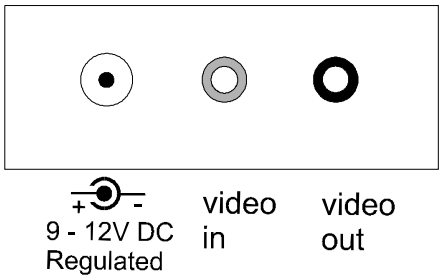
Video Text Overlay Keyboard Interface Program

The video text overlay keyboard interface unit demonstrates simple control of a video text overlay from a PC keyboard. It uses the standard UK keyboard key mapping as illustrated below.

Connections

Before connecting the system to a power supply connect video in and video out via the phono connectors on the front panel. The PS/2 keyboard should be connected to the socket on the left of the enclosure.



Front panel connectors

Power supply

The unit draws approximately 50mA and is designed to be powered from a 9 - 12V dc regulated power supply. The power supply used should be capable of providing 300 - 500mA according to the requirements of the keyboard and camera being used with the overlay unit. The keyboard used should not have a current draw greater than 200mA. The power supply should be connected via the 2.1mm power connector on the front panel of the enclosure. The unit is designed to be powered from the same power supply as the camera so it does not have a power switch. A 9V PP3 battery can also be connected via the internal battery clip. The battery connection is only provided so that the unit can be used remotely when the text display has been previously set with the keyboard. Due to the current draw it is not recommended that a battery is used when a keyboard is connected to the unit.

WARNING! It is important to ensure correct connection of the video text overlay to the power supply and/or battery. Failure to observe correct power supply connection polarity may result in the electronic failure of the unit or in the battery bursting to cause personal injury and damage.

Program Operation

The program runs immediately the unit is connected to a power supply and the text display will appear within approximately 1 second. If the unit is connected to power before a video in signal is connected the display may be a fuzzy, rolling picture. In this case the unit has not synchronised to the video input signal. Disconnect the power, connect the video input signal and connect the power again to clear this problem.

The basic operation of the text overlay unit is simple and straightforward. A flashing underscore cursor indicates the current screen position. This cursor can be moved around the screen by the keyboard cursor keys. The cursor will wrap around the screen left and right, top and bottom. If no key is pressed then the cursor will disappear after approximately fifteen seconds. The video text overlay unit uses the standard UK keyboard mapping shown in Figure 1. There is no provision for the keyboard mappings of other countries or languages other than English. The alphanumeric characters in the QWERTY section of the keyboard can be typed directly to the screen as would normally be expected. Each alphabetic character key is normally lowercase. Uppercase characters can be typed by holding down the shift key or pressing the CAPS LOCK key. The keyboard LED indicators will not be lit by the unit. To exit CAPS LOCK mode press the key again. The numeric characters 1 to 0 can be typed using the keys along the top of the keyboard. The keys of the numeric keypad on the right of the keyboard are used for display control and can not be used to enter characters.

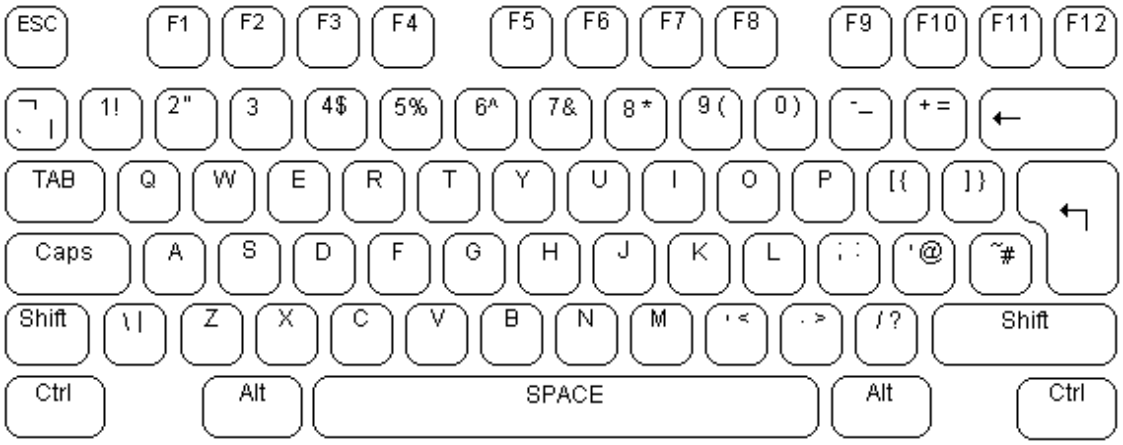
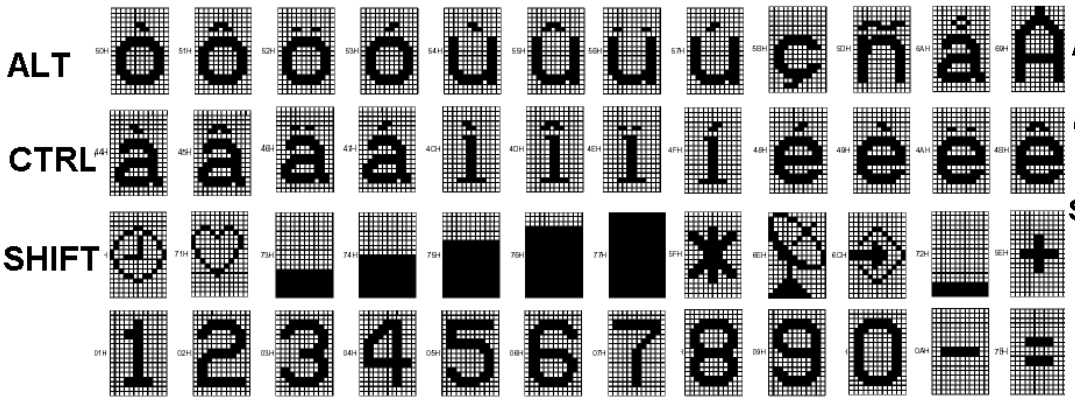
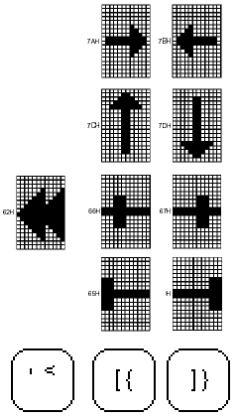


Figure 1 Standard UK keyboard mapping used by the video text overlay unit

The special characters of the STV5730A character set can be typed by pressing either SHIFT⇑, CTRL or ALT and then the relevant number key as shown Command Table 1 and Command Table 2. The #~ key is translated to the β



Command Table 1. Special STV5730A Characters are mapped to number and punctuation keys character.



Command Table 2. STV5730A Special characters

To remove a character from the screen use the backspace key. This will replace the character immediately to the left of the current cursor position with a blank space and move the cursor to that position. The Delete key has no function. The Home and End keys move the cursor position to the left and right of the current line on the screen. The Return key moves the cursor to the beginning of the next line.

The video text overlay unit divides its display between four on screen pages. Text written to each of these pages is will be stored in the unit's non-volatile memory until overwritten. There is no default on screen indication of which page is currently selected. To move between the screen pages use the page up and page down keys. Page up moves toward page 1. Page down moves toward page 4.

The video text overlay unit operates in two modes. In mixed mode the text is overlaid over the video input signal. In full page mode the unit generates its own video signal internally and the text is overlaid onto this. All keyboard commands operate in the same way in mixed and full page modes, except for those which control the colour of the screen elements which only work in full page mode. The STV5730A uses a non-standard method to generate its colour signal in full page mode. Some video monitors are unable to pick up this colour signal and will only display the full page mode screen in monochrome. To switch between mixed and full page modes use the F3 key as shown in Command Table 3.

SHIFT	F3	Set full page mode, text over internal video signal
	"	Set mixed mode, text over external video signal

Command Table 3. Display mode selection

Each text character can be displayed with a background and / or a blink attribute. These attributes can be set to control how the text characters are displayed using the F1 & F2 keys as shown in Command Table 4. In mixed mode when the background setting is off the text will be displayed with solid characters. When the background setting is on the text characters are translucent with a grey translucent background. The change from solid to translucent text and background has immediate effect on all text already displayed and text typed subsequently until the background attribute is changed. This means that you may also display translucent text without a background and solid text with a solid background although these settings will not be stored when the page is changed. In full page mode the characters and the background are solid and their colour can be changed. The blink attribute affects each character which is typed while it is on individually.

SHIFT	F1	Turn the background setting off
	"	Turn the background setting on
SHIFT	F2	Turn the blink setting off
	"	Turn the blink setting on

Command Table 4. Background and blink attribute selection

Numeric Keypad Key	Colour*
0	Black
1	Blue
2	Green
3	Cyan
4	Red
5	Magenta
6	Yellow
7	White

Command Table 5. Colour selection
*Not all colours can be displayed for all screen elements

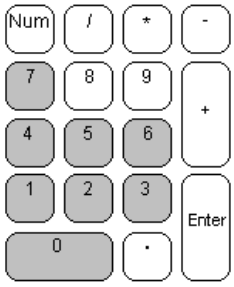


Figure 2
Numeric keypad

ALT	Numeric Keypad 0 -7	Character border
CTRL	“	Screen background
SHIFT	“	Character background
	“	Character

Command Table 6. Screen display element colour selection

In full page mode the colour of the text characters as well as the screen display elements can be changed. According to its datasheet the STV5730A is able to generate eight different colours. However, due to the way the colour signal is generated, in most cases only a few can be displayed, particularly the character colours. It is recommended that you experiment to see which colours your monitor will display. Characters can have their colour attribute set individually. The attribute is set by pressing the numeric keypad number for the desired colour defined in the colour selection Command Table 5. The flashing cursor will change colour to indicate the colour selected. The colour setting of the screen display elements, character background, screen background and character border affect the entire current screen page. The colours of the screen display elements are independently set on each page. Use the SHIFT⇑, CTRL or ALT keys as shown in Command Table 6 to select the element required and using the numeric keypad to select the desired colour. For example to select a green screen background press CRTL and 2 on the numeric keypad. To change this to red press CTRL and 4 on the numeric keypad. The character border colour is sometimes very difficult to see as it only affects a small number of pixels around each character. It can normally only be seen when the colour of the character background contrasts strongly with the character border colour. For example if the character background colour is set to black (actually dark grey on most monitors) by typing SHIFT⇑ and 0, then typing ALT and 2 will change the character border to green. This should be easily visible. Try typing ALT and 4 to change the border colour to red (or another numeric key for another colour) and observing the change. This may be more easily seen if the text size is increased.

The size of the text on the screen can be set to one of four sizes in three separate zones, the top row, the middle 9 rows and the bottom row. See the character size selection Command Table 7 below. The text sizes you set are stored in EEPROM memory as they are made. The size changes affect only the screen page on which they are made.

ALT	F5	Set line 1 to text size 4
CTRL	“	Set line 1 to text size 3
SHIFT	“	Set line 1 to text size 2
	“	Set line 1 to text size 1
ALT	F6	Set lines 2 - 10 to text size 4
CTRL	“	Set lines 2 - 10 to text size 3
SHIFT	“	Set lines 2 - 10 to text size 2
	“	Set lines 2 - 10 to text size 1
ALT	F7	Set line 11 to text size 4
CTRL	“	Set line 11 to text size 3
SHIFT	“	Set line 11 to text size 2
	“	Set line 11 to text size 1

Command Table 7. Character size selection

To clear the screen page of text press F9. Background and blink settings in effect on the screen page will be lost. The screen display element colour and character size can be reset to default settings using the F10 and F11 keys as shown in Command Table 8. F10 resets only the current screen page, F11 resets all the screen pages to the defaults. These commands will set the system into mixed mode, which is the default setting. The ESC key will clear the unit’s internal settings for SHIFT⇑, CTRL, ALT and CAPS. Occasionally these settings may not be unset correctly by the keyboard so if the keyboard appears to be stuck in CAPS press ESC.

F8	Start scrolling
F9	Clear the screen
F10	Reset the default settings for the current page
F11	Reset the default settings for all screen pages
ESC	Clear SHIFT⇑, CTRL, ALT and CAPS settings

Command Table 8. Screen setting control

Scrolling

All the text on a screen page can be scrolled along a single line. To use the scrolling command first type the text that you want see scroll. By default all the text will be scrolled starting from what is typed in the top left of the screen until the last character in the bottom right. To use a shorter message enter the ⍑ character at the desired end point by typing ALT and /. This character will not be seen when scrolling. When the end of the message is reached scrolling will start again at the beginning of the message. No keyboard commands or characters can be entered when in scrolling mode therefore the display mode and the screen display element colours should be set before entering the scroll command. The text will scroll on the line on which the cursor is positioned when the scrolling is started. To start scrolling press F8. The text will start to move across the screen from right to left. When the end of the

message is reached the text will scroll off the left of the screen and then start from the beginning. The message will continue to scroll until the return key is pressed. If the unit is switched off while scrolling is in progress, scrolling will start again when power is restored.

WARRANTY

The BlackBoxCamera™ Company Ltd. warrants its products to be free of defects in materials and workmanship under normal use and service for a period of twelve months from the date of original purchase. The obligations of The BlackBoxCamera™ Company Ltd. shall be limited within the warranty period, at its option, to repair or replace the product or any part thereof. The company shall not be responsible for dismantling and/or installation charges. To exercise the warranty the product must be returned carriage paid and insured. Under this limited warranty the maximum liability of The BlackBoxCamera™ Company Ltd. shall not in any case exceed the purchase price of the product, which shall be fixed as liquidated damages and not as a penalty, and shall be the complete and exclusive remedy against The BlackBoxCamera™ Company. **This warranty does not apply in the following cases:** Improper installation, misuse, failure to follow installation and operating instructions, alteration, abuse, accident or tampering, and repair by anyone other than The BlackBoxCamera™ Company.

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