

Auto EGA 4+

USER'S MANUAL



The following is applicable to U.S.A. FCC class B version only

This equipment generates and uses radio frequency energy. If it is not installed and used properly, that is, in strict accordance with the manufacturer's instructions, it may cause interference to radio and television reception.

It has been tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J, Part 15, of FCC Rules. These rules are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna
- Relocate the computer with respect to the receiver
- Move the computer away from the receiver
- Plug the computer into a different outlet so that computer and receiver are on different branch circuits

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

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

This booklet is available from the U.S. Government Printing Office, Washington, DC20402, Stock No. 004-000-00345-4.

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OVERVIEW DIAGRAM

DELIVERY

The package that contains your new AutoEGA4+ should contain the AutoEGA4+ card, a utility diskette, this manual, and a registration card. If any of these items are missing, you should immediately contact your dealer.

Be sure to fill out and mail your registration card.

Your new AutoEGA4+ Graphics Adapter, like any electronic equipment, should be handled carefully at all times.

You should make a copy of the utility diskette before doing anything. Put the original disk in a safe place, and use the copy for any work you need to do.

1. INTRODUCTION

You made a wise choice when you chose the new AutoEGA4+ Graphics Adapter as your computer's display controller. This powerful adapter is capable of controlling five different types of monitors and will allow you to use most programs to the best of their abilities.

This manual will discuss the AutoEGA4+, its installation, use, and special features. The installation procedure is designed to get you up and running quickly.

The AutoEGA4+ is a high resolution enhanced graphics adapter that can be installed in an IBM[®] PC/XT/AT (and most compatibles) and is fully compatible with the IBM[®] Enhanced Graphics Adapter (EGA).

However, it is not just an IBM[®] compatible EGA card, it is actually a 'SUPER' Graphics Adapter which is fully compatible with three other display standards including the Monochrome Display Adapter (MDA), Color Graphics Adapter (CGA), and Hercules[®] Graphics Card (HGC). The AutoEGA4+ actually contains the hardware for each of these configuration. Thus it is a true CGA card when it is in CGA configuration. It is essentially a combination of all four cards.

In addition to being fully hardware compatible with each of the display standard, the AutoEGA4+ can automatically switch between configurations as the software requires. That is, you do not have to re-install your program or set the DIP switches in the computer main board and display board again. You only need to have the appropriate monitor attached and set the AutoEGA4+ to 'auto' mode.

In addition to the four DIP (dual-in line package) switches provided in a normal EGA card, two extra switches are added to configure the adapter to CGA, EGA, MDA, or Auto as the default configuration. In the Auto mode the adapter is able to switch automatically among all three configurations depending on the currently running software.

The AutoEGA4+ can also emulate Hercules® Graphics on an Enhanced Color Display. This enables software that supports the Hercules® graphics mode to work equally well on the Enhanced Color Display as well as the Monochrome Display. Therefore you can get all the features provided by four graphics adapters with one card, the AutoEGA4+ together with an Enhanced Color Display.

In addition to the three standard IBM® monitors, the AutoEGA4+ also has two extra composite video jacks. One jack is for composite color monitors, the other one is for composite monochrome monitors. The monochrome composite signal simulates colors with 16 levels of brightness. This enables patterns with different colors to be displayed on composite monochrome monitors.

AutoEGA4+FEATURES

HARDWARE COMPATIBILITY

- | | |
|------------------------------|-----|
| • Enhanced Graphics Adapter | EGA |
| • Color Graphics Adapter | CGA |
| • Monochrome Display Adapter | MDA |
| • Hercules® Graphics Card | HGC |

TYPES OF MONITORS SUPPORTED

- | | |
|--------------------------------|-----|
| • IBM® Enhanced Color Display | ECD |
| • IBM® Color Display | CD |
| • IBM® Monochrome Display | MD |
| • Composite Monochrome Monitor | MM |
| • Composite Color Monitor | CM |

EXPANDABILITY

- Expandable from 64K Bytes to 256K Bytes of memory if required.

SPECIAL FEATURES

- Switches for default configuration selection.
- Hercules® Graphics emulation on an EGA monitor.
- Can co-exist with other display adapters.
- Display mode can be changed from DOS.
- Color simulation on a composite monochrome monitor with 16 levels of grey.
- Custom Gate Array chips supply complete hardware compatibility as well as speed and reliability.

2. INSTALLATION

SYSTEM REQUIREMENTS

IBM® PC/XT/AT or compatibles

Support the following monitors:

- IBM® Enhanced Color Display (or compatibles)
- IBM® Color Display (or compatibles)
- IBM® Monochrome Display (or compatibles)
- Composite Monochrome Monitor
- Composite Color Monitor

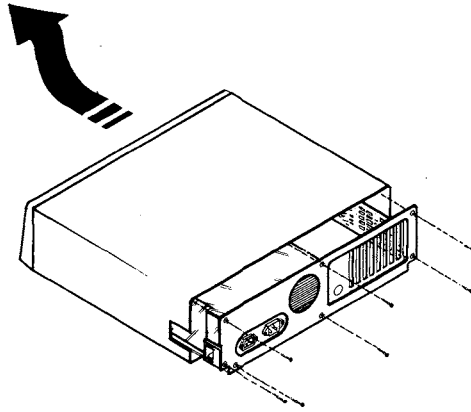
TOOLS REQUIRED

- Medium size, flat blade screwdriver
- Medium screwdriver (optional)
- 3/16" nutdriver (optional)
- Chip puller (optional)
- Small screwdriver

INSTALLATION INSTRUCTIONS

TO PREPARE THE SYSTEM FOR INSTALLATION

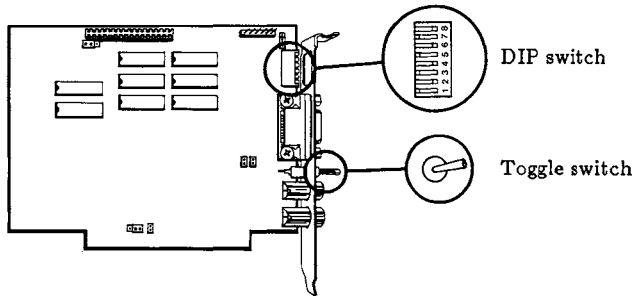
- 1) Turn off the power to the computer.
- 2) Turn off all external devices (printer, display, etc.)
- 3) Unplug the computer from the wall power outlet.
- 4) Disconnect all cables from the rear of the computer and remove anything placed on the top of the unit.
- 5) Position the computer to allow access to the rear.
- 6) Use the flat blade screwdriver to remove the five top cabinet mounting screws on the rear of the computer. Remove the cover. Save the screws.



PREPARE THE AUTOEGA4+ GRAPHICS CARD

- 7) Set the switches on the AutoEGA4+ Graphics Adapter.

There are 6 DIP switches and a toggle switch on the Graphics Adapter which must be correctly set for the desired operating configuration and monitor attached.



The switches are used to indicate:

- The type of display attached.
- The display mode of the Adapter.
- The type of Graphics Adapter co-resident on another expansion slot.
- The initial configuration of the Graphics Adapter.

8) Multiple Display Adapter settings.

If no other Display Adapter is to be used, then proceed to Step 9.

Before setting the switches, if you want to have another Display Adapter co-resident in your system, see Appendix E (Co-residency Check) to check for permissible combinations. If the combination of Display Adapters is allowed, then be sure to set the switches in step 10 below correctly. Proceed to Step 9.

9) Set switches 5 and 6 for the default operating configuration of the AutoEGA4+ configuration Switch Settings.

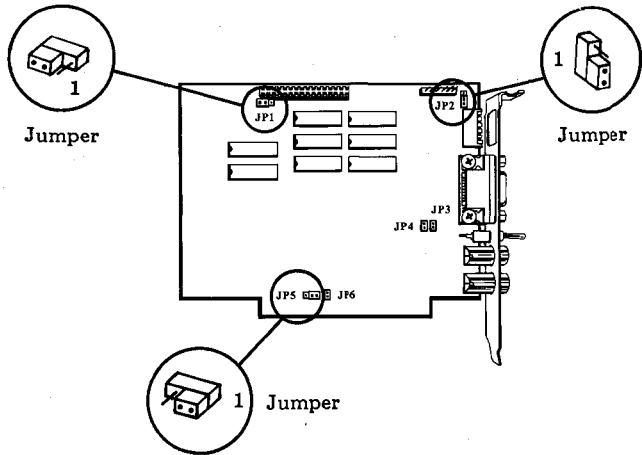
If another Display Adapter will be used, then the Auto configuration cannot be set.

10) If you are going to configure the default AutoEGA4+ configuration as EGA, set switches 1 to 4 according to the different system setups in Appendix B (AutoEGA4+ EGA configuration Switch Settings), otherwise skip it and go straight to the next step.

- 11) Set the toggle switch for type of display attached. For monochrome or Color Display, set the switch at 'left' position for Enhanced Color display, set the switch at 'right' position.

WARNING: DAMAGE MAY RESULT IF THE SETTINGS ARE NOT CORRECTLY SET.

- 12) There are 6 jumpers on the Graphics Adapter which must be positioned for the desired configuration. They may be two or three pins. In the later case, make sure which pin is pin 1.



The jumpers are used to indicate:

- The memory size on the Adapter.
- The character fonts to be displayed (for CGA configuration).
- The existence of feature expansion.
- The EGA I/O mapping.
- The choice of dot clock.

See Appendix C (AutoEGA4+ Jumper Settings) for the settings of jumpers 1 to 6 for your system configuration. If they need to be changed, pull them off or re-insert accordingly.

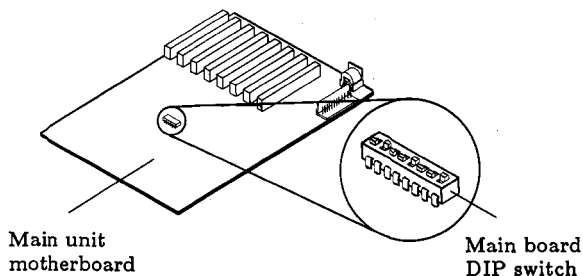
WARNING: DAMAGE TO THE GRAPHICS ADAPTER, THE DISPLAY, OR BOTH MAY RESULT IF THESE JUMPERS ARE NOT CORRECTLY SET.

NOTE: Save the jumpers that are not used.

- 13) There are 8 Dip switches on the main board of the computer. Only switches 5 and 6 are used to set the Adapter type. Both of them must be set for the default configuration of the Adapter.

These switch numbers are for a standard IBM[®] PC/XT/AT. Be sure to check your computer documentation to make sure that the switches you set are for the display device.

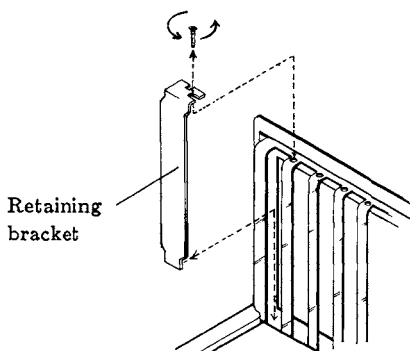
Refer to Appendix D (Main Board Switch Settings) to indicate the default adapter configuration.



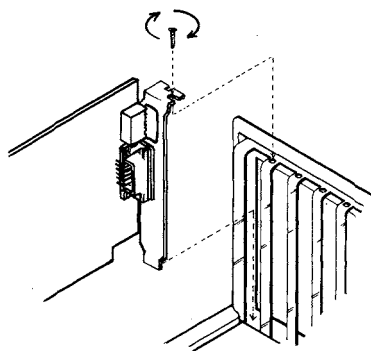
INSTALL THE AUTOEGA4+ CARD

- 14) Find an unused slot. Use the flat blade screwdriver or 3/16" nutdriver and remove the screw that holds the bracket in place by turning the screw counter-clockwise. Save the screw for a later installation.

Note: The Adapter may be inserted in any expansion slot.



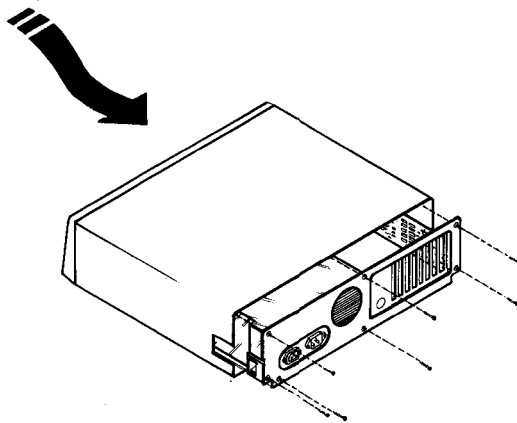
- 15) Hold the Adapter by the top and firmly press it into the expansion slot making certain the Adapter is inserted all the way.



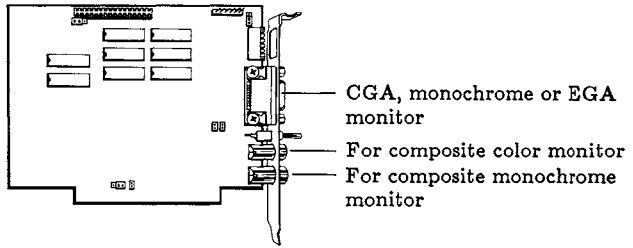
- 16) Line up the Adapter's retaining bracket with the hole in the rear plate of the computer. Secure the bracket with the screw removed in step 14.

PUTTING THE SYSTEM BACK TOGETHER

- 17) Push all cables down into the computer. This will prevent them from catching on the cover.
- 18) Slide the cover back on the computer. Be sure the bottom of the cover is under the rails on either side of the frame. Secure it with the five mounting screws.



- 19) Return the external devices to their original positions. Reconnect the cable of the system. Connect the monitor cable to the appropriate connector on the Adapter in accordance with the type of display attached.



INSTALLATION CHECKUP

If you have any problems with the graphics adapter, please check out your installation first since it is the most likely source of trouble.

The following list is indicative of the types of situations that may cause problems:

- Make sure that your computer is either an IBM[®] PC/XT/AT or a compatible.
- Make sure that all cables are connected properly, and that you have power to all of the devices.
- Make sure that other co-resident graphics adapters (if any) are acceptable under your system set-up.
- Make sure that the Adapter as well as other cards stand firmly in their expansion slots, and that they are not touching against each other.
- Check your monitor cable to insure that it is properly connected to the Adapter and that it has the proper pin-out configuration.
- Check that the switches and jumper settings on both the Adapter and the main board are correctly set for the configuration you have.
- Check that the memory chips are firmly seated in their sockets and that they are correctly oriented.
- Make sure that you are using the correct software command when configuring the Adapter.
- Check your software. Be sure you are using the correct type of software for the selected operating configuration.

3. USING VTEGA

The AutoEGA4+ comes with a diskette that contains the VTEGA program that can change the current configuration of the Display Adapter with commands from DOS.

In addition to switching configurations, the program allows you to set different variations of the Hercules® graphics mode. The software commands are only effective in Hercules® (switches 5 and 6 are both ON) or Auto (switches 5 and 6 are both OFF) configuration. The configuration currently set will not be altered by the system warm boot.

Before you use the software commands, make sure that you have the following ready:

- 1) You have already installed the AutoEGA4+ according to the instructions given in the Installation Section.
- 2) You have set the switches 5 and 6 of the AutoEGA4+ switch block both to the ON or OFF position.
(Hercules® or Auto configuration)
- 3) You are using the correct display for the type of graphics adapter you intend to configure. For example, you cannot configure AutoEGA4+ in CGA operation when it is connected to a Monochrome Display. See the Appendices for details.
- 4) Verify that you have a copy of the VTEGA program in your current directory or DOS path. The filename is VTEGA.EXE. You can only issue the commands from the DOS prompt or from within a batch file.

COMMAND SUMMARY

<u>COMMAND</u>	<u>DESCRIPTION</u>
VTEGA	On screen help menu
VTEGA TEST	Diagnostic test
VTEGA MONO	Turn off Auto switch. Configure to MDA.
VTEGA HGC:HALF	Turn off Auto switch. Configure to HGC one page graphics.
VTEGA HGC:FULL	Turn off Auto switch. Configure to HGC two page graphics.
VTEGA CGA	Turn off Auto switch. Configure to CGA.
VTEGA EGA	Turn off Auto switch. Configure to EGA.
VTEGA HGC:SIM	Enable Hercules® emulation on the Enhanced Color Display.
VTEGA AUTO	Turn on Auto switch. Enable Hercules® emulation in Enhanced Color Display if required.

COMMAND DETAILS

VTEGA

This command brings up the AutoEGA4+ on-screen help menu, in which the available VTEGA command options will be listed with brief descriptions.

Example: A>VTEGA [RETURN]

VTEGA TEST

This command is used to perform diagnostic tests on the AutoEGA4+.

Example: A>VTEGA TEST [RETURN]

VTEGA MONO

This command is applicable to both HGC and Auto configurations. It is used to configure the AutoEGA4+ to the Monochrome Display Adapter. If it was in Auto configuration, the Auto switch will be turned off.

Example: A>VTEGA MONO [RETURN]

VTEGA HGC:HALF

This command is applicable to both HGC and Auto configurations. It is used to configure the AutoEGA4+ to Hercules® graphics mode with one page of graphic memory. If it was in HGC configuration, this permits a CGA card or an EGA card in CGA emulation mode to co-exist with the AutoEGA4+. If it was in Auto configuration, the Auto switch will be turned off.

Example: A>VTEGA HGC:HALF [RETURN]

VTEGA HGC:FULL

This command is applicable to both HGC and Auto configurations. It is used to configure the AutoEGA4+ to Hercules® graphics mode with two-page of graphic memory. If it was in HGC configuration, this does NOT permit a CGA card or an EGA card in CGA emulation mode to co-exist with the AutoEGA4+ due to overlapping of video data areas. If it was in Auto configuration, the Auto switch will be turned off.

Example: A>VTEGA HGC:FULL [RETURN]

VTEGA CGA

This command is only applicable to Auto configuration. It is used to turn off the Auto switch and configure the AutoEGA4+ to CGA operation.

Example: A>VTEGA CGA [RETURN]

VTEGA EGA

This command is only applicable to Auto configuration. It is used to turn off the Auto switch and configure the AutoEGA4+ to normal EGA operation.

Example: A>VTEGA EGA [RETURN]

VTEGA HGC:SIM

This command is only applicable to Auto configuration. It is used to enable Hercules® monochrome text and graphics emulation on an Enhanced Color Display.

Example: A>VTEGA HGC:SIM [RETURN]

VTEGA AUTO

If you use this command in Auto configuration, the automatic switching function of AutoEGA4+ is activated and the Adapter will configure itself according to the current software. Also, emulation of Hercules® text and graphics on Enhanced Color Display is invoked whenever required. This innovation, together with the fact that Enhanced Color Display can be used as normal Color Display render it possible to get all the features of four graphics adapters with just one AutoEGA4+ in connection to an Enhanced Color Display.

Note that after you have set the switches 5 and 6 to OFF, the Adapter is default to Auto configuration and there is no need to type in this command at the first instant.

Example : A>VTEGA AUTO [RETURN]

APPENDIX A

AUTOEGA4+ CONFIGURATION SWITCH SETTINGS

Set the switches 5 and 6 to select the configuration of AutoEGA4+ according to the following table.

SW5	SW6	Configuration
ON	ON	Hercules®
OFF	ON	CGA
ON	OFF	EGA
OFF	OFF	Auto

Note: When in Auto configuration, AutoEGA4+ configure itself according to the type of Display attached as indicated by DIP switch SW1-4.

APPENDIX B

AUTOEGA4+ EGA CONFIGURATION SWITCH SETTINGS

The following tables show the switch settings for different system setups when the AutoEGA4+ is configured as EGA.

The tables in this appendix are the only acceptable combinations that can be installed.

Mode selection is only for initial setup and can be changed by software.

PRIMARY ADAPTER : AUTOEGA4+
SECONDARY ADAPTER : NONE

EGA MODE	DISPLAY ATTACHED *	SWITCH SETTINGS			
		SW1	SW2	SW3	SW4
MONO-CHROME	MD	OFF	OFF	ON	OFF
CGA emulation 40X25	CD,ECD ¹ , MM,CM	ON	OFF	OFF	ON
CGA emulation 80X25	CD,ECD ¹ , MM,CM	OFF	OFF	OFF	ON
CGA emulation 80X25	ECD	ON	ON	ON	OFF
Enhanced 80X25	ECD	OFF	ON	ON	OFF

PRIMARY² ADAPTER : AUTOEGA4+
 SECONDARY ADAPTER : MDA or HGC (with MD)

EGA MODE	DISPLAY ATTACHED *	SWITCH SETTINGS			
		SW1	SW2	SW3	SW4
CGA emulation 40X25	CD,ECD ¹ , MM,CM	ON	OFF	OFF	ON
CGA emulation 80X25	CD,ECD ¹ , MM,CM	OFF	OFF	OFF	ON
CGA emulation 80X25	ECD	ON	ON	ON	OFF
Enhanced 80X25	ECD	OFF	ON	ON	OFF

The DISPLAY ATTACHED display codes are as follows:

- MD = TTL Monochrome Display (standard IBM or compatible)
- CD = RGB Color Display (standard IBM or compatible)
- ECD = Enhanced Color Display (standard IBM or compatible)
- MM = Composite Monochrome Monitor
- CM = Composite Color Monitor

- NOTE:
- 1) The Enhanced Color Display will automatically configure itself as a normal Color Display for the CGA 40x25 and 80x25 emulation modes.
 - 2) PRIMARY means it is the prime video output source upon bootup. The SECONDARY adapter will remain dormant until it is activated later by the software.

PRIMARY² ADAPTER : MDA or HGC (with MD)
 SECONDARY ADAPTER : AUTOEGA4+

EGA MODE	DISPLAY ATTACHED *	SWITCH SETTINGS			
		SW1	SW2	SW3	SW4
CGA emulation 40X25	CO,ECD ¹ , MM,CM	ON	ON	ON	ON
CGA emulation 80X25	CD,ECD ¹ , MM,CM	OFF	ON	ON	ON
CGA emulation 80X25	ECD	ON	OFF	ON	ON
Enhanced 80X25	ECD	OFF	OFF	ON	ON

The DISPLAY ATTACHED display codes are as follows:

- MD = TTL Monochrome Display (standard IBM or compatible)
- CD = RGB Color Display (standard IBM or compatible)
- ECD = Enhanced Color Display (standard IBM or compatible)
- MM = Composite Monochrome Monitor
- CM = Composite Color Monitor

- NOTE:
- 1) The Enhanced Color Display will automatically configure itself as a normal Color Display for the CGA 40x25 and 80x25 emulation modes.
 - 2) PRIMARY means it is the prime video output source upon bootup. The SECONDARY adapter will remain dormant until it is activated later by the software.

PRIMARY² ADAPTER : AUTOEGA4+ (with MD only)
 SECONDARY ADAPTER : CGA

CGA MODE	DISPLAY ATTACHED *	SWITCH SETTING			
		SW1	SW2	SW3	SW4
40X25	CD,ECD ¹ , MM,CM	ON	OFF	ON	OFF
80X 25	CD,ECD ¹ , MM,CM	OFF	OFF	ON	OFF

PRIMARY² ADAPTER : CGA
 SECONDARY ADAPTER : AUTOEGA4+ (with MD only)

CGA MODE	DISPLAY ATTACHED *	SWITCH SETTING			
		SW1	SW2	SW3	SW4
40x25	CD,ECD ¹ , MM,CM	ON	ON	OFF	ON
80X25	CD,ECD ¹ , MM,CM	OFF	ON	OFF	ON

The DISPLAY ATTACHED display codes are as follows:

- MD = TTL Monochrome Display (standard IBM or compatible)
- CD = RGB Color Display (standard IBM or compatible)
- ECD = Enhanced Color Display (standard IBM or compatible)
- MM = Composite Monochrome Monitor
- CM = Composite Color Monitor

- NOTE:**
- 1) The Enhanced Color Display will automatically configure itself as a normal Color Display for the CGA 40x25 and 80x25 emulation modes.
 - 2) **PRIMARY** means it is the prime video output source upon bootup. The **SECONDARY** adapter will remain dormant until it is activated later by the software.

APPENDIX C

AUTOEGA4+ JUMPER SETTINGS

The following table shows the jumper settings for the different configuration requirements.

	FUNCTIONS	SETTINGS
JP1	Choose external oscillator from feature connector Choose 18.432MHz for Hercules emulation	INSERT 1 & 2 INSERT 2 & 3
JP2 & JP5	Direct composite video output Composite video via feature expansion	INSERT 1 & 2 INSERT 2 & 3
JP3	EGA I/O port-3xx EGA I/O port-2xx	INSERTED NOT INSERTED
JP4	Memory size 256KB Memory size 64KB	INSERTED NOT INSERTED
JP6	Double dot characters Single dot characters (for CGA configuration only)	INSERTED NOT INSERTED

APPENDIX D

MAIN BOARD SWITCH SETTINGS

The following table shows the main computers board switch settings for different operations of the AutoEGA4+.

You should check your computer's hardware manual and use the switch settings it recommends. Use this table to compare the use of the switches.

AutoEGA4+ CON- FIGURATION	OTHER CO-RESIDENT GRAPHICS CARD	MAINBOARD	
		SW5	SW6
HGC	none or CGA	OFF	OFF
HGC	EGA	ON	ON
CGA(40x25)	none or MDA or HGC	OFF	ON
CGA(80x25)	none or MDA or HGC	ON	OFF
CGA (as secondary adapter)	MDA or HGC	OFF	OFF
CGA	EGA	ON	ON
EGA	none or MDA or HGC or CGA	ON	ON
AUTO	NOT ALLOWED	ON	ON

APPENDIX E

CO-RESIDENCY CHECK

The following table shows the possible combinations in which the AutoEGA4+ can co-exist with other display adapters.

AUTOEGA4+ CONFIGURA- TION	CORESIDENT ADAPTER			
	MDA	CGA	EGA	HGC
HGC	N	Y	Y	N
CGA	Y	N	Y	Y
EGA	Y	Y	N	Y
AUTO	N	N	N	N

- Note:
- 1) In the cases where co-residency is allowed, the combinations are only conditionally acceptable, depending upon the current configuration settings of the AutoEGA4+ and the co-resident Adapter.
 - 2) Whenever the AutoEGA4+, having been configured in HGC, is co-resident with either a CGA or EGA card (which in this case must ONLY be in CGA emulation modes), the AutoEGA4+ must be in Hercules MONO or HALF mode ONLY.

- 3) Whenever an EGA card is co-resident with the AutoEGA4+, its switch settings must be appropriately set for different operation modes. Look at the EGA manual for details with reference to the following table:

AUTOEGA4+ Configuration	equivalent Graphics Adapter listed in EGA manual
HGC	Monochrome Display Adapter
CGA	Color Graphics Adapter

- 4) Whenever AutoEGA4+ is in AUTO configuration, no other Graphics Adapter is allowed to co-exist in the system.

APPENDIX F

DISPLAY PARAMETERS

The following tables show some of the display parameters of the AutoEGA4+ at different configurations.

HERCULES CONFIGURATION

BIOS MODE	TYPE	PIXEL RES.	ALPHA FORMAT	MAX. COLOR	MONITOR SUPPORT
7	alpha	720x350	80x25	2	MD
NOTE1	graphics	720x348	NOTE2	2	MD,

- NOTE: 1) Hercules® graphics mode.
2) Character display not supported by BIOS.

CGA CONFIGURATION¹

BIOS MODE	TYPE	PIXEL RES.	ALPHA *** FORMAT	MAX. COLOR	MONITOR SUPPORT
0	alpha	320x200	40x25	16	CD,ECD, MM ^{**} ,CM [*]
1	alpha	320x200	40x25	16	CD,ECD, MM ^{**} ,CM
2	alpha	640x200	40x25	16	CD,ECD, MM ^{**} ,CM [*]
3	alpha	640x200	40x25	16	CD,ECD, MM ^{**} ,CM
4	graphics	320x200	40x25	4/16 ²	CD,ECD, MM ^{**} ,CM
5	graphics	320x200	40x25	4/16 ²	CD,ECD, MM ^{**} ,CM [*]
6	graphics	640x200	40x25	2	CD,ECD, MM ^{**} ,CM [*]

- NOTE:
- 1) In this configuration the character fonts can be single or double dots depending on the jumper setting.
 - 2) 4 out of 16 colors can be selected.

EGA CONFIGURATION

BIOS MODE	TYPE	PIXEL RES.	ALPHA *** FORMAT	MAX. COLOR	MONITOR SUPPORT
0 ¹	alpha	320x200	40x25	16	ECD, CD, MM **, CM *
0 ²	alpha	320x350	40x25	16/64 ⁴	ECD
1 ¹	alpha	320x200	40x25	16	ECD, CD, MM **, CM
1 ²	alpha	320x350	40x25	16/64 ⁴	ECD
2 ¹	alpha	640x200	80x25	16	ECD, CD, MM **, CM *
2 ²	alpha	640x350	80x25	16/64 ⁴	ECD
3 ¹	alpha	640x200	80x25	16	ECD, CD, MM **, CM
3 ²	alpha	640x350	40x25	16/64 ⁴	ECD
4 ¹	graphics	320x200	40x25	4/16 ⁴	ECD, CD, MM **, CM
5 ¹	graphics	320x200	40x25	4/16 ⁴	ECD, CD, MM **, CM *
6 ¹	graphics	640x200	40x25	2	ECD, CD, MM **, CM *
7 ³	alpha	720x350	80x25	2	MD
D	graphics	320x200	40x25	16	ECD, CD, MM **, CM *
E	graphics	640x200	80x25	16	ECD, CD, MM **, CM *
F	graphics	640x350	80x25	2	MD
10	graphics	640x350	80x25	4/16 ⁵ 16/64	ECD

- NOTE:
- 1) These modes emulate the support provided by the IBM[®] CGA card (or CGA configuration in AutoEGA4+).
 - 2) These modes provide enhanced support when the Enhanced Color Display is attached.
 - 3) This mode emulates the support provided by the IBM[®] Monochrome Display Adapter (or AutoEGA4+ Hercules[®] Mono mode).
 - 4) 4 out of 16 or 16 out of 64 colors can be selected.
 - 5) 4 out of 16 or 16 out of 64 colors can be selected when the memory size is 64KB or 256KB respectively.

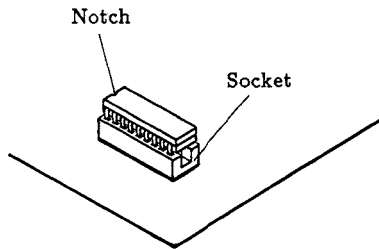
- NOTE:
- * Color is not displayable on Composite Color Monitors in these modes.
 - ** Color is simulated on Composite Monochrome Monitors with 16 brightness levels.
 - *** Character displays are also supported by BIOS in graphics modes.

APPENDIX G

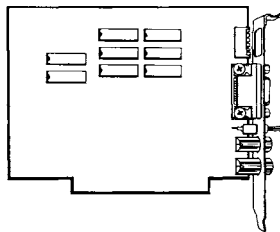
MEMORY REPLACEMENT

Two versions of AutoEGA4+ Graphics Adapter are available: 64KB or 256KB memory size. However, if you want to upgrade a 64KB card to 256KB card, you can simply replace the memory chips with new memory chips of the correct size. The following steps illustrate how to install or replace the memory chips.

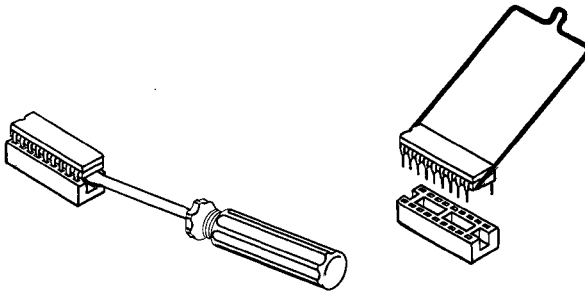
A set of Graphics Memory Modules consists of 8 identical memory chips that can be plugged directly onto the Graphics Adapter, which determines the graphics memory size. Each chip has a notch at one end to indicate the orientation for installation.



- 1) Take the Graphics Adapter and place it on a flat surface with the component side facing up.



- 2) Remove the memory chips by lifting them out with a chip puller or a small screwdriver. A gentle rocking motion along the length of the chip works well.



- 3) Align the pins of the new chips with the socket and firmly press each of the 8 chips into place. Make sure that the notch of each chip faces the left side of the Adapter.

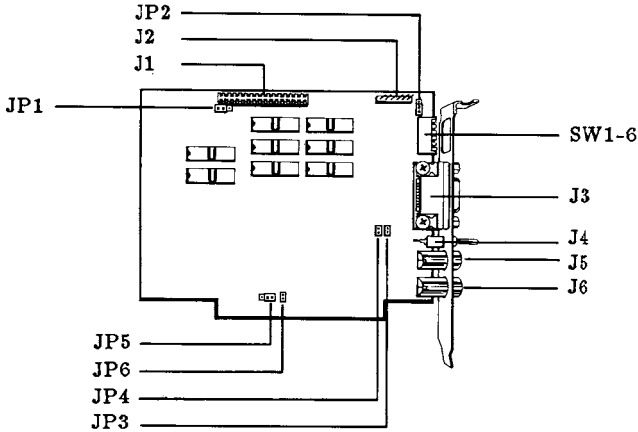
WARNING: 1) THE PINS OF THE CHIPS ARE EASILY BENT AND MUST BE ALIGNED WITH THE SOCKET BEFORE THE CHIP IS PRESSED INTO PLACE.

2) INCORRECT ORIENTATION OF THE CHIPS MAY RESULT IN THE DAMAGE TO GRAPHICS ADAPTER AS WELL AS THE CHIP ITSELF.

- 4) If a chip is not installed correctly, carefully remove it with a chip puller (or small screwdriver) and install it again. Carefully straighten out any pins that may have been bent.

APPENDIX H

OVERVIEW DIAGRAM



DIMENSION : 141 mm x 101 mm (fit in any slot of an IBM[®] PC/XT/AT or compatibles)

- SW1-SW6 : DIP switches
- JP1-JP6 : Jumper blocks
- J5 : video jack (Composite Color Monitor)
- J6 : video jack (composite Monochrome Monitor)
- J3 : 9 pin D-shell female connector (for TTL Display)
- J2 : 6 pin keyed (pin 2 removed) light pen connector
- J1 : 32 pin feature connector (IBM[®] compatible, for display feature expansion)
- J4 : Toggle switch (for Enhanced Color Display selection)
- U2, U3, U6-U11 : Eight 18-pin dual-in-line memory ICs (may be 64KB or 256KB memory size)

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QUICK REFERENCE GUIDE

The purpose of this document is to help you to install your EGA 4+ quickly.

- 1) Set the DIP-switches and toggle switch on the EGA 4+ according to the type of monitor you are using:

	6 pole DIP-switches						Toggle switch (looking from the rear side)
	SW6	SW5	SW4	SW3	SW2	SW1	
RGB or composite monitor	OFF	OFF	ON	OFF	OFF	OFF	Left
TTL mono-chrome monitor	OFF	OFF	OFF	ON	OFF	OFF	Left
Enhanced color display	OFF	OFF	OFF	ON	ON	OFF	Right

The other jumpers on the board have been set to their correct position so you do not need to change it. For details of the settings you may refer to the manual.

- 2) Locate a 8-pole DIP-switches on the computer main-board and set both SW5 and SW6 to the ON position.
- 3) Find a vacant slot on you computer (do not use the rightmost slot) and insert the card into it.
- 4) Power up the computer. If you do not see the normal display, please refer to the manual for more information.