

MICRO DISPLAY SYSTEMS, INC.

THE GENIUS

OPERATIONS MANUAL

Version 2.1

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**MICRO DISPLAY SYSTEMS, INC.
THE GENIUS**

**QUICK START INSTALLATION
INSTRUCTIONS**

Version 2.1

QUICK START INSTRUCTIONS FOR INSTALLING
THE GENIUS Monitor on a
microcomputer

The First Thing You Need to Know

Your microcomputer and software, need to be prepared for use with THE GENIUS Monitor.

What These Pages Will do For You

Guide you step by step through the hardware and DOS operating system preparation procedure.

Explain the GENIUS's three different display modes and give examples of how you might use them.

After completing this Quick Start set of instructions your micro-computer will be ready for preparing application software packages for use in the 66 line mode or for using the other GENIUS display modes. Application software preparation (ie. WordStar, Lotus 123, etc...) is in a separate instruction document called, "GENIUS Software Bulletin".

What You Need to Complete the Quick Start Procedure

The GENIUS Demo and Utilities diskette version 2.75 or higher
A DOS system disk version 2.1 or higher
IBM or compatible operations manual (for switch settings)
GENIUS Monitor and GENIUS Monitor card

```
***** CAUTION: *****
*
* FOR NON-IBM COMPUTERS:
*
* If your computer has a display attached, you will want
* to configure your booting diskette (floppy or hard drive) before
* connecting the GENIUS. (Follow Section II of these instructions
* before continuing with Section I).
*
* If your IBM compatible computer does not have a display, complete
* Section I then II but, you may be expected to enter some
* keystrokes that will not be seen on the display.
*
*****
```

INSTALLATION PROCEDURES

Section I

Hardware Installation

1. Power off and unplug power from the PC and any attached peripherals.
2. Remove the cover of your microcomputer.
3. Remove or disable any and all monitor cards.
(Consult the PC manual for disabling instructions if monitor card can not be removed)
4. Set the micro's switches to IBM Monochrome mode.
(These switches can be either hardware switches or software switches. Consult your PC operations manual for the particular type of switch and it's postion)
5. Install the GENIUS monitor card in the microcomputer.
(On an IBM AT the card must be in slot #1 or#7)
6. Replace the microcomputer's cover.
7. Connect the GENIUS's cables.
8. Plug in all power cords for the PC and peripherals.
9. Boot the micro with DOS or the disk you may have prepared if you started this procedure with Section II.
(If you are using a Compaq 286 you will need to touch F1 after the boot up procedure)

FOR NON-IBM COMPUTERS

If you are using an IBM compatible PC you may not be able to see any the screen. What this should mean is that your PC will not display anything on the GENIUS without our software installed on the operating system (DOS) disk. If this is the case for your PC complete Section II, taking extra care to follow the instructions.

Before continuing touch the return key about five times to make certain you have passed any time or date prompts.

SECTION II

Operating Software Installation

In order to use The GENIUS in 66 lines it is necessary to have three GENIUS software items on the disk used for booting up the PC.

1. DEVICE=VHR_ANSI.SYS must be in the config.sys file.
2. VHR.COM must be on the booting disk.
3. VHR_ANSI.SYS must be on the booting diskette.

This is automated by using the procedures that follow. Use Procedure 1 if you have a hard drive system or Procedure 2 if you wish to install a floppy system. Consult appendix A for details regarding what is done during these automated procedures.

Procedure 1. Hard drive system.

1. Boot the PC from the hard drive.
2. Put the GENIUS DEMO AND UTILITIES diskette in drive A: and type A:IH (Hard drive name) <return>. EXAMPLE: If your hard drive is labeled C, then
you would type:

A:IH C

(you must type the A: because your default drive is the one you used to boot your computer)

3. Remove the diskette from drive A and reboot.

You should have a full 66 lines of text available at this time. The next step is to become familiar with the GENIUS UTILITIES program. (Go to Section III)

Procedure 2. Two floppy system.

1. Put your DOS diskette in drive A and the GENIUS DEMO AND UTILITIES diskette in drive B and type- B:IF B <return>.
2. Remove the DOS disk from drive A and the GENIUS DEMO diskette from drive B.
3. Place the GENIUS DEMO disk in drive A and reboot.

You should have a full 66 lines of text available at this time. The next step is to become familiar with the GENIUS UTILITIES program. (Go to Section III)

TIME OUT

Let's take a moment to focus on where we are and what's next. So far you have installed the monitor and monitor card plus prepared a DOS disk that contains the GENIUS utilities. At this point you should be able to display 66 lines of text on the screen after booting with this new DOS disk. Test this by displaying a directory, repeating if necessary to fill the screen. If you do not see a full 66 lines try setting the mode to 66 lines (see Section III). If you are not in the 66 line mode or having difficulty, take a break! After a short break try the quick start procedure again, starting at page one, word one! If that fails, call your dealer or Micro Display Systems toll free at 1-800-328-9524.

SECTION III

THE GENIUS UTILITIES PROGRAM

It is necessary to tell the monitor whether you are going to be using a program designed for use with 25 lines or 66 lines. The GENIUS UTILITY program allows the user to set up The GENIUS for 66 line or 25 line operation. The procedure for doing this is simple.

1. You must be at the DOS prompt to access the Utility program.
2. The VHR.COM file must be present on the drive and in the current directory.
3. Type VHR <RETURN>.
(This will display the VHR menu as seen below)

THE VHR UTILITY PROGRAM		Ver 3.1
COMMAND FORMATS VHR <mode> VHR <mode>/<options> VHR /<options>	DISPLAY MODES MDS = MDS (66 Line) Mode IBM = IBM Mono (25 Line) Mode DUAL = IBM Mono & CGA (640x200)	
CURSOR OPTIONS 0 = No Cursor 1 = No Blink Block Cursor 2 = No Blink Underline Cursor 3 = Slow Blink Block Cursor 4 = Slow Blink Underline Cursor 5 = Fast Blink Block Cursor * 6 = Fast Blink Underline Cursor (* Default)	SCREEN OPTIONS N = Normal Video * R = Reverse Video (* Default)	
EXAMPLE VHR MDS/3 = (66 Line Mode & Slow Blink Block Cursor)		

4. In order to select a display mode it is necessary to type VHR and then the mode desired. (EXAMPLE: VHR IBM <RETURN> will give you 25 lines of double height reverse video text)
5. Additional selections such as cursor options may be specified within the command by preceding them with a / .
(EXAMPLE: VHR MDS/N3 will give you 66 lines of normal video text with a slow blink block cursor)

Simplifying the Procedure

When using The GENIUS UTILITIES program it is not necessary to type a VHR return and display the menu before selecting the desired display mode. As long as VHR.COM is on the drive selected and in the current directory just follow step 4. of Section III. For even greater simplicity these commands may be put into batch files used for invoking the application program.

Changing GENIUS Display Modes

Which one should you use? The answer is determined by two considerations. One, what the software application package is capable of and two, what you want. For example, if you are using a word processing package that can be redefined to display 66 lines and that's what you want then you should set the Genius display mode to VHR MDS, (MDS sets the display to 66 lines).

Continuing on to Applications

Assuming that everything has gone well and that you are in the 66 line mode, you are ready to prepare your first application package for 66 line use.

Helpful Information Before Continuing

When you wish to prepare an application package for 66 line mode please refer to our "GENIUS Software Bulletin". It will give the how to steps for several of the popular packages. If the package you have in mind isn't in the guide check with your dealer, Micro Display Systems or the software publisher.

In brief, the purpose of the Software Bulletin is to instruct you on how to redefine the size of display parameters in the application package. Not every application package will respond to this procedure. Packages that can not be redefined for 66 line operation can be used in the 25 line mode. This can be done by setting THE GENIUS display mode to 25 lines. The keystrokes are VHR IBM. The display mode is set before invoking the application package. More information on selecting GENIUS display modes may be found in the "GENIUS Software Bulletin".

Thank you for using the Quick Start Instructions.

APPENDIX A

The Software Installation Process

The hard disk installation makes three changes to the hard disk.

1. The existing config.sys is renamed to config.gns. This is necessary because VHR_ANSI.SYS needs to be in the config.sys file in order for the GENIUS to display 66 lines. If it is necessary to have other commands in the config.sys file they may be added to the new config.sys or "DEVICE=VHR_ANSI.SYS" may be included in the old config.sys.
2. VHR.COM is copied to the hard drive. (VHR.COM is the GENIUS Utility Program)
3. VHR_ANSI.SYS is copied to the hard drive. (VHR_ANSI.SYS is the GENIUS device driver)

The floppy installation copies DOS onto the GENIUS Demonstration and Utilities Diskette.

In order to use The GENIUS it is necessary to have three GENIUS software items on the disk used for booting up the PC.

1. DEVICE=VHR_ANSI.SYS must be present in the config.sys file.
2. VHR.COM must be on the booting diskette.
3. VHR_ANSI.SYS must be on the booting deskette.

CAUTION: The GENIUS will not work properly if ANSI.SYS is in the config.sys file.

Cabling Your Display to the System Unit

- 1** Connect the monochrome display's signal cable to the monochrome display adapter, and tighten the screws.
- 2** Connect your display's power cable to the back of your system unit.

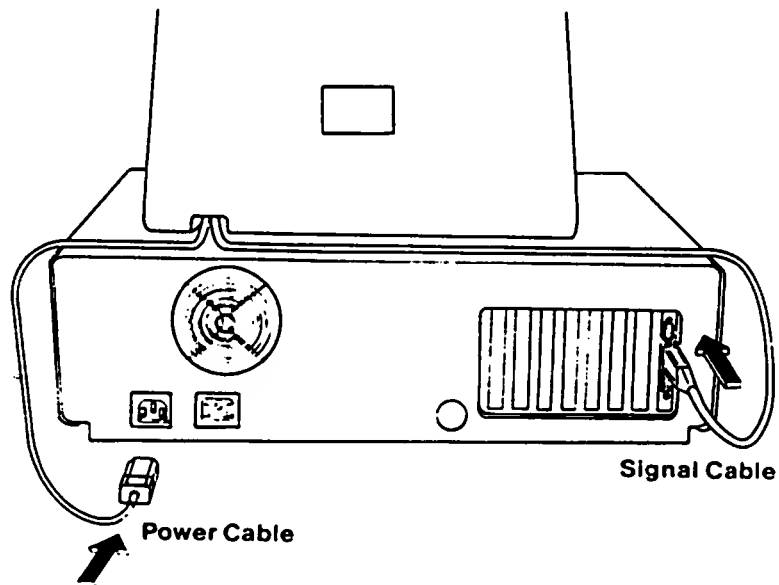
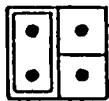
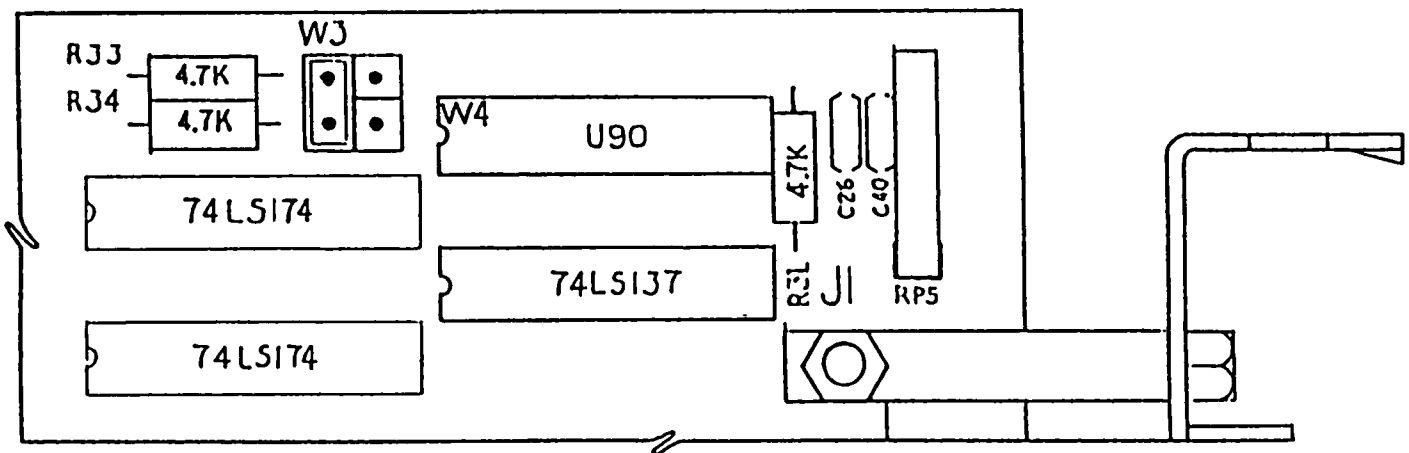


Figure 1

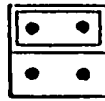
PARALLEL PRINTER PORT

The GENIUS VHR Display Adapter Card offers you a parallel printer port. This port is configured as LPT1 when you receive it. It can be changed to LPT2 or disabled. This is done by repositioning the jumper located in the upper right corner of the board.

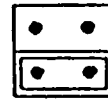
Refer to the drawing below to reposition the jumper to the desired configuration.



LPT1



LPT2



DISABLED

MICRO DISPLAY SYSTEMS, INC.

THE GENIUS

SOFTWARE PROGRAMMING TIPS
Version 2.1

MICRO DISPLAY SYSTEMS, INC.

IBM DUAL SCREEN MODE

DOS in IBM mode	output MODE 6 for CGA 640x200 output MODE 7 for Text 25 Line
VHR board in IBM mode	output to Port 3B0 x 20H Rev. Video output to Port 3B0 x 00H Nor. Video
Text memory plane on	output to Port 3B8 Value 28
Graphics memory on	output to Port 3D8 Value 08
Memory Map (IBM compatible)	start address B0000 for text and at B8000 for CGA 640x200 graphics

MDS 66 LINE MODE

DOS in MDS mode	output to DOS MODE 8
VHR board in MDS mode	output to Port 3B0 x 21H Rev. Video output to Port 3B0 x 01H Nor. Video
Text memory plane on	output to Port 3B8 Value 28
Graphics memory off	output to Port 3D8 Value 00
Memory Map (Text 66 lines)	start address B0000 to B3FFF.

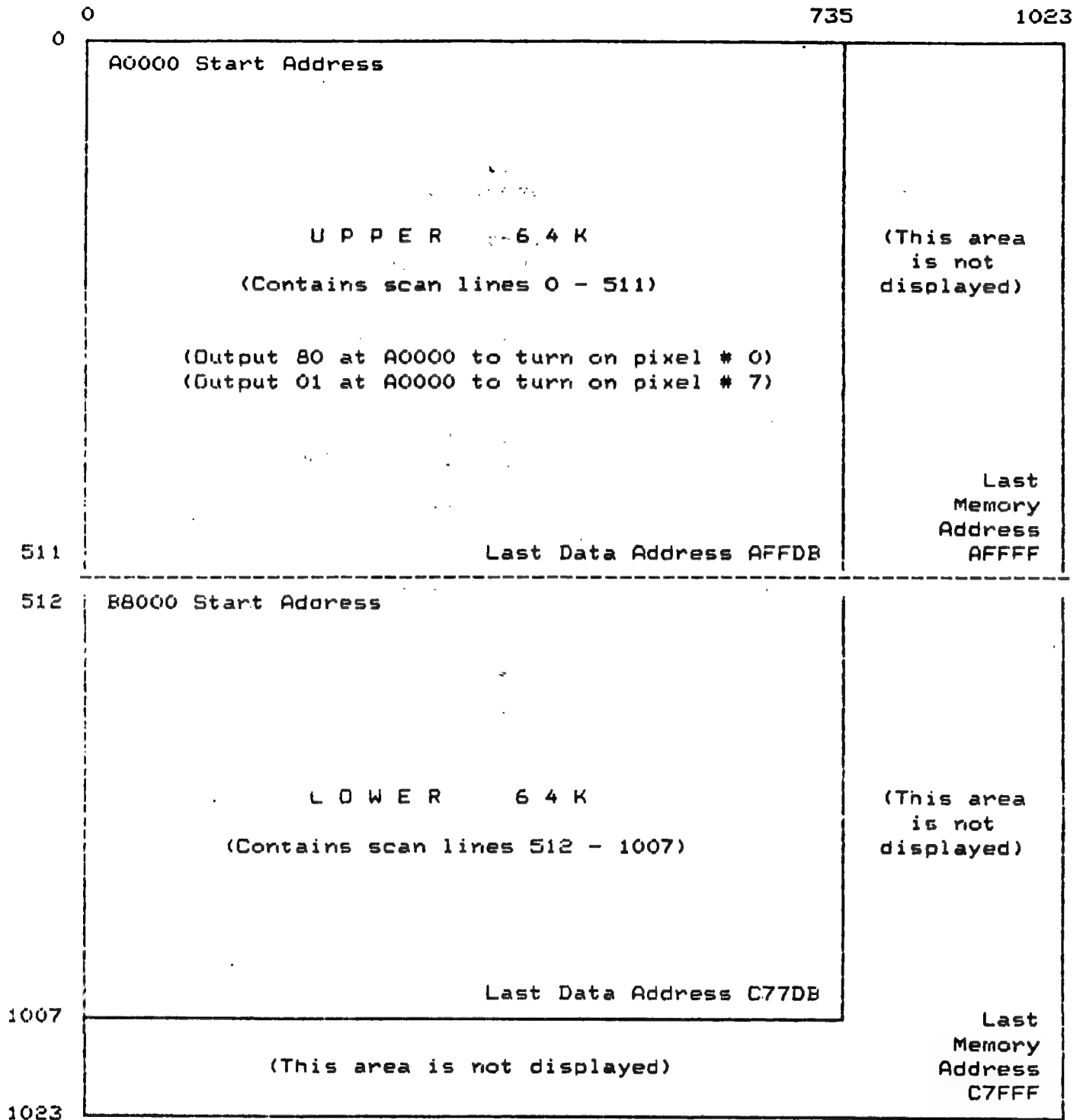
MDS VHR GRAPHICS

DOS in MDS mode	output to DOS MODE 8
VHR board in MDS mode	output to Port 3B0 x 21H Rev. Video output to Port 3B0 x 01H Nor. Video
Text memory plane off	output to Port 3B8 Value 00
Graphics memory on	output to Port 3D8 Value 08
Memory Map (Graphics 728x1008) ...	start address A0000 to AFFFF for upper half 512 scan lines and at start address B8000 to C7FFF for lower half 496 scan lines.

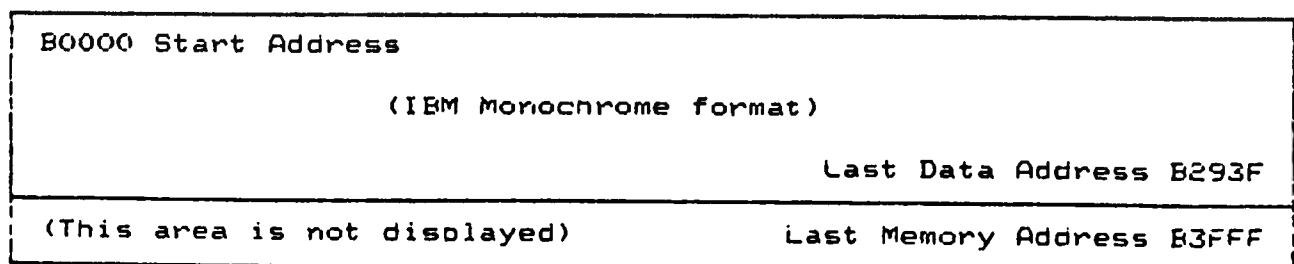
MDS OVERLAY MODE

DOS in MDS mode	output to DOS MODE 8
VHR board in MDS mode	output to Port 3B0 x 21H Rev. Video output to Port 3B0 x 01H Nor. Video
Text memory plane on	output to Port 3B8 Value 28
Graphics memory on	output to Port 3D8 Value 08
Memory Map (Text 66 lines)	start address B0000 to B3FFF.
Memory Map (Graphics 728x1008) ...	start address A0000 to AFFFF for upper half 512 scan lines and at start address B8000 to C7FFF for lower half 496 scan lines.

THE GENIUS VHR BIT-MAP GRAPHICS MEMORY MAP



THE GENIUS VHR TEXT MEMORY MAP



CRT CONTROL PORT # 1 (WRITE ONLY)
Port Address = 3B8(H)
Enable Blink (Character Attribute)
Disable Blink (Character Attribute)
Enable Video (Text Memory Plane)
Disable Video (Text Memory Plane)

7	6	5	4	3	2	1	0
		1					
		0					
				1			
				0			

Bits 0, 1, 2, 4, 6 & 7 are not used.

CRT CONTROL PORT # 2
Port Address = 3B0(H)
Level 2 Interrupt (end of each row)
Level 2 Int. (start of vert retrace)
Reverse Video (Screen Attribute)
Normal Video (Screen Attribute)
Inverse Graphics Video (Screen Attr.)
Normal Graphics Video (Screen Attr.)
(8x15) Character Cell
Normal (9x15) Character Cell
MDS Enhanced Character Attributes
IBM Character Attributes
Extended Character Set (no blink)
Normal Character Set
MDS Mode (66 lines & VHR graphics)
IBM Mode (25 lines & 640x200 graph)

7	6	5	4	3	2	1	0
1							
	1						
		1					
		0					
			1				
			0				
				1			
				0			
					1		
					0		
							1
							0

CRT CONTROL PORT # 3 (Write only)	
Port Address = 3B1(H)	
No Reset of Scroll Register	
Double Width (screen attribute)	
Double Width (line attribute)	
Double Height (screen attribute)	
Double Height (line attribute)	
66 Line Screen (15 scan line Cell)	
70 Line Screen (14 scan line Cell)	
76 Line Screen (13 scan line Cell)	
83 Line Screen (12 scan line Cell)	
14 Scan Line Cell (Line Attribute)	
13 Scan Line Cell (Line Attribute)	
12 Scan Line Cell (Line Attribute)	

7	6	5	4	3	2	1	0
1							
1		1					
0		1					
1			1				
0			1				
0				0	0	0	0
1				0	0	0	1
1				0	0	1	0
1				0	0	1	1
0				0	0	0	1
0				0	0	1	0
0				0	0	1	1

Port 3B1 (Bit 7)

When set does not reset the scroll register at the end of a character row. Can be used with bits 0-3 to do a smooth scroll or with either bit 4 (double height) or bit 5 (double width) for a screen attribute.

Port 3B1 (Bits 6)

This bit is not currently being used.

Port 3B1 (Bits 0-3)

Binary register with number of scan lines to reduce character cell size.

Port 3B1

These features are available only with the enhanced VHR Adapter board.

GRAPHICS CONTROL REGISTER (WRITE ONLY)	
Port Address = 3D8(H)	
Enable Video (Graphics Memory Plane)	
Disable Video (Graphics Memory Plane)	

7	6	5	4	3	2	1	0
				1			
				0			

Port 3D8 (Bits 0-2, 4-7)

Bits 0, 1, 2, 4, 5, 6 & 7 are not used.

CHARACTER ATTRIBUTES

IBM CHARACTER ATTRIBUTES			
Active if Port 3B0 Bit 2 = 0			
Blink			
Normal Video			
Reverse Video			
Non-Display (Black)			
Bolo			
Underline (Normal or Bold)			

7	6	5	4	3	2	1	0
1							
	1	1	1		1	1	1
	1	1	1		0	0	0
	0	0	0		0	0	0
				1			
	0	0	0		0	0	1

MDS CHARACTER ATTRIBUTES												
Active if Port 3B0 Bit 2 = 1	7	6	5	4	3	2	1	0				
Blink/Extended Character Set	1											
Alternate Character Set		1										
Bold Background			1	1								
Dim Background			1	0								
Normal Background			0	1								
Black Background			0	0								
Bold Foreground					1	1						
Dim Foreground					1	0						
Normal Foreground					0	1						
Black Foreground					0	0						
Normal							1	1				
Superscript							1	0				
Underline							0	1				
Subscript							0	0				

MICRO DISPLAY SYSTEMS, INC.

THE GENIUS

**PRECAUTIONS AND
SPECIFICATIONS**

Version 2.1

THE GENIUS VHR FULL PAGE DISPLAY SYSTEM

Micro Display Systems, Inc. makes no warranty for the use of its product and assumes no responsibility for any errors which may appear in this manual.

The contents of this manual are subject to change.

Micro Display Systems, Inc. retains the right to make changes to these specifications at any time, without notice.

THE GENIUS is a registered trademark of Micro Display Systems, Inc.

IBM is a registered trademark of International Business Machines.

Additional copies of this manual or other Micro Display Systems, Inc., literature may be obtained from;

MICRO DISPLAY SYSTEMS, INC.
1310 Vermillion Street
Hastings, Minnesota 55033

612/437-2233

SAFETY PRECAUTIONS

WARNING

THE GENIUS is manufactured and tested with your safety in mind. However, if you do not use THE GENIUS correctly, you risk potential electrical shock or fire hazards. Please observe the following precautions:

To prevent fire or shock hazard, do not expose this product to rain or moisture.

Do not spill liquids on or into THE GENIUS.

Water pipes, damp floors or earth, and sinks or bathtubs that contain water can all conduct electricity. Never handle any electrical appliance when you are in contact with such conductors.

If THE GENIUS should become wet, unplug it immediately. Take it to your dealer for checkout before you use it again.

THE GENIUS is made to operate on normal line voltage. Using the wrong power source may damage it.

Notice that THE GENIUS' power cord has a three-pronged plug. If the blades do not enter, the outlet is non-standard and should be replaced by a qualified electrician.

To prevent electric shock, do not use this polarized plug with an extension cord, receptacle, or other outlet unless the blades are fully inserted. Do not use the plug with the blades exposed. To do so defeats the safety purpose of the plug.

As with any electrical appliance, do not let anything rest on or roll over the power cord. Keep the power cord out of traffic patterns. If the power cord becomes frayed or broken, obtain a replacement cord from your dealer.

WARNING

This equipment generates, uses, and can radiate high frequency energy, and if not installed and used in accordance with this instruction manual, may cause interference to radio or television communications.

Operation of this equipment in a residential area is likely to cause interference in which case the user, at his or her own expense, will be required to take whatever measures may be required to correct the interference.

The presence of interference can be determined by turning this equipment off and on. You are encouraged to try to correct the interference by one or more of the following measures;

move this equipment away from the receiver;

plug this equipment into a different electrical outlet so that it and the receiver are on different branch circuit.

If necessary, consult the dealer or an experienced radio/television technician for additional suggestions. You may find the following booklet prepared by the FCC helpful:

"How to Identify and Resolve Radio-TV Interference Problems"

This booklet is available from:

US Government Printing Office
Washington, DC 20402
Stock No. 004-000-00345-4

WARNING

THE GENIUS` cabinet is a safety enclosure to protect you from the high voltage inside. NEVER open the cabinet.

Do not place objects on the cabinet.

Do not block the ventilation openings at the back of the cabinet. Do not use a lamp or candle on or near the THE GENIUS. Keep it away from heat-producers such as radiators.

Do not push objects through the ventilation slits. You may create an electrical shock or fire hazard.

WARRANTY

Micro Display Systems, Inc., warrants that for a period of ninety (90) days this product shall be free from defects in material and workmanship. Warranty begins on the date of purchase at retail, or lease, by the end user.

DISCLAIMER

Under no circumstances shall Micro Display Systems, Inc., be liable in any way to the user for indirect, special, incidental, or consequential damages, including but not limited to any loss of business or profits, whether foreseeable or not and whether or not based on breach of warranty or contract or on negligence. If your state does not allow the exclusion or limitation of incidental or consequential damages, those limitations or exclusions do not apply to you.

TECHNICAL SPECIFICATIONS

DISPLAY CHARACTERISTICS

- * 9 x 15 pixel character cell
- * 8 x 12 pixel character matrix, including 3 scan lines for descenders
- * 13th scan line for underscore
- * Non-Interlaced
- * 60 Hz Refresh Rate
- * 64 KHz Horizontal Scan Rate
- * 100 MHz Video Bandwidth
- * 110 Degree Deflection CRT
- * 15" (diagonal) Portrait Mount CRT
- * White Phosphor

PHYSICAL CHARACTERISTICS

- * 15.5" (39.5 cm) Height (overall)
- * 13.75" (35.0 cm) Width (overall)
- * 13" (32.9 cm) Depth (overall)
- * 30 lbs. (13.6 Kg.) Shipping Weight

POWER REQUIREMENTS

GENIUS MONITOR:

- * 95-130 or 190-260 AC Line Voltage (field selectable)
- * 47-440 Hz Line Frequency

VHR Display Adapter Card:

- * 2.7 at 5V (From PC Power Supply)
- * Designed to plug into the IBM PC and certain IBM PC - compatible systems.

Graphics Display Board:

- * 2.7 at 5V (From PC Power Supply)

ENVIRONMENTAL REQUIREMENTS

- * 40 - 150 degrees F (5-40 degrees C)
- * 0 to 90% Relative Humidity

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