

## Philips Safari to Eurotext I2C Translation Chip

## Functional Specification

Colin Hinson, April 15, 1993

This device is required to translate between Safari I2C commands and Eurotext commands. The Safari device resides at address 60 (& 61) hex, whilst Eurotext resides at address 22 (&23) hex.

This BUS TranslatOR (referred to from here on as BUSTOR ) will consist of two I2C interfaces with probably a state machine and a ROM (or ROM equivalent) in between them. The interface to the TV uC will have an address of 60(hex) and will be a slave transceiver. The second I2C interface will be used to communicate with Eurotext (at address 22/3 hex) and will be a master transceiver.

There are 2 types of Safari commands, "user" and "system". The user commands are single byte (+ address) commands, and the system commands are 2 byte commands. So far as I can ascertain, we can afford to ignore the 2 byte commands as they are concerned with DAC bars and the like.

Most of the user commands have a direct one to one translation, however some of them don't, and some of them don't in all circumstances. The general complications are listed below:

1. Some Safari commands require 2 or more commands to Eurotext to produce the same effect(s).
2. Some commands require the use of a 6 second timer to remove data from the screen (such as packet 8/30 status display). This timer does not need to be very accurate, as there is up to a 1 second delay before the packet 8/30 arrives anyway.
3. Some commands have a different effect determined by external links on Safari. The relevant 2 links will have to be fitted to Bustor so that the same effects can be produced - see table of Links.
4. The status read command requires an almost immediate response, i.e. the delay caused by Bustor having to read the status from Eurotext, translate the data and then send it to the TV uC can't be tolerated. This means that Bustor will have to have an up to date copy of Eurotext's status - this can be achieved by reading the status (say) once per second. More on this later.
5. Bustor is also required to talk to Unitext. An external link will be fitted to distinguish between Eurotext and Unitext. This link affects only 2 commands (Status and Flof).

The following list of commands will need supporting

< = I2C start condition

> = I2C Stop Condition

All number are hex numbers

Codes used = 00 to 3f (6 bits only). Ignore all others, including 2 byte commands.

If the I2C block from Eurotext is used, then the state machine does not need to know about the incoming address from the TV uC, as the receive register full bit will only be set if the data in the register was preceded by the correct address, but note that it will be set to 22 or 23 hex and needs changing to 60 or 61 hex in the hardware.

\*\*\*\* added 150493.

On Power Up, Eurotext (not Unitext) is required to put out an odd/even field signal on pin 28. This is one of the programmable pins and requires a 3 byte instruction to be sent: (22),08,0f,20.

If PICTURE mode selected ie bit 5 = 0 (in the byte after the address).

Safari	Code	Eurotext	Type
<60,00>	0		
<60,01>	0		
<60,02>	0		
<60,03>	<22,70>U	1 & 3	Picture - SEE NOTE 1
<60,04>	<22,1E>X	3,4 & 7	Status - Wait 6 seconds <22,1D> - SEE NOTE 1
<60,05>	0		
<60,06>	0		
<60,07>	<22,48>U	4	Time - Wait 6 seconds <22,49>
<60,08>	0		
<60,09>	0		
<60,0a>	0		
<60,0b>	0		
<60,0c>	0		
<60,0d>	0		
<60,0e>	0		
<60,0f>	0		
<60,10>	<22,04>U	2 & 3	Digit 1
<60,11>	<22,04>U	2 & 3	Digit 2
<60,12>	<22,04>U	2 & 3	Digit 3
<60,13>	<22,04>U	2 & 3	Digit 4
<60,14>	<22,04>U	2 & 3	Digit 5
<60,15>	<22,04>U	2 & 3	Digit 6
<60,16>	<22,04>U	2 & 3	Digit 7
<60,17>	<22,04>U	2 & 3	Digit 8
<60,18>	<22,04>U	2 & 3	Digit 9
<60,19>	<22,04>U	2 & 3	Digit 0
<60,1a>	<22,04>U	2 & 3	Digit 10
<60,1b>	<22,04>U	2 & 3	Digit 11
<60,1c>	<22,04>U	2 & 3	Digit 12
<60,1d>	<22,04>U	2 & 3	Digit 13
<60,1e>	<22,04>U	2 & 3	Digit 14
<60,1f>	<22,04>U	2 & 3	Digit 15

IF text mode selected ie bit 5 = 1

Safari	Code	Eurotext	Type
<60,20>	<22,38>U	1	Red - see note 4
<60,21>	<22,39>U	1	Green - see note 4
<60,22>	<22,3A>U	1	Yellow - see note 4
<60,23>	0		
<60,24>	0		Status - see note 3
<60,25>	<22,1A>U	1	Hold
<60,26>	<22,1C>U	6	Reveal
<60,27>	<22,10>U	1	Update(Cancel) - see note 7
<60,28>	<22,3C>U	1	Index - see note 4
<60,29>	<22,7x>X	5	Mode Toggle.
<60,2a>	<22,17>U	1	Browse
<60,2b>	<22,1C>U	1	Reveal-set toggle
<60,2c>	0		Store - see note 5
<60,2d>			
<60,2e>			
<60,2f>	<22,11>U	1	Sub-page
<60,30>	<22,21>U	1	Digit 1
<60,31>	<22,22>U	1	Digit 2
<60,32>	<22,23>U	1	Digit 3

<60,33>	<22,24>U	1	Digit 4
<60,34>	<22,25>U	1	Digit 5
<60,35>	<22,26>U	1	Digit 6
<60,36>	<22,27>U	1	Digit 7
<60,37>	<22,28>U	1	Digit 8
<60,38>	<22,29>U	1	Digit 9
<60,39>	<22,20>U	1	Digit 0
<60,3a>	<22,13>U	1	Expand
<60,3b>	<22,16>U	1	Page up - see note 6
<60,3c>	<22,15>U	1	Page down - see note 6
<60,3d>	<22,3b>U	1	Cyan - see note 4
<60,3e>	<22,73>U	1	Mix - see note 2
<60,3f>	<22,71>U	1	Text - see note 2

CODE TYPES:

0. Code type 0 means that this Safari code should be ignored.
1. Code type 1 indicates that a simple 1 to 1 translation is required.
2. Code type 2 indicates a digit entry in Picture mode - i.e. is a channel change (04 hex to Eurotext).
3. Code type 3 indicates that if the 8/30 link is set, then the packet 8/30 status command (1E) should be sent, and then 6 seconds later, the clear status command (1D) should be sent.
4. Code type 4 indicates that the time from teletext packet 0 should be displayed for 6 seconds. This is achieved by sending 48 hex and then 6 seconds later sending 49 hex.
5. Code type 5 - West/East mode toggle. The codes sent here are determined by a link (West bar/East).

If the link is in the West bar position, then at power up, the codes 01 (lang), 02 (English) should be sent. If the toggle command is received subsequently, then it should be ignored, or 01, 02 sent to Eurotext.

If the link is in the East position, then at power up, the codes 01 (lang), 01 (Polish) should be sent. If the toggle command is received subsequently, then the codes 01,02 or 01,01 should be sent on alternate commands in order to toggle between West and Eastern European language sets.

6. Code type 6 is the Reveal toggle code. Code 1C hex should be sent and 6 seconds later, code 1C hex should be sent again.
7. Code type 7: if Unitext is fitted to the chassis, then code 3D is required to cancel the status command.

The TV uC has to be able to read a status byte from the decoder. This information can be constructed from a combination of data received by reading Eurotext Status and by keeping track of the current text/mix/picture mode.

The bits in the byte required by the TV uC are as follows:

- Bit 0 Text/Mix mode. Logic high = There is some text on the screen, and the decoder is in text mode (i.e. digit button = page number, not channel change.)
- Bit 1 Picture On. Inverted copy of 'POFF' in Eurotext status byte.
- Bit 2 Good signal
- Bit 3 Ready to receive commands.
- Bit 4 n/u
- Bit 5 n/u
- Bit 6 n/u

Bit 7 Power on reset received. Set to logic low only on the first read of the I2C status byte after power up.

All bits are active high.

#### Table of Links

-----

Not fitted.

Fitted.

1. Eastern mode. Western mode. (see code type 5, above)
2. Packet 8/30 status used Packet 8/30 status not used  
The remaining 8 links used on Safari can be ignored.
3. Eurotext fitted to chassis. Unitext fitted to chassis.

#### NOTES:

1. The Safari chip set displays the channel number for this command if the appropriate link is set. Eurotext will not do so even if the link is set.
2. Command does not set HOLD to OFF or EXPAND to TOP.
3. The Status command in Text mode has no equivalent function in Eurotext.
4. These commands do not set display to Normal size (goes to Top expand if in bottom expand), and do not clear the Update(Cancel) function.
5. Store List has no equivalent function in Eurotext (has no EEROM).
6. The Up/down function on Eurotext does not recognise Magazine boundaries.
7. The Update function on Eurotext does not clear the Hold or the Reveal functions.

#### ADDITIONAL LOGIC FUNCTION:

Some TV chassis require the odd/even signal as supplied by the Safari chip set. This signal is available from Eurotext, but it requires modification:

1. It needs inverting
2. It should only appear in TEXT mode. In Picture or Mix it should be a logic low.

For the Curtis TV, a series resistor of about 4K7 is required on the board as the signal feeds the base of a transistor direct from the teletext board.

□