image will be still. If the PAN sliders are near either extreme, the image will slide very rapidly across the screen. **Slide** overrides the **Glide** function on both PAN sliders.

NOTE: With **Slide** selected, the function of the HORIZONTAL and VERTICAL PAN sliders changes slightly. Instead of relating to the actual *position* of the image, they control a *rate of change* of position. If the two PAN sliders are positioned at midway, the image will remain still. There is a small region, or 'dead spot' around the centre of the slider travel to make it easier to stop the image motion.

If the HORIZONTAL PAN slider is above the central position, the image will slide to the *right* at a speed relative to the position of the HORIZONTAL PAN slider.

If the HORIZONTAL PAN slider is below the central position, the image will slide to the *left* at a speed relative to the position of the HORIZONTAL PAN slider.

In a similar way, the VERTICAL PAN slider determines the rate of change of position in an upward and downward direction.

If the VERTICAL PAN slider is above the central position, the image will slide *upwards* at a speed relative to the position of the VERTICAL PAN slider.

If the VERTICAL PAN slider is below the central position, the image will slide *downwards* at a speed relative to the position of the VERTICAL PAN slider.

The slide function has a special non-linear curve, allowing both very slow and very fast slides in any direction. The maximum rate of slide is half the field-store every field. Various 'harmonic' motions are also accounted for. See the PRESETS 61, 62, and 63 for an application of fast slide.

FREEZE CONTROL MENU

This menu determines how the FREEZE control will operate. It works in conjunction with the DISPLAY CONTROL menu selections and the stencil. If the FREEZE button is **Off**, the **Digital path** signal will update certain areas of the field store defined by the stencil and the DISPLAY CONTROL selection. The selection in the FREEZE CONTROL Menu gives further control over how the selected field store areas are updated. When the FREEZE button is turned **On**, the updating of the field store ceases, and so the field store becomes a **frozen** image. See Section 3 - DISPLAY CONTROL Menu for more information on **display formats** and **freezing**.

0) Continuous: This means that the digital path input will continuously update those field store regions that are selected in the DISPLAY CONTROL menu.
For moving images, the FREEZE button should be **Off**. If this button is **On**, the image will be still.

1) Strobe: This selection freezes a single image at a rate controlled by the RATE 2 slider.
For example: With RATE 2 near the top, it may be freezing a single video field every fourth field; or at the fastest rate of the RATE 2 slider, it will be updating the field store continually (equivalent to **Continuous** selection).

NOTE: **Strobe** can also be stopped by the FREEZE button in the same manner as for **Continuous**.

2) Burst: When this is selected, it will grab a 'burst ' of images, that is, a sequence of images, lasting for a particular time that is determined by the RATE 2 slider. It will freeze for a particular time, then it will grab another sequential burst of images, then freeze, etc...

This selection operates in the same way as **Strobe**, except that instead of grabbing a single image, it swaps between an image updating state and a still image state. Pressing the FREEZE button will make the image still.

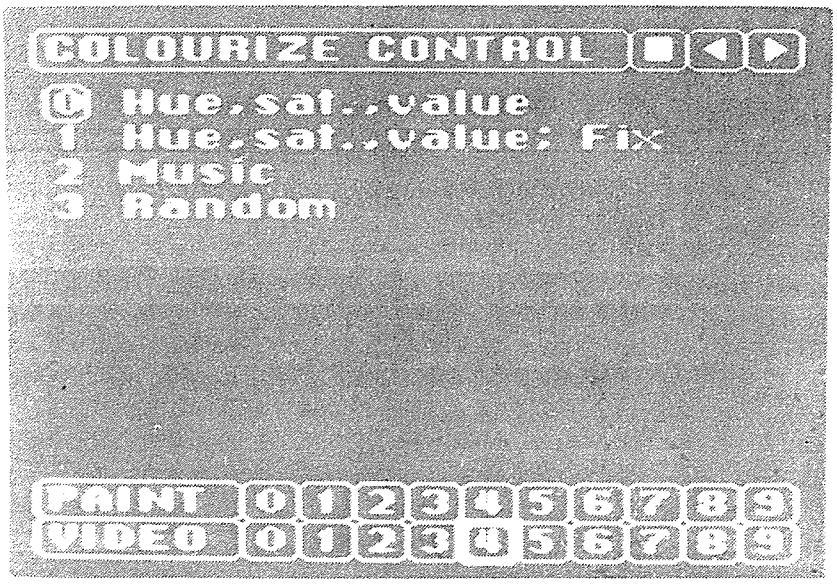
3) Single Freeze: Will acquire a field every time that the FREEZE button is pressed. The normal display will be a still image, but if you press the FREEZE button, the screen display will be updated to the current digital input.

NOTE: This changes the normal function of the FREEZE button, from a push on/push off control to a single push control.

4) Music: This selection enables the freeze function to be controlled (**strobed**) from an external music input. An image will be acquired into the field store every time there is a peak in the level of the **bass** frequencies of the music. So this will continually respond to the music, freezing one image on every musical beat.

5) External Control: This enables the freeze function to be controlled by the remote switch input. This is a socket on the back panel of the CVI that can be connected to any switch that will short the input to ground.
For example, a normal video camera trigger switch or a manual switching mechanism may be wired up for external control. If a switch is connected to this socket then the image updating will occur for as long as the switch is **On**. When the switch is turned **Off**, the image will freeze.

COLOURIZE CONTROL MENU



This determines what is controlling the colours that are used for **colourizing**. It is a similar menu to the COLOUR CONTROL menu (Paint Menu **4**), except that instead of controlling the colour for the **paint** functions, it controls the **colourize** function for digital images.

NOTE: This function requires the COLOURIZE button to be **On**. Colours will return to normal when the COLOURIZE button is turned **Off**.

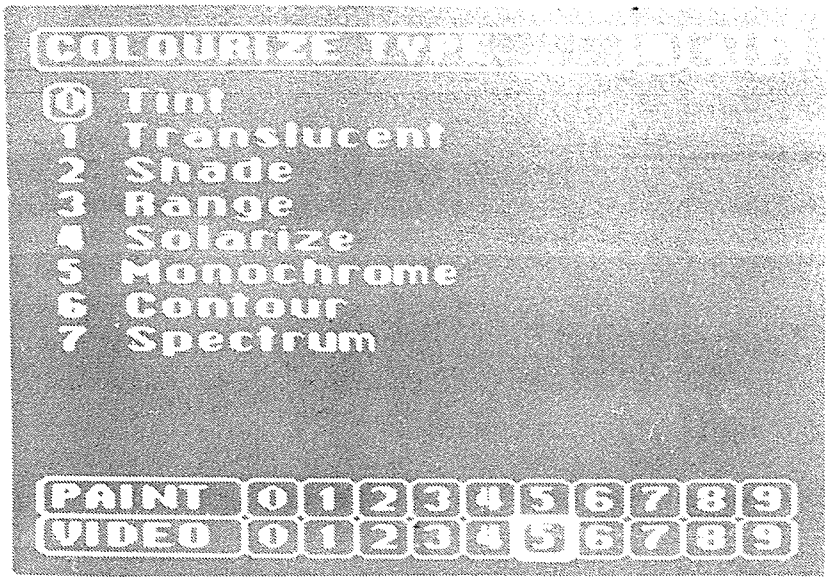
0) Hue, Sat., Value: The first 3 slider controls - HUE, SATURATION and VALUE (as well as COLOUR DEPTH) adjust the **Colourize type** selected in the COLOURIZE TYPE menu. This is the normal selection for this menu.

1) Hue, Sat., Value; Fix: This is similar to **H.S.V.** (above) except that after you have turned the COLOURIZE button **On**, if you then turn it **Off** again, the image will remain colourized and not return to normal colours. This enables you to fix a particular colourizing on screen, therefore freeing the H.S.V. sliders so that they can be used for determining the colours for **paint** functions.

2) Music: This selection allows the colourizing to be controlled by the music input. The **red** component of the colourizing control colour responds to the **bass** content of the sound input, the **green** component responds to the **mid-range** and the **blue** to the **treble**.

3) Random: Enables random fluctuations of colour to occur in the colourizing. These fluctuations change at a speed controlled by the RATE 1 slider.

COLOURIZE TYPE MENU

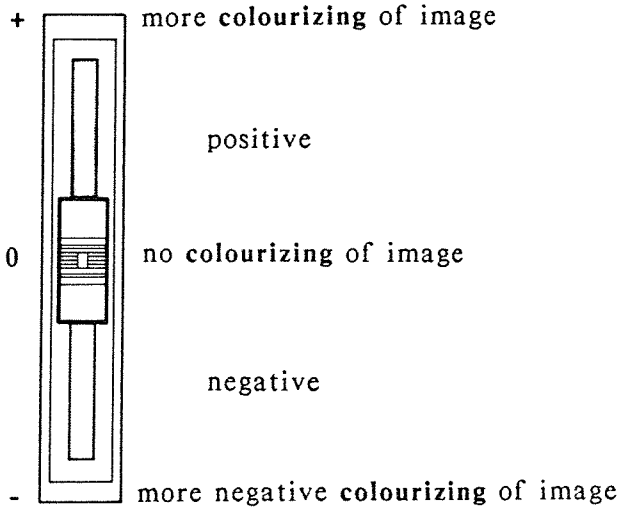


This menu defines how the colours of the digitized or drawn areas will look on the screen. Within the 4096 colours of the CVI, any colour may be 'mapped' or changed to any other colour. COLOURIZE TYPE menu allows control over these colour changes for digital video.

COLOURIZING does not affect **Analog** video.

The COLOUR DEPTH slider is important as it governs the degree of colourizing, as shown below. Note that the middle (zero) position will have no effect on the image. As soon as the slider is moved off the middle point, the colourization takes effect.

COLOUR DEPTH
SLIDER



COLOURIZE TYPE MENU

As there are over 1,000,000 colourizings available through the use of the COLOURIZE TYPES, it is not possible to provide explicit descriptions of what they look like. Rather, a brief description of *how* the colour specified with the HUE, SATURATION and VALUE colour controls interacts with the image colours is provided. Experimentation is the only way to get a good idea of the colourizing capabilities. When you encounter a colourizing that you particularly like, it can be saved as a PRESET (see PRESETS CONTROL menu) for later use.

NOTE: For the COLOURIZE TYPE to have an effect, you must press the COLOURIZE button **On**.

0) Tint: The colour you specify with the H.S.V. sliders is added to, or subtracted from, the existing screen colour - depending where the COLOUR DEPTH slider is positioned. As the COLOUR DEPTH is moved increasingly +, the screen colours will be brightened by the specified colour. Moving the COLOUR DEPTH slider towards - will darken the image.

1) Translucent: This colourize type is similar to overlaying the image with a translucent film of variable 'density' and colour. The degree of translucency is determined by the COLOUR DEPTH slider. This can vary from fully transparent (COLOUR DEPTH = 0) to opaque, where only the one colour will be visible (COLOUR DEPTH = fully - or +)
If the COLOUR DEPTH slider is -, the 'overlaying film' will be in the opposite or negative of the colour you specify with the H.S.V. sliders.

2) Shade: This colourize type is related to **Tint**, in that the specified colour is subtracted from the image, to the degree specified by the COLOUR DEPTH slider.

3) Range: The **red, green** and **blue** components of the image will be 'scaled' to the colour selected with the HUE, SATURATION and VALUE sliders. Thus the specified colour determines the *maximum* brightness of the component colours of the image. For instance, if the H.S.V. sliders are set to **red**, only the red component of the image will be seen, as the blue and green components are 'scaled' to zero. Moving the COLOUR DEPTH slider into the negative region will result in scaling of the **negative** of the original image.

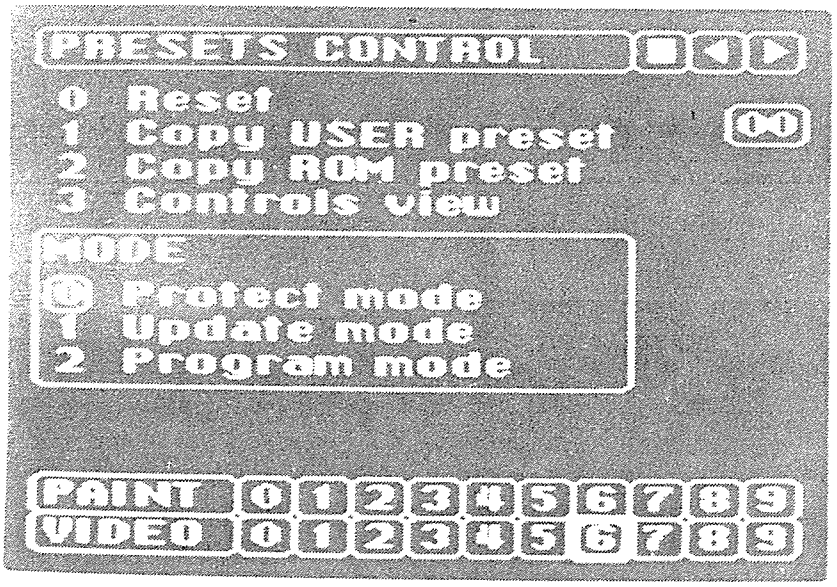
4) Solarize: This colourize type creates perhaps the most dramatic and beautiful, as well as varied, colourizings. Amongst the colourizings available are subtle effects reminiscent of oil on water, bizarre posterizations, negatives of any combination of the three primaries (RGB) while retaining the others positive, and a wide range of effects similar to photographic solarization. Several examples of **Solarize** colourizings are included in the PRESETS, and you may use them as a starting point for experimentation.

5) Monochrome: The image will be converted to a monochromatic picture, which is then tinted by the specified colour. If the COLOUR DEPTH is negative, a tinted black-and-white negative will result. As an example, if the COLOUR DEPTH is positive, and the H.S.V. sliders are set to light brown, the result is similar to sepia-toning a black and white photo.

6) Contour: This colourize type can generate a range of posterizing effects. At various settings of the HUE, SATURATION and VALUE sliders, it will generate a range of colour contours on the screen. Dark colour settings of the colour controls will result in a large number of colour contours, closely spaced. Brighter colours will reduce the number of contours, but make them more dramatic. Again, it is best to find out what this colourize type does by experimentation.

7) Spectrum: This colourize type changes the intensity information in the original video image into the **hue** of the final picture. The H.S.V. sliders change from their normal function. The HUE slider 'rotates' the result around the 'colour wheel' (Red, Yellow, Green, Cyan, Blue, Magenta, Red). The SATURATION slider affects the saturation of the final image (i.e. it whitens the image if down from maximum). The VALUE slider affects the *range* of colours on the screen, and the COLOUR DEPTH slider allows intermediate colourizings between the full effect, and the normal image.

PRESETS CONTROL MENU



The PRESETS CONTROL menu allows the setup and modification of the CVI's 100 **Presets**. A 'preset' is a copy of the positions of the 10 SLIDER CONTROLS, the 16 PUSH BUTTONS, and most of the MENUS.

This particular menu has three sections. The first group of four items selects a 'sub-menu' for resetting and copying PRESETS, and for viewing the contents of a PRESET. The second group of items - MODE - selects a PRESET **modifying** mode. The third aspect to this menu is the number in the top right corner of the menu. This is the current **Preset number**, and will always be the same as the PRESET number display on the CVI's CONTROL CONSOLE.

USING THE PRESETS

Selecting PRESETS while in this menu is the same as at other times: press the PRESET button, followed by a two digit number, or the NEXT (DRAW LOCK) or PREVIOUS (DRAW) buttons. To re-select the current PRESET (and hence return all the menus and controls to the values stored in the current PRESET) press the PRESET button followed by the STOP button.

When the CVI first arrives, the 100 USER (stored in RAM) PRESETS will be set to the **factory** or ROM PRESETS described in Section 2. To return to this condition at any time, use the **Reset** function described below.

The PRESETS can be altered or **Set** to save effects that you have developed. A PRESET can be set at any time (whether a menu or image is displayed) by the following two button combination:

Press **PRESET** button, then
press **FREEZE** button.

This 'freezes' the current USER PRESET to the state of the CVI. All the current menu selections, slider positions and button statuses are saved, and may be recalled simply by entering the PRESET in the usual way. The USER PRESETS are retained until they are modified or **Reset**, even with the power off.

The PRESET **Reset** function allows any or all of the USER PRESETS to be reset to the original ROM version. The PRESET **Copy** functions allow you to copy any ROM or USER PRESET into a given USER PRESET. This allows you to re-order the factory PRESETS, or to make multiple copies of a PRESET. This can be useful if you need several USER PRESETS which are the same except for minor variations. (See also **Program mode** described below.)

An important feature of the CVI PRESETS system is that the a position for each of the ten CONTROL CONSOLE sliders is stored and recalled for each PRESET. This means that after selecting a PRESET the physical positions of the sliders does not necessarily reflect the control value that the CVI is actually using. The CVI will continue to use the slider control value stored in the PRESET until the position of the slider is changed. The CVI will then "jump" to the actual physical slider position and follow it faithfully until a new PRESET is selected. Although this may be confusing at first, it can be used to great advantage to obtain precise and repeatable selection of colours, pans and zooms.
If a slider does not appear to be giving the expected effect after selecting a PRESET, a slight change in its position will cause the CVI to suddenly start "taking notice" of that slider's position.
Note that PRESETS which have the VALUE or RATE 2 sliders at zero can disable the colour and movement controls. To see the PRESET positions for the buttons and sliders, use the **Controls view** function below.

Each PRESET can also be saved to automatically press the WIPE COLOUR, WIPE STENCIL, PICK COLOUR or TITLE buttons when you enter the PRESET. See the **Controls view** function below for more information.

PRESETS CONTROL MENU

PRESETS CONTROL

0) Reset: This selection allows you to regain the **factory** or ROM PRESETS, which are those shown in Section 2. **Resetting** a PRESET will override any changes that have been made to that PRESET, and replace it with the **factory** PRESET. This selection has a verification stage; selecting **Reset** will cause the following sub-menu to appear. This sub-menu has three selections:

How it is done

a) Selecting **Return** will result in no change to the PRESET.
b) Selecting **Reset preset** will reset only the PRESET indicated by the **Preset number**.
c) Selecting **Reset all presets** will revert *all* 100 USER PRESETS to the **factory** PRESETS.

NOTE: Selecting Reset all presets will cause any PRESETS that you have created to be over-written. If you wish to regain your PRESETS at a later stage, they should be digitally saved onto video-tape using the SAVE AND RECALL menu (Video Menu 8), *before* selecting Reset all presets.

1) Copy USER Preset: This one lets you move PRESETS around. You may prefer to have your PRESETS in a different order.

How it is done:

a) Move cursor to number box opposite **Copy USER preset:** Box will be outlined.

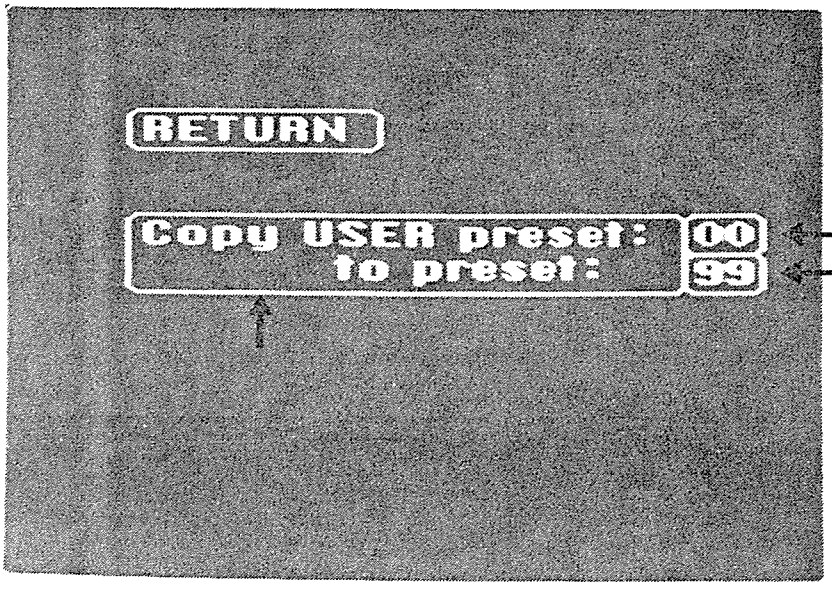
b) Choose PRESET number via the ten number buttons. PRESET number may be *incremented* by pressing PRESET, then DRAW LOCK button, (doubles as NEXT). PRESET number may be *decremented* by pressing PRESET, then DRAW button, (doubles as PREVIOUS).

c) Move cursor to number box opposite **to preset:**. Box will be outlined.

d) Choose PRESET number as in step b). This PRESET will be overwritten with the contents of preset selected in step b).

e) Move cursor anywhere within
Copy USER preset:
to preset:

f) Lift stylus from pad. PRESET will be copied and previous menu will be displayed.



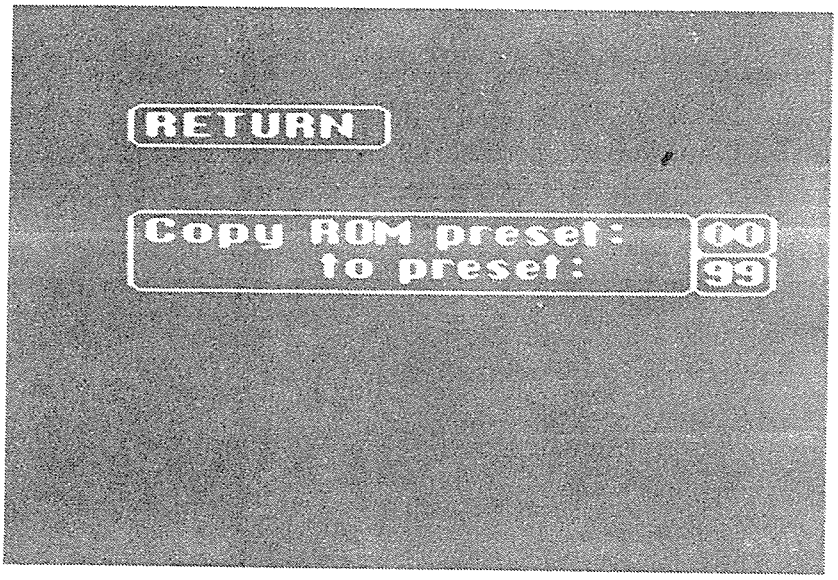
just return to PRESETS CONTROL menu that is, do nothing

PRESET information is copied *from* here
to here

move cursor to this area to do copy

PRESETS CONTROL

2) Copy ROM Preset: This one is very similar to **Copy USER preset** except that **factory** PRESETS from the ROM (Read Only Memory - permanent) are used rather than presets in RAM (Random Access Memory - battery backup) for copying. There are 100 PRESET spaces available for your use, to change as desired. There are also 100 **factory** PRESETS permanently in the program. These **factory** PRESETS are copied into the USER PRESET area before being shipped.

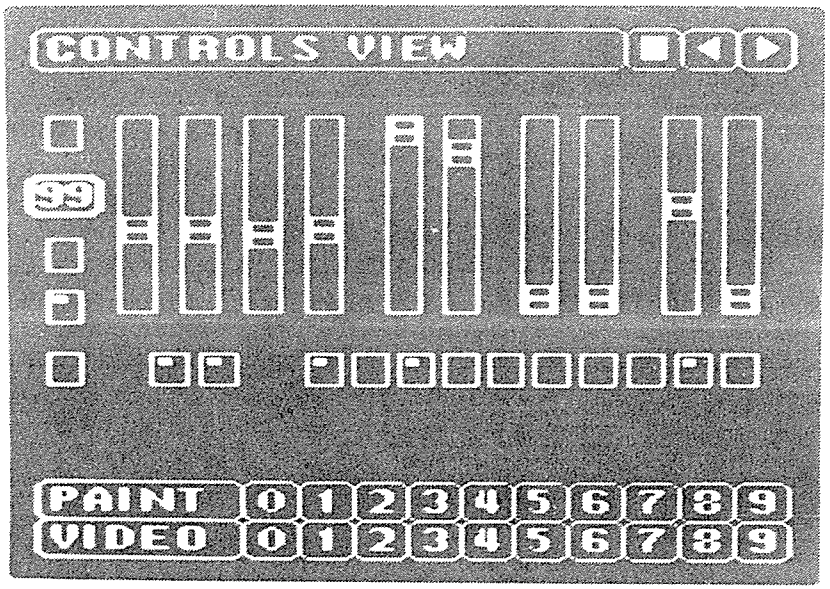


How it is done

The procedure for copying is exactly the same as for **Copy USER preset.**

3) Controls View: This selection allows you to see the value of the 10 SLIDER controls, and the condition of the 16 PUSH-BUTTONS, that is stored in the current PRESET. It also allows these values to be changed. This is useful to see PRESET settings, and to change values.

Selecting **Controls view** will cause the following sub-menu to appear:

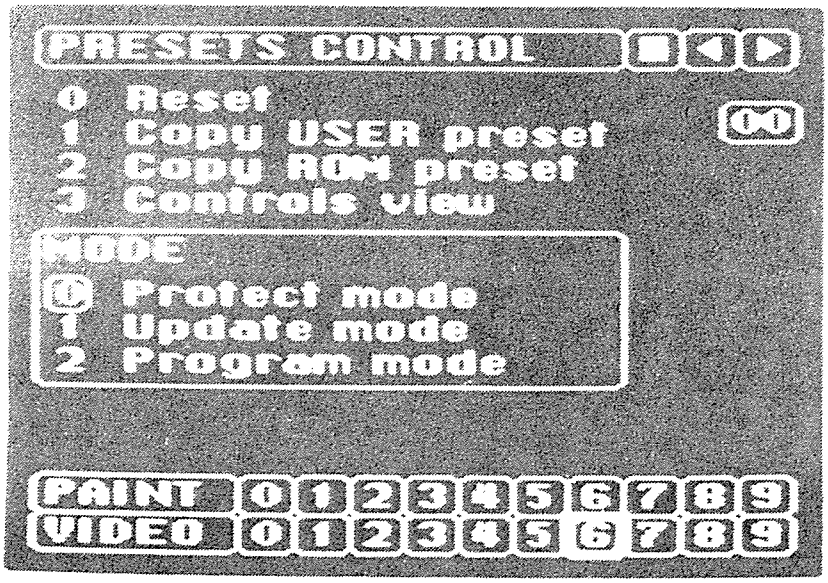


This sub-menu contains a diagram that represents the CONTROL CONSOLE. The 16 BUTTONS and 10 SLIDERS appear in this diagram in the same relative positions as they are on the CONTROL PANEL. The position of the slider controls is shown, and may be changed by moving the cursor to the desired position and lifting the stylus.

Likewise, the status of the button function is indicated. This may be changed by moving the cursor over the on-screen button, and lifting the stylus. So, for example, if you wish to define a PRESET which performs a COLOUR or STENCIL WIPE as soon as you enter it, turn the WIPE COLOUR or WIPE STENCIL button *on* in this menu, then save the PRESET. The selected wipe will take place every time this PRESET is selected. Many of the **factory** PRESETS have this feature.

To save these changes into the current PRESET, use the PRESET/FREEZE button combination to set the PRESET.

PRESETS CONTROL MENU



MODE

The lower section of the PRESETS CONTROL menu contains this PRESET MODE selection.

0) Protect Mode: This is the normal selection for preset mode. If selected, the PRESETS will not be altered except in the following cases:

i) by specific **Reset** or **Copy** selections in the PRESETS CONTROL menu
ii) by pressing the PRESET button then the FREEZE button ('freeze' or **set** the PRESET)
iii) by copying one PRESET to another
iv) by **recalling** PRESETS in the SAVE AND RECALL menu.

1) Update Mode: This selection will cause any changes made to the CONTROLS or MENUS while in a PRESET to be recorded in that PRESET. Thus, if this selection is made, the PRESETS will be **updated** as they are used. This is useful for modifying existing PRESETS without having to explicitly **set** or **Reset** them. The PRESET is actually updated at the time when you change to another PRESET. Use this selection with care, and be sure to return to **Protect mode** when updating is complete, or PRESETS may be altered unintentionally.

2) Program Mode: This selection can be used to generate a series of associated PRESETS. If this selection is made, selecting a new PRESET will *not* result in the stored information in the new PRESET being used. No change will be apparent when the PRESET is changed, but the current state of the controls will be stored into the PRESET that you have just left. This allows the rapid programming of a chain of PRESETS which have differences that follow on from the previous PRESETS. This selection should be used with care, and PRESETS MODE should be returned to **Protect mode** to prevent the unintentional overwriting of other presets.

SEQUENCER MENU

The CVI SEQUENCER allows real-time recording and playback of a series of effects and drawings. The control movements and graphics pad operations which produce the drawings and effects are stored in the internal memory of the CVI, where they may be edited to precise times and positions, and then replayed. Events may be timed down to one video field time. The sequence stored in the SEQUENCER memory is retained, even on power down.

Note that it is not the screen images that are stored by the Sequencer, but rather the actions which form the image. So if a sequence is recorded with a particular video input or field store image and replayed with a different one, the result will be the same *process* applied to the new input or image.

The SEQUENCER cannot change selections in the menus directly. However through the use of the 100 user-definable PRESETS you can access all of the CVI's menu functions. The PRESETS and the SEQUENCER in combination allow an accuracy and versatility of control which is not possible through manual manipulation. The required effects can be saved as PRESETS before recording the Sequence. These PRESETS and the SEQUENCER data can be stored onto video tape for future use with the SAVE & RECALL function, or they may be sent to an external computer via the serial link.

The Sequencer can synchronised to external equipment, such as a video tape, through the START options on this menu. This allows repeatable event sequencing for post-production or live situations.

Each box on the menu initiates a function of the Sequencer when touched. The top three boxes, **Record**, **Append** and **Insert**, are concerned with *recording* a sequence of actions into the Sequencer memory. The next three boxes, **Play**, **Repeat** and **Step**, are concerned with playback of the recorded sequence. The MENU button will stop all these Sequencer functions and return you to the SEQUENCER menu.

SEQUENCER MENU

START: The start of all Sequencer functions is under the control of the **START** list in the menu, as follows:

Immediate: The Sequencer function begins as soon as the box is touched. The CVI returns immediately to the colour image for recording or playback.

Audio: The function begins when a high audio level is applied to the CVI audio input. For example, this could be a beep on the audio track of a video tape.

Remote: The function begins when a switch connected to the CVI Remote input is closed. This allows many types of systems to synchronise to the CVI Sequencer.

When **Audio** or **Remote** Start is active, the CVI will give a beep and then wait for the audio or switch signal. The cursor will disappear. **Audio** or **Remote** Start may be bypassed, if necessary, by pressing the STOP button.

Record: All CVI events (such as pad moves, slider movements, button presses, preset changes, etc) are recorded into the Sequencer memory simply by performing the actions at the CONTROL CONSOLE in the **Record** mode. **Record** will overwrite any existing sequence in the memory. If you will need the existing sequence at a later date it can be stored onto video tape using SAVE & RECALL. The first event to be recorded is *always* the current PRESET. This ensures that the CVI will always begin a sequence in a known state. If this is not wanted, the first step can be removed using the **Edit** function.

As an example, to record a sequence which changes from Preset 34 to Preset 01, then paints a few scattered dots and stretches them, the CVI operator would perform the following steps.

i) Select Preset 34. This will be the first step of the new sequence.

ii) Move the cursor to the **Record** box and lift the stylus. The display will return to the colour image. Recording has begun.

iii) After the required time has been spent in Preset 34, change to Preset 01.

iv) Preset 01 allows **Dots** to be drawn, so draw the dots where you want them. Don't worry too much about mistakes - they can be corrected in the **Edit** mode.

v) Move the STRETCH slider as required.

vi) Press the MENU button. This returns you to the Sequencer Menu and stops the **Record** function.

The CVI has now stored into its memory the sequence of actions and the times at which each CONTROL CONSOLE change was made. It is now possible to replay the sequence as it was recorded using the **Play** function, or to modify the recorded actions and times using the **Edit** capability.

Note that to **Record** a particular Paint Method (such as **Dots**) you must enter a PRESET where that Paint Method is selected. However, you can **Edit** the recorded sequence so that all the Paint Methods occur in the *same* PRESET. See below, under "Hints on the Sequencer".

Play: A previously recorded sequence may be played back using **Play**. The actions in the sequence are played with exactly the same timing and positioning with which they were recorded. These times and positions may be altered using the **Edit** function. Note that **Paint** actions will be performed at exactly the places that they were recorded and hence may not be visible if the field store has not been cleared. At the end of the playback, the Sequencer returns to the menu page. **Play** may be halted by pressing the MENU button.

The user is able to paint and manipulate the controls during **Play**. Unusual effects can occur, however, when the Sequencer also tries to do something. The Sequencer will always override the user.

Repeat: The **Repeat** function operates exactly as **Play** except that when the end of the sequence is reached, the Sequencer returns immediately to the beginning. The endless loop can be stopped with the MENU button.

Step: The **Step** function operates as **Play**, except that the Sequencer program is executed step by step. The Sequencer will perform one step from the current point in the program each time that the DRAW LOCK button is pressed. If you stop the **Play** function during a sequence, you can then use the **Step** function to locate the exact point in the sequence to place an **Insert** or an **Edit** (see below).

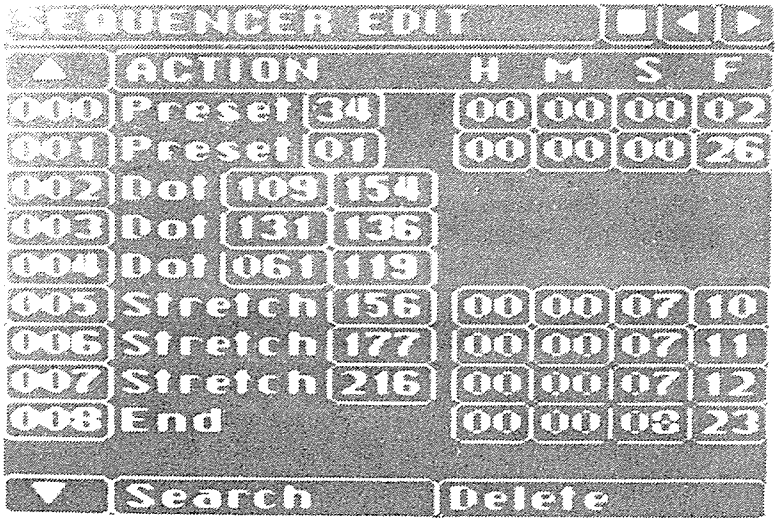
Append: This is the same as **Record** except that the actions subsequently recorded are stored at the end of the sequence already in memory. **Record**, on the other hand, erases any existing sequence. **Append** does *not* automatically record the current Preset number when it begins.

Insert: This is the same as **Record** except that the recorded actions are inserted *into* the existing sequence after the current program step. A program step consists of an action such as pushing a button, changing PRESET or drawing a line. The *current* program step is the point at which a **Play**, **Repeat** or **Step** function is terminated by the MENU button. You can also set the current program step using the **Edit** function (see below). **Insert** does *not* automatically record the current PRESET number when it begins.

SEQUENCER MENU

SEQUENCER EDIT MENU

Edit: When the **Edit** box is touched, the menu will change to the SEQUENCER EDIT menu, shown below. This menu displays ten Sequencer program steps, starting at the current one. The data concerning times and positions for a step are displayed in one program line, and may be modified to adjust the sequencer program as required.



Searching for lines

The SEQUENCER EDIT menu shown here is the result of recording a sequence using the steps listed under **Record** above. It shows some typical program lines, each beginning with a line number. During **Play** these lines are performed sequentially from 000 to the end of the sequence.

If your sequence has more than ten lines (and most of them do), the *up arrow* and *down arrow* boxes on the menu let you move up or down by ten lines to see more of the sequence. For larger movements:

i) Move the cursor to any line number box. It will light up.
ii) Type in a 3-digit number using the CONTROL CONSOLE buttons.
iii) Move the cursor to the **Search** box. The display will change to show the selected line number at the selected position.

You can also locate specific steps in the Sequencer program by using the **Play** or **Step** functions to execute the Sequencer program:

i) Select **Play** or **Step**.
ii) When you recognise the action that corresponds to the program line that you want, press the MENU button to stop the playing.
iii) Select **Edit** in the Sequencer Edit Menu, and the line number at which you stopped playing will be displayed. You can then **Delete**, **Insert** or *change* the program lines.

Deleting lines

If you find that you have recorded some program lines that you did not intend, they can be deleted. To do this:

i) Locate the line in the Sequencer Edit menu, and move the cursor to light up the box around its line number.

ii) Move the cursor to the **Delete** box. The selected line will be removed and the lines renumbered.

Inserting lines

If you need to add some more instructions in the middle of your recorded sequence, you can use the **Insert** function. To do this:

i) Find the point in the sequence where the extra instructions are to be inserted. This can be done by the methods described under **Searching for lines** above.

ii) Select the line number *before which* you wish to **Insert** by moving the cursor to light up the appropriate line number box.

iii) Return to the SEQUENCER menu and select **Insert**.

iv) Record the required additions by performing those actions at the CONTROL CONSOLE.

v) When all tha additions have been recorded, press the MENU button to terminate the **Insert**.

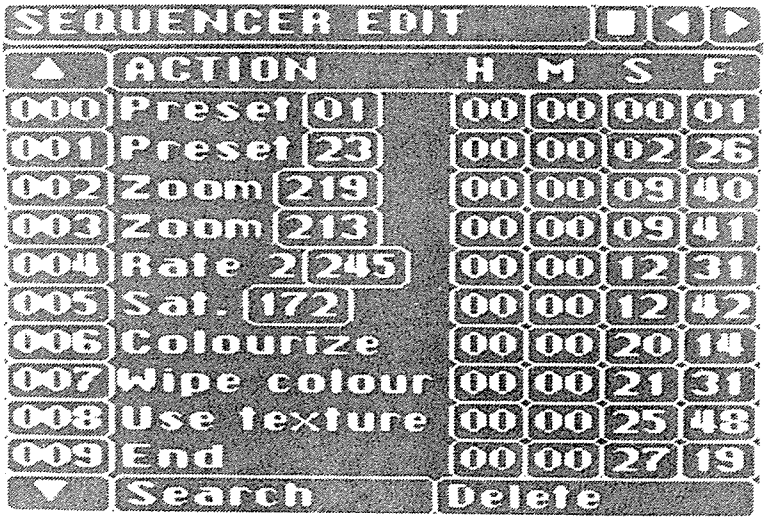
To add more to the *end* of your sequence, use **Append**.

Changing Sequencer lines

The program lines consist of a word followed by some numbers in boxes. The last line will always be an **End** statement. Sequencer lines are of two types:

1) Buttons, sliders and presets, and
2) Paint methods.

The Sequencer lines corresponding to changes in the buttons, sliders and presets take the following forms:



The first number is the line number (000 to 999). The number after the words indicates the position to which the slider was moved (000 to 255) or the PRESET number (00 to 99). The following set of numbers below **H M S F** is the time at which the particular event occurred in **H**ours, **M**inutes, **S**econds and **F**ields. This entry represents the time that the event will occur relative to the start of a **Play** command.

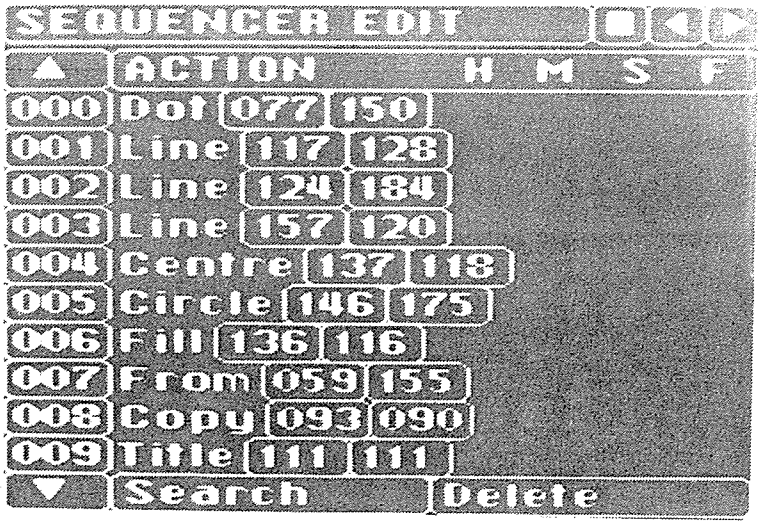
Any or all of the numbers in a program line may be changed by simply moving the cursor to the box to light it up, then typing in a new number. This changes the *value* to which the slider will move, the *PRESET number* that will be selected, or the *time* at which the specified event occurs.

When a time is changed, all the following times will change by a corresponding amount to preserve the relative timing of following events. For example, if a time entry is reduced by 9 seconds then all following times are reduced by 9 seconds. When this is not desired, the next time entry can be increased by 9 seconds to restore all subsequent entries. Using such adjustments it is possible to make the time for one sequence step *earlier* than the time above it. When such a set of program lines is executed by **Play**, the lines with earlier times will be executed immediately they are reached. It is also possible to create a situation where times should actually have *negative* values. In these cases the Sequencer will display a very high time entry for these program lines (greater than 50 hours). Such entries are necessary to preserve the time intervals between events. These entries will return to normal small values when the *negative time* situation is removed. It's all much simpler than it sounds - try it!

The Sequencer lines corresponding to Paint Methods are similar to other lines, except that there are no *time* entries associated with them. The Sequencer will **Play** Paint Method instructions as fast as possible until an instruction with a time entry is reached. The Sequencer will then wait for that time to arrive before proceeding. See "Hints on the Sequencer" below.

Examples of Paint Method instructions are shown below. The pair of numbers following the word is a screen position (x,y) relative to the top left corner of the screen. These range from 000 to 255, so that the bottom right of the screen is (255,255), the top right is (255,000), etc. These positions can be changed by moving the cursor to the required box and then typing in a new number.

Note that the Paint Methods **Rectangle, Circle, Copy** and **Title** each require two Sequencer lines to define them (for example: **Corner/Rectangle, Centre/Circle**). **Ellipse** requires three (**Centre/Axis/Ellipse**).



Hints on the Sequencer

Here are a few tricks which may help you to get more out of the Sequencer.

1. It is possible to have a sequence with several different Paint Methods occurring in the *same* PRESET. To do this:

i) Set several PRESETS so that each of your required Paint Methods is stored in a *different* PRESET.

ii) **Record** the sequence of Paint Methods that you want by changing between the PRESETS of step (i). The Brush Shapes, Paint Types, etc, will probably not be the ones you want, but do not worry about this at the moment.

iii) When you have recorded all the Methods, return to the SEQUENCER EDIT menu. The sequence will consist of the Paint Methods that you recorded with PRESET changes in between.

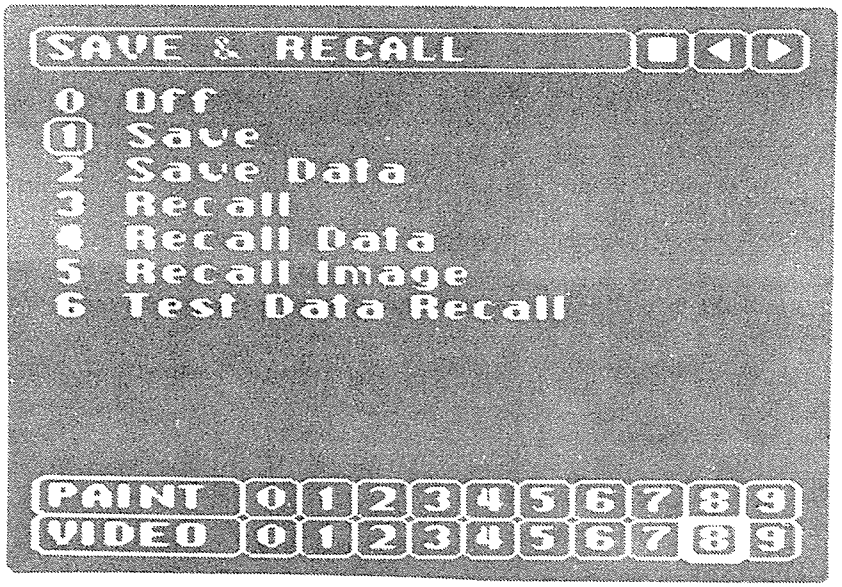
iv) Use the **Delete** function to remove all the **Preset** lines except the first one.

v) When you now **Play** the sequence, the Preset number will remain constant and all the Paint Methods will be performed with the painting selections (Brush, colour, etc) of that PRESET.

2. A series of Paint Method lines in the Sequencer will be performed as quickly as possible. If a pause is required in the painting, simply **Record** or **Insert** a harmless timed instruction (such as STOP or DRAW LOCK) at that point in the sequence. The **Play** function will pause at that point until the correct time elapses.

3. If you want a sequence to run as fast as possible, ignoring time, then you can use the **Edit** facility. Set the time entry of the first timed instruction to zero. Scroll through the sequence, and when the time exceeds about ten seconds, set it to zero again. When the Sequencer now **Plays** the sequence it will be continually running late, and hence will run as fast as it can.

SAVE AND RECALL MENU



This menu controls the digital storage and retrieval of still images, sequences, and presets onto video tape or video cassette. Any variety of video tape may be used for this purpose: 1/2" VHS or Beta, or 3/4" U-Matic, 1", or others, provided that it can record and replay a video signal.

The CVI cannot control your video cassette or tape recorder, so some manual intervention is required. Specifically, you must fast forward or reverse the video recorder to the point on the tape that you wish to record or retrieve the information, and operate the recorder's play and record buttons.

The Save and Recall functions have error correction, and will withstand tape dropouts of up to seven video lines in every field without loss of information.

To use, first make the appropriate selection in the SAVE & RECALL menu. Return to the image by pressing the STOP button. The SAVE & RECALL function will be active immediately.

0) Off: If you do not require a SAVE & RECALL function, select **Off**.

Display Method

1) Save: This saves everything currently in the CVI. It saves the digital image from the field store, the sequencer, and the 100 user-defined PRESETS.

How it is done:

a) FAST FORWARD or REWIND tape to desired Save position on tape. STOP tape recorder. CVI output is displayed on monitor.

b) Create an identification title via TITLE EDIT menu.

c) Return to SAVE & RECALL menu.

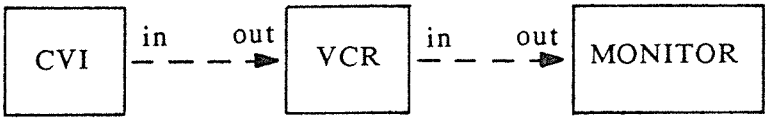
d) Press RECORD on VCR.

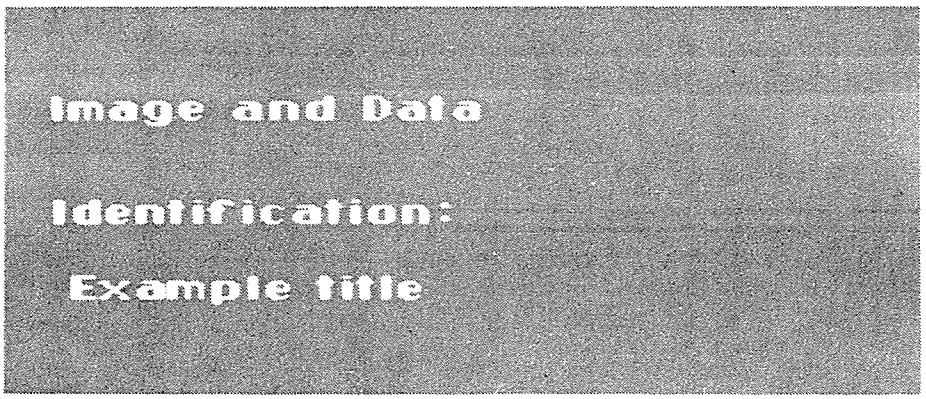
e) Select SAVE option on menu and press STOP button.

f) CVI will now generate an identification display incorporating the **title** defined earlier (5 seconds). This will be recorded in the normal analog manner of the VCR, enabling you to find the image on the tape at a later time by a visual search. Following this is a display of the still image (5 seconds), followed by sync frames and the digital data.

g) After 3 1/2 minutes, the CVI will beep at you to indicate the end of the saving process. Press STOP on the VCR.

Setup





2) Save Data: Similar to Save function, except that only the PRESETS and SEQUENCER data is saved. Consequently, Save data takes only thirty seconds to complete as the image is not saved.

The procedure is as for Save.

Display Method

3) Recall: The opposite function to Save. This selection recalls all of the digital information saved onto the video-tape, and puts it into the CVI's memory. Note that this will overwrite anything that is currently in the CVI. Thus the image, sequencer and presets in the CVI *before* the Recall function is initiated, will be lost. However, this information can be separately saved before Recall if you think you may need it later.

How it is done:

a) Select Video Menu 1 - VIDEO SOURCE. On this menu, select

b) Select Video Menu 8 - SAVE & RECALL. Select Recall. Press STOP button on CVI to return to image.

c) Output from the VCR now goes straight through the CVI analog path to the monitor. Rewind or fast forward the VCR to locate the identification and picture you saved previously with the Save function.

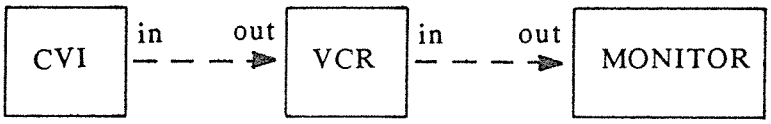
d) Press play on the VCR and while identification is displayed, press DRAW button on the CVI.

How it is done

e) The CVI should give a beep after several seconds to indicate synchronization of the CVI and VCR, after which the data from the VCR will be visible on the left-half of the screen. With this **Recall** function selected, image, stencil, sequencer and presets will be recalled - overwriting the current image, stencil, sequencer and presets.

f) After 3 1/2 minutes, the CVI will beep to indicate end of the RECALL process.

g) Press STOP button on VCR.



NOTE: The CVI jumps to PRESET 00 before recalling from tape to avoid mangling the image from tape. Whenever you use factory (ROM) PRESET 00, the field store image is preserved. If you have changed the internal setup of PRESET 00, Reset it to factory (ROM) PRESET 00. See Video Menu 6 - PRESETS CONTROL.

4) Recall Data: Recalls the 100 user alterable PRESETS, and the SEQUENCER information previously **Saved** to tape. This will *not* affect the current image in the field store.

The procedure is the same as for **Recall.**

5) Recall Image: Recalls only the image information, and will not affect the SEQUENCER or PRESETS. Thus **Recall image** may be used where a new field store image is required, but the current SEQUENCER information and PRESETS are to be retained.

The procedure is the same as for **Recall.**

6) Test Data Recall: Test whether it is possible to perform an error-free **Recall** of the PRESETS and SEQUENCER data from tape, without actually altering data already stored in the CVI. A message on the screen indicates the result of test.

This test takes thirty seconds to complete and is a useful way of verifying that data has not been lost when **Saving** due to bad tape or recording conditions. See **Error messages** below.

SAVE AND RECALL MENU

ERROR MESSAGES ON RECALL

Error correction and multiple-copy comparision techniques are used to prevent data errors in the PRESET and SEQUENCER **Save and Recall** process. Unrecoverable errors may still occur due to poor tape quality or recording conditions. So, use high quality tape, keep those little tape heads clean and ensure proper termination of connecting cables.

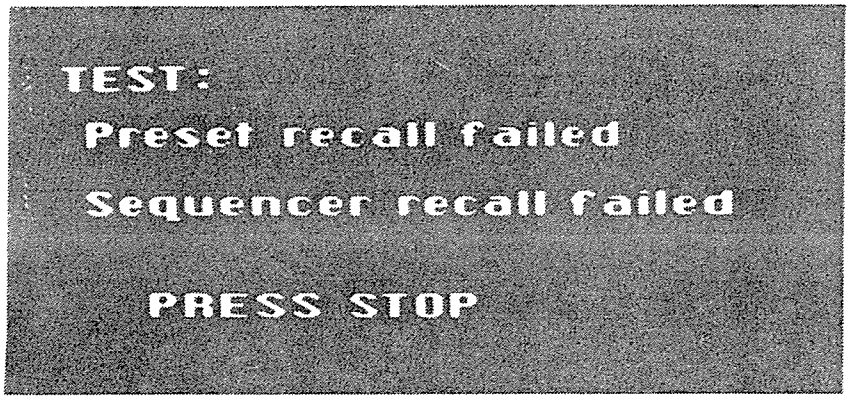
RECALL or RECALL DATA

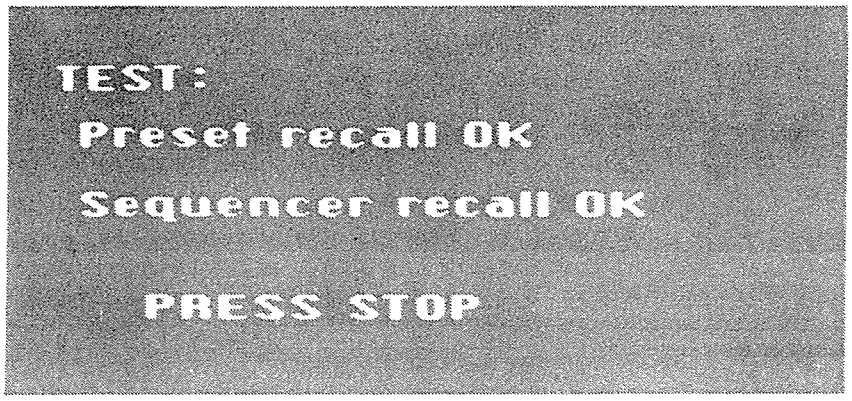
In the event of an error, a message is displayed upon completion to indicate whether the PRESETS data, SEQUENCER data, or both, have been corrupted.

If the error occurred in the PRESETS data, the USER PRESETS of the CVI will be reset to the **factory** (ROM) PRESETS. If the error occurred in the SEQUENCER data, then the SEQUENCER program will be cleared.

TEST DATA RECALL

A message is displayed upon completion of **Test data recall** to indicate whether any unrecoverable errors occurred. Test results are indicated by:



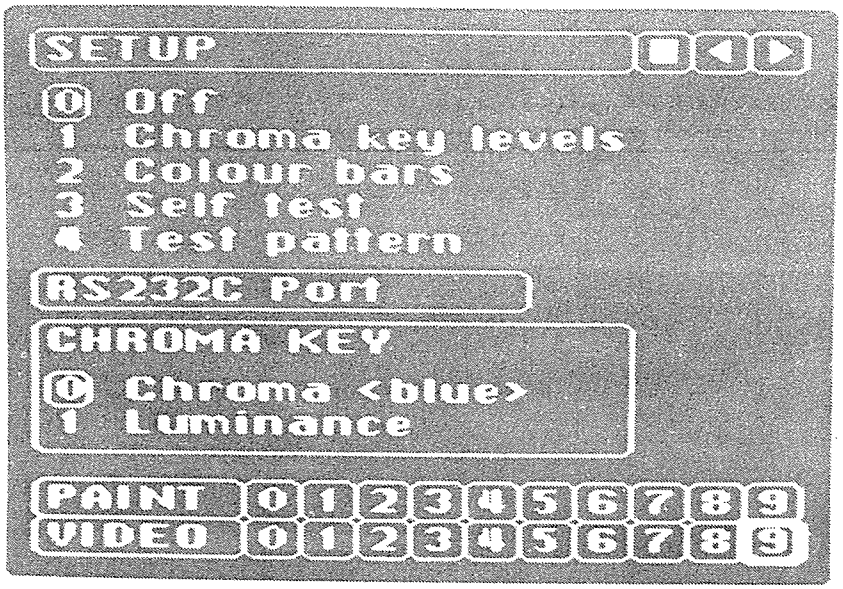


Regardless of the test result, the PRESETS and SEQUENCER of the CVI will not be altered using **Test data recall**.

RECALL TROUBLE SHOOTING

PROBLEM	REASON	SOLUTION
No sync beep on **Recall**	1) Beeper turned **Off** on Paint Menu 4	Turn it **On**
	2) Video Menu 1 (VIDEO SOURCE) incorrectly selected	Select  on menu
	3) Incorrect connections	Check connections
	4) Video board controls badly adjusted	Turn **contrast** *up* and and **brightness** *down* to give good black and white on the digital data coming from tape Select terminated VIDEO 1, composite input
	5) Poor tape or recorder quality, indicated by ragged, jumpy or fuzzy picture	a) Use new tape b) Use a cleaner section of tape c) Adjust recorder
Sync beep but errors in image or data	1) Video board controls badly adjusted	(See REASON 4) above
	2) Poor tape or recorder quality	(See REASON 5) above

SETUP MENU



This menu contains various functions useful for setting up the CVI with external equipment. If a selection other than **Off** is made in this menu, then when you return to your image, (press STOP button or position cursor over the white square) - then the selection you have made will override the normal operation until the STOP button is pressed again.

0) Off: The normal selection during CVI operation.

Display Method

1) Chroma key Levels: This enables you to adjust the threshold level of the inbuilt **Chroma key** circuits with, the H.S.V. sliders. Note that it changes the function of the H.S.V. sliders to allow fine adjustment of the chroma key levels.
The HUE slider = red level
The SATURATION slider = green level
The VALUE slider = blue level
The COLOUR DEPTH slider will have no effect.

You may adjust **Chroma key** levels while an effect is being used. This may be necessary if lighting levels fluctuate.

How it is done

a) Select **Chroma key levels** in the Setup menu.
b) Press STOP button to return to image.
c) Adjust H.S.V. sliders for best result.
d) Press **STOP.**

To ideally adjust **chroma key** levels with constant lighting levels, follow this procedure:

a) Select **Chroma key levels** in the SETUP menu.
b) Select **Chroma (blue)** from the CHROMA KEY menu if blue keying is required.
Select **Luminance** if keying from the ambient light levels is required.
c) Select **Chroma key** in the STENCIL SOURCE menu (Video Menu 1).
Select **Stencil Show** in Paint Menu 4.
d) Ensure that the video camera is aimed and focussed on the subject that you wish to chroma key, against a well illuminated blue background (no shadows). See CHROMA-KEY SETUP SUGGESTIONS in Section 2 - PRESETS SELECTION, PRESETS **98 & 99.**
e) After ensuring that the USE STENCIL button is **On**, adjust the chroma key levels with the HSV sliders, so that the stencil display indicator *entirely covers* the blue background, but *leaves the subject in camera focus unaffected.* The stencil display indicator is seen as a brightening of the image.
f) When the screen display levels are adjusted correctly, press the STOP button. This will turn **Off** the chroma key adjustment mode and return you to the normal operational mode of the CVI.

NOTE: PRESET **99** will setup adjustments for VIDEO 1 input.
PRESET **98** will setup adjustments for VIDEO 2 input.
In these PRESETS the 'background' levels are colourized to appear in the complement of the colour of the keyed image to aid ease of adjustment.

2) Colour Bars: If this selection is made, and then the STOP button is pressed, a 100% **Colour bars** display will appear on the screen. It will not destroy the image you may have on the digital image plane. **Colour bars** is also selectable by using PRESET **97**.

Press the STOP button to return to previous image.

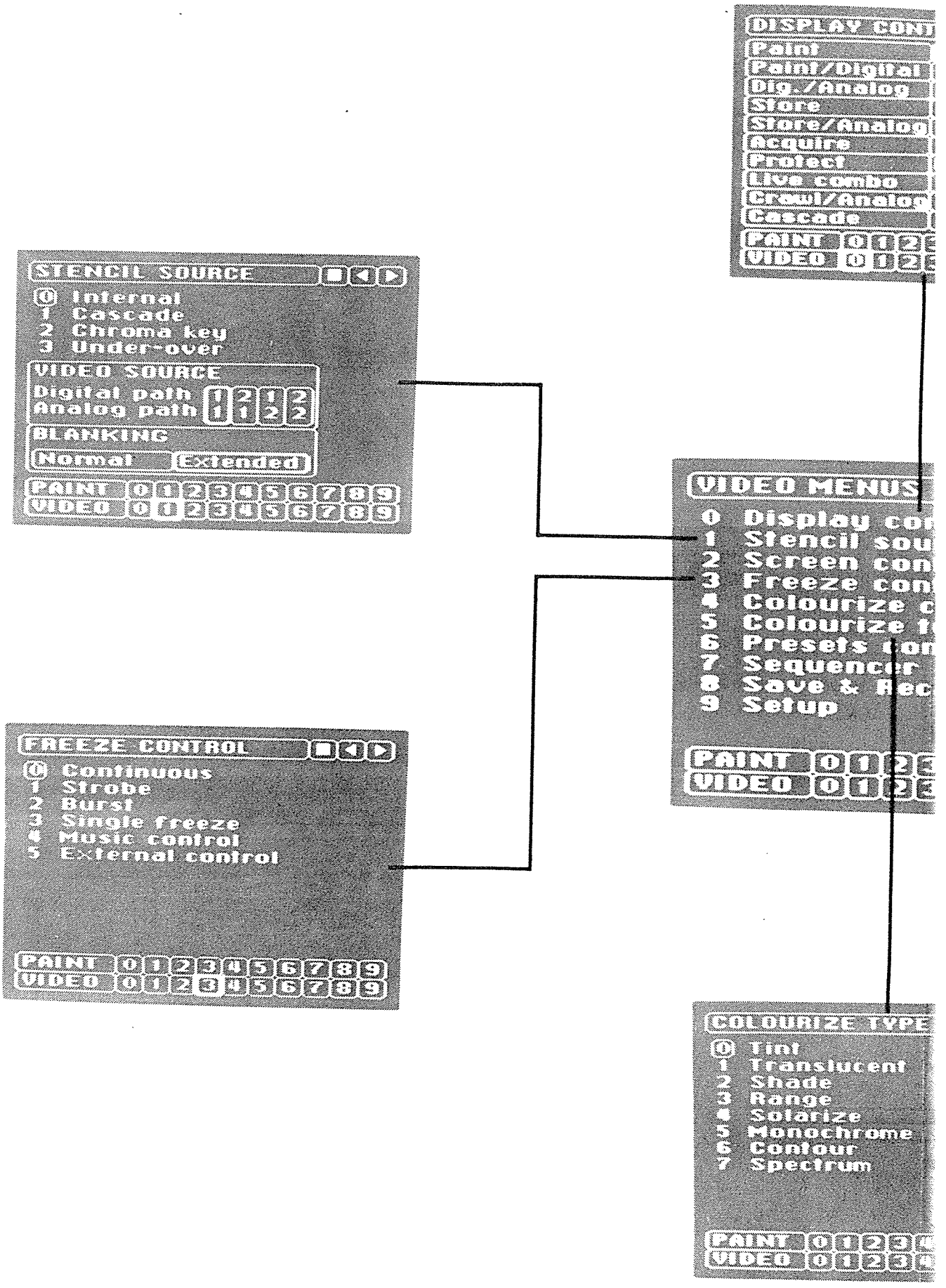
3) Self Test: This selection initiates the CVI's self-test function and tests the majority of the CVI's digital circuitry. Any image in the field store will be destroyed by this test. If the CVI passes the test, the message **Self-test passed** will appear on the screen. If the CVI fails the test, appropriate messages will appear. Contact your distributor.

This is what a self test result looks like:

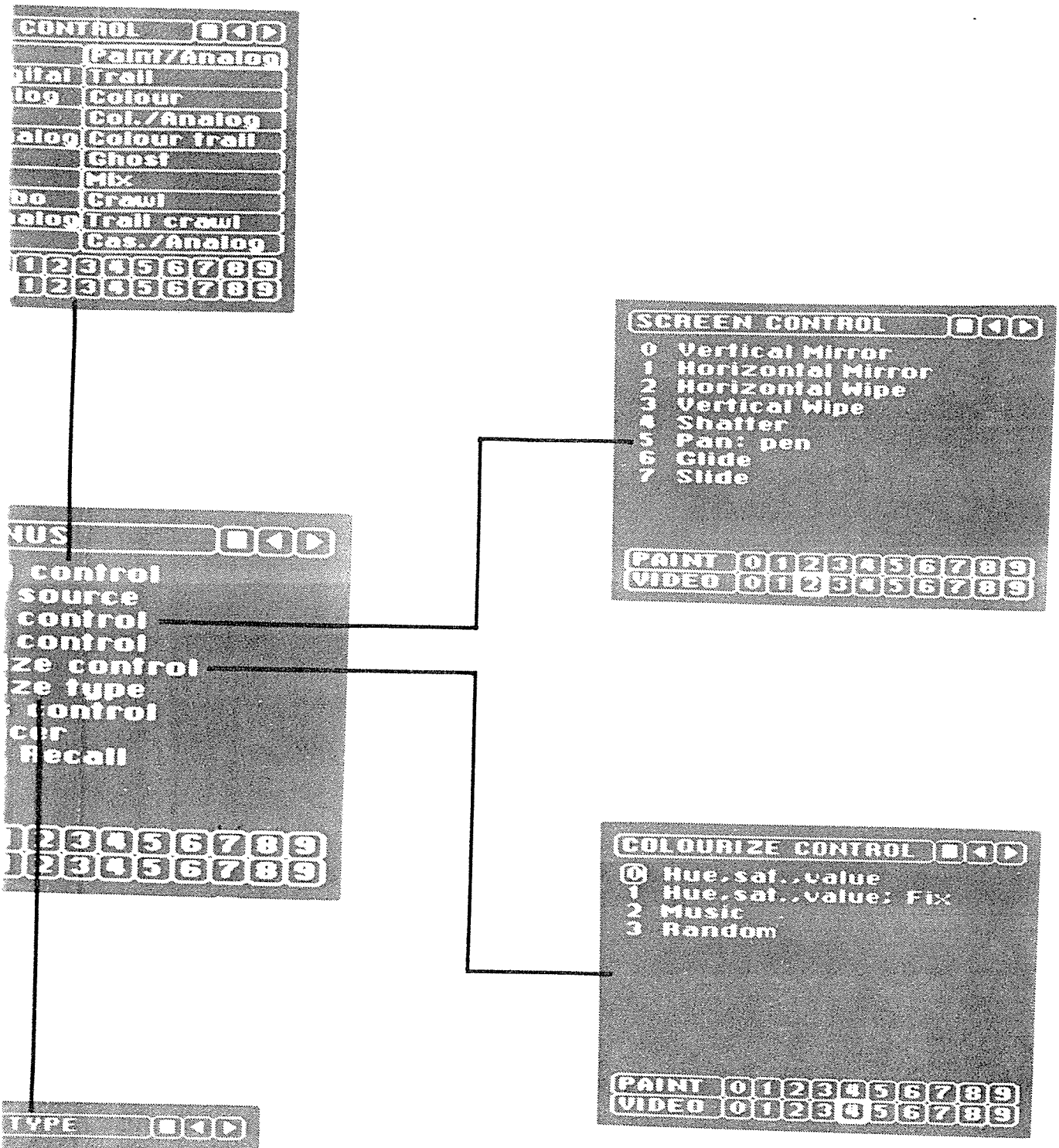
After the self test, you may return to normal by pressing the STOP button.

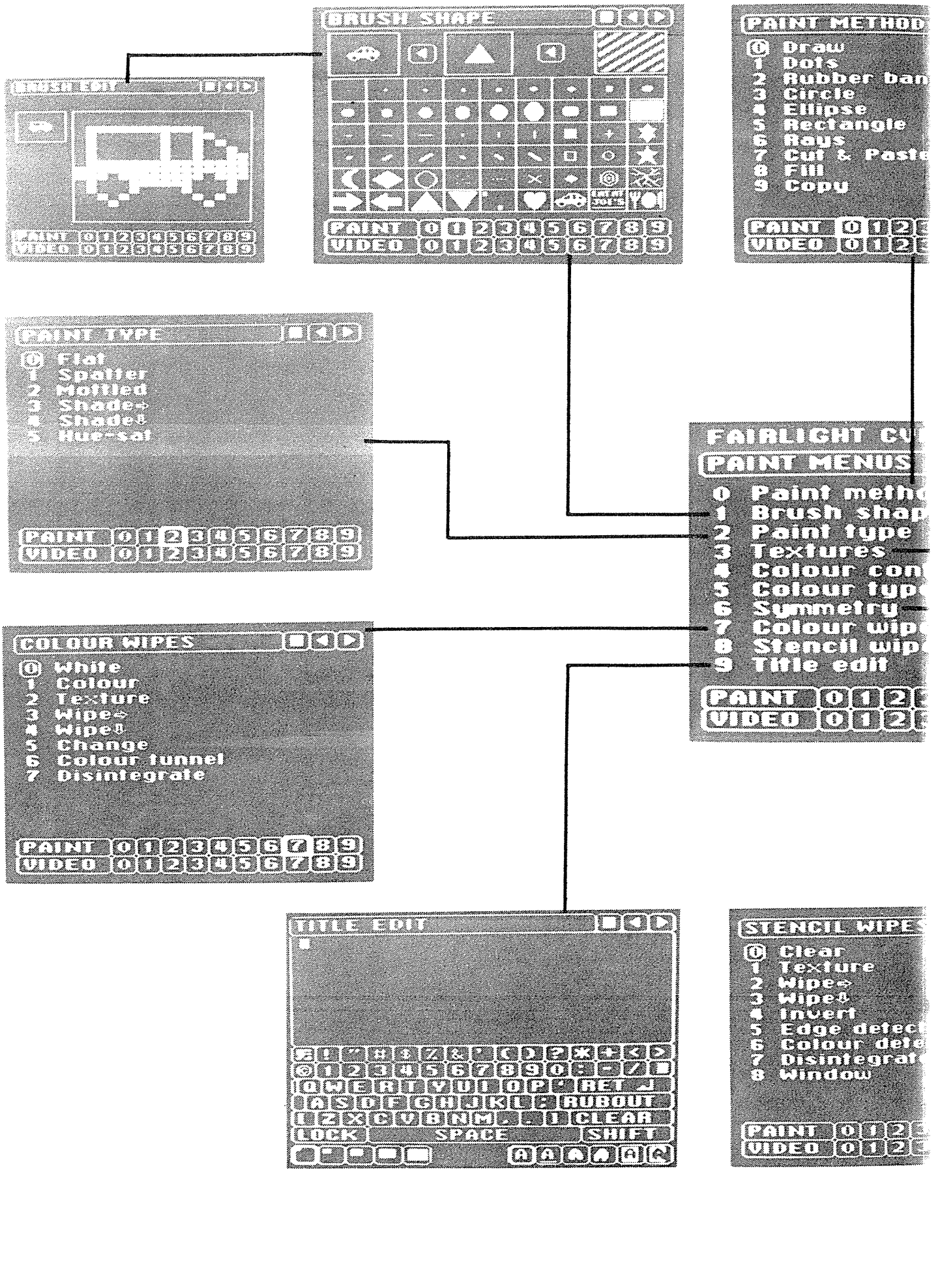
4) Test Pattern: If this function is selected, and then the STOP button is pressed, an inbuilt **Test pattern** will appear on the screen. This will destroy the previous image you may have had in the field store. **Test pattern** permits the correct setup of external monitors and other video equipment. It is for fine adjustment of external monitors to ensure optimal picture quality. **Test pattern** is also selectable by using PRESET **94**.

To stop the **Test pattern** function, press the STOP button.

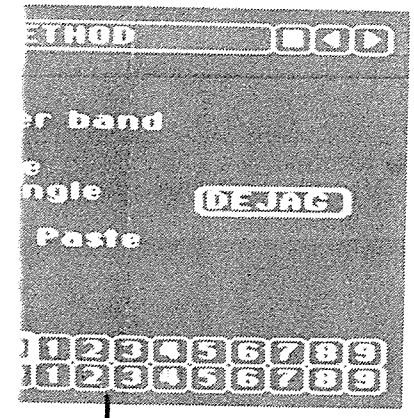

DISPLAY CONT
Paint
Paint/Digital
Dig./Analog
Store
Store/Analog
Acquire
Protect
Live combo
Crawl/Analog
Cascade
PAINT 0 1 2
VIDEO 0 1 2
STENCIL SOURCE
0 Internal
1 Cascade
2 Chroma key
3 Under-over
VIDEO SOURCE
Digital path 1 2 1 2
Analog path 1 1 2 2
BLANKING
Normal
Extended
PAINT 0 1 2 3 4 5 6 7 8 9
VIDEO 0 1 2 3 4 5 6 7 8 9
VIDEO MENUS
0 Display con
1 Stencil sou
2 Screen con
3 Freeze con
4 Colourize c
5 Colourize f
6 Presets for
7 Sequencer
8 Save & Rec
9 Setup
PAINT 0 1 2 3
VIDEO 0 1 2 3
FREEZE CONTROL
0 Continuous
1 Strobe
2 Burst
3 Single freeze
4 Music control
5 External control
PAINT 0 1 2 3 4 5 6 7 8 9
VIDEO 0 1 2 3 4 5 6 7 8 9
COLOURIZE TYPE
0 Tint
1 Translucent
2 Shade
3 Range
4 Solarize
5 Monochrome
6 Contour
7 Spectrum
PAINT 0 1 2 3
VIDEO 0 1 2 3

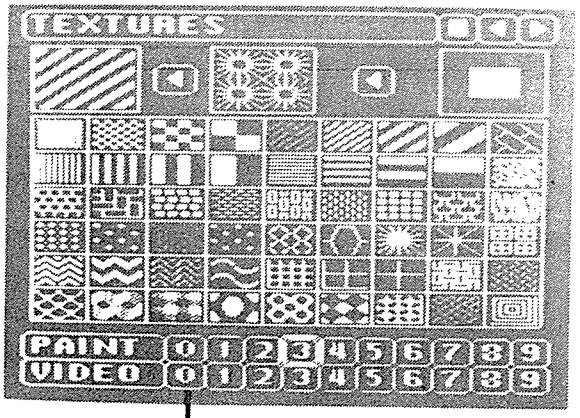
QUICK SELECTION VIDEO MENU

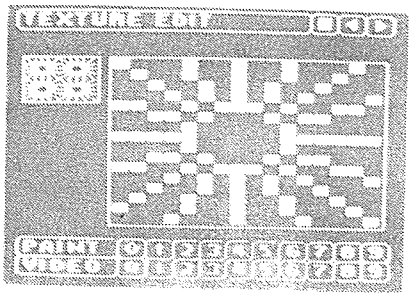


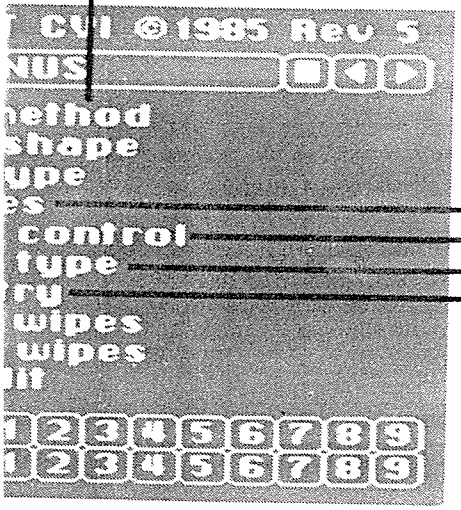

BRUSH SHAPE
PAINT 0 1 2 3 4 5 6 7 8 9
VIDEO 0 1 2 3 4 5 6 7 8 9
PAINT METHOD
0 Draw
1 Dots
2 Rubber ban
3 Circle
4 Ellipse
5 Rectangle
6 Rays
7 Cut & Paste
8 Fill
9 Copy
PAINT TYPE
0 Flat
1 Spatter
2 Mottled
3 Shade⇨
4 Shade⇩
5 Hue-sat
FAIRLIGHT CV
PAINT MENUS
0 Paint meth
1 Brush shap
2 Paint type
3 Textures
4 Colour con
5 Colour type
6 Symmetry
7 Colour wipe
8 Stencil wip
9 Title edit
COLOUR WIPES
0 White
1 Colour
2 Texture
3 Wipe⇨
4 Wipe⇩
5 Change
6 Colour tunnel
7 Disintegrate
TITLE EDIT
RET
RUBOUT
CLEAR
LOCK
SPACE
SHIFT
STENCIL WIPES
0 Clear
1 Texture
2 Wipe⇨
3 Wipe⇩
4 Invert
5 Edge detect
6 Colour dete
7 Disintegrat
8 Window

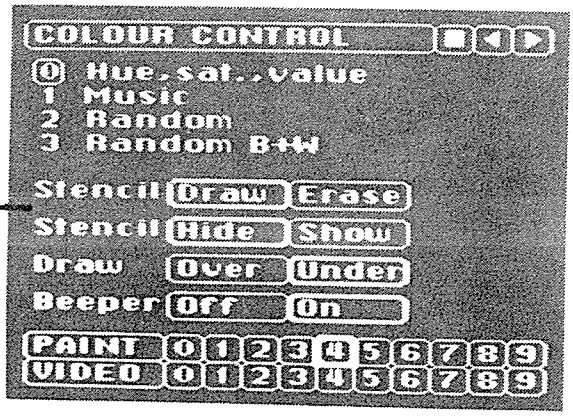
QUICK SELECTION PAINT MENU

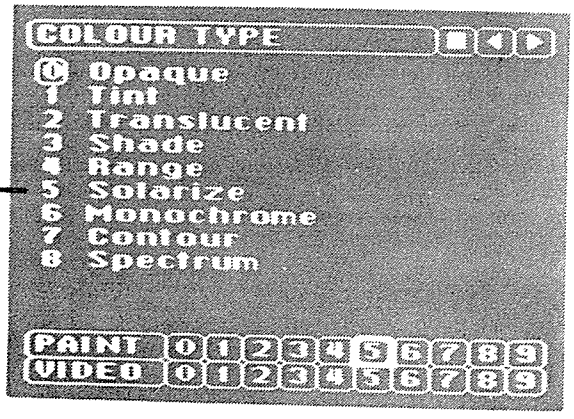


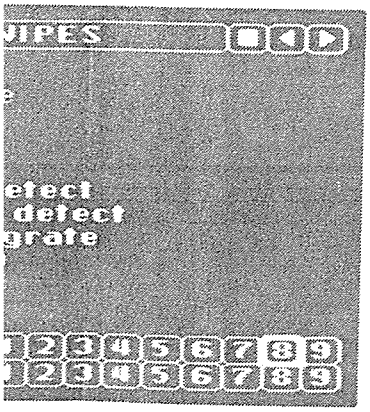


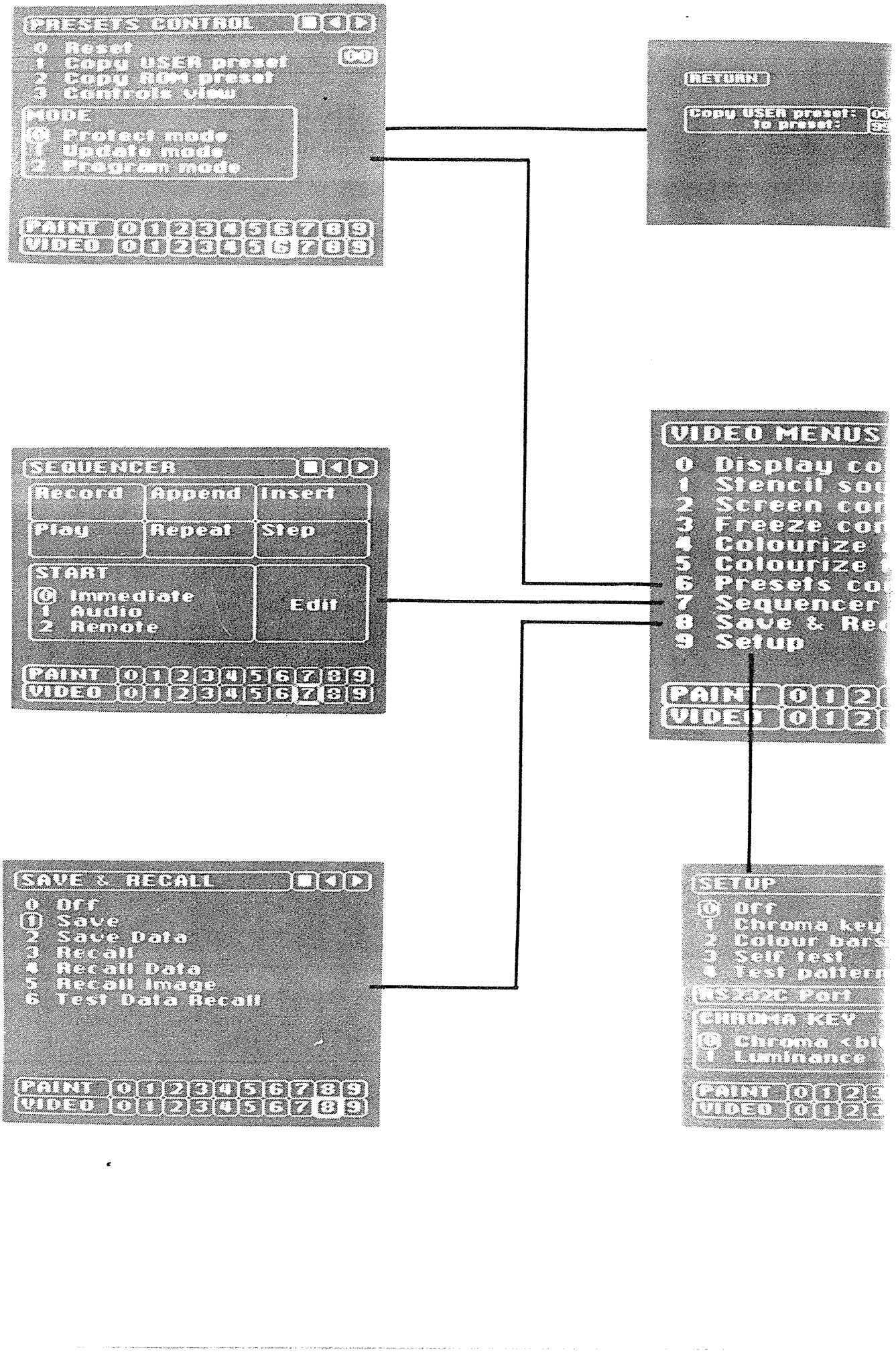




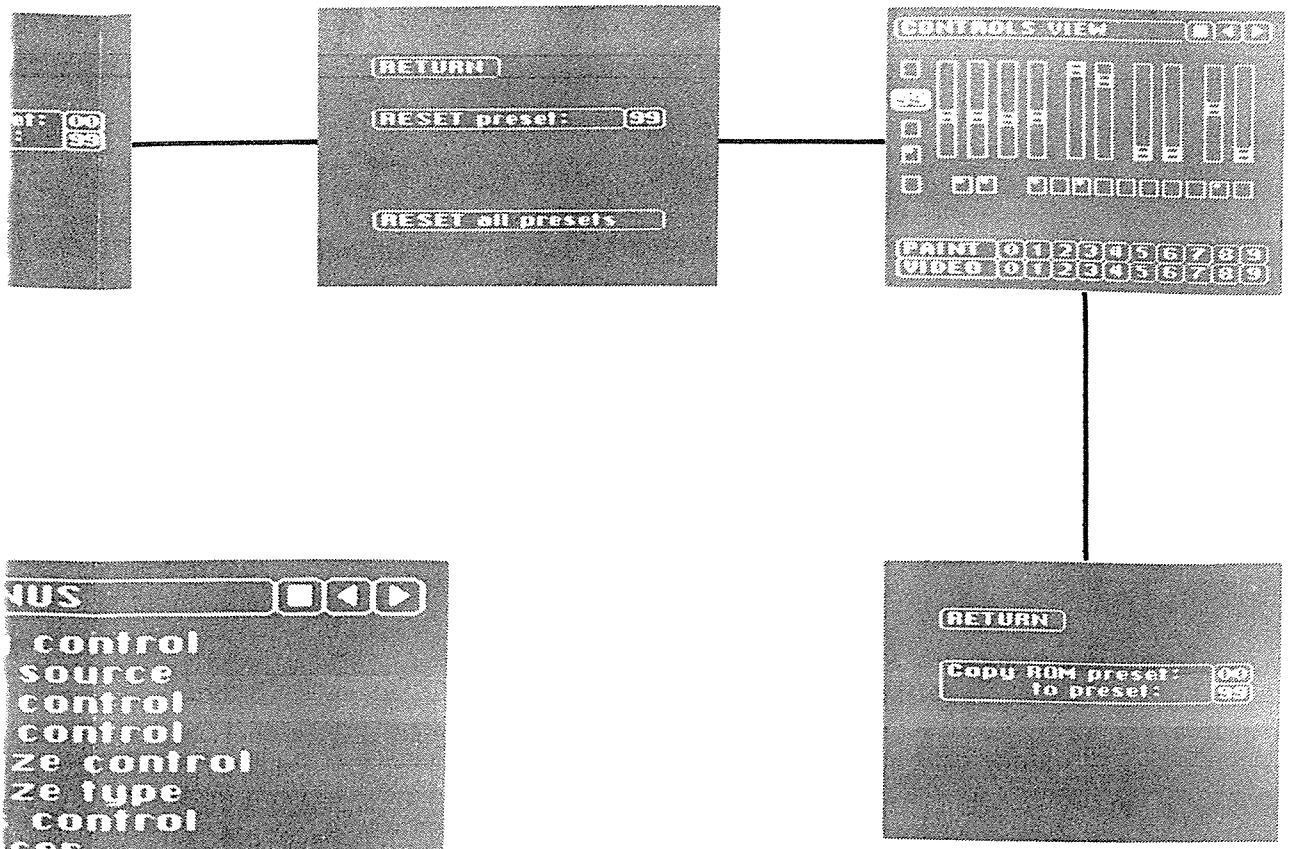


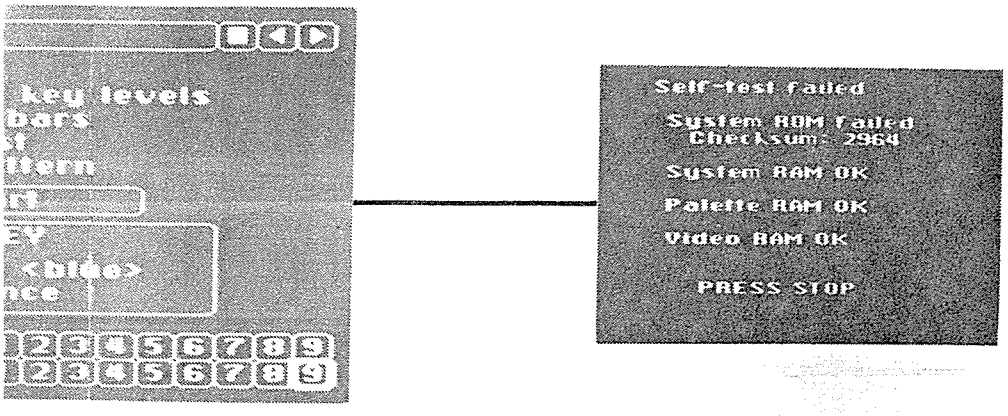





PRESETS CONTROL
0 Reset
1 Copy USER preset
2 Copy ROM preset
3 Controls view
MODE
0 Protect mode
1 Update mode
2 Program mode
PAINT 0 1 2 3 4 5 6 7 8 9
VIDEO 0 1 2 3 4 5 6 7 8 9
RETURN
Copy USER preset:
to preset:
SEQUENCER
Record
Append
Insert
Play
Repeat
Step
START
0 Immediate
1 Audio
2 Remote
Edit
PAINT 0 1 2 3 4 5 6 7 8 9
VIDEO 0 1 2 3 4 5 6 7 8 9
VIDEO MENUS
0 Display co
1 Stencil sou
2 Screen co
3 Freeze co
4 Colourize
5 Colourize
6 Presets co
7 Sequencer
8 Save & Re
9 Setup
PAINT 0 1 2
VIDEO 0 1 2
SAVE & RECALL
0 Off
1 Save
2 Save Data
3 Recall
4 Recall Data
5 Recall Image
6 Test Data Recall
PAINT 0 1 2 3 4 5 6 7 8 9
VIDEO 0 1 2 3 4 5 6 7 8 9
SETUP
0 Off
1 Chroma key
2 Colour bars
3 Self test
4 Test pattern
RS232C Port
CHROMA KEY
0 Chroma <bl
1 Luminance
PAINT 0 1 2
VIDEO 0 1 2

QUICK SELECTION VIDEO MENU





RS 232C PORT CONTROL

This menu is selected from Video Menu 9, SETUP. It controls the data rate and character format for the RS232C serial communications link of the CVI. To use this feature of the CVI you must have a computer or keyboard capable of communicating in the RS232C format. Technical details are given at the end of this section.

The RS232C interface allows an external computer to control the functions of the CONTROL CONSOLE; that is, pressing buttons, moving sliders and performing all sorts of **Paint** functions. In addition, the external computer can be used for storage. Images from the field store, the User-definable PRESETS and the SEQUENCER may all be transmitted to and from the external computer. Titles may also be entered with more flexibility than is possible with the TITLE EDIT menu.

The RS232 link does not allow direct access to the CVI menus, but rather allows previously-defined presets to be selected, hence invoking menu selections. Individual presets may be loaded from the external computer if more than 100 presets are needed in a given application.

All the RS232C functions are initiated from the external computer by transmitting commands of ASCII characters. The CVI responds to these commands either by performing some internal function (Preset change, Paint Method, Button press, etc), by preparing to receive data, or by starting to transmit data.

If the CVI is being used simply as a data terminal (i.e. no transmission from the CVI) then the computer may send the ASCII commands through its printer interface, allowing existing computer software to be used. An ASCII keyboard can also be connected to access the "Receive-only" RS232 functions. When data transmission is needed from the CVI then the computer must communicate throgh a two-way RS232C Port, and some programming of the computer will be necessary to process and store the received data.

COMMAND AND DATA FORMATS

Every command is preceded by an @ character (ASCII 40). The transmission of @ to the CVI at any time terminates the current communications operation and prepares the CVI for a new command. Unrecognised commands will be ignored, and the CVI will then wait to receive another @ character. With the exception of **Load Title** mode, all input characters are converted to upper case, and blanks and carriage returns in the input are ignored.

Commands consist of two ASCII characters followed by a number of parameters, as required. The parameters are 3-digit ASCII decimal numbers (except for **Preset Save/Load**) and must have leading zeroes included. The parameters may be separated by blanks.

Commands fall into two categories: those which request transfer of a block of data to or from the CVI, and those which perform a CONTROL CONSOLE function. In commands where data transfer is requested, each byte of data is transmitted as two ASCII hexadecimal characters (0..9,A..F). For example, a byte with decimal value 61 will be transmitted as two ASCII characters "3D" (3x16+13), decimal 16 as ASCII "10", etc.. The data format is the same for loading data *to* or *from* the CVI.

When a command requests data from the CVI, the data transmission will begin *immediately* after completion of the command, unless the CTS or DSR input to the CVI is set low by the computer (i.e. RTS or DTR computer output set low). The computer may lose some data if these control lines are not set.

CONTROL CONSOLE COMMANDS

The first type of command instructs the CVI to perform an CONTROL CONSOLE action, such as pressing a button, moving a slider, changing a preset or performing one of the Paint Methods. During the execution of these commands, the CVI sets its RTS output low, as some functions (particularly Paint Methods) take some time to perform. The CVI will ignore all commands (including @) during this time. The CVI will also ignore Control Console commands if the SEQUENCER is in a **Play** mode.

The number of parameters required varies between commands. All parameters are decimal and range from 000 to 255. Leading zeroes *must* be included. In the descriptions below:

nn = 2-digit decimal value
nnn = 3-digit decimal value
xxx = 3-digit decimal x co-ordinate
yyy = 3-digit decimal y co-ordinate

Button presses

No parameters are required. Each command is equivalent to pressing the button concerned.

Commands:

CZ - colourize
DC - draw colour
DS - draw stencil
UT - use texture
WC - wipe colour
WS - wipe stencil
US - use stencil
IS - invert stencil
ST - stop
FZ - freeze

Preset change

One parameter is required to specify the preset.

Command: PS*nn*

Slider moves

One parameter is required to set the new value for the specified slider. This ranges from *000* for the slider at the bottom to *255* for the slider at the top. The centre click of the slider occurs at *128*. The slider value will remain as set until the slider is physically moved, or the Preset is changed.

Commands:

HU*nnn* - hue
SA*nnn* - saturation
VA*nnn* - value
CD*nnn* - colour depth
R1*nnn* - rate one
R2*nnn* - rate two
HP*nnn* - horizontal pan
VP*nnn* - vertical pan
SH*nnn* - stretch
ZM*nnn* - zoom

Paint methods

Two parameters are required to define the location on the screen at which the painting should occur. The first parameter defines horizontal position (left side = *000*, right side = *255*), while the second defines vertical position (top = *000*, bottom = *255*). These positions are *relative* to the current PAN position, so that panning the image changes the *absolute* position in the field store.

Commands:

DT*xxxyyy* - draw dot
LN*xxxyyy* - draw line
CE*xxxyyy* - set circle centre
CI*xxxyyy* - draw circle
CE*xxxyyy* - set ellipse centre
AX*xxxyyy* - set ellipse axis
EL*xxxyyy* - draw ellipse
FI*xxxyyy* - fill
CN*xxxyyy* - set rectangle corner
RE*xxxyyy* - draw rectangle
CU*xxxyyy* - cut
PA*xxxyyy* - paste
FR*xxxyyy* - copy from
TO*xxxyyy* - copy to
TT*xxxyyy* - print title

Data transfer commands

The second type of command initiates the transfer of a block of data to or from the CVI. The parameters (if any) define the size and location of the data block.

When the command indicates that data is to be sent *to* the CVI, the characters received immediately after the command are interpreted as data. The data load modes are terminated when the CVI has received the required number of characters, or when an @ character is received.

NOTE: All 8-bit data bytes are transmitted as two hex ASCII characters (0-9,A-F), as described above. The most significant nybble is transmitted first.

Save Sequencer

Command: SS

This instructs the CVI to transmit the data of the current Sequence. The Sequencer data block is 3000 bytes long, resulting in 6000 transmitted ASCII characters. If the recorded Sequence is short, then much of this data will be irrelevant. The recorded Sequence always ends with a *zero* byte (two ASCII "0" characters), and hence the receiving computer can detect the end of the relevant Sequence data and ignore the remainder of the block. However, there is **Colour Crawl** and PAN initialisation data at the end of the Sequencer data block which, although not essential to Sequencer operation, is often useful. It is therefore left to the user to decide whether the entire Sequencer data block or only the recorded Sequence section is stored in the external computer.

Load Sequencer

Command: LS

The CVI will receive characters as Sequencer data. The data (two ASCII characters per byte) will be written to the Sequencer data area, where they are interpreted as Sequencer instructions. If unrecognizable commands are received they appear as blank lines in the SEQUENCER EDIT menu and are ignored. The CVI will remain in the **Load Sequencer** mode until 6000 characters have been received or an @ character is received, initiating a new command.

Save Preset

Command: SP*nn*

A two-digit decimal parameter specifies the User-defined Preset to be transmitted. The 25 bytes of data are transmitted as 50 ASCII characters. The 25 bytes contain all the information associated with the selected Preset: menu selections, slider settings and push-buttons. This information is in a packed format, detailed under PRESET DATA FORMAT at the end of this section.

PRESET DATA FORMAT

The CVI configuration for each Preset is stored as 25 8-bit bytes. Using the **Load/Save Preset** commands, this data may be transmitted as 50 ASCII characters.

The packed data format of these 25 bytes is given below. The maximum values, given in decimal, must not be exceeded as they will cause a Processor Crash in the CVI.

Bytes 1-10:
Values for ten sliders. Byte 1 = HUE, Byte 10 = ZOOM.
Value range 0 to 255.

Byte 11:
Status of 8 switches. 1 = on, 0 = off. From most-significant bit to least significant bit: FREEZE, PRESET, MENU, STOP, DRAW, DRAW LOCK, INVERT STENCIL, USE STENCIL.

Byte 12:
Status of 8 switches. 1 = on, 0 = off. From most-significant bit to least significant bit: TITLE, PICK COLOUR, WIPE STENCIL, WIPE COLOUR, USE TEXTURE, DRAW STENCIL, DRAW COLOUR, COLOURIZE.

Byte 13:
Most significant nybble (4 bits): Paint Type selection. Max value 5.
Least significant nybble: Colour Type selection. Max value 8.

Byte 14:
Brush Shape selection. Max value 53.

Byte 15:
Textures selection. Max value 53.

Byte 16:
Most significant nybble: Stencil Wipes selection. Max value 8.
Least significant nybble: Colour Wipes selection. Max value 7.

Byte 17:
Most significant nybble: Paint Method selection. Max value 9.
Least significant nybble: Symmetry selection. Max value 8.

Byte 18:
Most significant nybble: Stencil Source selection. Max value 3.
Least significant nybble: Colourize Type selection. Max value 7.

Byte 19:
Five least significant bits: Display Control selection. Max value 19.
Bit 7 (MSB): Stencil Draw/Erase flag.
Bit 6: Dejag enable flag.

Byte 20:
Screen Control selection. Max value 255.

Byte 21:
Most significant nybble: Freeze Control selection. Max value 5.
Least significant nybble: Colourize Control selection. Max value 3.

Byte 22:
Most significant nybble: Colour Control selection. Max value 3.
Bit 2: Show Stencil flag.
Bit 1: Draw Over/Under flag.
Bit 0: Beeper off/On flag.

Byte 23:
Least significant nybble: Setup selection. Max value 4.
Bit 7: Analog Path select.
Bit 6: Digital Path select.
Bit 5: Chromakey type select.
Bit 4: Extended Blanking select.

Bytes 24 & 25:
Unused.

SPECIFICATIONS

Baud rate	menu-selectable: 300, 600, 1200, 4800, 9600
Parity	menu-selectable: none, odd, even, space
Stop bits	menu-selectable: one, two
Word length	7 bits
Signal levels	+/-12 volts, RS232C

Transmission from the CVI is stopped if its CTS or DSR inputs are pulled low. CTS halts transmission immediately; DSR halts transmission after the current character.

The CVI sets its RTS output low while executing CONTROL CONSOLE type commands. Commands issued while RTS is low will not be received. Note also that the CVI will ignore CONTROL CONSOLE commands if the SEQUENCER is in a **Play** mode.

Load Preset

Command: LP*nn*

The specified Preset is loaded with data transmitted from the external computer. This is can be used in conjunction with the **Save Preset** function, as it allows previously saved Presets to be loaded to augment the 100 Presets stored in the machine. It will often be desirable to save and load certain Presets in conjunction with a Sequence. 50 characters are expected to complete one Preset. The packed format of the Preset data is given under PRESET DATA FORMAT at the end of this section.

WARNING!! The CVI Presets are used directly by the Central Processing Unit. If out-of-range values or data errors are received the CVI will probably crash when that Preset is selected, destroying all the Presets, the Sequencer program and the image. The only remedy is then to turn the CVI **off** then **on** again. The CVI does *not* check for out-of-range Preset data. Verify the reliability of this function with your computer *before* you use it in any critical applications. Also take extreme care if you modify Preset data. See PRESET DATA FORMAT.

Save Image

Command: SI *xxx yyy nnn nnn*

The four parameters specify an *absolute* rectangle of pixels in the field store. These pixels are transmitted from the CVI, using the format described below.

The parameters range in value from *000* to *255*. The first two parameters set the *absolute* (i.e. not pan-relative) position of the top left corner of the rectangle. *xxx* is horizontal position, *yyy* is vertical position. The third and fourth parameters specify the number of pixels to be saved in the horizontal and vertical directions, respectively.

NOTE: To save 256 pixels horizontally and/or vertically, set the third and/or fourth parameter respectively, to *000*.

Pixel data format:

Each pixel is represented by four ASCII characters. If the entire field store is transmitted (256x256 pixels), this will result in 256K ASCII characters.

The first character will be either "S" or "U", indicating *stencil on* or *stencil off* at the pixel. This character can be used to maintain data synchronisation between the CVI and the computer. The second, third and fourth characters represent the value of the *blue*, *green* and *red* components of the pixel colour. These values range from *0* to *15* and are represented by hexadecimal characters. For example the characters "S777" represent mid-grey, stencil on; "U0FF" represents saturated yellow, stencil off.

The transmitted characters can be stored and edited as an ASCII file on the computer. The file can then be transmitted back to the CVI using the **Load Image** command.

Load Image

Command: LI *xxx yyy nnn nnn*

The four parameters define an absolute rectangle in the field store, as for **Save Image**. Four characters are read for each pixel, using the same format as described for **Save Image**.

The first character of each group of four is used to maintain data synchronisation and to indicate the stencil status. In addition to "S" (stencil *on*) and "U" (stencil *off*), the first character may also be "Z". "Z" indicates that the pixel should not be written to the field store or to the stencil plane. This allows irregularly shaped images to be loaded to the CVI. The pixel colour data is "don't care" after "Z".

Load Title

Command: LT

The CVI title is loaded with a string of ASCII characters. The ASCII characters from SPACE (20) to DELETE (7F) can be printed (with the exception of "@" and "\"). This covers all numbers, letters and ASCII symbols. Once the title is entered, it may be printed onto the image using the **Print Title** command, **TT**, described under **Paint Methods** above. Titles may be up to 300 characters in length, and there is no restriction on the length or number of lines.

Changes of letter size and style are entered as the title control character "\" (ASCII 5C) followed by a selection letter. These are listed below. The end of the title is indicated by transmitting either "\E" or CONTROL D to the CVI.

Title Control Functions:

\1 - Size 1 (smallest)	**\N** - Normal style
\2 - Size 2	**\U** - Underline
\3 - Size 3	**\S** - Drop shadow right
\4 - Size 4	**\T** - drop shadow left
\5 - Size 5 (largest)	**\B** - background
\E - End title	**\C** - background + drop shadow

RS232C PORT PIN ASSIGNMENTS

The 25-pin D-connector at the rear of the CVI carries all the signals necessary for RS232C computer communication. In addition, this connector can supply power to an external peripheral, such as a keyboard or a graphics tablet.

For a full description of the RS323C facilities of the CVI, see Section 4 of the Revision 5 User Manual.

The connector provides +12V, -12V and +5V, with a maximum current of 200mA. These power lines should not be connected to a device with its own power supply, such as a computer. The Ground line should always be connected.

The CVI is wired as Data Terminal Equipment (DTE), with data out of Pin 2. The pin assignments are given below. Pins not listed are not connected.

Pin 2	TXD
Pin 3	RXD
Pin 4	RTS
Pin 5	CTS
Pin 6	DSR
Pin 7	GND (Ground)
Pin 11	-12V
Pin 15	-12V
Pin 18	+12V
Pin 20	DTR
Pin 25	+5V