Windows
Test Pattern Generator
Version 3.0
ETV/AN97004

Windows Test Pattern Generator, version 3.0

Application Note
ETV/AN97004

Abstract

The Test Pattern Generator creates several types of test patterns, that can be used to examine or to align several monitor adjustments. It runs under the Windows operating system and can be used at all Graphic Resolution Modes, with the restriction that the Colour Mode is True Colour (24-bit). Full Screen as well as Windowed Test Patterns (1/2, 1/4 and 1/9 screen area) can be generated. Monitor screen aspect ratios of 4:3 and 16:9 (Wide Screen) can be used.
The version 3.0 is the first version that is distributed officially, the former versions where test vehicles for this official version 3.0.

APPLICATION NOTE

Windows Test Pattern Generator Version 3.0

ETV/AN97004

Author(s):

Herman J.S.Aben
Philips Semiconductors Systems Laboratory Eindhoven,
The Netherlands.

Keywords

Windows
Test Patterns
Aspect Ratio
Convergence Alignment
Video Alignment

Date: 6th June, 1995

Pages: 27

Windows Test Pattern Generator, version 3.0

Application Note ETV/AN97004

Summary

The Windows Test Pattern Generator creates several types of test patterns, that can be used to examine or to align several monitor adjustments. It runs under the Windows operating system and can be used at all Graphic Resolution Modes, with the restriction that the Colour Mode is True Colour (24-bit). Full Screen as well as Windowed Test Patterns (1/2, 1/4 and 1/9 screen area) can be generated. Monitor screen aspect ratios of 4:3 and 16:9 (Wide Screen) can be used.
The version 3.0 is the first version that is distributed officially, the former versions where test vehicles for this official version 3.0.

Windows Test Pattern Generator, version 3.0 — Application Note ETV/AN97004

CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION.

The Test Pattern Generator creates several types of test patterns, that can be used to examine or to align several monitor adjustments, like convergence and video controls. It runs under the Windows operating system and can be used at all Graphic Resolution Modes, with the restriction that the Colour Mode is True Colour (24-bit). Full screen as well as smaller (1/2, 1/4 and 1/9 screen area) test patterns can be generated. Monitor screen aspect ratios of 4:3 and 16:9 can be used.
The version 3.0 is the first version that is distributed officially, the former versions where test vehicles for this official version 3.0.

2. THE MENU WINDOWS.

All the Test Patterns can be selected/composed by a Menu Window. This Menu Window consists of eight Menu Tabs: the first five contain several types of Test Patterns, the other three are used for program definitions like Colour Settings, Program Settings (e.g. Saving User Settings) and Program Info.

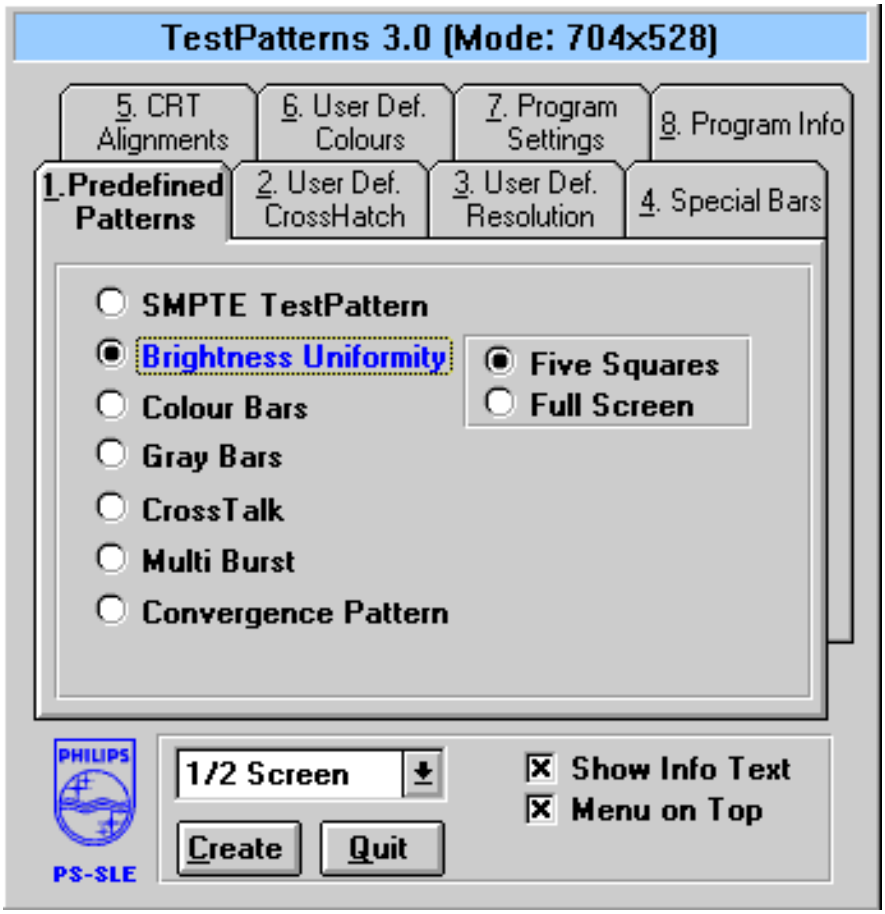


Fig.1 Menu Window "Predefined Patterns".

Tab 1 is used to Select one of the Predefined Test Patterns.

Here you can also see the Main Program Selections:

- **"Test Pattern Size" Selection Box** for defining the Size of the Test Pattern
- **"Show Info Text" Check Box**. If activated (x-sign present): A Textual Information Layer will be displayed on top of the Test Pattern.
- **"Menu on Top" Check Box**. If activated (x-sign present): The Menu Window will stay on Top of the Test Pattern. (If not activated: Clicking the Left-Mouse onto the Test Pattern will pop-up the Menu Window again.)

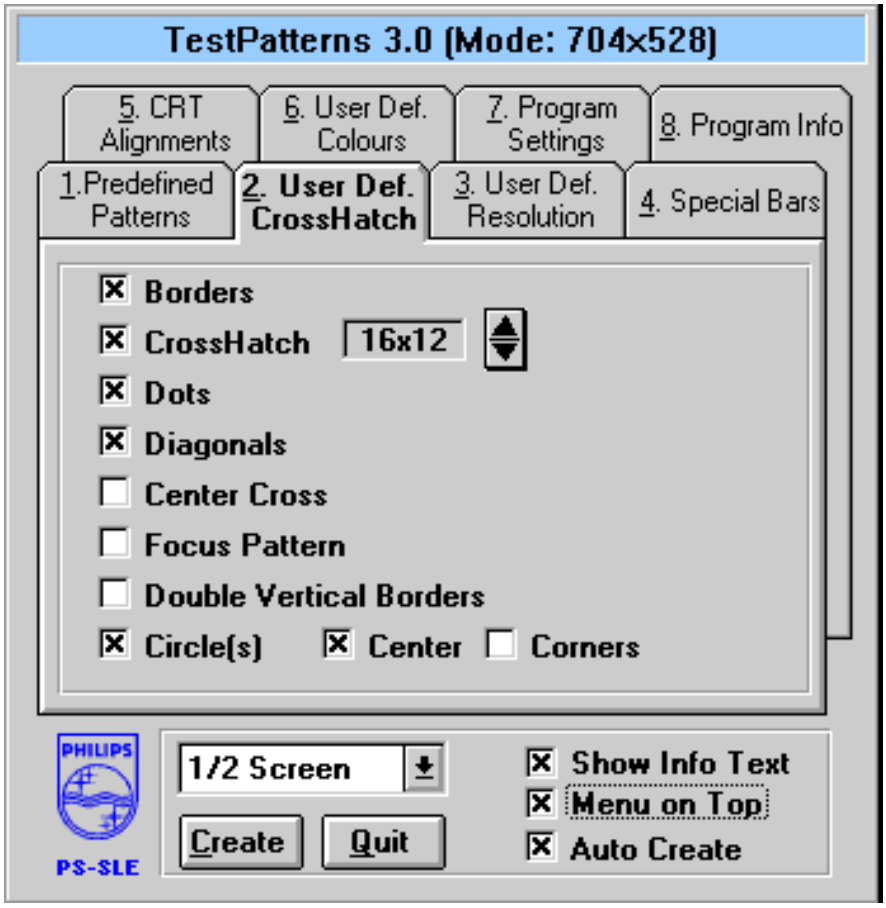


Fig.2 Menu Window "User Defined CrossHatch".

Tab 2 is used to Compose an User Defined CrossHatch Test Pattern. Several items can be (de)selected from the complete Crosshatch Test Pattern.

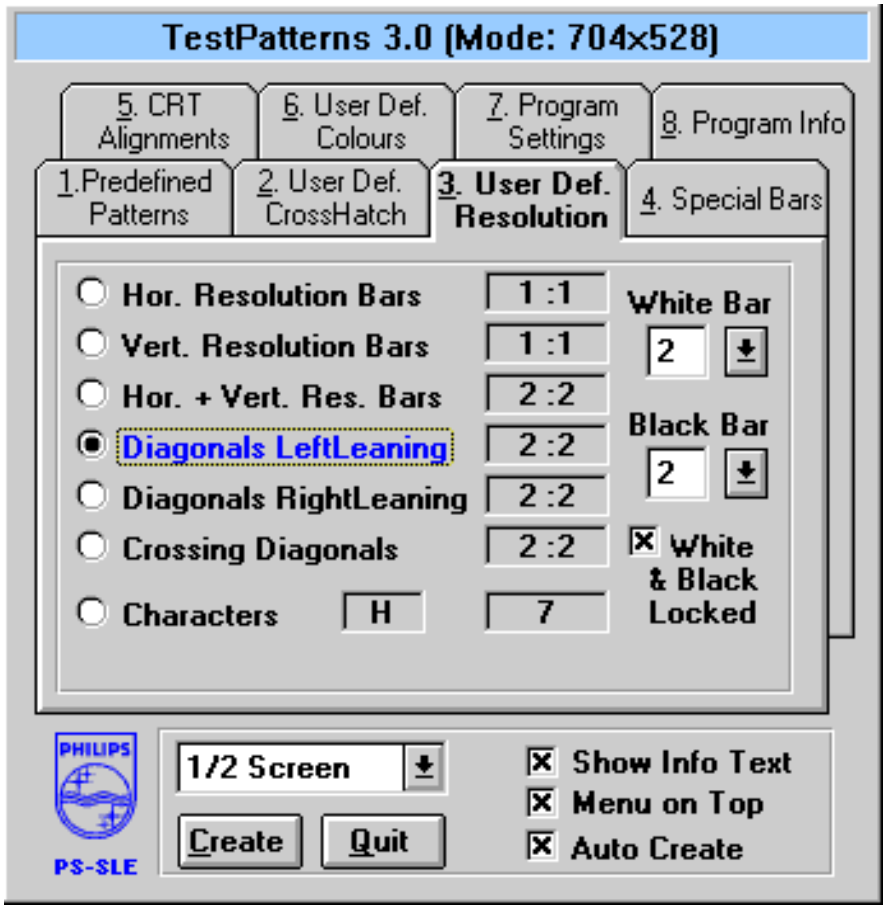


Fig.3 Menu Window "User Defined Resolution".

From this Tab 3 several types of Resolution Test Patterns can be composed.

When this Tab 3 is selected another Main Program Selection Box becomes visible: the **"Auto Create" Check Box**. When this Box is activated (x-sign present) each selection will automatically update the Test Pattern. When the Check Box is not-activated, you can compose the complete new resolution pattern without changing the actual Test Pattern. After all new settings have been made Click onto the **"Create"-Button** to create the new Test Pattern.

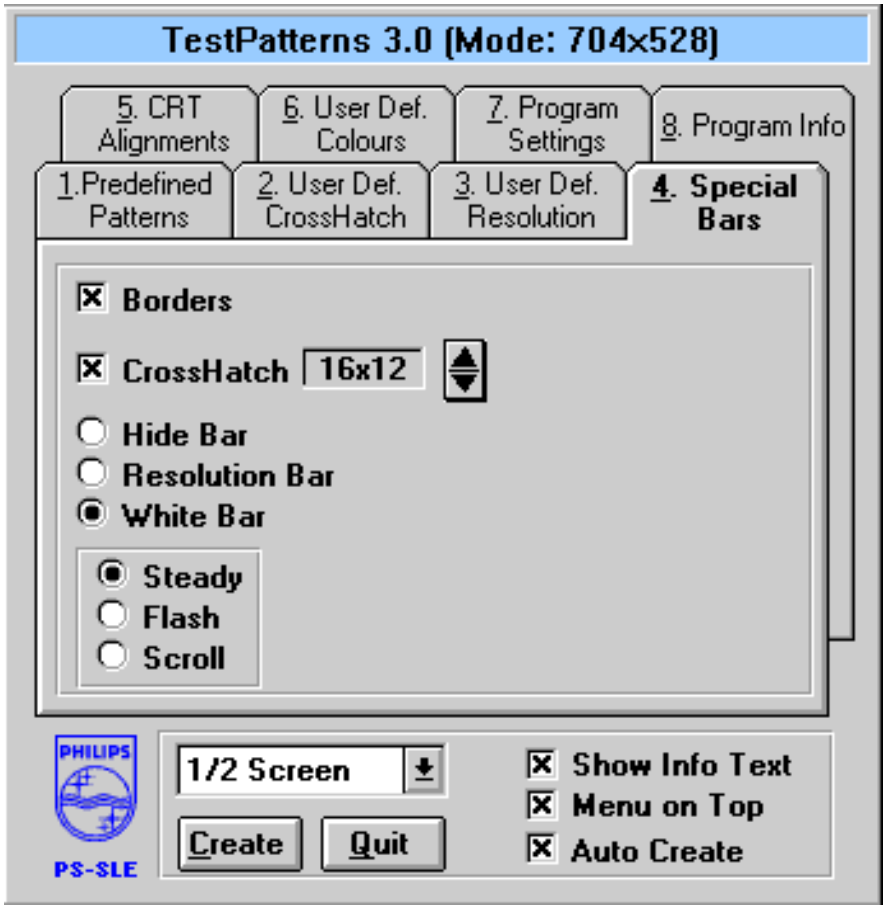


Fig.4 Menu Window "Special Bars".

From this Tab 4 a Test Pattern including a Special Bar can be created. The Special Bar can have several properties: it can be a Scrolling or Flashing White Bar or it can be filled with Horizontal Resolution Bars. It can be Sized and Positioned by the user.
(Also at this Tab 4 the "Auto Create" Check Box is present.)

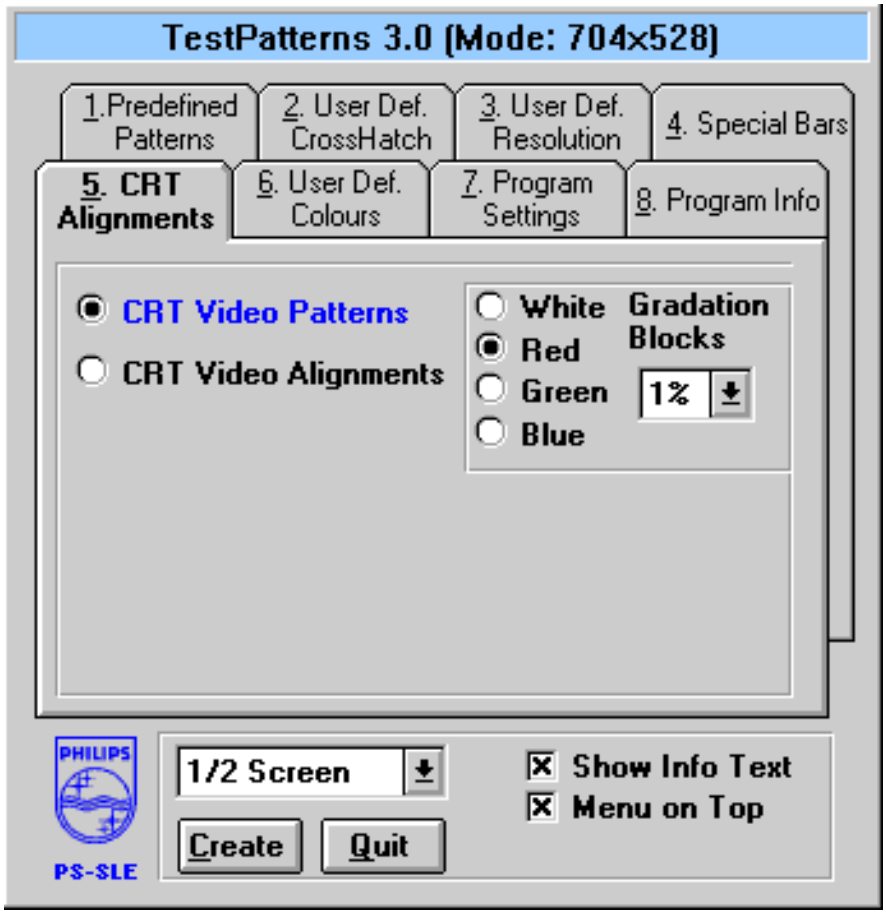


Fig.5 Menu Window "CRT Alignments".

At this Tab 5 you find the Video Alignment Test Patterns for adjusting the Black Levels and Gain Settings of the three Colour Channels.

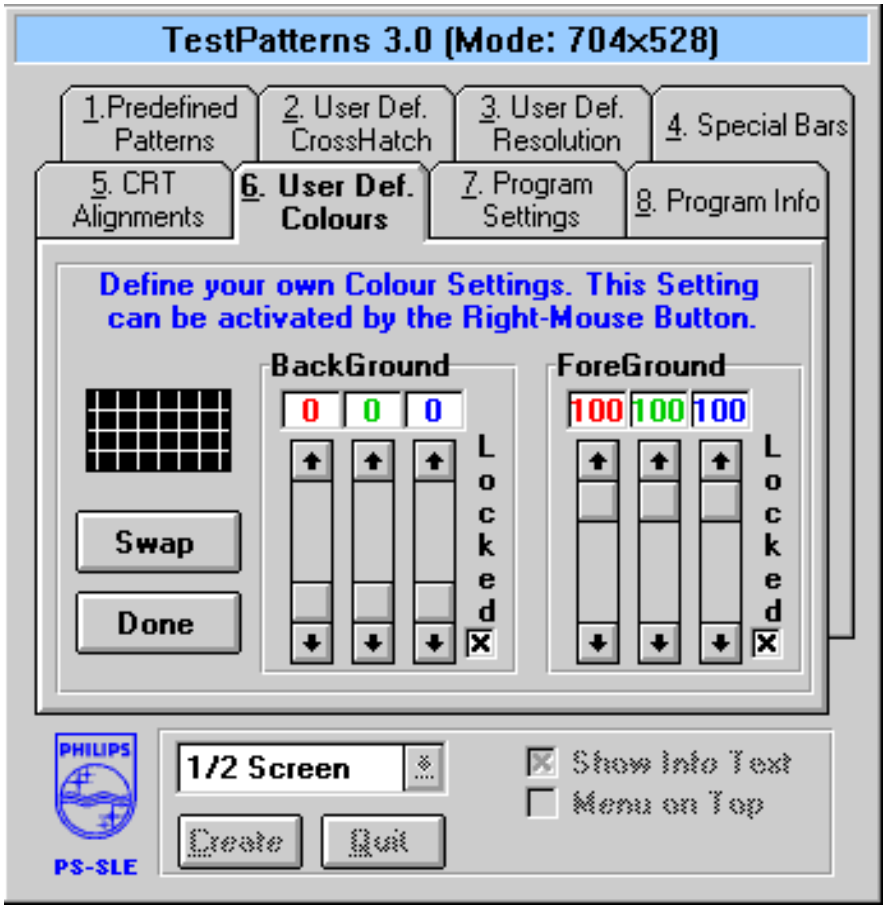


Fig.6 Menu Window "User Defined Colours".

The Program Colours used for composing the Test Patterns are 100%-Amplitude colours. On this Tab 6 the user can define its own Back- and ForeGround Colours. In this way it is possible to create the Test Patterns using almost every colour combination. (See Tab 7 for activating this feature.)

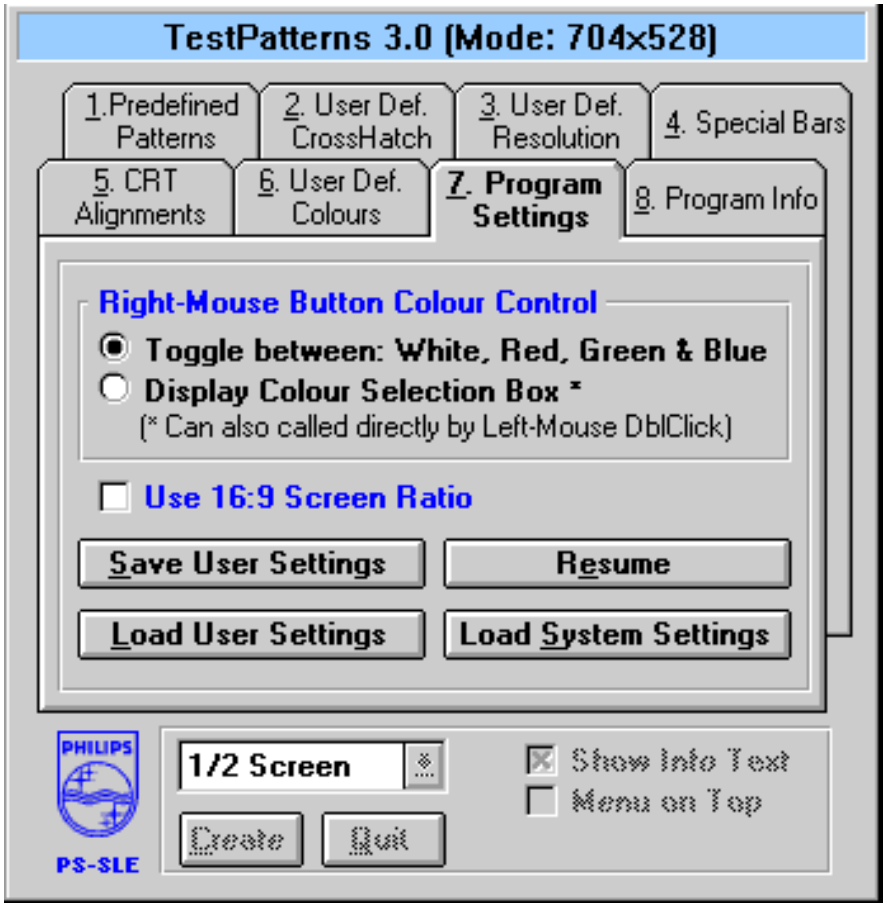


Fig.7 Menu Window "Program Settings".

Tab 7 is used to define the Program Settings.

The first Program Setting is the Right-Mouse Button Colour Control.
Default the upper option **"Toggle between: White, Red, Green & Blue"** is activated. In this case clicking the Right-Mouse button onto the Test Pattern Window will toggle the ForeGround Colours used within the active Test Pattern between these four colours. If the second option **"Display Colours Selection Box"** is activated, clicking the Right-Mouse Button onto the Test Pattern Window will pop-up a Colour Selection Box. Now you can select between three situations (also see next page):

- Select between eight ForeGround Colours (White, red, Green, Blue, Yellow, Cyan, Magenta and Black) combined with a Black BackGround
- Activate the User Defined Back- and ForeGround Colours (defined on Tab 6)
- Swap the active Back- and ForeGround Colours

The Colour Selection Box can also be called by a Double-Click of the Left-Mouse Button, independent of the setting of this control.

(continued on next page)

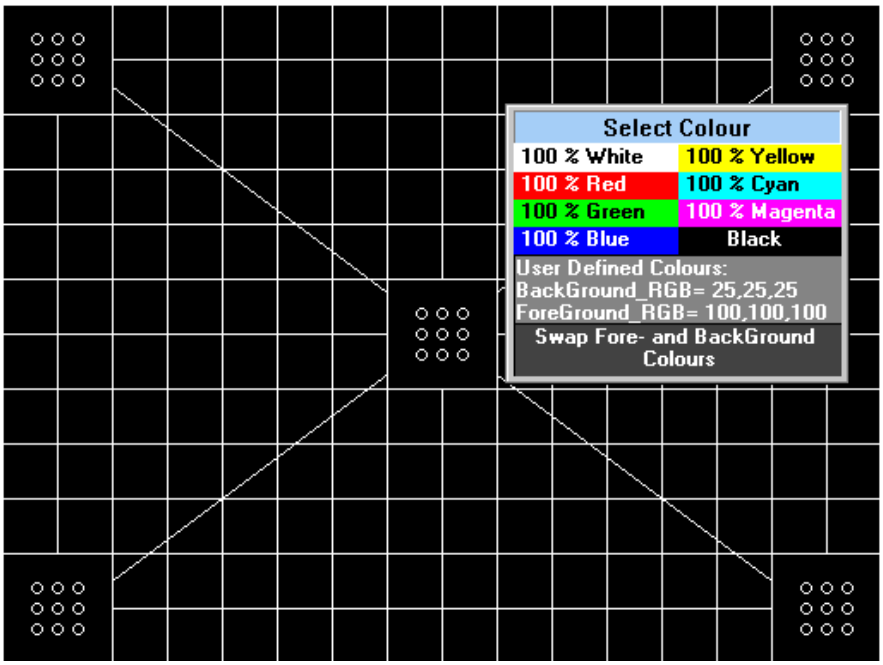


Fig.8 The Colour Selection Box.

The second Program Setting is the Screen Ratio Definition.
Default this Check Box **"Use 16:9 Screen Ratio"** is not activated (no x-sign present) and all Test Patterns will have a Horizontal to Vertical Size Aspect Ratio of 4:3. When this Check Box is activated all Test Patterns will have a Screen Aspect Ratio of 16:9 and can be used for testing or aligning Wide Screen Monitors.

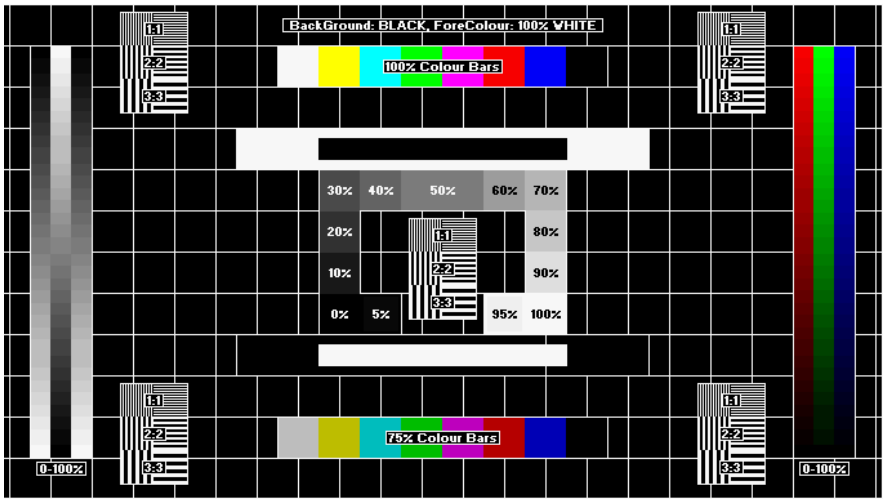


Fig.9 SMPTE Test Pattern using the 16:9 Screen Ratio.

Saving and Restoring Test Pattern Generator Settings.
At Tab 7 you also find the possibility the Save and Load Test Pattern Generator Settings. These settings include **all control settings** you find within the Test Patterns Menus. The user-defined settings are saved in the file TESTPATT.INI, when this file is present within the startup directory the Test Pattern Generator program will use these settings each time it starts. When this file is not present the program will use its own default settings.
The following Buttons are present on Tab 7:
Save User Settings:Saves save all current control settings.
Load User Settings:Loads all saved settings.
Load System Settings:Loads the program's default settings.
Resume: Switches back to actual Test Pattern Tab.

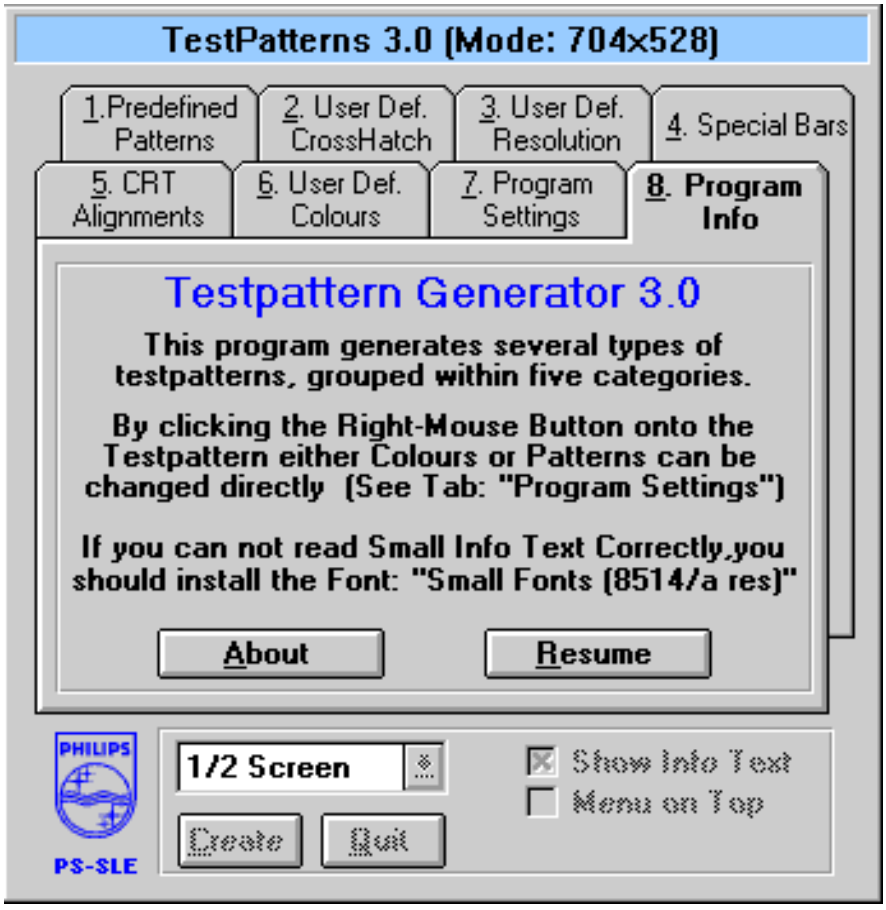


Fig.10 Menu Window "Program Info"

Tab 8 displays a short description of the Test Pattern Generator Program. Pressing the "About" Button will pop-up the Program's Disclaimer (see next page).

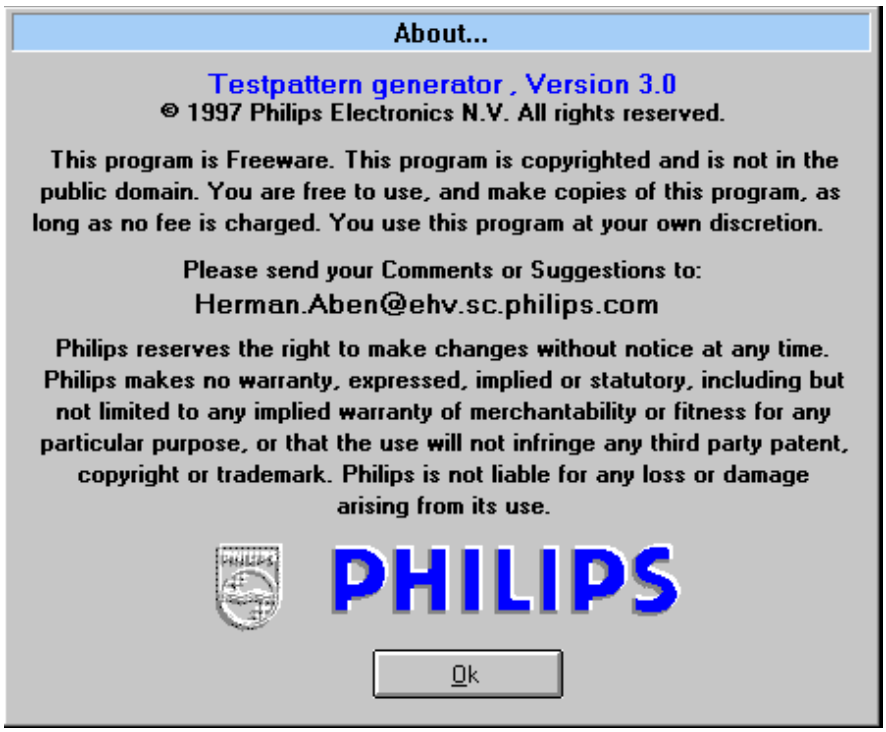


Fig.11 The Program Disclaimer.

3. THE TEST PATTERNS.

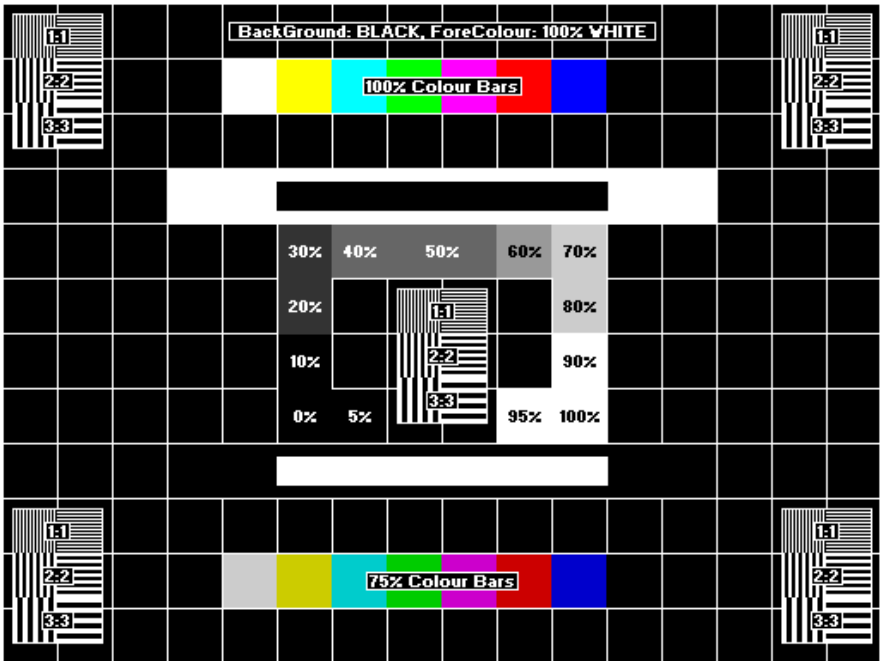


Fig.12 The SMPTE Test Pattern.

This Test Pattern can be used to achieve a complete overview on several signal behaviours, within one Pattern.

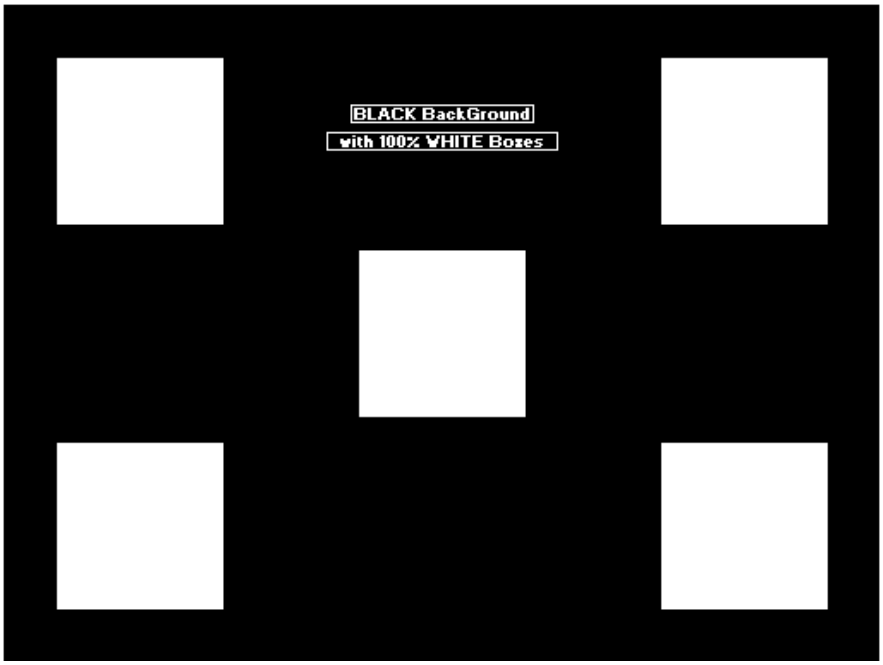


Fig.13 The Brightness Uniformity Test Pattern.

This Test Pattern can be used to test if the variation of light output of the picture tube measured across the CRT face meets the specifications.

(By selecting other Fore-Ground Colours it can also be used to test the Colour Uniformity. If the Full Screen option is used also Colour Purity can be checked.)

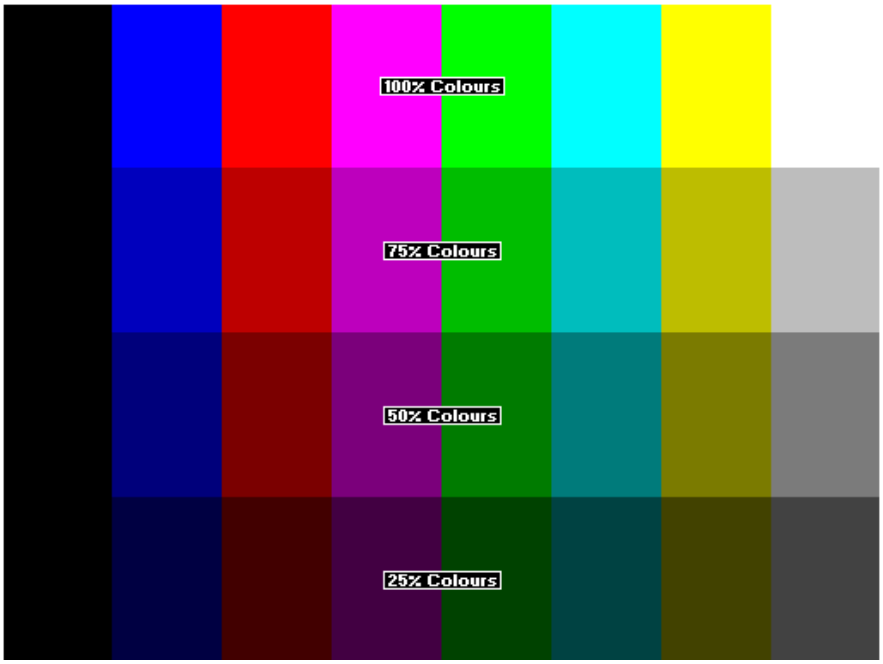


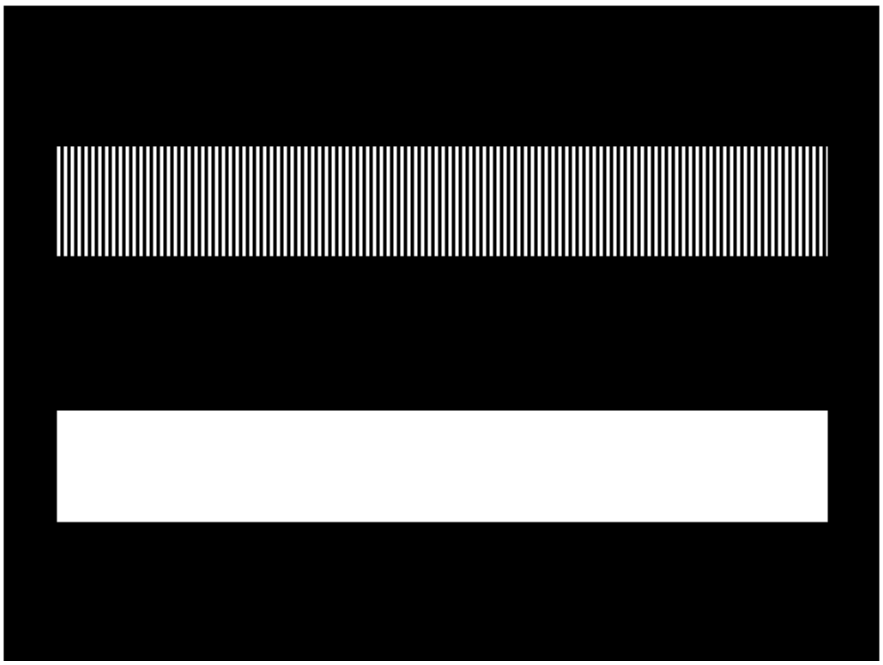
Fig.14 The Colour Bars Test Pattern.

There are four types of patterns: horizontal and vertical Bars, with decreasing or increasing amplitudes. This Test Pattern can be used to check if all three colour channels are working properly.

Fig.15 The Gray Bars Test Pattern.

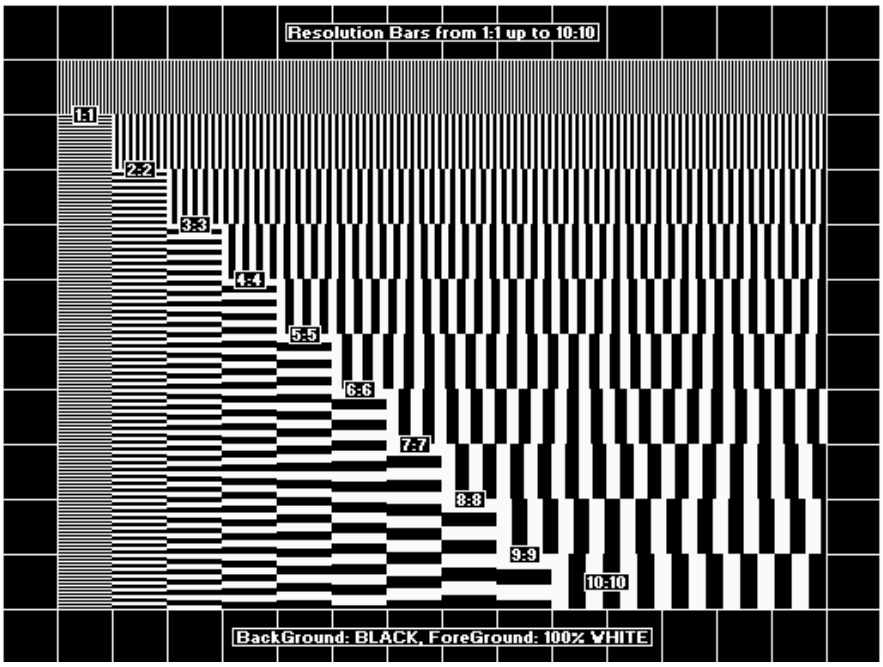
There are four types of patterns: horizontal and vertical Bars, with decreasing or increasing amplitudes. This Test Pattern can be used to check the differential gain of the three colour channels.

(By selecting other Fore-Ground Colours it can also be used to check the video gain linearity of the three colour channels separately.)



This Test Pattern can be used to test for crosstalk problems, that causes vertical lines to appear bent at one or more places.

Fig.16 The CrossTalk Test Pattern.



This Test Pattern can be used to test the video amplifiers bandwidth resp. rise- and fall times.

(By selecting other Fore-Ground Colours it can also be used to check the response of each channel separately, or to test for differences between channels.)

Fig.17 The MultiBurst Test Pattern.

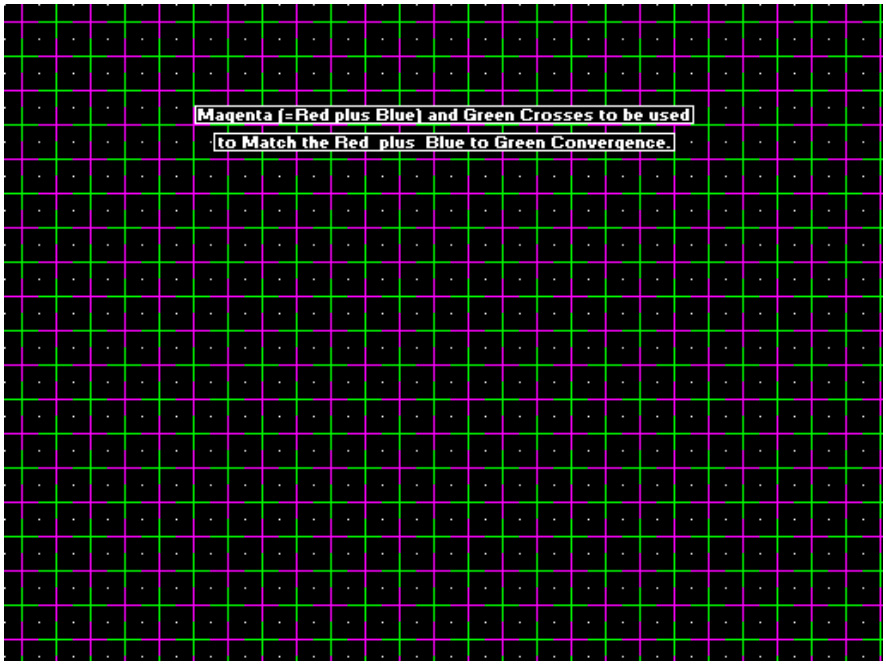


Fig.18 The Convergence Test Patterns.

There are three Convergence Test Patterns: a black screen filled with Red & Blue Crosses, or filled with Magenta & Green Crosses, or a White Cross Hatch.

These Patterns can be used to align convergence of the three electron beams in the CRT in a very accurate way.

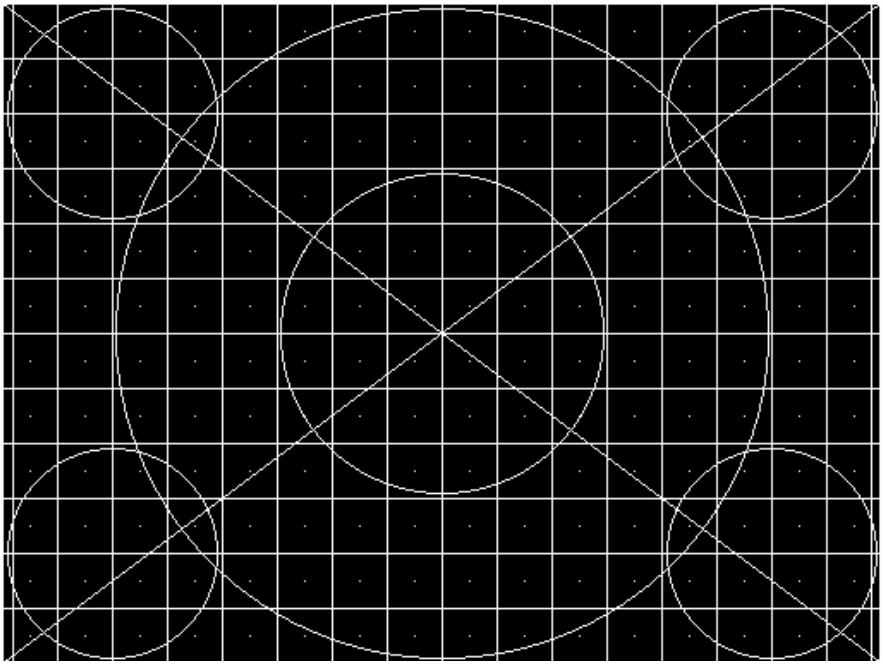


Fig.19 The CrossHatch Test Pattern.

This Test Pattern can be used to examine the Linearity or Focus of the Picture tube.

The Complete CrossHatch Test Pattern can be composed by several patterns, such as diagonals, circles, etc.

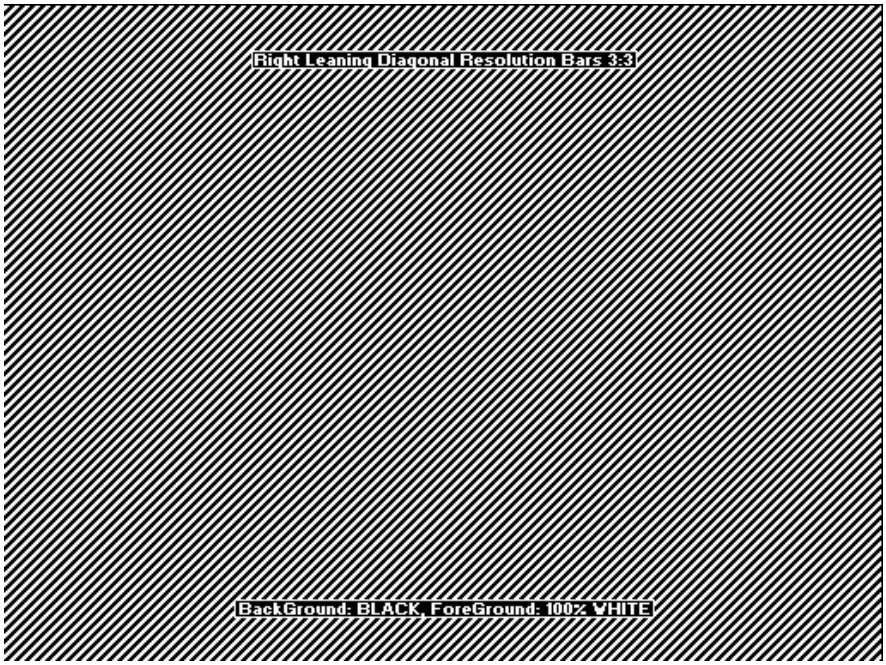
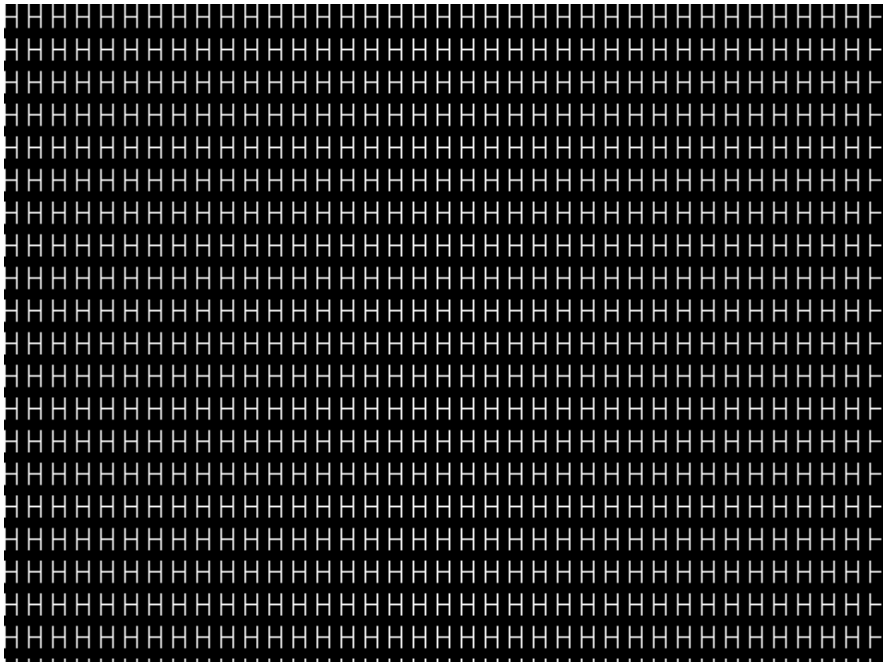


Fig.20 The Resolution Test Patterns.

These Test Patterns can be used to verify the monitor's resolution as for testing Moire.



This Test Pattern can be used to test the video output stages, TCO and Focus.

Three characters can be used (m, H and E), each in three sizes.

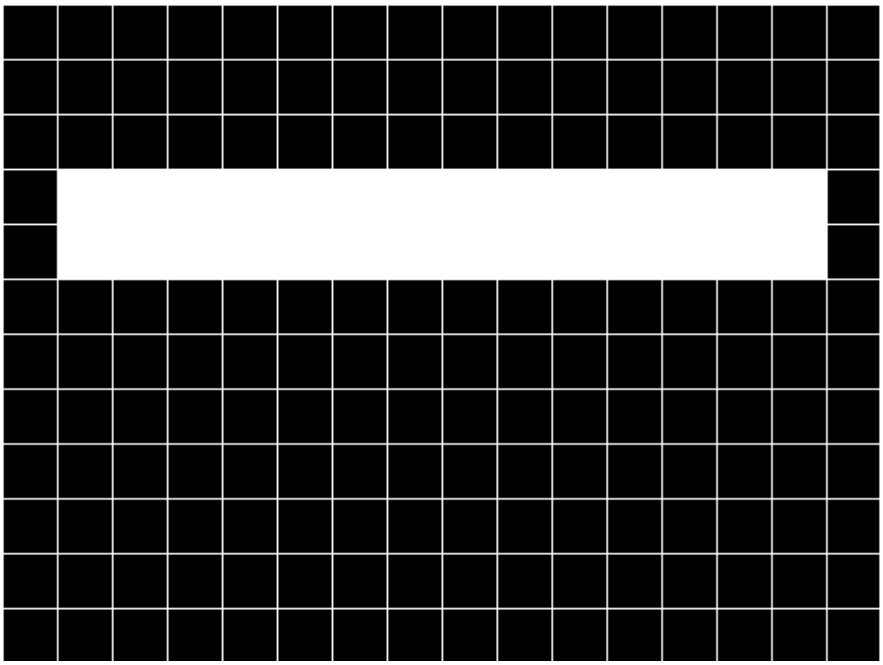


Fig.22 The White Bar Test Pattern.

This Test Pattern can be used to test the EHT stability geometry control and to check for the Smearing effects.

The White Bar can be Sized and Positioned by the user.

The White Bar can also Flash and Scroll up- or down.

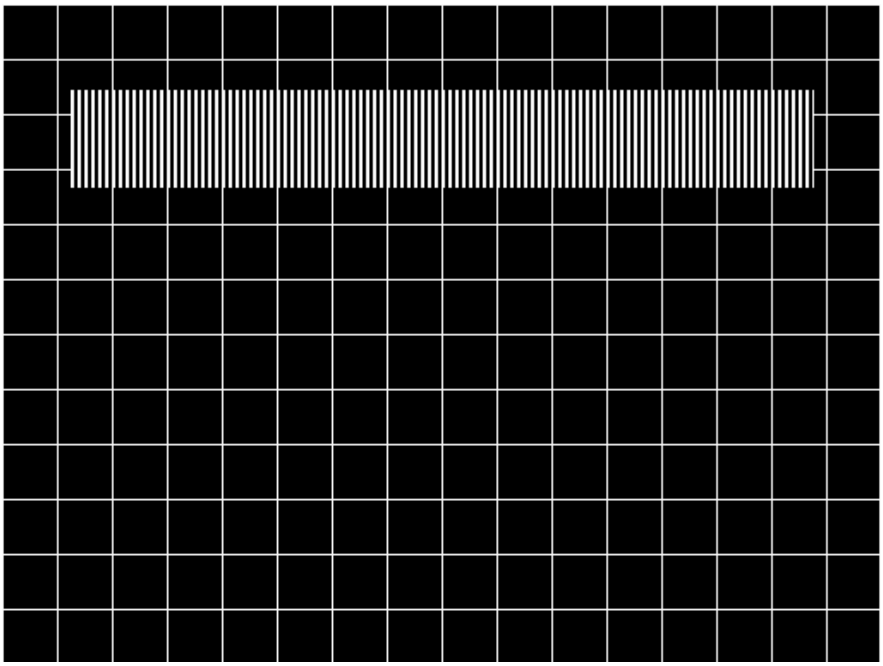


Fig.23 The Resolution Bar Test Pattern.

This Test Pattern can be used for examine Smearing effects.

The Bar can be Sized and Positioned by the user.
The Resolution is controlled by set by the user.

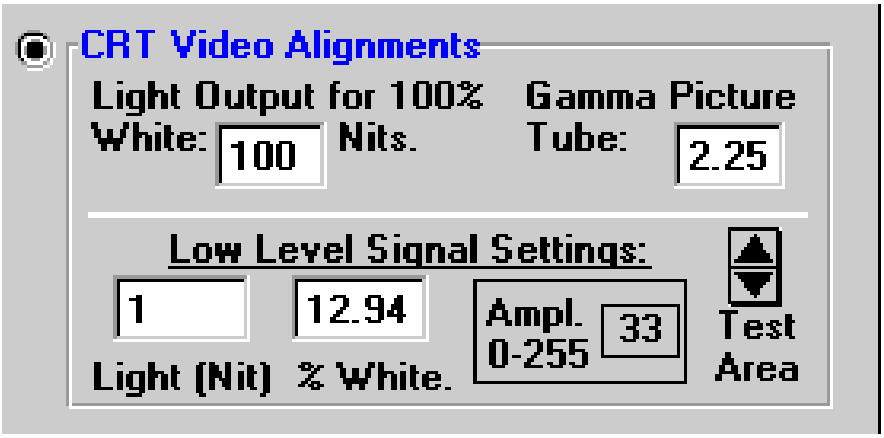


Fig.24 The Menu Window for the Video Alignment Test Pattern.

The Test Pattern Generator creates a sophisticated test pattern to align the Black Levels and Gain Settings of the three colour channels.

Within the Menu Window the following settings can be controlled:

The settings defining the picture tube behaviour:
- **Light Output at maximum drive** (100% White)
- **Gamma Correction** of the Picture Tube (standard 2.25)

and the **Low Level Output** that is used to align the Black Levels.
Either enter
- The Light Output (in Nits).

or
- The Drive Output (percentage of White Signal)

Because the output signals are 8-bit (255 steps), each entered value will be re-calculated to reflect the practical values.

The Test Signal Area can be adjusted in Size and Position, to optimize it to the Size of the Light Sensor that is used to perform these alignments.

The complete set of Information and Testing patterns for the Video Alignment consists of five pages, which are shown on the next pages.

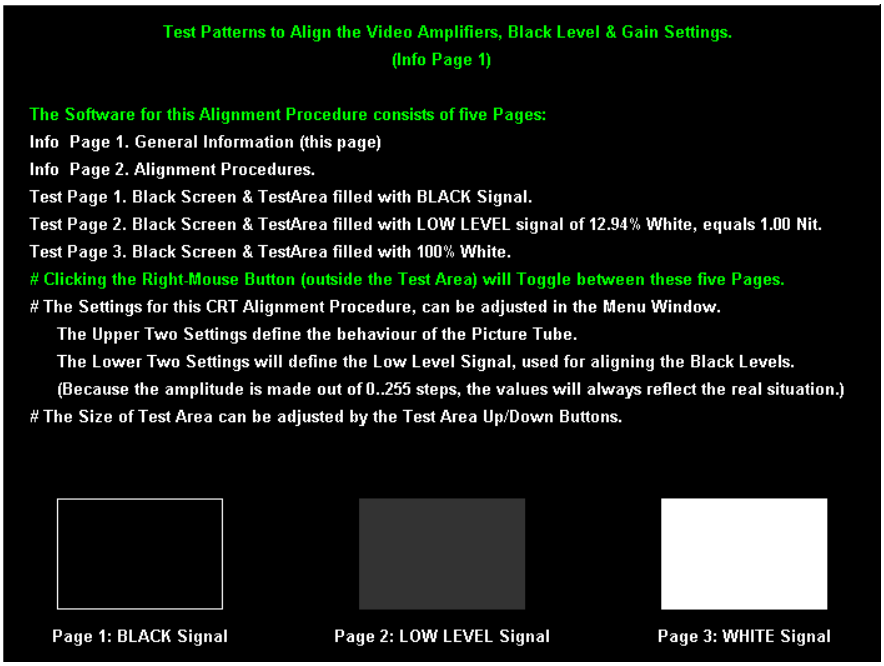


Fig.25 Video Alignment Test Pattern, Info Page 1.

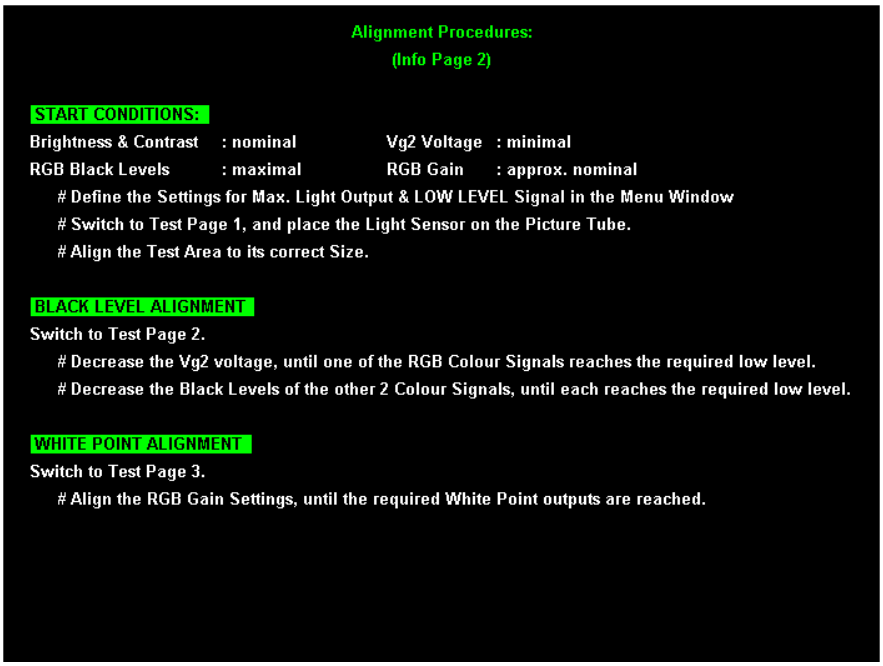


Fig.26 Video Alignment Test Pattern, Info Page 2.

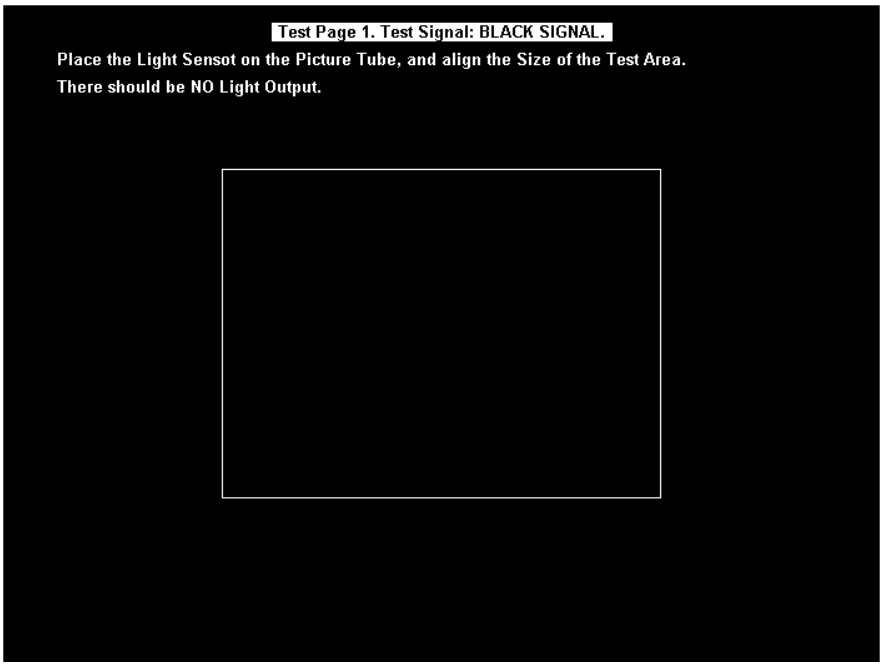


Fig.27 Video Alignment Test Pattern, Test Page 1.

Fig.28 Video Alignment Test Pattern, Test Page 2.

Fig.29 Video Alignment Test Pattern, Test Page 3.

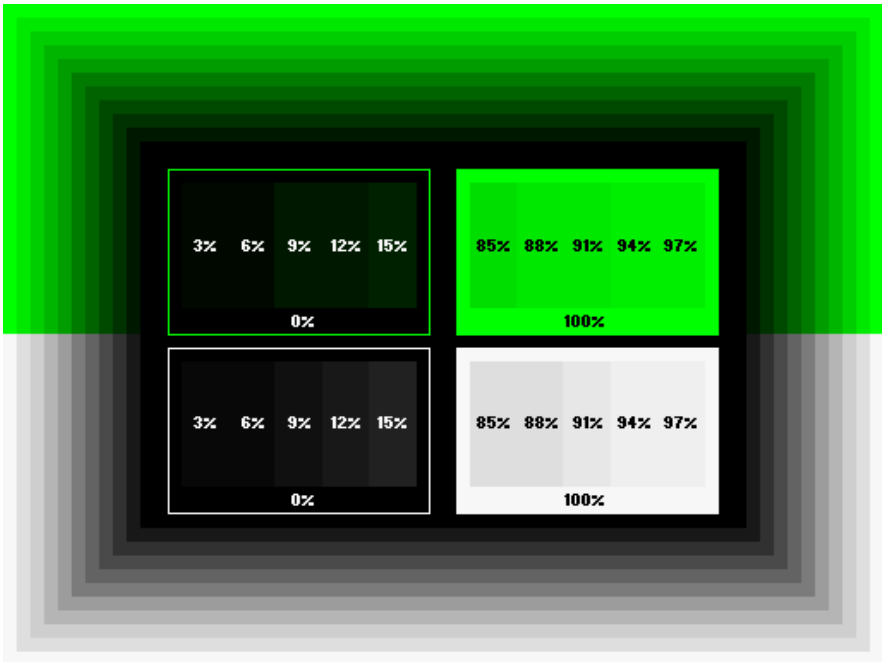


Fig.30 The Video Alignment Test pattern.

These Test Patterns (using different ForeGround Colours) can be used to test the Black Levels as well as Gain Settings.