



**BARCO N.V.**  
**Communication Systems**  
Th. Sevenslaan 106  
B-8500 Kortrijk (Belgium)  
Tel.: +32.56.233.211  
Fax: + 32.56.233.461  
E-mail: support.bcs@barco.com  
Web site: <http://www.barco.com>

**HIGH DEFINITION MONITOR**

**HDM 5049 PLUS**

**USER'S MANUAL**

**Serial Number:**

Edition: May 27<sup>th</sup>, 1999  
Part Number: V598958/01



# Contents

<b>1</b>	<b>SAFETY INSTRUCTIONS.....</b>	<b>1-1</b>
1.1	FCC NOTICE.....	1-1
1.2	POWER CONNECTION.....	1-1
1.3	WATER AND MOISTURE.....	1-1
<b>2</b>	<b>FEATURES.....</b>	<b>2-1</b>
<b>3</b>	<b>HDM 5049 PLUS INSTALLATION.....</b>	<b>3-1</b>
3.1	PRECAUTIONS.....	3-1
3.2	RACK MOUNTING.....	3-1
3.3	SIGNAL CONNECTION.....	3-1
3.3.1	Factory-stored HDTV Modes.....	3-2
3.3.2	Vivaldi Modes.....	3-2
3.3.3	Sync Input Conditions.....	3-3
<b>4</b>	<b>OPERATION AND ADJUSTMENT.....</b>	<b>4-1</b>
4.1	USING THE KEYBOARD.....	4-1
4.2	MAIN MENU.....	4-2
4.3	STATUS MENU.....	4-2
4.4	SETTINGS MENU.....	4-2
4.4.1	Modename.....	4-3
4.4.2	AKB.....	4-3
4.4.3	Orbiter.....	4-3
4.4.4	Degauss rate.....	4-4
4.4.5	Color temp.....	4-4
4.4.6	White level.....	4-4
4.4.7	Change password.....	4-4
4.4.8	Other Menu Items.....	4-4
4.5	ADJUSTMENTS MENU.....	4-5
4.5.1	Color.....	4-5
	▶ Manual.....	4-5
	▶ Automatic.....	4-6
4.5.2	Geometry.....	4-8
4.5.3	Uniformity.....	4-9
	▶ Moiré canceler.....	4-9
	▶ Dynamic H focus.....	4-9
	▶ V WH Uniformity.....	4-9
	▶ AX WH Uniformity.....	4-9
4.6	INFORMATION MENU.....	4-10
<b>5</b>	<b>TECHNICAL SPECIFICATIONS.....</b>	<b>5-1</b>



# 1 SAFETY INSTRUCTIONS

- Read the safety and operating instructions before operating the monitor.
- Retain safety and operating instructions for future reference.
- Adhere to all warnings on the monitor and in the operating instructions manual.
- Follow all instructions for operation and use.

This monitor conforms to the following rules: DHHS21, IEC950/EN60950, UL1950, C-UL950.

## 1.1 FCC Notice

This equipment has been tested and found to comply with the limits of a class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

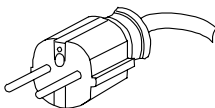
## 1.2 Power Connection

- Power requirements: connect the monitor to an AC voltage as indicated at its back. Using a lower voltage, the monitor will not be able to operate. Using a higher voltage may damage the monitor.

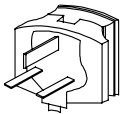
**WARNING!**

THIS APPARATUS MUST BE EARTHED!

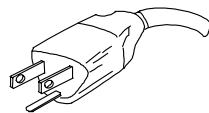
The wires in the mains lead are colored in accordance to the following code :

**CEE7 and British Standard:**

Green-and-yellow: Earth (safety earth)  
Blue: Neutral  
Brown: Live

**ANSI 73.11:**

Green-and-yellow: Ground  
White: Neutral  
Black: Live



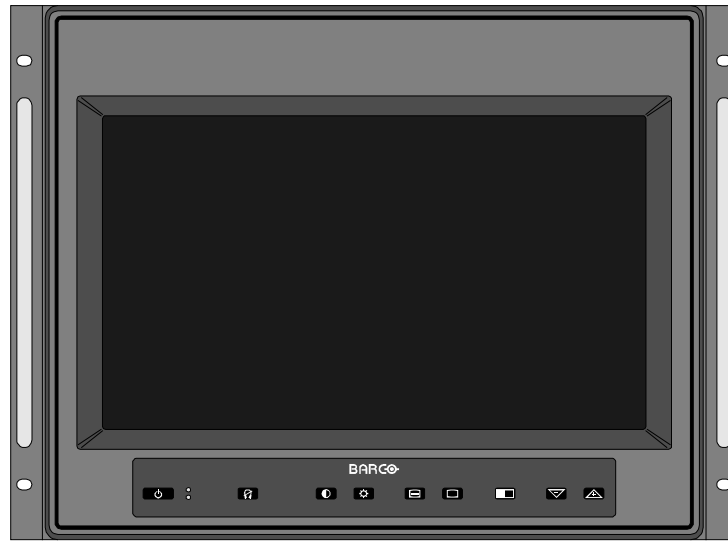
- Do not overload wall outlets and extension cords as this may result in fire or electric shock.
- Mains lead protection (U.S.: Power cord): Supply cords should be routed so that they are not likely to be walked upon or pinched by items placed upon or against them, paying particular attention to cords at plugs and receptacles.

## 1.3 Water and Moisture

- Never expose the monitor to rain or moisture.
- Never use the monitor near water.



## 2 FEATURES



The HDM 5049 PLUS is equipped with a super high resolution CRT and a dark and flat face plate, ensuring high contrast ratio and natural looking pictures.

Resolution is maintained by excellent spot performance and ultra fine pitch (= 0.26 mm). Its sleek 16:9 aspect ratio and reduced rack space requirements make it the ideal studio picture quality monitor for today's crammed control and equipment rooms.

Standard features are:

- 16:9 aspect ratio
- 19" picture tube (17" visible)
- Occupies only 8 RU space in a 19" rack
- Superfine dot pitch of 0.26 mm
- Small spot size over the entire screen
- Automatically adjusts to different HD input formats, up to 1080L x 1920P, interlaced.
- Short and long term color stability thanks to the AKB system (Automatic Kinescope Biasing)
- High bandwidth RGB inputs
- User-friendly keyboard and OSD guide the operator through the basic operation and menus for color and geometry alignment
- Automatic Color Alignment with Thoma Color Analyzer.
- Orbiting to avoid burn-in of the CRT phosphors
- Compatible with BARCO's VIVALDI display system products





## 3 HDM 5049 PLUS INSTALLATION

### 3.1 Precautions

- Keep your original packaging. It is designed for this monitor and is the ideal protection during transport.
- Do not lift the monitor alone to avoid injury.
- Avoid reflections in the picture tube to reduce eye strain.
- Keep the monitor away from heat sources and provide enough ventilation if it is installed in a rack or console.
- Keep the monitor away from strong sources of magnetic radiation.

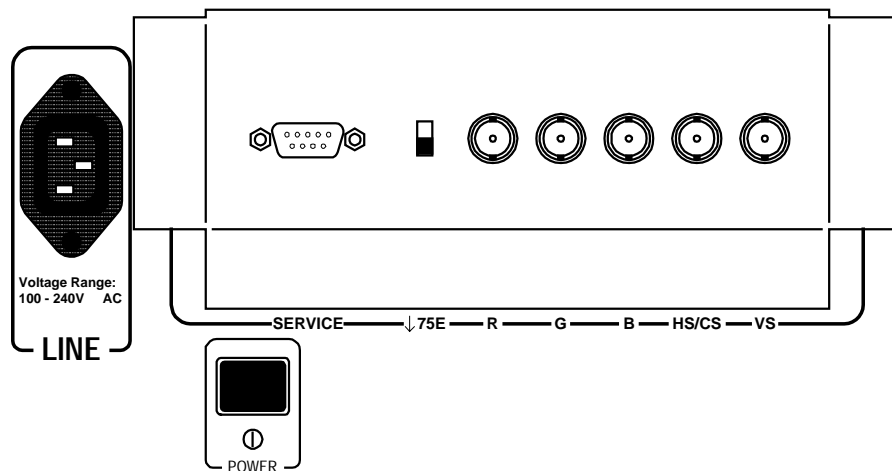
### 3.2 Rack Mounting

The monitor should be mounted in a 19" rack. Four retaining screws in the handles keep the monitor in place.

#### WARNING!

Do not cover or block the ventilation openings in the cover.

### 3.3 Signal Connection



Five BNC connectors are available at the rear of the monitor: R, G, B, HS/CS and VS. When the monitor is the only monitor connected to the source or the last one in a chain, the 75 ohm termination switch should be set in the lower position.

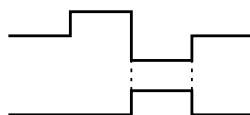
To loop-through the video signals, use T- or Y-connectors and place the 75 ohm termination switch in the upper position.

A Thoma Color Analyzer can be connected to the **SERVICE** connector using the optional ThomaLink cable (order number Z345501).

### 3.3.1 Factory-stored HDTV Modes

System:	480L x 704P 60P	720L x 1280P 60P	1035L x 1920P 60I	1080L x 1920P 60I	
<b>Mode Name:</b>	SMPTE293M (483L x 720P)	SMPTE296M	SMPTE240M- 260M	SMPTE274M	
<b>Horizontal Timings:</b>	Units				
Horizontal Scan Frequency:	kHz	31,5	45	33,75	33,75
Total Line Time:	µs	31,75	22,22	29,63	29,63
Active Line Time:	µs	26,64	17,24	25,86	25,86
Horizontal Blanking:	µs	5,1	4,98	3,77	3,77
Horizontal Sync Width:	µs	2.33(*)	0.54(*)	0.6 (*)	0.6(*)
Horizontal Front Porch:	µs	0.63(*)	1.50(*)	1.2 (*)	1.2(*)
Horizontal Back Porch:	µs	2.15	2.95	1.99	1.99
<b>Vertical Timings:</b>	Units				
Scan System:	I / P	P	P	I	I
Vertical Scan Frequency:	Hz	60	60	60	60
Active Lines / Frame:	Lines	483	720	1035	1080
Active Frame Time:	ms	15,33	16	30,66	32
Blanking Lines / Frame:	Lines	42	30	90	45
Blanking Time Frame:	ms	1,33	0,67	2,66	1,34
Total Lines / Frame:	Lines	525	750	1125	1125
Active Lines / Field:	Lines			517,5	540
Active Field Time:	ms			15,33	16
Blanking Lines / Field:	Lines			45	22,5
Blanking Time / Field:	ms			1,33	0,67
Total Lines / Field:	Lines			562,5	562,5
Vertical Sync Width:	Lines	6	5	5	5
Vertical Front Porch:	Lines	6	5	2-2.5	2
Vertical Back Porch:	Lines	30	20	38-37.5	15

(\*) Conversion from tri-level sync to bi-level sync



1035Lx1920P 60I is not stored as a separate mode, but the HDM 5049 PLUS displays this signal type using the 1080Lx1920P 60I mode. The only difference is the number of active lines.

### 3.3.2 Vivaldi Modes

Two VIVALDI Modes (only for 525 lines / 60 Hz) are factory-stored as well: 4 Pictures and 1 Picture Full Screen.

**IMPORTANT!**

When connected to a VIVALDI, you have to configure the VIVALDI for positive horizontal and vertical sync, no composite sync, no sync on green. Set the VIVALDI to 4/3 (positive vertical sync). The HDM 5049 PLUS is already aligned for 16/9. Do not toggle between 4/3 and 16/9 on the VIVALDI, since this changes the vertical sync polarity.

### 3.3.3 Sync Input Conditions

	GREEN	HS / CS	VS	HDM5049 PLUS Picture	Solution
	SOG	CS	HS		
1	—	+		+	Clamping problem Remove CS (⇒ condition 7) or remove SOG (⇒ condition 16)
2	—	+		—	No vertical sync due to addition of two opposite pulses Clamping problem Remove VS to solve Vert Sync problem and Remove CS to solve Clamping problem (⇒ condition 9) or Remove VS to solve Vert Sync problem and remove SOG (⇒ condition 18)
3	—	+		/	Clamping problem Remove CS (⇒ condition 9) or Remove SOG (⇒ condition 18)
4	—	—		+	<b>OK</b>
5	—	—		—	No vertical sync due to addition of two opposite pulses Remove VS to solve Vert Sync problem (⇒ condition 6)
6	—	—		/	<b>OK</b>
7	—	/		+	<b>OK</b>
8	—	/		—	No vertical sync due to addition of two opposite pulses Remove VS (⇒ condition 9)
9	—	/		/	<b>OK</b>
10	—		+	+	Clamping problem Remove HS (⇒ condition 7)
11	—		+	—	No vertical sync due to addition of two opposite pulses Clamping problem Remove VS to solve Vert Sync problem and Remove HS because no vertical sync is present any more (enable SOG, ⇒ condition 9) or remove SOG (⇒ condition 26)
12	—		+	/	No vertical sync due to CS/HS priority on SOG Clamping problem Remove HS (enable SOG, ⇒ condition 9)
13	—		—	+	<b>OK</b>
14	—		—	—	<b>OK</b>
15	—		—	/	No vertical sync due to CS/HS priority on SOG Remove HS (enable SOG, ⇒ condition 9)
16	/	+		+	<b>OK</b>
17	/	+		—	No vertical sync due to addition of two opposite pulses Remove VS (⇒ condition 18)
18	/	+		/	<b>OK</b>
19	/	—		+	<b>OK</b>
20	/	—		—	No vertical sync due to addition of two opposite pulses Remove VS (⇒ condition 21)
21	/	—		/	<b>OK</b>
22	/	/		+	No horizontal sync ⇒ Valid condition
23	/	/		—	No horizontal sync ⇒ Valid condition
24	/	/		/	No Sync ⇒ Valid condition
25	/		+	+	<b>OK</b>
26	/		+	—	<b>OK</b>
27	/		+	/	No vertical sync ⇒ Valid condition
28	/		—	+	<b>OK</b>
29	/		—	—	<b>OK</b>
30	/		—	/	No vertical sync ⇒ Valid condition

+: Positive Sync

—: Negative Sync


/: Not connected







## 4 OPERATION AND ADJUSTMENT

### 4.1 Using The Keyboard






 Power On / Off: Press this button to start-up the monitor if it is in standby mode (red led is on). The green led turns on if the monitor has started up. A blinking red led indicates a problem.


 Degauss (demagnetization).


 Contrast: Use to reveal / remove the Contrast setting. Adjust with  or . Press both keys simultaneously to return to the calibrated value.






 Brightness: Use to reveal / remove the Brightness setting. Adjust with  or . Press both keys simultaneously to return to the calibrated value.



 Menu In: Use to enter a submenu or to select an item to change.

 Menu Out: Use to leave a submenu or to save a changed value.

 Toggle: Use to change menu items that are displayed in magenta.

,  Down, Up: Use to scroll through the menu items or to decrease / increase a value.

## 4.2 Main Menu



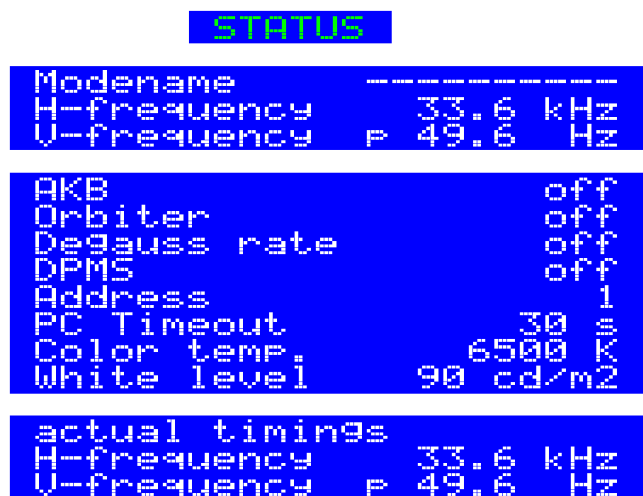
Press to enter the main menu.

Select a submenu with or and press to enter.

Press to exit from the main menu.

The menu disappears automatically after 20 seconds of keyboard inactivity.

## 4.3 Status Menu



The Status Menu shows the current display mode with its corresponding syncs, the current settings and the detected actual sync frequencies.

You cannot make changes in this menu. To make changes, refer to the Settings Menu.

Depending on the resolution of the input signal, the middle part of this menu is split into two parts that are displayed alternately.

Press to leave the Status menu.

The menu disappears automatically after 20 seconds of keyboard inactivity.

## 4.4 Settings Menu

Before entering the Settings menu, you will be prompted for a four-figure password. The default password is 0000. To enter a password, select a figure from 0 to 9 with or and press to move the cursor to the next figure. Pressing after you have entered the last figure will open the Settings menu.



If you have entered a wrong password, following message appears:



Wait 10 seconds or press , the password entrance menu reappears.



**SETTINGS**

```


Modename
AKB                               off
Orbiter                           off
Degauss rate                       off
DPMS                               off
Address                            1
PC Timeout                         30 s
Color temp.                        6500 K
White level                         90 cd/m2

```

Select an item with  or .

If the item has a red background, press  to change it. If the item has a magenta background, press  to change it.






Changes become active immediately. These settings (except Modename) are valid for all modes.

Press  to leave the Settings menu.

### 4.4.1 Modename

**MODENAME**

Max 1 -----

With  or , scroll through the available characters and move the cursor with . When pressing  at the end of the line, the cursor returns to the first character. Press  to store the Mode name.

If the mode is a new mode, you cannot change the mode name unless you save the geometry parameters for this new mode:

```

Name cannot be changed.
Save new mode first.

```

See 4.5 Adjustments Menu.

### 4.4.2 AKB


With , select AKB On, Off or Auto.

The AKB system guarantees color stability by changing the DC-levels of the RGB cathode drive signals in order to keep the light output of the AKB measuring lines constant. Note that AKB is not active when a menu is displayed.




With AKB on, the monitor requires up to a minute to stabilize each time the input signal has dropped or was changed to another line system. When stabilized however, you can turn AKB off. The monitor will now keep the current DC-levels, even when the input signal drops.

AKB Auto leaves the AKB on for half an hour, then turns it off. AKB Auto starts the AKB when the monitor is powered up or when AKB is set to Auto. In the Status Menu, you can see if AKB is currently on or off.

### 4.4.3 Orbiter




The Orbiter unnoticeably moves around the entire picture to avoid burn-in of the phosphors on static pictures. Turn it on or off with .

#### 4.4.4 Degauss rate

The monitor can periodically degauss itself. Press  or  to change the degauss rate between off (non-active) and 12 hours. Leave the menu with .






#### 4.4.5 Color temp.

Press  or  to change the color temperature from 5000 to 9900 K in steps of 100 K. This setting is also used during automatic color temperature alignment. Leave the menu with .






#### 4.4.6 White level

Press  or  to change the light output from 60 to 120 cd/m<sup>2</sup> (nit) in steps of 1 cd/m<sup>2</sup>. This setting is also used during automatic color temperature alignment. Leave the menu with .



#### 4.4.7 Change password

The default password is 0000. To enter a new password, select a figure from 0 to 9 with  or  and press to move the cursor to the next figure. Pressing  after you have entered the last figure will activate the new password.







#### 4.4.8 Other Menu Items

Menu items that are not mentioned in this list are non-functional in the HDM 5049 PLUS and should be left off or unchanged for correct operation of the monitor.




## 4.5 Adjustments Menu

Before entering the Adjustments menu, you will be prompted for a four-figure password. The default password is 0000. To enter a password, select a figure from 0 to 9 with  or  and press  to move the cursor to the next figure. Pressing  after you have entered the last figure will open the Adjustments menu.







If you have entered a wrong password, following message appears:



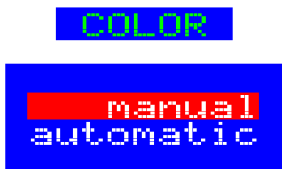
Wait 10 seconds or press , the password entrance menu reappears.







Select a submenu with  or  and press  to enter.

Press  to leave the Adjustments menu.

### 4.5.1 Color







Select manual or automatic color alignment with  or  and press  to continue.

Press  to leave the Color menu.

#### ► Manual

In the manual alignment menu, the Red, Green and Blue Highlights can be adjusted.



Select a Highlights setting with  or  and press , or press  first to turn Scrollbar on or off.

Scrollbar on:



Scrollbar off:





Adjust with  or  then press .

Press  to leave the Color menu.

If changes have been made, you will be asked to save or to discard these changes:



Press  to select yes or no, then press .

## ► Automatic

Remember that the monitor will be aligned according to the **Color temp.** and **White level** settings you have made in the Settings menu. If you align the monitor to 6000 K and 80 nit, you can set it to 6500 K and 90 nit in the Settings menu, but then, the color temperature and light output will be approximate. To obtain 6500 K and 90 nit, make sure you make the correct settings before starting automatic alignment.

The HDM 5049 PLUS can be automatically aligned with a Thoma TMF3 or TMF 6 Color Analyzer or with a Philips® PM5639/90 Color Sensor.

### Required for alignment with Thoma TMF3 or TMF6:

- Thoma TMF3 or TMF6 Color Analyzer
- ThomaLink connector cable, order number Z345501.

### Required for alignment with Philips® PM 5639/90 Color Sensor

- HDM 5049 PLUS Software version 1.03 or higher (see Information Menu on page 4-10)
- Philips® PM 5639/90 Color Sensor
- Power Supply box for PM 5639/90 Color Sensor
- Power cord
- Interface cable between monitor and Power Supply box (male and female SubD-9 connectors)
- Interface cable between Color Sensor and Power Supply box (FCC68 connectors)

All required items are included in the Philips® PM 5639/01 kit or the combined PM 5639/02 and PM 5639/62 kits.

To align the HDM 5049 PLUS, proceed as follows:




### With Thoma Color Analyzer:

1. Connect the Thoma TMF3 or TMF6 Color Analyzer to the Service connector on the rear of the monitor using a ThomaLink connector cable (order number Z345501).
2. Cover the Thoma sensor and press [ADJ] twice. This will start the zero calibration. Then press [XYZ]. The Thoma should now read values between -4 and +4.
3. Connect the grounding clip on the Thoma sensor to one of the monitor's handles **before** placing the sensor on the screen. This prevents damage to the Thoma in case the monitor flashes.

### With Philips® PM 5639 Color Sensor:

1. Connect the Color Sensor to the Power Supply box via the interface cable with FCC68 connectors.
2. Connect the HDM 5049 PLUS Service connector (on the rear) to the RS232-C IN connector on the Power Supply box using the interface cable with the male and female SubD-9 connectors.
3. Apply power to the Power Supply box.

### For Thoma and Philips® :

1. Connect a 100% White Field to the monitor.
2. Place the sensor in the center of the screen. Do not turn on or off the monitor while the sensor is on the screen!
3. With  or  select Automatic in the Color menu and press  to start the alignment.




Adjusting Color

If the monitor does not recognize the Thoma Color Analyzer or the Philips® Color Sensor, following message is displayed after a while:




No optical sensor found.

Press  to return to the Color menu, correct the problem and restart alignment.

After alignment is finished, the HDM 5049 PLUS displays following message:




```
6500 K
  White level
    aligned
```

Press  to return to the Color menu.

If alignment failed, the HDM 5049 PLUS displays following message:



```
Alignment not successful
```

Press  to return to the Color menu. The old alignment values are restored.

An alignment can fail due to following reasons:

- The Thoma has not been adjusted for offset (see procedure above).
- Too much ambient light.
- Incorrect 100% White Field connected to the monitor.

### 4.5.2 Geometry



Select a geometry setting with or and press , or press first to turn Scrollbar on or off.

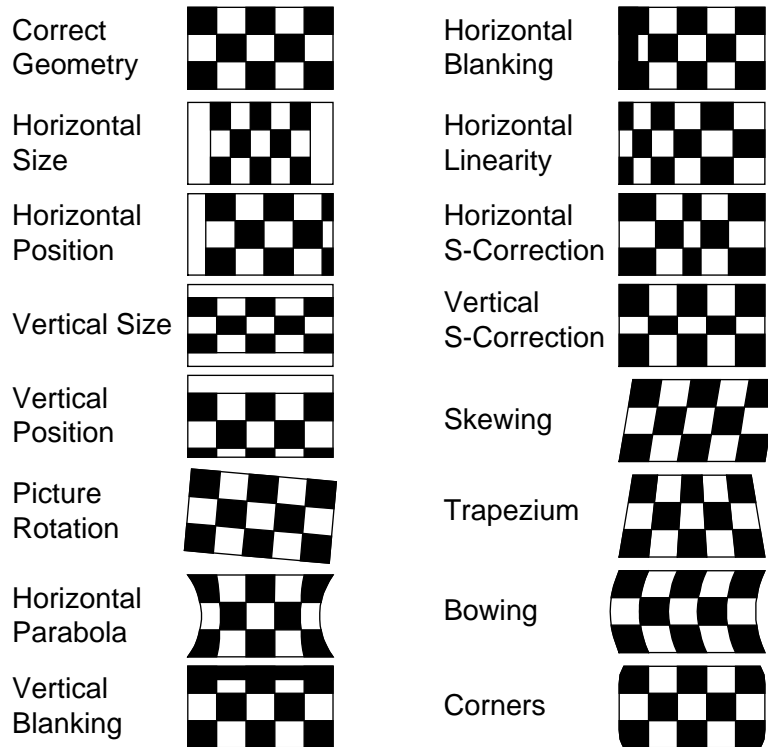


Adjust with or then press .

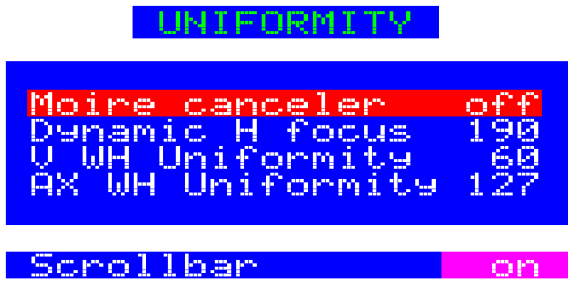
Press to leave the Geometry menu. If changes have been made, you will be asked to save or to discard these changes:



Press to select yes or no, then press .



### 4.5.3 Uniformity



Select a setting with or and press , or press first to turn Scrollbar on or off.



Adjust with or then press . Press to leave the Uniformity menu. If changes have been made, you will be asked to save or to discard these changes:



Press to select yes or no, then press .

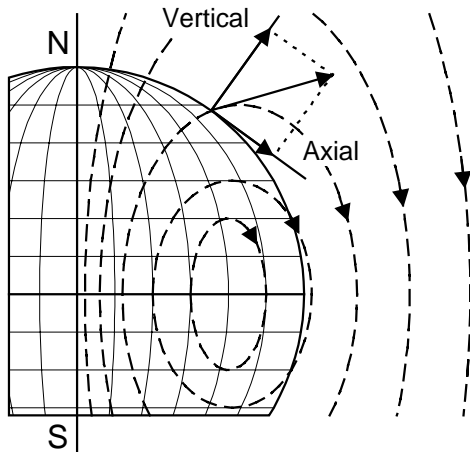
#### ► Moiré canceler

When a disturbing Moiré pattern is visible caused by the superposition of the image pattern and the display's raster pattern, you can eliminate it by adjusting the Moiré canceler.

The visibility of Moiré patterns depends on the geometry settings. Making small changes to the vertical size of the picture can reduce Moiré significantly.

#### ► Dynamic H focus

Adjust in case horizontal lines appear to be unsharp in the middle of the picture.



#### ► V WH Uniformity

The Vertical White Uniformity compensates for the vertical component of the earth's magnetic field. The vertical component causes a horizontal deviation of the electron beam. The compensation is a DC current through the degauss coils in the top and bottom of the monitor's bezel. After adjusting this setting, the monitor degausses automatically.

Adjust in case of purity or white uniformity errors, in particular in the middle of the screen, using a microscope to check the beam landing.

#### ► AX WH Uniformity


The Axial White Uniformity compensates for the axial component of the earth's magnetic field. When this axial component enters the monitor from the front or rear side, it causes an electron beam rotation. As a result the beam landing is affected. The factory adjustment is 127 (no compensation), since it is factory-aligned with the picture tube facing east, with the axial component entering from the left side of the monitor. The compensation is a DC current through a coil surrounding the tube's front side.

Adjust in case of purity or white uniformity errors at the edges of the screen, using a microscope to check the beam landing.

## 4.6 Information Menu

```
INFORMATION
HDM5049 PLUS      HDM5049 P1
Serial number     5152535
Part number       U9522601
Soft. number      U5686551
Soft. version     V1.03
Run time         540 hours
```

In the Information Menu, you can find the serial number, the part number, the software number and version and the time the monitor has been running since it left the factory.

Press  to leave the menu.

The menu disappears automatically after 20 seconds of keyboard inactivity.

## 5 TECHNICAL SPECIFICATIONS

### HDM 5049 PLUS FEATURES

- User-friendly keyboard and OSD
- AKB color stability circuit
- Orbiting pixel shift system
- Automatic Color Alignment
- Password protection
- 19" rack-mountable
- Programmable quick degauss

### INPUT CONFIGURATION

#### RGB Input

- Nominal level: 0.7 V<sub>pp</sub> ± 3 dB
- BNC connectors
- 75 ohm termination switch

#### Sync Input

- Nominal level: 2 V<sub>pp</sub>,
- Min. 1 V<sub>pp</sub>, max 5 V<sub>pp</sub>
- Composite or separate H/V sync
- BNC connectors
- 390 ohm

#### Communication Input / Output

- Female Sub-D 9-pin connector (RS-232) for Thoma / Philips Color Analyzer

### VIDEO PERFORMANCE RGB DRIVE

- RGB bandwidth: 135 MHz typical
- Pulse rise and fall time: typical 3.5 ns
- Black level stability: 0.5% (0-100% APL)

### SCANNING SYSTEMS

#### Horizontal scanning

- Multisync microprocessor controlled
- Frequency range: 30 - 82 kHz

#### Vertical scanning

- Frequency range: 48 – 150 Hz
- Minimum blanking: 420 μs

#### Factory-stored Modes

- 1080L x 1920P, 60 Hz Interlaced (SMPTE 274M)
- 1035L x 1920P, 60 Hz Interlaced (SMPTE 240M-260M)
- 720L x 1280P, 60 Hz Non-interlaced (SMPTE 296M)
- 480L x 704P, 60 Hz Non-interlaced (SMPTE 293M)
- VIVALDI 525 lines / 60Hz 4 Pictures Mode
- VIVALDI 525 lines / 60Hz 1 Picture Full Screen Mode

### VISUAL PERFORMANCE

#### Picture tube

- Dot-In-Line, diagonal: 19" (17" visible)
- Dot pitch: 0.26 mm
- Transparency: 46%
- Phosphor type: P22, rare-earth (red), sulfide (blue and green)
- Max. convergence error:  
Zone A: 0.3 mm, Zone B: 0.4 mm.

#### Resolution

- Addressable pixels: 1240
- Focus control: DAF system

#### Geometry

- Maximum error: 1%

### CONTROL

- OSD (On Screen Display) menus
- Direct access buttons for contrast, brightness, Degauss, Power On/Off (standby)
- Menu push-buttons
- Power switch at rear side

### POWER SUPPLY

- Auto-selection: 90–135 / 195–265 V AC
- Power consumption: 120 W nominal
- Frequency limits: 45 – 65 Hz

### ENVIRONMENTAL SPECIFICATIONS

- Temperature range:  
Operation: 0 / +45 °C  
Storage: -20 / +65 °C
- Altitude: 10,000 ft / 3000 m
- Humidity (relative): 95% maximum, non-condensing

### MAGNETIC IMMUNITY

- Automatic Quick Degauss system (minimum interval: 10 s)
- Vertical and Axial White Uniformity correction

### PHYSICAL SPECIFICATIONS

- Number of 19" rack units: 8
- Dimensions (without handles):  
Width: 438 mm / 17.24 inch  
Height: 354 mm / 13.97 inch  
Depth: 483 mm / 19.01 inch  
Weight: 25 kg / 55.12 lb.

Technical specifications are subject to change without prior notice.