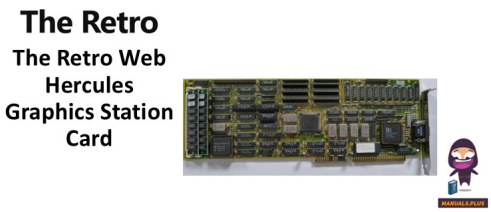
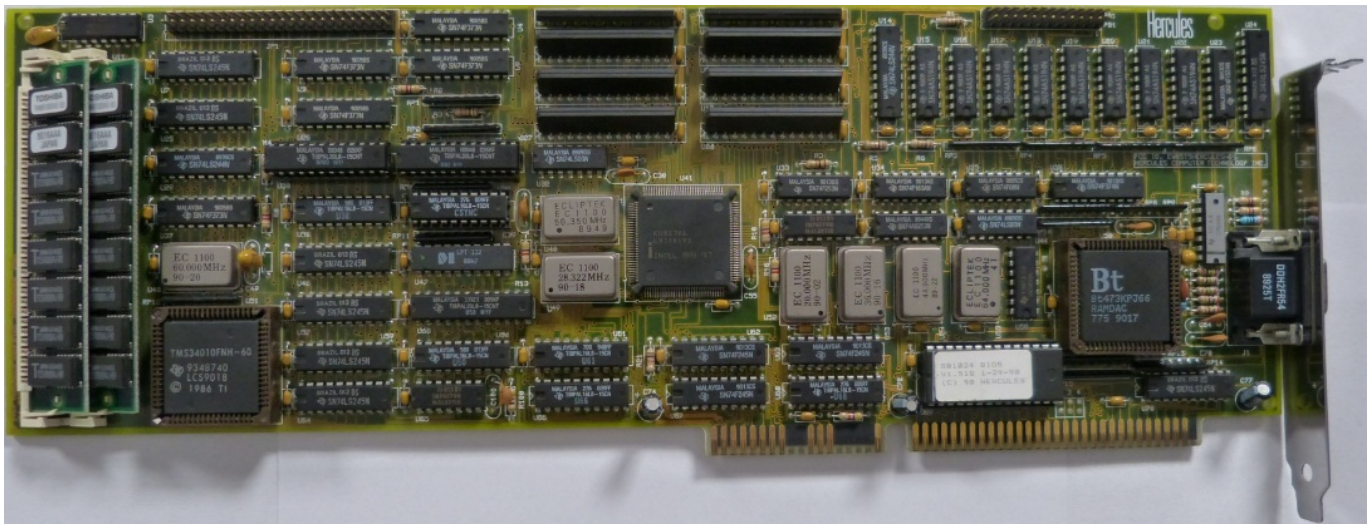


The Retro Web Hercules Graphics Station Card Owner's Manual

Contents

The Retro

The Retro Web Hercules Graphics Station Card



What is the Hercules Graphics Station Card?
The Hercules Graphics Station Card is a powerful new video display adapter for industry standard ‘286 and ‘386 based personal computers. The Hercules Graphics Station Card combines VGA compatibility for today’s most popular software, and a powerful Texas Instruments 34010 graphics processor for high performance at resolutions beyond VGA.

The Hercules Graphics Station Card features an Intel 82706 VGA controller chip for 100% register-level compatibility with the IBM VGA standard. It supports all 17 IBM-standard video modes, including EGA and CGA modes. The Hercules Graphics Station Card is functionally equivalent to the IBM VGA Adapter, and is fully compatible with all popular DOS applications.

The Hercules Graphics Station Card is also equipped with a Texas Instruments 34010 graphics coprocessor to drive all non-VGA modes. With a megabyte of on-board video RAM, the Hercules Graphics Station Card can accommodate a vast array of display formats:

- 8-bit Continuous color VGA
- 640x480x8 for 256 color or 256 grey level VGA resolution on standard analog monitors
- 16-bit High-Precision Color
- 640x480x16 for graphics and imaging applications requiring color realism. This mode includes a non-destructive 1-bit memory overlay and provides continuous-tone shading on standard analog VGA monitors.
- 24-bit Super Precision Color
  512x480x24 for photo-realistic continuous tone images on standard analog VGA monitors. The 24-bit mode includes a non-destructive 4-bit memory overlay and supports the simultaneous display of 256 grey levels and 24-bit color images.

High Resolution Format
1024×768 resolution with 256 colors in either interlaced or non-interlaced operation on high-resolution analog monitors.

The Graphics Station Card also supports TIGA (Texas Instruments Graphics Architecture), the proposed software-interface standard for TMS 340×0 based graphics systems. Applications that support TIGA will run on any TIGA-compatible display adapter/monitor combination without the need for special drivers. Hercules-supplied TIGA software allows you to configure your TIGA applications to obtain the highest available performance from whatever monitor you are using.

Getting Started

Before You Begin
The Latest Information (The README File)

Do You Have The Proper Equipment?

- Installing the Hercules Graphics Station Card
- Testing the Hercules Graphics Station Card

Before You Begin
Please take a few minutes to fill out and return the enclosed registration card. It is essential that we receive the card in order to provide you with important information about software updates.

The Latest Information (The README File)
On the Hercules Graphics Station Utilities diskette, there is a program called **README.COM** and a text file called README. The README text file contains important updated information on Hercules Graphics Station Card utility programs and application drivers that is not included in this manual. Be sure to run the **README.COM** program before you use the Hercules Graphics Station Card. Place the Hercules Graphics Station Utilities diskette, which contains **README.COM** and README, in drive A, make sure A is your current drive, and type:

README
README.COM will automatically load the README file and display it on the screen. Use the cursor-control keys on the numeric keypad to scroll or page through the document. Typing H will display a list of available commands. Typing P will display the printer control commands that will allow you to print a copy of the READ ME file on your printer.

Do You Have the Proper Equipment?

Computer
The Hercules Graphics Station Card is designed to be installed in an IBM AT or a compatible 80286- or 80386-based personal computer which features the AT bus (also known as the Industry Standard Architecture or ISA). The Hercules Graphics Station Card cannot be installed in computers, such as the IBM PS/2 series, which use the Micro Channel architecture. The Hercules Graphics Station Card is a full-length, full-height, AT form-factor board and cannot be installed in a computer which uses a PC/XT-style or low-profile case. Software installation instructions in this manual assume that your system is equipped with a hard disk. While it is not absolutely necessary to have a hard disk in your system to install and test the Graphics Station Card, all of the applications which support the card's high-resolution graphics modes require significant hard-disk space.

Monitor
The Hercules Graphics Station Card supports a wide variety of analog monitors, ranging from fixed-frequency VGA monitors with a resolution of 640 by 480, to high-resolution monitors which support a non-interlaced resolution of 1024 by 768. The degree of resolution you obtain from the Hercules Graphics Station Card will depend upon the monitor you choose. If you are uncertain of the maximum resolution of your monitor, consult your dealer or the manufacturer.
Note: You may be able to deduce the maximum resolution attainable by your monitor from its sync frequency range Consult the table of sync frequencies in Appendix 3.

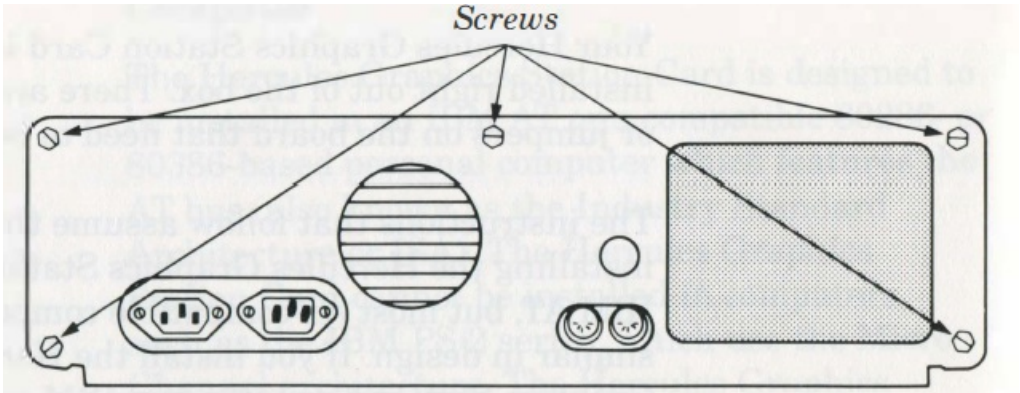
Installing the Hercules Graphics Station Card
Your Hercules Graphics Station Card is ready to be installed right out of the box. There are no switches or jumpers on the board that need to be set. The instructions that follow assume that you are installing the Hercules Graphics Station Card in an IBM AT, but most AT-compatible computers are similar in design. If you install the Hercules Graphics Station Card in a non-IBM system, please consult your system user's guide for specifics.

Notes: If you wish to install the Hercules Graphics Station Card in a two-monitor system, please refer to Appendix 2 of this manual for instructions and information on limitations.

Before you install the Hercules Graphics Station Card, we recommend that you copy the card's serial number (the number beginning with the letters 'GS,' found on a sticker on the back of the board) inside the front cover of this manual. If your Hercules Graphics Station Card ever requires service, you will need to refer to this number.

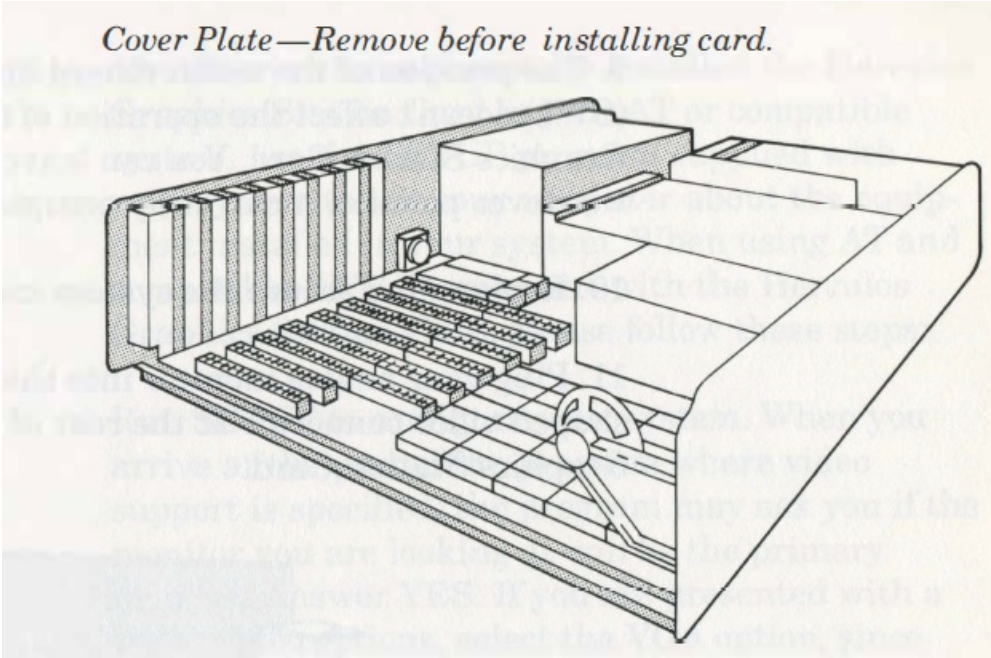
To Install:

1. Before you open your system, be sure that you have turned off your system unit and all devices connected to it.
2. Remove the screws from the back of your computer's case, as shown in figure 1.



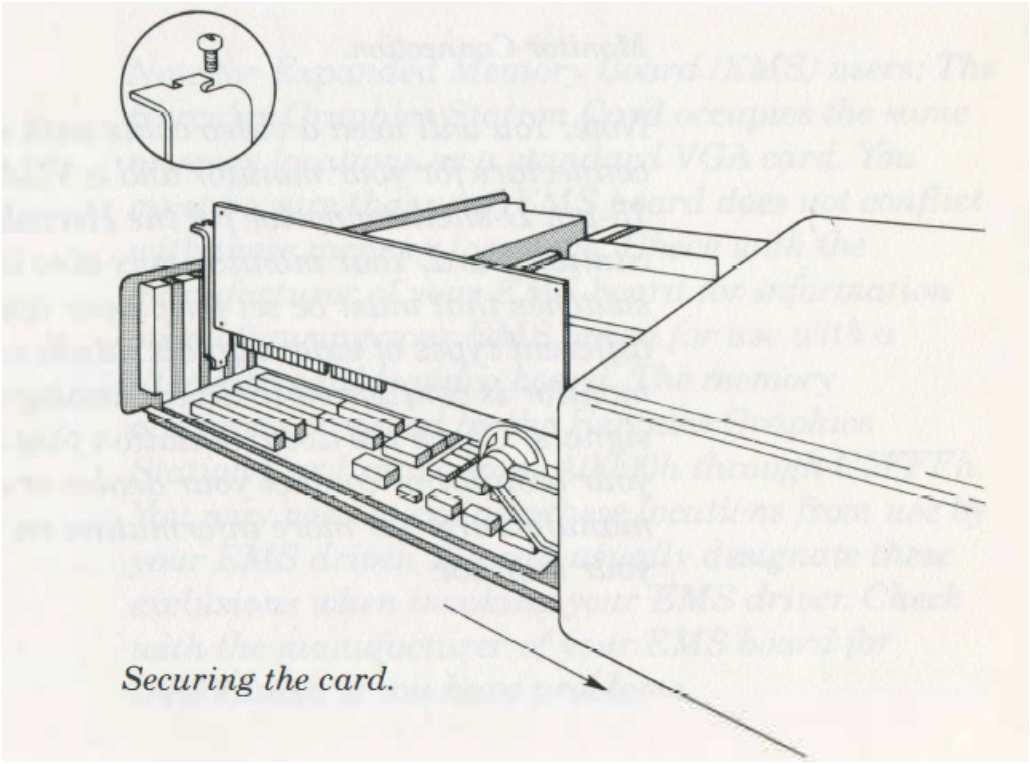
Location of cover screws on the back of an IBM AT.

3. Carefully slide the system unit cover forward. When the cover will not go any further, tilt it up and lift it away.
4. If you have used your system prior to installing the Hercules Graphics Station Card, be sure to remove your old video display adapter before installing the card (unless you are setting up a dual-monitor system, in which case you should consult Appendix 2 before proceeding).
5. Select an empty 16-bit expansion slot. (The Graphics Station Card can be installed in an 8-bit slot, but its performance will be significantly degraded. We do not, therefore, recommend such an installation.)
6. Remove the system expansion slot cover by removing its retaining screw and lifting it out. Save the screw.



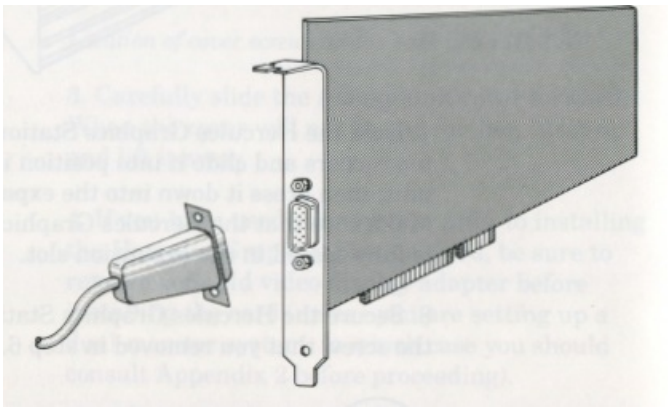
Cover Plate-Remove before installing card.

7. Hold the Hercules Graphics Station Card by its top corners and slide it into position in the system unit; then press it down into the expansion slot. Make sure that the Hercules Graphics Station Card is fully seated in the expansion slot.
8. Secure the Hercules Graphics Station Card with the screw that you removed in step 6.



Securing the card.

9. The position of the motherboard display switch (SWI) doesn't affect the operation of the Hercules Graphics Station Card. You can leave this switch in whatever position it currently occupies.
10. Replace and secure the system cover.
11. Plug your analog monitor into the 15 pin "D" shaped video connector at the rear of the Hercules Graphics Station Card.



Monitor Connection.
Note: You will need a video cable with appropriate connectors for your monitor and a VGA-style male 15-pin D-shell connector for the Hercules Graphics Station Card. Your monitor may also include switches that must be set for proper operation with different types of video signals. Make sure your monitor is configured to accept analog video signals. Check the documentation that came with your monitor or contact your dealer or display manufacturer for more information on configuring your monitor.

Installing the Hercules Graphics Station Card 12. After you have physically installed the Hercules Graphics Station Card in your AT or compatible system, use the SETUP program supplied with your system to tell your computer about the equipment installed in your system. When using AT and compatible SETUP programs with the Hercules Graphics Station Card, please follow these steps:
Run SETUP to configure your system. When you arrive at the part of the program where video support is specified, the program may ask you if the monitor you are looking at will be the primary monitor. Answer YES. If you are presented with a list of video options, select the VGA option, since your Hercules Graphics Station Card will look to most systems like a VGA card. If no VGA option is offered, select EGA. If neither a VGA nor an EGA option is available, try the option for NO MONITOR,

RESERVED, or SPECIAL.
These will usually work. If not, contact your dealer or the manufacturer of your system. Your Hercules Graphics Station Card installation is now complete.
Note for Expanded Memory Board (EMS) users: The Hercules Graphics Station Card occupies the same memory locations as a standard VGA card. You must be sure that your EMS board does not confiict with these memory locations. Check with the manufacturer of your EMS board for information on configuring your EMS board for use with a VGA-compatible video board. The memory addresses occupied by the Hercules Graphics Station Card range from A0000h through C7FFFh. You may need to exclude these locations from use by your EMS driver. You can usually designate these exclusions when invoking your EMS driver. Check with the manufacturer of your EMS board for information if you have problems.

Testing the Hercules Graphics Station Card
To test the video modes of the Hercules Graphics Station Card, place the Hercules Graphics Station Utilities Diskette in drive A, make sure that drive A is your current drive, and type:

TEST [Enter] Follow the instructions that appear on the screen.

Note that the TEST program does not diagnose the circuitry of the Hercules Graphics Station Card. You must observe the screens displayed by the program to verify that the card is working properly.

In Case of Difficulty
If you encounter difficulty installing or using your Hercules Graphics Station Card, you may contact Hercules for assistance. Hercules Technical Support can be reached at **415-540-0749** Monday through Friday between 8:30 am and 5:00 pm Pacific time. Please be prepared to give a succinct description of your problem when you call. If possible, call from your computer, as the technical support representative may ask you to perform additional tests to determine the cause of the problem. You may also correspond with Hercules Technical Support via a facsimile machine at **415-540-6621**. Additionally, Hercules maintains a 24-hour BBS for technical support and information exchange. The Hercules BBS can be reached at **415-540-0621** and operates at 300, 1200, or 2400 baud, no parity, 8 data bits, 1 stop bit. Be prepared to register and enter your Graphics Station Card's serial number the first time you call the BBS. The BBS is a good place to request information from Hercules, get the latest distribution software and utilities, or become acquainted with other Graphics Station Card users who access the bulletin board.

Software

Copying the Hercules Graphics Station Card Utilities Diskette

Installing and Configuring TIGA Software

Copying the Hercules Graphics
Station Card Utilities Diskette
Before proceeding, we suggest that you make a working copy of your Hercules Graphics Station Card Utilities Diskette. Place your DOS diskette in drive A, make sure drive A is your current drive, and type:

DISKCOPY A: A: [Enter]
Remove the DOS diskette from drive A. Place the Hercules Graphics Station Card Utilities Diskette in drive A and have a blank diskette ready. Next, press any key to begin copying. The DISKCOPY program will tell you when to swap diskettes. Just follow the instructions that appear on your screen. When you have finished making the copy, put the Hercules Graphics Station Card Utilities Diskette away in a safe place and label your copy. Use your· copy whenever this manual instructs you to use the diskette.

Installing and Configuring TIGA Software
The Hercules Graphics Station Installation Utility (STATION.EXE) is used select the TIGA directory, install general-purpose TIGA software, install application-specific Graphics Station drivers, and set the default video mode for TI GA-based applications. In addition, STATION.EXE can create batch files to load TIGA and start selected

applications. To start the installation utility, place your working copy of the Hercules Graphics Station Card Utilities Diskette in drive A, make sure A is your current drive, and type:

STATION[Enter]
You will see a menu with three options:

1. Copy Hercules-supplied TIGA files to your system
2. Install Hercules-supplied Graphics Station drivers
3. Select screen resolution for TIGA applications

Installing TIGA Files
TIGA provides a standard interface between applications and the TMS 34010 graphics processor that drives the Graphics Station Card's non-VGA modes. Certain TIGA files are required in common by all TI GA-compatible applications. When you run the installation program for the first time, you should first execute option 1 to install these general purpose TIGA files. Performing this installation will create a TIGA directory on your hard disk, copy the necessary TIGA files from the utilities diskette to the newly-created directory, and modify your AUTOEXEC.BAT file.

The installation utility first displays the default path for the TIGA directory, which is directly under the root directory, e.g., C:\TIGAif your hard drive is drive C. You can accept the default path by pressing [Enter], or you can edit the path name. Next, the program asks you to verify the location of the TIGAfiles to be copied (the default is A:\TIGA). It then creates the TIGA directory and copies the necessary files. Next, you will be asked to confirm that you want to modify your AUTOE XEC.BAT file. Press [Enter] to modify the file or press ESC to return to the main menu. If you say yes, the program will add the TIGA directory to your path statement, and will add the following environment variable: SET TIGA=-mn:[PATHJ -ln:[PATHJ, where n:[PATH] is the drive and path where the TIGA files were-installed in the previous step. Your old AUTOEXEC.BAT file will be saved under the name AUTOEXEC.SAV.

Note: If you do not choose to let the installation program modify your AUTOEXEC.BAT file, you must make the indicated modifications manually in order for TIGA applications to function properly. For instance, if you installed the TIGA files in a directory called C:\GRAPHICS\GSTIGA, you would have to add the following lines to your AUTOEXEC.BAT file:

- PATH=C:\GRAPHICS\GSTIGA
- SET TIGA=-mC:\GRAPHICS\GSTIGA -lC:\GRAPHICS\GSTIGA

Installing Application-Specific Graphics Station Drivers
After you have installed the general purpose TIGA files, you may need to install application -specific Graphics Station Drivers. Due to the rapidlyevolving state of TIGA-compatible applications, you should consult the README file for information about installing and configuring these programs.

Selecting Screen Resolution
The third and final option on the installation menu selects the screen resolution for TIGA-based applications. The available resolution is dependent on your monitor. You will be presented with four options:

1. 640 x 480 (standard VGA monitors)
2. 800 x 600 (enhanced VGA monitors, e.g., MultiSync 2D)
3. 1024 x 768 interlaced (8514 -type monitors, e.g., MultiSync 3D)
4. 1024 x 768 non -interlaced (e.g., MultiSync 4D)

You should select the highest resolution that your monitor supports. You will then be asked to confirm your choice. Next, you will be asked if you want to save your choice as a configuration file. If you answer yes, you will be

prompted for a filename. Type a filename of up to eight characters. Do not type an extension. The extension .STA will be added automatically. A configuration file created by the installation program can be used to set the configuration for TIGA applications by specifying the filename on the command line when starting the installation program, e.g.:

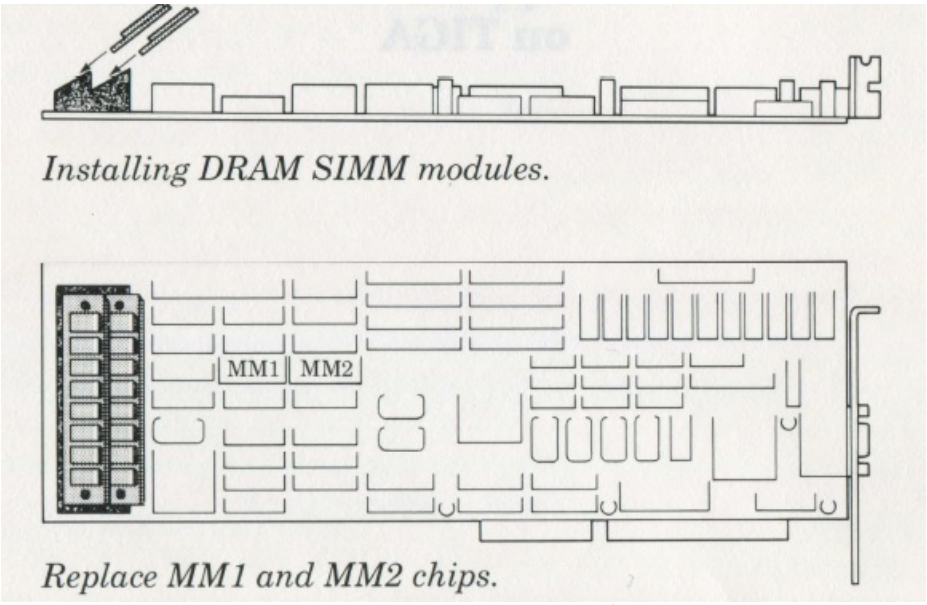
STATION [path]MYFILE.STA [Enter]
When the installation program is started with a valid configuration filename on the command line, the screen configuration is set from the data in the file and you are returned to the DOS prompt.

Appendix

1. Appendix 1: Memory Expansion
2. Appendix 2: Dual-Monitor Systems and Systems with Built-in Video
3. Appendix 3: Technical Information
4. Appendix 4: For More Information on TIGA

Appendix 1: Memory Expansion

Memory Expansion
The Hercules Graphics Station Card comes equipped with 1 Megabyte of video memory (VRAM). This memory is used for display buffer purposes and is sufficient to fully support all of the card's video modes. In addition, the Graphics Station Card can optionally be equipped with 2 Megabytes of dynamic RAM (DRAM). This DRAM takes the form of two 1 Mbx8 DRAM SIM modules, with an access time of 120ns or better, which can be installed at the end of the board farthest from the video connector, as illustrated below. The expansion DRAM should be purchased from an authorized Hercules dealer, because a new memory mapper must be installed on the Graphics Station Card for the memory expansion to operate properly.



Installing DRAM SIMM modules.

Replace MM1 and MM2 chips.

If installed, this dynamic RAM serves as program memory for the TMS 34010 graphics processor. This added memory is not required to run any of the drivers supplied on the Hercules Graphics Station Card Utilities Diskette, such as 1-2-3, AutoCAD, or Windows. However, adding this optional RAM will significantly enhance the performance of AutoCAD by providing fast display list processing capability. Future TIGA applications may also take advantage of this added memory.

Appendix 2:

- Dual-Monitor Systems and Systems with Built-in Video
- Dual-Monitor Systems

Your Hercules Graphics Station Card and analog monitor may be used in conjunction with an IBM Monochrome Display Adapter connected to a TTL monochrome monitor. If you use the Hercules Graphics Station Card in conjunction with a Monochrome Display Adapter and monochrome monitor, the Hercules Graphics Station Card's VGA operation will be limited to its color modes. Its TMS 34010 operation will not be affected.

You can also install the Hercules Graphics Station Card in conjunction with any other member of the Hercules graphics card family: the Hercules Graphics Card, the Hercules Graphics Card Plus, or the Hercules In Color Card. All of these Hercules cards require TTL monitors, so a second appropriate monitor is necessary for this type of installation.

Regardless of what other video board you install the Hercules Graphics Station Card with, you must install the Graphics Station Card in an 8-bit slot. Such an installation will result in a speed penalty in TMS 34010 operations, but is necessary to avoid conflicts during 16-bit data transfers. Also, in dualmonitor installations, you must run the SETUP program as if you were installing only a VGA Card.

In a dual-monitor system, the Hercules Graphics Station Card is always the primary video display adapter. When you turn on your computer, the Hercules Graphics Station Card will be the default display. If you have a Monochrome Display Adapter in your system, use the DOS MODE command to switch between the two video cards. To select the Monochrome Display Adapter, type:

MODE MONO [Enter]
To return to the Graphics Station Card display after using the monochrome display, type:

MODE COBO [Enter]
For more information on using the MODE command, consult the DOS manual that came with your computer.

Note: MODE is an "external" DOS command. This means that you must have the file MODE. COM from your DOS diskette in your current drive or directory, or in your DOS path before you can execute this command.
Using the Hercules Graphics Station Card in conjunction with one of the Hercules graphics cards requires a program from the Hercules Graphics Station Card Utilities Diskette: HBOOT.SYS. HBOOT.SYS is a program that will reset your other Hercules Card (Graphics Card, Graphics Card Plus, or InColor Card) when you reboot your system. This is necessary since if the other Hercules Card is in its "FULL" configuration when you reboot your system, a memory conflict will occur between the Graphics Station Card and the other Hercules Card, and the Graphics Station will not operate properly. Copy the HBOOT.SYS file from the Hercules Graphics Station Card Utilities Diskette to the root directory of your hard disk, then add the following line to your CONFIG.SYS file:

DEVICE=HBOOT.SYS

Notes: You can create or modify your CONFIG.SYS file using any text editor or word processor that creates ASCII text files.

Be sure you don't have the command HGC FULL in your AUTOEXEC.BAT file, as recommended in some Hercules Graphics Card Owner's Manuals, since this command will reverse the effect of the HBOOT.SYS program. The Hercules Graphics Station Card has been designed so that it can coexist with another installed Hercules monochrome or InColor Card. As detailed above, Hercules provides special utility software to disable the Graphics Station Card and toggle between the two installed display systems. However, even though the hardware can coexist, some application software may not function properly in a dual-monitor system. Specifically, programs that attempt to dynamically determine the type of display that is installed may detect the presence of the Graphics Station's VGA BIOS and assume that a VGA is active even when the Graphics Station Card has been disabled. Because we cannot guarantee the proper operation of all software in this situation, we recommend dual-monitor configurations only for advanced users who are prepared to work around any problems that might arise.

Systems with Built-in Video

Some AT-compatible systems are equipped with built-in VGA display circuitry. To install the Hercules Graphics Station Card in a system that includes built-in video circuitry, you must disable your system's built-in video. This procedure may require physically removing an add-on board from one of the expansion slots or changing some DIP switch or jumper settings on the system board. Please refer to the documentation that came with your computer system or check with the dealer or manufacturer for information on how to disable the built-in video circuitry.

Appendix 3:

Technical Information

Video Port Connector Pinout

PIN	Function
1	Red Video
2	Green Video
3	Blue Video
4	Monitor ID Bit 2
5	Ground
6	Red Return (ground)
7	Green Return (ground)
8	Blue Return (ground)
9	Not Used
10	Sync Return (ground)
11	Monitor ID Bit 0
12	Monitor ID Bit 1
13	Horizontal Sync
14	Vertical Sync
15	Not Used

Analog monochrome monitors use green video for all video input and ignore red video and blue video.

Sync Signals

	Sync Frequencies (nominal)	
Resolution	**Horizontal**	**Vertical**
512 by 480	31.5k Hz	60 Hz
640 by 480	31.5k Hz	60 Hz
800 by 600	35.2k Hz	56 Hz
1024 by 768	35.5k Hz	43.5 Hz (interlaced)
1024 by 768	48.0k Hz	60 Hz (non-interlaced)

Current Consumption

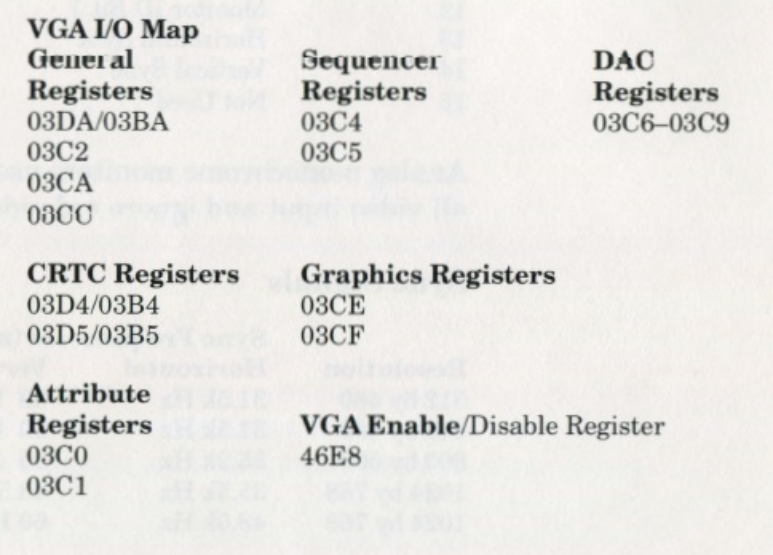
(with optional 2Mb DRAM installed) Approximately 5 amps at +5 volts

Memory and 1/0 Map

The Hercules Graphics Station Card resides entirely within the VGA memory and I/0 map. All TMS 34010 registers are memory mapped at the 80×86 addresses indicated below:

TMS 34010 Memory Map

TMS 34010 Memory Map	
A000:0000–FFFF	TMS 34010 Host Registers—Fast
B000:0000–FFFF	Reserved for Alternate Video Adapter
C000:0000–6FFF	BIOS
C000:7000–7CFF	TMS 34010 Host Data Registers—Slow
C000:7D00	TMS 34010 Host Control Register
C000:7E00	TMS 34010 Host Address Register—LSB
C000:7F00	TMS 34010 Host Address Register—MSB



VGA I/O Map

General Registers	Sequencer Registers	DAC Registers
03DA/03BA	03C4	03C6–03C9
03C2	03C5	
03CA		
03CC		

CRTC Registers	Graphics Registers
03D4/03B4	03CE
03D5/03B5	03CF

Attribute Registers	VGA Enable/Disable Register
03C0	46E8
03C1	

Appendix 4:

For More Information on TIGA
Software developers wanting more information on TIGA should call:

- Texas Instruments Graphics Hotline 713-274-2340 or write:
- Texas Instruments Graphics Products Attention: Marketing Communications Manager P.O. Box 1443, MS 736 Houston, TX 77251-1443

To request a copy of the TIGA 340™ Interface User's Guide, call Texas Instruments Customer Service Response Center at 214-995-6111. Request item no. SPVU015A.

Notice to Users

This equipment has been tested and found to comply with the FCC limits for a Class B digital device, pursuant to Part 15 of the protection Rules. These limits are designed to provide reasonable This against harmful interference in a residential installation. frequency equipment generates, uses, and can radiate radio energy instructions, and, if not installed and used in accordance with the communications. may cause harmful interference to radio will However, there is no guarantee that interference not occur in a particular installation. If this equipment does which can cause be harmful determined by interference turning to the radio or equipment television off and reception, on, the user correct the interference by one or more of is the encouraged following to measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver on a circuit different from that
- Connect to which the the equipment receiver into is an connected outlet
- Consult the dealer or an experienced radio/TV technician for help

Shielded interconnect compliance cables with must the be pertinent employed RF with emission this equiplimits ment governing to ensure this device. party Changes or modifications compliance not could expressly void the approved user's by authority the to operate responsible the for equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any , including interference that may cause interference receive undesired operation.

Limited Warranty

Hercules Computer Technology (HCT) warrants this Hercules Graphics Station Card to be free from defects in materials and workmanship for a period of two years from the date of purchase from HCT or an authorized dealer. Should this Hercules Graphics Station Card fail to be in good working order at any time during the two year period, HCT will, at its option, repair or replace it at no additional charge, except as set out below. Replacement parts will be either reconditioned or new, and the replaced parts will become the property of HCT. This limited warranty does not cover damage from accident, disaster, abuse, misuse, or unauthorized repair or modification.

Limited warranty service may be obtained by delivering this product to an authorized Hercules dealer along with proof of purchase date. If the product is mailed directly to HCT, you must first obtain a return authorization number (RMA) from HCT and then send the board freight prepaid. You must insure the product or assume the risk of loss or damage in transit, and you must return it in its original shipping container or an equivalent.

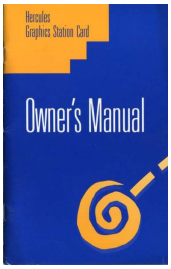
All express and implied warranties for the Hercules Graphics Station Card, including warranties of merchantability and fitness for a particular purpose, are limited to two years from the date of purchase. No warranties, either express or implied, will apply after this period. Some states do not allow limitations on implied warranties, so this limitation may not apply to you.

If this Hercules Graphics Station Card is not in good working order, your sole and exclusive remedy shall be repair or replacement as described above. In no event will HCT be liable for damages arising out of the use of or inability to use this product. Some states do not allow exclusion or limitation of incidental or consequential damages from consumer products, so these limitations may not apply to you. This limited warranty gives you specific legal rights, and you may have other rights which vary from state to state

Hercules Graphics Station Card Owner's Manual-Edition 1.0, February 1990 Hercules Computer Technology makes every effort to ensure that these documents are accurate. However, because we are always striving to improve our products, we are unable to guarantee the accuracy of these documents after the date of publication, and we disclaim liability for any changes, errors, or omissions. No reproduction of this document, in any form, is allowed without written permission of Hercules Computer Technology.

Trademarks/Owners:
1-2-3, Lotus Development; AutoCAD, Autodesk Inc; Graphics Station Card, Hercules Computer Technology, Inc.; IBM, International Business Machines; MultiSync, NEC Home Electronics (USA) Inc.; TIGA, Texas Instruments, Inc.; Windows 286, Microsoft Corporation.

Documents / Resources

	The Retro Web Hercules Graphics Station Card [pdf] Owner's Manual Hercules Graphics Station Card, Graphics Station Card, Station Card

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- User Manual