

GENOA

USER'S MANUAL

SuperEGA HiRes +™

Enhanced Graphics
Adapter

(Model 4850-7)

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Important FCC Statement

The equipment described in this manual generates and uses radio frequency energy. If it is not installed and used properly, that is, in strict accordance with the instruction manual, it may cause interference to radio and television reception. It has been type tested and found to comply with limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which 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:

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

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user 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, DC 20402, Stock No. 004-000-00345-4.

Note: An unshielded plug or cable may cause radiation interference. The peripheral device is designed for use with a properly shielded interface cable. The shield must be connected directly to the chassis of the peripheral device.

PREFACE

This manual contains detailed instructions for installing and operating the Genoa Systems SuperEGA HiRes+ for the IBM and its compatible personal computers.

We have made every effort to document all necessary information which will allow users to install and operate the SuperEGA HiRes+ without special training.

All product information provided in this manual is based on the latest information available at the time of printing. We have carefully reviewed the accuracy of product information. However, Genoa Systems Corporation cannot be held responsible for any inadvertent omissions or errors that may appear in this document.

Genoa's products are warranted against defects in material and workmanship. The warranty period for the hardware supplied by Genoa Systems Corporation is one year including parts and labor. For additional information on warranty, refer to Appendix A.

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1.0 Features

The SuperEGA HiRes+ is fully compatible with IBM Enhanced Graphics Adapter hardware and software. It supports functions of the IBM Color/Graphics Monitor Adapter and IBM Monochrome Display Adapter and comes equipped with 256K bytes of on-board video memory, providing 16 colors out of a palette of 64 possible display colors.

The SuperEGA HiRes+

Supports Standard EGA Features:

- o 640 x 350, 16-color graphics on the IBM Enhanced Color Display.
- o 320 x 200 and 640 x 200, 16-color graphics on the IBM Color Graphics Monitor.
- o 640 x 350, four shade graphics on the IBM Monochrome Display (black, normal, intensified, and blink).
- o Soft scrolling, panning and windowing.
- o Flicker-free display.
- o Split mode screen display.
- o Bit-mapped graphics in four planes.
- o Up to 512 user-definable characters.
- o Up to 43 lines of 80 column text.
- o Virtual Device Interface (VDI).

SuperEGA HiRes+

Provides:

- o Light pen interface compatible with IBM adapters.
- o IBM compatible "feature adapter" that combines EGA signals with external sources and turns the SuperEGA HiRes+ into a video graphics generator system.

Advanced Features:

- o 800 x 600 maximum resolution.
- o Enhanced ANSISYS provided.
- o Fully IBM Enhanced Graphics Adapter compatible (down to the register level).
- o Supports 132 columns x 60/44/32/29/25 lines.
- o Fully IBM Color/Graphics Adapter compatible (down to register level).
- o Fully IBM Monochrome Display Adapter compatible (down to register level).
- o Fully Hercules Monochrome Graphics compatible (down to register level).
- o Supports 640 x 480 as well as 800 x 600 on multi-frequency monitors.
- o Supports 80 x 66 full-page desktop publishing applications.
- o Supports programs that have to boot from disk by using the BOOTGAME utility.
- o Supports VGA Modes 0+, 1+ with 9 x 16 character box, 360 x 400 resolution, 16 out of 64 colors, 40 x 25 text.

SuperEGA HiRes+

- o Supports VGA Modes 2+, 3+ with 9 x 16 character box, 720 x 400 resolution, 16 out of 64 colors, 80 x 25 text.
- o Automatically doublescans CGA, 320 x 200, and 640 x 200 into 400 line high resolution graphics.
- o Runs VGA programs with 16 out of 64 colors.

2.0 Computer and Monitor Compatibility

2.1 Computers

The SuperEGA HiRes+ can be plugged into any available system expansion slot of your IBM PC, XT or AT, or fully compatible computer.

2.2 Displays

2.2.1 Monochrome Display

- a. IBM Monochrome Display
- b. Compatible IBM Monochrome Display

Before you select your displays we suggest that you check the compatibility specifications listed (Table 2-1).

**Table 2-1
Compatibility Specifications**

	Monochrome Display	Color Display	Enhanced Color Display	Multi-frequency Display
Horizontal Scan Rate	18.432KHz	15.750KHz	21.850KHz	15-36KHz
Vertical Scan Rate	50Hz	60Hz	60Hz	50-60Hz
Video Band Width	16.257MHz	14.318MHz	16.257MHz	39MHz +
Maximum Resolution	720 x 350	640 x 200	640 x 350	800 x 600

SuperEGA HiRes+

2.2.2 Color Display

- a. IBM Color Display
- b. Compatible IBM Color Display

Before you select your displays we suggest that you check the compatibility specifications listed in Table 2-1.

2.2.3 Enhanced Color Display

- a. IBM Enhanced Color Display
- b. Compatible IBM Enhanced Color Display

Before you select your displays we suggest that you check the compatibility specifications listed in Table 2-1.

2.2.4 Multifrequency Displays

- a. Magnavox Multimode Display
- b. Mitsubishi AUM 1371A Display
- c. NEC MultiSync Display, JC14-01
- d. Sony Multiscan Display
- e. Taxan 770
- f. Electrohome 19" Vari-Scan Display, ECM 1910
- g. Microvitec 19" Auto-Sync Display Models 1019/SP and 1019/LP
- h. Conrac 19" 7250C19
- i. NANA0 8060S, 8060G1
- j. Other displays compatible with those listed above

Before you select your displays we suggest that you check the compatibility specifications listed in Table 2-1.

SuperEGA HiRes+

3.0 Installation

Use the following procedure to install your SuperEGA HiRes+:

1. Power off your personal computer and unplug the power cord.
2. Take off the system unit top cover by removing the mounting screws from the back of the system unit (refer to Figure 3-1).

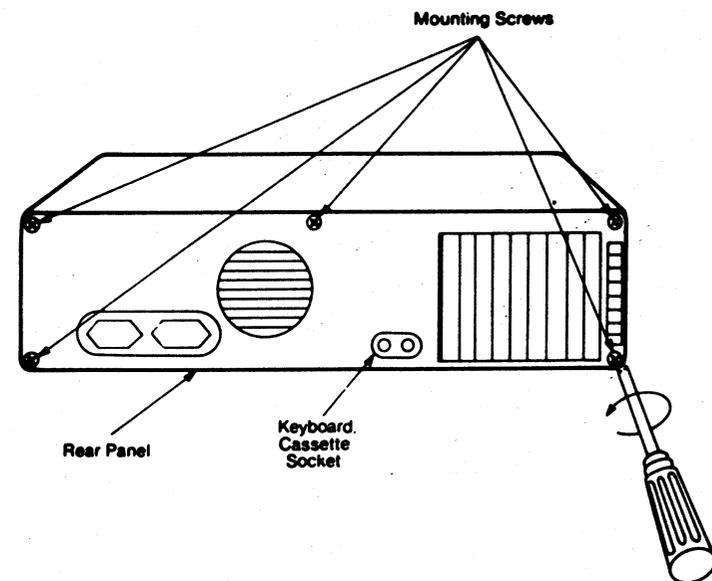


Figure 3-1. Remove Rear-Panel Mounting Screws

3. Remove the cover by sliding it toward you until it stops and then tilt it up as shown in Figure 3-2.

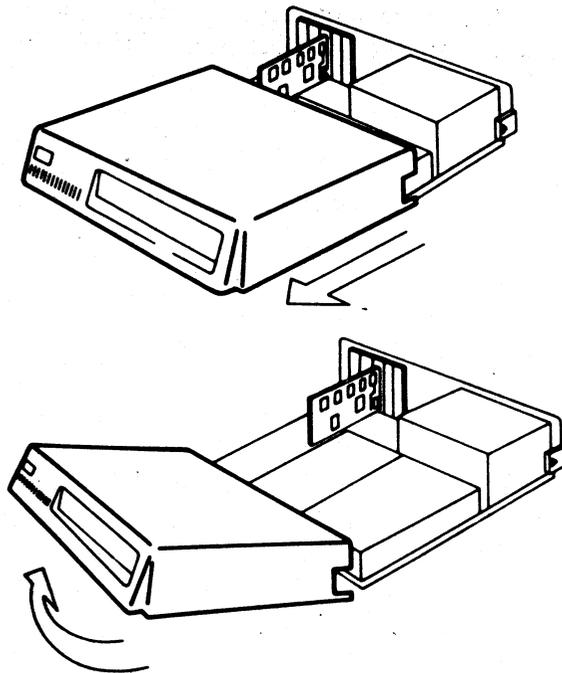


Figure 3-2. Removing IBM PC Top Cover

4. For PC, PC/XT users: Set switches 5 and 6 of your switch block 1 to ON as shown in Figure 3-3. Note that other switches are set as usual. For PC/AT users: Go directly to Step 5.

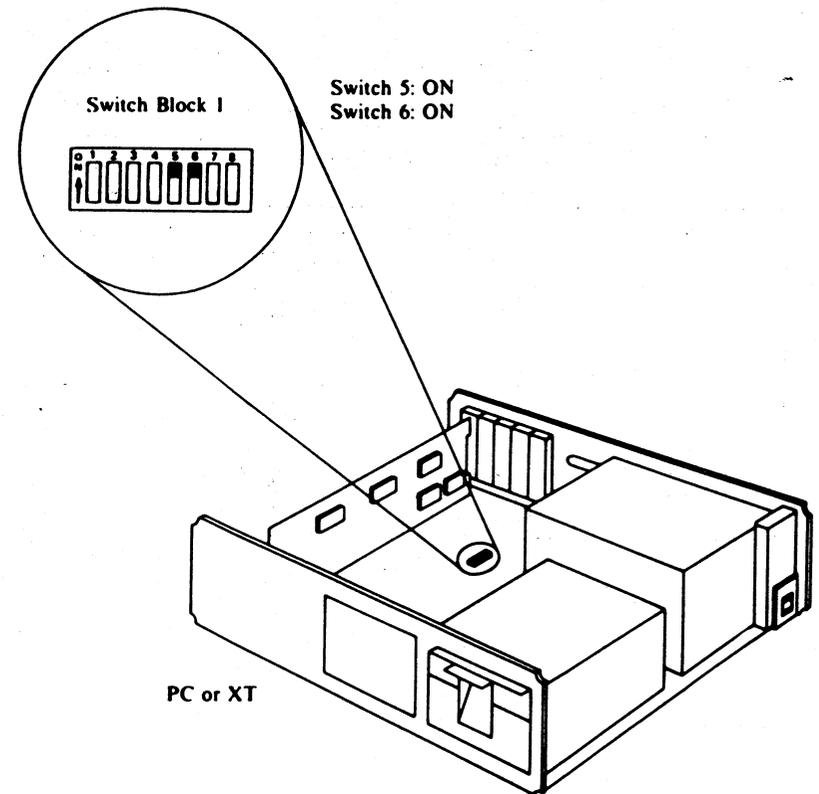
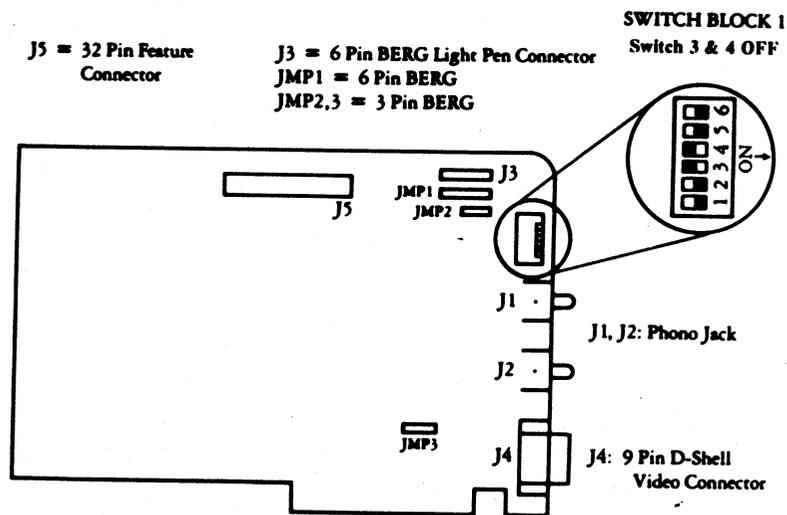


Figure 3-3. IBM System Switch

SuperEGA HiRes+

5. Install your SuperEGA HiRes+ jumpers according to Table 3-1. Refer to Figure 3-4 for locations of the switch and jumpers.



Note: Default setting for Multisync monitor is illustrated

Figure 3-4. Jumpers, Switches and Connectors

SuperEGA HiRes+

Table 3-1
SuperEGA HiRes+
Switch Settings and Jumper Installation

A. SuperEGA HiRes+ Mode Type Select Switch

SW5	SW6	Configuration
On	On	For standard EGA modes and advanced EGA modes
Off	On	Downward CGA compatible modes
Off	Off	Downward MDA, Hercules compatible modes

SuperEGA HiRes+

B. Standard Configuration Switch Settings

Switch settings for the SuperEGA HiRes+ when it is used as the only video card or as the primary display adapter.

SW1	SW2	SW3	SW4	Enhanced Adapter	Monochrome Adapter	C/G Adapter
On	Off	Off	On	Color Display 40 x 25 #1	Secondary	-
Off	Off	Off	On	Color Display 80 x 25 #1	Secondary	-
On	On	On	Off	Enhanced Display Normal Color Mode #2	Secondary	-
Off	On	On	Off	Enhanced Display HiRes Mode #3	Secondary	-
On	Off	On	Off	Monochrome Display #4	-	Secondary 40 x 25
Off	Off	On	Off	Monochrome Display #4	-	Secondary 80 x 25
On	On	Off	Off	Multifrequency Display #5	-	-

- #1 Use this setting if a Color Display is connected to the SuperEGA HiRes+.
- #2 If an Enhanced Color Display is connected to the SuperEGA HiRes+, this setting selects 640 x 200 text resolution.
- #3 If an Enhanced Color Display is connected to the SuperEGA HiRes+, this setting selects 640 x 350 text resolution.

SuperEGA HiRes+

- #4 Use this setting if a Monochrome Display is connected to the SuperEGA HiRes+.
- #5 If a multifrequency monitor is connected to the SuperEGA HiRes+, this setting selects 720 x 400 text resolution.

Switch settings for the SuperEGA HiRes+ when it is used as the secondary display adapter.

SW1	SW2	SW3	SW4	Enhanced Adapter	Monochrome Adapter	C/G Adapter
On	On	On	On	Color Display 40 x 25	Primary	-
Off	On	On	On	Color Display 80 x 25	Primary	-
On	Off	On	On	Enhanced Display Normal Color Mode	Primary	-
Off	Off	On	On	Enhanced Display HiRes Mode	Primary	-
On	On	Off	On	Monochrome Display	-	Primary 40 x 25
Off	On	Off	On	Monochrome Display	-	Primary 80 x 25

C. SuperEGA HiRes+ Jumper Installation

	Jumper	Setting Environment
JMP1	2&3 On	
	5&6 On	
JMP2	2&3 On	I/O Add=3xx
JMP2	1&2 On	I/O Add=2xx
JMP3	2&3 On	IBM Color display or IBM Monochrome display is attached
JMP3	1&2 On	IBM Enhanced Color display is attached

6. Locate an unused expansion slot in your system unit and remove the screw and the cover.

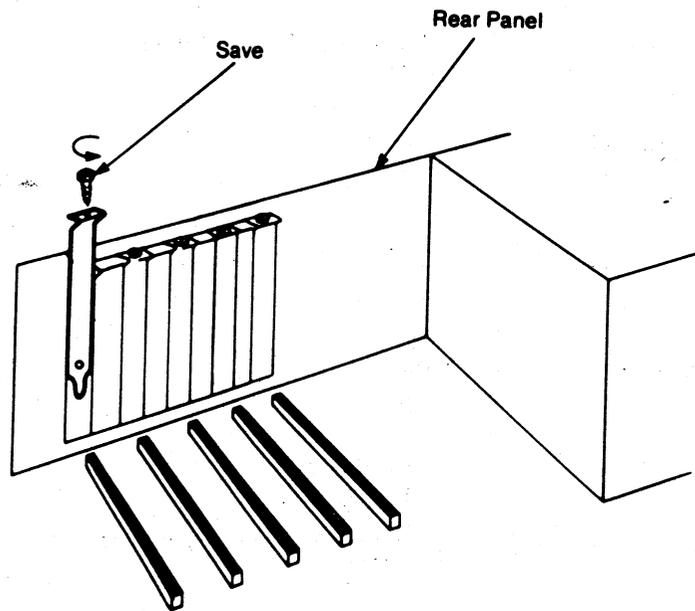


Figure 3-5. IBM Chassis

7. Install light pen, if any, according to the manufacturer's instructions. (Note that pin 2 on the socket may need to be cut before connecting to some light pens.)

DUE TO HIGH PERSISTENCE PHOSPHORS OF THE MONOCHROME DISPLAY, LIGHT PENS WILL NOT WORK ON MONOCHROME MONITORS.

8. Firmly press the SuperEGA HiRes+ downward into the selected system expansion slot and connect your monitor to the card.
9. Replace the system unit cover and fasten the screws.
10. Plug in computer power cord.

This completes the installation of your SuperEGA HiRes+.

NOTE: If you install a Microsoft Mouse, it must be Version 6.0 or greater.



4.0 Operation Modes

4.1 IBM Color Display and Compatibles

The following tables describe the modes supported by the SuperEGA HiRes+ on the IBM Color Display and its compatibles.

Table 4-1
Standard EGA Modes

Mode #	Type	Text Format	Box Size	Resolution	Colors	Max Pages
0	Text	40 x 25	8 x 8	320 x 200	16	8
1	Text	40 x 25	8 x 8	320 x 200	16	8
2	Text	80 x 25	8 x 8	640 x 200	16	8
3	Text	80 x 25	8 x 8	640 x 200	16	8
4	Graphic	40 x 25	8 x 8	320 x 200	4	1
5	Graphic	40 x 25	8 x 8	320 x 200	4	1
6	Graphic	80 x 25	8 x 8	640 x 200	2	1
D	Graphic	40 x 25	8 x 8	320 x 200	16	8
E	Graphic	80 x 25	8 x 8	640 x 200	16	4

NOTICE:

- a. Modes 0 through 6 emulate the IBM Color Graphics Display.
- b. Modes 0, 2 and 5 are identical to modes 1, 3 and 4 respectively, per the adapter's direct drive interface.

**Table 4-2
Downward CGA Modes**

Mode #	Type	Text Format	Box Size	Resolution	Colors	Max Pages
CGA0	Text	40 x 25	8 x 8	320 x 200	16	8
CGA1	Text	40 x 25	8 x 8	320 x 200	16	8
CGA2	Text	80 x 25	8 x 8	640 x 200	16	8
CGA3	Text	80 x 25	8 x 8	640 x 200	16	8
CGA4	Graphic	40 x 25	8 x 8	320 x 200	4	1
CGA5	Graphic	40 x 25	8 x 8	320 x 200	4	1
CGA6	Graphic	80 x 25	8 x 8	640 x 200	2	1
Pltr1	Graphic	40 x 25	8 x 8	320 x 200	16	1
Pltr2	Graphic	80 x 25	8 x 8	640 x 200	4	1

4.2 IBM Monochrome Display and Compatibles

The SuperEGA HiRes+ supports two modes on the IBM Monochrome Display and its compatibles.

**Table 4-3
Standard EGA Modes**

Mode #	Type	Text Format	Box Size	Resolution	Colors	Max Pages
7	Text	80 x 25	9 x 14	720 x 350	B/W	8
F	Graphic	80 x 25	8 x 14	640 x 350	B/W	2

**Table 4-4
MDA, Hercules and
EGA Monochrome Modes**

Mode #	Type	Text Format	Box Size	Resolution	Colors	Max Pages
MDA	Text	80 x 25	9 x 14	720 x 350	B/W	8
Herc	Gfx	80 x 25	9 x 14	720 x 348	B/W	2
EMono	Text	80 x 29	9 x 12	720 x 348	B/W	8
EMono	Text	80 x 32	9 x 11	720 x 352	B/W	8
EMono	Text	80 x 44	9 x 8	720 x 352	B/W	8
EMono	Text	132 x 25	9 x 14	1188 x 350	B/W	8
EMono	Text	132 x 29	9 x 12	1188 x 348	B/W	8
EMono	Text	132 x 32	9 x 11	1188 x 352	B/W	8
EMono	Text	132 x 44	9 x 8	1188 x 352	B/W	8

4.3 IBM Enhanced Color Display and Compatibles

4.3.1 SuperEGA HiRes+ Modes

The Enhanced Color Display is compatible with all modes listed in section 4.1. When the display is in the high resolution mode the SuperEGA HiRes+ provides enhanced text character support. This enhanced text support not only transforms the 8 x 8 character box into an 8 x 14 character box, but it also provides 16 display colors out of a palette of 64 colors.

SuperEGA HiRes+

The following table lists additional modes supported by the SuperEGA HiRes+ for the Enhanced Color Display.

Table 4-5
Standard EGA Modes

Mode #	Type	Text Format	Box Size	Resolution	Colors	Max Pages
0	Text	40 x 25	8 x 14	320 x 350	16/64	8
1	Text	40 x 25	8 x 14	320 x 350	16/64	8
2	Text	80 x 25	8 x 14	640 x 350	16/64	8
3	Text	80 x 25	8 x 14	640 x 350	16/64	8
10	Gfx	80 x 25	8 x 14	640 x 350	16/64	2

4.3.2 Advance Video Modes

The SuperEGA HiRes+ can display the following advanced video modes.

Table 4-6
Advanced Video Modes

Mode #	Type	Text Format	Box Size	Resolution	Colors	Max Pages
GE1	Text	132 x 25	8 x 14	1056 x 350	16/64	8
GE2	Text	132 x 29	8 x 12	1056 x 348	16/64	8
GE3	Text	132 x 32	8 x 11	1056 x 352	16/64	6
GE4	Text	132 x 44	8 x 8	1056 x 352	16/64	5

SuperEGA HiRes+

4.4 Multifrequency Display Modes

The SuperEGA HiRes+ supports Advanced and VGA Modes on multifrequency monitors.

Table 4-7
Advanced Display Modes

Mode #	Type	Text Format	Box Size	Resolution	Colors	Max Pages
GA1	T/G	40 x 25	8 x 16	320 x 400	16	8
GA2	T/G	80 x 25	8 x 16	640 x 400	16	8
GA3	BGAME	80 x 25	8 x 8	640 x 400	16/64	8
GA4	TEXT	80 x 60	8 x 8	640 x 480	16/64	8
GA5	GFX	80 x 60	8 x 8	640 x 480	16/64	8
GA6	TEXT	80 x 66	8 x 8	640 x 528	16/64	8
GA7	GFX	80 x 66	8 x 8	640 x 528	16/64	8
GA8	TEXT	94 x 29	8 x 12	752 x 406	16/64	8
GA9	GFX	94 x 29	8 x 12	752 x 406	16/64	8
GA10	TEXT	100 x 75	8 x 8	800 x 600	16/64	8
GA11	GFX	100 x 75	8 x 8	800 x 600	16/64	8
GA12	TEXT	114 x 60	8 x 8	912 x 480	16/64	8
GA13	GFX	114 x 60	8 x 8	912 x 480	16/64	8

Table 4-8
VGA Display Modes

Mode #	Type	Text Format	Box Size	Resolution	Colors	Max Pages
VGA[0+,1+]	TEXT	40x25	9x16	360x400	16/64	8
VGA[2+,3+]	TEXT	80x25	9x16	720x400	16/64	8
VGA[4+,5+]	GFX	40x25	8x16	320x200D	16/64	8
VGA[6+]	GFX	80x25	8x16	640x200D	16/64	8
VGA[D+]	GFX	40x25	8x16	320x200D	16/64	8
VGA[E+]	GFX	80x25	8x16	640x200D	16/64	4
VGA[10]	GFX	80x66	8x14	640x350	16/64	2
VGA[11]	GFX	80x30	8x12	640x480	16/64	1
VGA[12]	GFX	80x29	8x12	640x480	16/64	1
EGA	TEXT	132x25	8x14	1056x350	16/64	8
EGA	TEXT	132x29	8x12	1056x348	16/64	8
EGA	TEXT	132x32	8x11	1056x352	16/64	8
EGA	TEXT	132x44	8x8	1056x352	16/64	8
EGA	TEXT	132x60	8x8	1056x480	16/64	8
CGA	T/G	40x25	8x8	320x200	4	8
CGA	T/G	80x25	8x8	640x200	2	8

5.0 Using the SuperEGA HiRes+ Utility Diskettes

The SuperEGA HiRes+ Utility Diskette #1 includes the following programs:

SPEGA.EXE
FNT8 X 11.FNT
FNT8 X 12.FNT
Application Display Drivers*

- * Installation procedures are included in Appendix A. These procedures offer detailed instructions to install the available drivers.

The SPEGA program allows you to select among EGA and VGA, Downward CGA, MDA, Hercules, and Advanced Video modes without changing the hardware switch on your SuperEGA HiRes+.

SPEGA is menu-driven. Everything you need to know about using the program is shown on the menu. There is also a batch mode you can use.

NOTE: Make a copy of each of the Utility Diskettes (#1, #2) before proceeding any further. To run utility programs use the backup diskette.

The SPEGA.EXE and the font files, FNT8X11.FNT and FNT8X12.FNT, can be copied to any directory as long as they reside in the same directory. If they do not reside in the same directory, an Error Message is returned to the screen when certain fonts are called. The Error Message disappears after four seconds, and you are returned to the previous menu--your mode choice is not activated.

5.1 SPEGA.EXE Program

SPEGA is a powerful mode change program. At the system prompt type:

SPEGA, then press [Enter]

The SPEGA program can be operated in a menu-driven as well as command-driven manner.

5.1.1 Menu-Driven

There are seven menus, four of which can be seen with any currently selected configuration. Display status is displayed in a "window" format. The menu that appears first depends solely upon the system display status. That is, if the system display status is configured for a multifrequency display, then the VGA Multifrequency display menu is displayed first.

If the system display status is configured for the EGA display, then the EGA menu is displayed first and the VGA Multifrequency display cannot be selected. Note that if the switch settings are to an EGA display with a multifrequency display, the VGA modes cannot be selected.

Choosing Menus

To access your selections directly, toggle between menus using the appropriate Function Key ([F1], [F2], [F3], or [F4]). To access the menus sequentially use the right or left arrow keys. Each menu has a selection marked as default. (You can choose a different selection by using the [up arrow] and [down arrow] cursor keys and pressing [RETURN].)

The [ESC] key can be used to exit this program at any time. The one exception is when a warning message is present on the screen. In this case the function Key [F10] (UNDO) erases the warning message and returns the previous menu.

Figure 5-1 shows the menu displayed when the F1 key is pressed if the SuperEGA HiRes+ is configured for a multifrequency display.

GENOA SuperEGA HiRes+ VGA *MULTIFREQ DISPLAY* MENU

Mode	Resolution	Keyword
1. VGA [0+, 1+] TEXT	40x25, 320x400	V1
2. VGA [2+, 3+] TEXT	80x25, 640x400	V3
3. VGA [4+, 5+] GFX	40x25, 320x200D	V5
4. VGA [6+] GFX	80x25, 640x200D	V6
5. VGA [D+] GFX	40x25, 320x200D	VD
6. VGA [E+] GFX	80x25, 640x200D	VE
7. VGA [10] GFX	80x25, 640x350	V10
8. VGA [11] GFX	80x30, 640x480	V11
9. VGA [12] GFX	80x30, 640x480	V12
10. EGA TEXT	132x25, 1056x350	E25
11. EGA TEXT	132x29, 1056x348	E29
12. EGA TEXT	132x32, 1056x352	E32
13. EGA TEXT	132x44, 1056x352	E44
14. EGA TEXT	132x60, 1056x480	E60
15. EGA BOOT GAME		EBOOT
16. CGA TXT,GFX	80x25, 640x200	C80

Press CR only to select the marked item,
or select a number (1 - 16) -->

Figure 5-1. VGA Multifrequency Display Menu

SuperEGA HiRes+

Figure 5-2 shows the menu displayed when the F1 key is pressed if the SuperEGA HiRes+ is configured for an EGA display.

GENOA SuperEGA HiRes+ *EGA DISPLAY* MENU

Mode	Resolution	Keyword
1. EGA[0,1] TEXT	40x25, 320x350	E1
2. EGA[2,3] TEXT	80x25, 640x350	E3
3. EGA[4,5] GFX	40x25, 320x200	E5
4. EGA[6] GFX	80x25, 640x200	E6
5. EGA[D] GFX	40x25, 320x200	ED
6. EGA[E] GFX	80x25, 640x200	EE
7. EGA[10] GFX	80x25, 640x350	E10
8. EGA TEXT	132x25, 1056x350	E25
9. EGA TEXT	132x29, 1056x348	E29
10. EGA TEXT	132x32, 1056x352	E32
11. EGA TEXT	132x44, 1056x352	E44
12. EGA BOOT GAME		EBOOT
13. CGA TEXT/GFX	40x25, 320x200	C40
14. CGA TEXT/GFX	80x25, 640x200	C80

Press CR only to select the marked item,
or select a number (1 - 14) -->

Figure 5-2. EGA Multifrequency Display Menu

SuperEGA HiRes+

Figure 5-3 shows the menu displayed when the F2 key is pressed if the SuperEGA HiRes+ is configured for a multifrequency display.

GENOA SuperEGA HiRes+ *CGA DISPLAY* MENU

Mode	Resolution	Keyword
1. CGA TEXT/GFX	40x25, 320x200	C40
2. CGA TEXT/GFX	80x25, 640x200	C80
3. CGA BOOT GAME		CBOOT

Press CR only to select the marked item,
or select a number (1 - 3) -->

Figure 5-3. CGA Display Menu

SuperEGA HiRes+

Figure 5-4 shows the menu displayed when the F2 key is pressed if the SuperEGA HiRes+ is configured for an EGA display.

GENOA SuperEGA HiRes+ *CGA DISPLAY* MENU

Mode		Resolution	Keyword
1. CGA	TEXT/GFX	40x25, 320x200	C40
2. CGA	TEXT/GFX	80x25, 640x200	C80
3. CGA	BOOT GAME		CBOOT
4. EGA[0,1]	TEXT	40x25, 320x200	CE1
5. EGA[2,3]	TEXT	80x25, 640x200	CE3
6. EGA[4,5]	GFX	40x25, 320x200	E5
7. EGA[6]	GFX	80x25, 640x200	E6
8. EGA[D]	GFX	40x25, 320x200	ED
9. EGA[E]	GFX	80x25, 640x200	EE

Press CR only to select the marked item,
or select a number (1 - 9) -->

Figure 5-4. CGA Display Menu

SuperEGA HiRes+

Figure 5-5 shows the menu displayed when the F3 key is pressed.

GENOA SuperEGA HiRes+ *MONO DISPLAY* MENU

Mode		Resolution	Keyword
1. MDA	TEXT	80x25, 720x350	M25
2. MDA	BOOT GAME		MBOOT
3. HERCU	GFX.1P	80x25, 720x348	H1
4. HERCU	GFX.2P	80x25, 720x348	H2
5. EGA[7]	TEXT	80x25, 720x350	E7
6. EGA[F]	GFX	80x25, 640x350	EF
7. EGAMONO.	TEXT	80x29, 720x348	M29
8. EGAMONO.	TEXT	80x32, 720x352	M32
9. EGAMONO.	TEXT	80x44, 720x352	M44
10. EGAMONO.	TEXT	132x25, 1188x350	MA25
11. EGAMONO.	TEXT	132x29, 1188x348	MA29
12. EGAMONO.	TEXT	132x32, 1188x352	MA32
13. EGAMONO.	TEXT	132x44, 1188x352	MA44

Press CR only to select the marked item,
or select a number (1 - 13) -->

Figure 5-5. Monochrome Display Menu

SuperEGA HiRes+

Figure 5-6 shows the menu displayed when the F4 key is pressed if the SuperEGA HiRes+ is configured with a multifrequency display.

GENOA SuperEGA HiRes+ *MULTIFREQ ADV* MENU

Mode	Resolution	Keyword
1. CGA DSCAN T/G	40x25, 320x200D	ADS40
2. CGA DSCAN T/G	80x25, 640x200D	ADS80
3. CGA DSCAN BOOT GAME		ABOOT
4. EGA TEXT	80x60, 640x480	A60T
5. EGA GFX	80x60, 640x480	A480G
6. EGA TEXT	80x66, 640x528	A66T
7. EGA GFX	80x66, 640x528	A528G
8. EGA TEXT	94x29, 752x406	A752T
9. EGA GFX	94x29, 752x410	A752G
10. EGA TEXT	100x75, 800x600	A75T
11. EGA GFX	100x75, 800x600	A600G
12. EGA TEXT	114x60, 912x480	A912T
13. EGA GFX	114x60, 912x480	A912G
14. VGA DISPLAY MODES [F1]		
15. CGA DISPLAY MODES [F2]		

Press CR only to select the marked item,
or select a number (1 - 15) -->

Figure 5-6. Multifrequency Display Menu

SuperEGA HiRes+

Figure 5-7 shows the menu displayed when the F4 key is pressed if the SuperEGA HiRes+ is configured with an EGA display.

GENOA SuperEGA HiRes+ *MULTIFREQ ADV* MENU

Mode	Resolution	Keyword
1. CGA DSCAN T/G	40x25, 320x200D	ADS40
2. CGA DSCAN T/G	80x25, 640x200D	ADS80
3. CGA DSCAN BOOT GAME		ABOOT
4. EGA TEXT	80x60, 640x480	A60T
5. EGA GFX	80x60, 640x480	A480G
6. EGA TEXT	80x66, 640x528	A66T
7. EGA GFX	80x66, 640x528	A528G
8. EGA TEXT	94x29, 752x406	A752T
9. EGA GFX	94x29, 752x410	A752G
10. EGA TEXT	100x75, 800x600	A75T
11. EGA GFX	100x75, 800x600	A600G
12. EGA TEXT	114x60, 912x480	A912T
13. EGA GFX	114x60, 912x480	A912G
14. EGA DISPLAY MODES [F1]		
15. CGA DISPLAY MODES [F2]		

Press CR only to select the marked item,
or select a number (1 - 15) -->

Figure 5-7. Multifrequency EGA Display Menu

BOOT GAME Utilities

You will find a BOOT GAME selection on all menus. Selection of this function serves as a substitute for the "warm boot" procedure ([CTRL]-[ALT]-[DEL]). This program is required since the system's "warm boot" procedure resets the video environment according to its hardware settings.

The BOOT GAME option for each menu is:

EBOOT	Enhanced Color Graphics display menu
CBOOT	CGA display menu
MBOOT	MONOCHROME display menu
ABOOT	ADVANCED display menu (double-scan)

For example, after using the SuperEGA HiRes+ to switch mode you decide to execute a CGA Game that has to boot from disk (boot-read). Doing a "warm boot" at this time changes your current video mode. To avoid the mode change:

1. Enter the proper display menu according to the game.
2. Select the BOOT GAME item and press [RETURN].
3. Insert the game diskette in drive A, close the door, and press any key (except [ESC] or [F10]) to start.

This procedure will execute your game without destroying the current video mode.

If the game does not require a boot-read, you can switch modes if necessary and execute it directly. BOOT GAME is not needed.

Command Status Line

A Command Status line appears on the 24th line for your convenience. This status line includes the following:

- [up/down arrows] These two keys are used to move the mark (in reversed video) to the desired selection.
- [F1] is used to select the EGA + VGA DISPLAY MENU.
- [F2] is used to select the CGA DISPLAY MENU.
- [F3] is used to select the MONOCHROME DISPLAY MENU.
- [F4] is used to select the MULTI-FREQUENCY ADVANCED DISPLAY MENU.

Each Menu Screen and its corresponding function key can be distinguished by color.

- [F9] This function key is a help key and will overlay a small window with detail of the currently highlighted mode.
- [F10] This function key is used to undo the current selection when a warning message appears on the screen.
- [ESC] This key is used to exit to DOS.

5.1.2 Command-Driven Modes

To use the command-driven mode simply type SPEGA followed by the desired Keyword. A Keyword (found on all display menus) is composed of a prefix character and corresponding alpha or numeric code. These prefix characters are:

SuperEGA HiRes+

- [E] which stands for Advanced EGA display modes
- [CE] which stands for EGA low resolution display modes 0-3
- [C] which stands for CGA display modes
- [M] which stands for MONOCHROME display modes
- [H] which stands for HERCULES display modes
- [A] which stands for ADVANCED display modes
- [V] which stands for VGA display modes

Each menu has a Keyword column displaying the possible Keyword choices. For example, if you want to select EGA Text 132 x 25, E25 is shown in the Keyword column. To select this mode in a command-driven manner from the DOS prompt, you would simply type:

SPEGA E25 then press [Enter]

If the Keyword is correct, the Command-Driven mode is activated automatically.

5.2 GANSI.SYS

GANSI.SYS file is an optional screen control driver provided on Utility Diskette #1 to be used only with DOS 3.1 or later.

If you have included an ANSISYS file in the CONFIG.SYS file and need to operate in non-DOS modes, e.g., 132 x 25/29/32/44/60, 80x66, etc., you need to replace ANSISYS as follows:

1. Use the COPY CON or EDLIN command to replace

DEVICE=ANSI.SYS with

DEVICE=GANSI.SYS

2. Then copy XANSI.SYS from the diskette to the boot directory on C.

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6.0 CONNECTOR INFORMATION

1. Monochrome Display Interface At Standard TTL Levels

Pin #	Signal Name
1	Ground
2	Ground
3	(Not Used)
4	(Not Used)
5	(Not Used)
6	Intensity
7	Video
8	Horizontal
9	Vertical

2. Color Display Interface

Pin #	Signal Name
1	Ground
2	Ground
3	Red
4	Green
5	Blue
6	Intensity
7	(Reserved)
8	Horizontal Drive
9	Vertical Drive

3. Enhanced Color Display Interface At Standard TTL Levels

Pin #	Signal Name
1	Ground
2	Secondary Red
3	Primary Red
4	Primary Green
5	Primary Blue
6	Secondary Green
7	Secondary Blue
8	Horizontal Drive
9	Vertical Drive

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4. Light Pen Interface
At Standard TTL Levels

Pin #	Signal Name
1	- Light Pen Input
2	(key) not used
3	- Light Pen Switch
4	Chassis Ground
5	+5 Volts
6	+12 Volts

5. Feature Connector Interface
Layout and pin numbering of the feature connector.

Pin #	Signal Name	Pin #	Signal Name
1	Gnd	2	-12 v
3	+12 v	4	J1
5	H2	6	G'OUT
7	R'OUT	8	R'OUT
9	ATRS/L	10	B'OUT
11	G OUT	12	G
13	R'	14	B
15	R	16	R OUT
17	FEAT1	18	BLANK.
19	FEAT0	20	FC1
21	FC0	22	G'/1
23	B'V	24	HIN
25	VIN	26	14 MHz
27	Internal	28	EXT OUT
29	V OUT	30	HOUT
31	GND	32	+5 v

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7.0 Installation of Application Drivers

7.1 Genoa Provided Drivers

7.1.1 AutoCAD Driver

In order to take full advantage of the higher resolutions provided by the SuperEGA HiRes+, you MUST use a multifrequency of monitor. Standard EGA monitors do not work properly in the higher resolution modes of the SuperEGA HiRes+. However, if you use the standard EGA resolution settings, you can use all of the advanced features of the AutoCAD Display Driver (ADI).

Use the following steps for easy software installation:

- Copy these files from your SPEGA Utility Diskette #1 to the AUTOCAD subdirectory:

```

DSGENOA.*
ACAD.MNU
GENOALOA.BAT

```

- Choose standard color settings:

```

type: DSGENOA [Enter]

```

This file must be loaded BEFORE loading AutoCAD. It is recommended that this file be placed in your AUTOEXEC.BAT file.

NOTE: You will need to make the following changes in this procedure if you are using a network such as Novell that utilizes interrupt vector 7Ah:

```

type: DSGENOA VXX [Enter]

```

(where XX can be 7B or any other vector which does not conflict with other applications.)

3. Configure AutoCAD to use the ADI drivers. Do this by typing the following keyboard entries at the C> prompt:

```
ACAD      [Enter]
5         (Configure Autocad)
3         (Configure Video Display)
Specify the ADI driver as the desired display driver.
```

This configuration process needs to be done only once. AutoCAD will use this driver each time it is accessed in the future until you change it.

NOTE: If you have changed the interrupt with the DSGENOA command, change the interrupt under "Video Adapter" information from 7A to the same vector used in the previous step.

4. Optional: Utilization of the Window Feature. If you want to select your own color configuration, step #2 can be replaced with:

```
C> DSGENOA C VXX 0 [Enter]
DSGENOA C
```

DSGENOA C is simply a batch file. It will ask you a series of questions concerning color selection. You can change the attributes desired and skip the rest, as the default (or previous) settings are used instead. You can also terminate the command by typing ^C (Ctrl-C), which is the standard DOS "terminate a command" key sequence. Once terminated, the driver accepts all the changes.

Note that all changes take effect once the AutoCAD redraw command is executed. The colors available, together with their numbers, are displayed in the command screen area. It is acceptable to enter the same color for both the foreground and background for all settings. By doing so, you turn off the menu, the coordinates, and the Command screen areas and only the drawing will be showing. This setting might be desirable if you need to take a picture of the display drawing alone.

NOTE: The color selections made in DSGENOA C must be re-entered any time the system is rebooted. Upon reboot, the system reverts to the default settings.

Optional Commands

The ACAD.MNU command offers a Window Utility which displays the Window in a 640x480 resolution. This Window feature is available only in the 640x480 resolution. To utilize these extra features:

type: DSGENOA 0 instead of DSGENOA

load: AutoCAD and select WINDOW Options

Extra features available under the Window option follow.

AutoCAD COMMAND DESCRIPTIONS

The commands described below are the extensions that you will see under the WINDOW FEATURE when using the ACAD.MNU file. Remember you must have AutoCAD version 2.6 or above.

STRVIEW

The STRVIEW command saves major portions of the current screen in memory for later recall. The area of the captured screen extends from the center toward the outer limits of the drawing area.

Please note that due to memory limitations only two-thirds of the drawing screen is captured. Previous captured views are replaced by the image of the current drawing screen at the time the STRVIEW command is executed.

RCLVIEW

The RCLVIEW command lets you display the stored view on the graphics screen area. The displayed window does not affect the drawing below it. AutoCAD does not know of the presence of the Window.

The view window is preserved by entering the text screen and is recovered upon return to the graphics screen.

NONE

The NONE command removes the window with the view from the screen. The stored view will remain in memory and can be recalled, if desired, using the RCLVIEW command.

In addition, the viewport may be toggled on or off by typing ^L (Ctrl-L). If the viewport is displayed, the viewport will be turned off and vice versa.

TOPLEFT

The TOPLEFT command lets you place the display viewport on the top left part of the graphics screen area.

TOPRT

The TOPRT command lets you place the display viewport on the top right part of the graphics screen area. Note that the viewport does not extend over the menu area.

BOTLEFT

The BOTLEFT command lets you place the displayed viewport on the bottom right part of the graphics screen area.

BOTRT

The BOTRT command lets you place the displayed viewport on the bottom right part of the graphics screen.

UP

The UP command pans the view inside the window up once. This command may be repeated to scroll a desired amount. The scroll resolution can also be set (this procedure is described later). The view will scroll up to the limit of the drawing area saved. In order to include the whole graphics area in the viewport, you must zoom out so that the drawing to be displayed in the viewport window is inside two-thirds of the graphics area.

DOWN

The DOWN command (works just like the UP command) pans the view inside the window down at the resolution specified.

LEFT

The LEFT command pans the view inside the window left at the resolution specified.

RIGHT

The RIGHT command pans the view inside the window right at the resolution specified.

FINE

The FINE command sets the scroll resolution of the viewport to the smallest increment. If you want to scroll to a far part of the view you might want to use lesser scroll resolution in order to reach the desired view faster, and then, as described later, use fine scroll resolution to pinpoint the desired view.

Please note that this, and the following two commands, do not change the view displayed on the viewport. They only set the scroll resolution for any scrolling commands issued. If the scroll

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resolution is never set, it will default to fine or to the most recent setting.

MEDIUM

The MEDIUM command sets the scroll resolution of the viewport to a medium resolution. This makes it possible to scroll faster through a displayed view.

COARSE

The COARSE command sets the scroll resolution at the least possible resolution. When selected, any subsequent scroll command pans the displayed view a page at a time.

SCREEN

The SCREEN command lets you completely reconfigure all current display settings without exiting AutoCAD. Once selected, the DSGENOA series of prompts appear in the Command prompt area.

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7.1.2 GEM Driver - Version 2.1

In order to take full advantage of the higher resolutions provided by the SuperEGA HiRes+, you **MUST** use a multifrequency display. Standard EGA monitors do not work properly at the higher resolution modes of the SuperEGA HiRes+.

Use the following steps for easy software installation:

NOTE: The GEM working diskette is required.

1. Insert the Utility Diskette #1 into drive A and copy GEMCOPY.BAT onto the hard disk.
2. Log onto the hard disk:

type: GEMCOPY [Enter]
3. Follow the prompts on the screen to continue.

This completes the driver installation process.

Many applications programs can be run under Digital Research's GEM. The GEM driver must be installed as previously described. After GEM has been installed, the following may be run as applications:

GEM Draw, Paint, Graph, Write, Wordchart
Desktop Publisher
Office Publisher by Laser Friendly
Smartchart, PRISM by Iconix Software
Crossroads by McDonnell Douglas
PC-CAPS V2.0 by Personal CAD
Superbase PERSONAL by Progressive Peripherals

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7.1.3 Windows Driver - Version 1.03

In order to take full advantage of the higher resolutions provided by the SuperEGA HiRes+, you **MUST** use a multifrequency display. Standard EGA monitors do not work properly at the higher resolution modes of the SuperEGA HiRes+.

Use the following steps for easy software installation:

1. Insert the Utility Diskette #1 in drive A and use the DOS copy command to copy WIN800.BAT or WIN640.BAT onto the hard disk.
2. Log onto the hard disk:

type: WIN800 or WIN640 [Enter]
3. Follow the prompts on the screen to continue.

This completes the driver installation process.

Many applications programs can be run under Microsoft Windows. The Windows driver must be installed as previously described. After running WIN.EXE, the following may be run as an application:

Pagemaker by Aldus
In*A*Vision by Micrografx
INSTINCT by CADlogic
Prolog by Arity
PC Image by Datacopy
Nimbus by Media Cybernetics
VP Planner by Paperback Software
Click Art by T/Maker

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7.1.4 Lotus 1-2-3 Driver - Version 2.0, Symphony 1.1

Four 132-column drivers are available for use with Lotus. These drivers allow all Lotus functions to take place in the 132-column display mode. (Note: The TRANSLATE and INSTALL functions **MUST** be performed in the 80 column mode.)

If you attempt to use either of these functions in 132-column mode, Lotus does not properly execute these functions. The difference among the four drivers is the number of lines displayed on the screen.

Use the following steps for easy software installation:

1. Copy all the 132*.DRV files to the Lotus subdirectory from the SuperEGA HiRes+ Utility Diskette #1.
2. Delete the LOTUS SINGLE.LBR file. If it does not exist, go to step #3.
3. Access Lotus and choose the INSTALL option from the Lotus Selection screen, and follow the screen prompts to the Main Menu.
4. Move the cursor to ADVANCED OPTIONS and press [Enter].
5. Move the cursor to ADD NEW DRIVERS TO LIBRARY and press [Enter].
6. Follow the screen prompts to return to the ADVANCED OPTIONS menu.
7. Move the cursor to MODIFY CURRENT DRIVER SET and press [Enter].
8. Move the cursor to TEXT DISPLAY and press [Enter].
9. Move the cursor to the driver to be loaded and press [Enter].
10. Move the cursor to RETURN TO MENU and press [Enter].
11. Move the cursor to SAVE CHANGES and press [Enter].
12. Type the name of the driver and press [Enter]. We **STRONGLY SUGGEST** that you use the numeric designation of the driver being loaded as the name.

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13. Follow the screen prompts to continue loading drivers or exit the INSTALL process.

This completes the Lotus driver installation process.

To access a driver once it has been installed from the DOS prompt, type Lotus and the driver name entered in step #12 above.

7.1.5 Framework II Driver - Version 1.1

The screen driver for Framework II Release 1.1 utilizes Framework's *Desktop* "view" to take advantage of the 132-column capability. It requires only one installation unless there is a change in the system configuration (e.g., a different monitor is used).

The following steps should be taken to install the driver:

1. Begin the Framework installation according to the Framework manual.
2. Select IBM Enhanced Graphics Adapter as the Video display and complete the software installation. Run **SETUP** from the Framework floppy disk or hard disk directory where Framework resides. There is not a separate installation program from Genoa.
3. Select 2 for "all other uses of the setup program."
4. Select 2 under "CHANGE CONFIGURATION."
5. Select 1 under "PRIMARY HARDWARE."
6. Select 1 under "SCREEN DRIVER."
7. Select 7 under "SELECT DRIVER." This choice allows you to choose a specific driver.
8. Enter one of the following under "NEW SETTING."

FW350.SC for normal EGA 640x350 resolution
FW480.SC for 640x480 resolution
FW600.SC for 800x600 resolution
FW_MONO.SC for monochrome monitors

9. Press M to go to the main menu.

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10. Press 7 to save the changes.
11. Insert the SuperEGA HiRes+ Utility Diskette #2 into the A drive.
12. Select either floppy or hard disk depending upon your system configuration.
13. Exit from the SETUP program.

This completes the driver installation process. For subsequent Framework sessions, SuperEGA HiRes+ does not need to be reinstalled.

7.1.6 Ventura Drivers - Version 1.1, 1.0, and 1.01

In order to take full advantage of the higher resolution provided by the SuperEGA HiRes+, you **MUST** use a multifrequency display. Standard EGA monitors do not work properly at the higher resolutions modes of the SuperEGA HiRes+.

The following steps should be taken to install the drivers:

1. Install Ventura Publisher according to the Ventura Publisher manual.
2. Hercules card must be selected during the Ventura installation procedure.

Note: If you have previously installed Ventura, and selected the Color Graphics Adapter, you must completely reinstall it choosing the Hercules card.

3. Insert Utility Diskette #2 into Drive A.
4. After A prompt:

type **VP11** [Enter] for Version 1.1
type **VP10** [Enter] for Versions 1.0 or 1.01

5. Follow the prompts on the screen to complete the installation.

7.1.7 Volkswriter 3 - Version 1.0

The following steps should be taken to install the driver:

1. Install Volkswriter 3 according to the Volkswriter 3 manual.
2. Insert the Genoa SuperEGA HiRes+ Utility Diskette #2 into floppy drive A.
3. Using the copy command, copy the following files to the subdirectory created on the hard disk during the Volkswriter installation:

FNT8X11.FNT
FNT8X12.FNT
SPEGA.EXE
VWDRIVER.EXE
VW.BAT

4. To run the program you must first select the desired mode by typing: SPEGA
5. Select the menu that corresponds with your monitor by pressing one of the four function keys described in 5.1.
6. From the available menus, you may choose the following modes:
VGA TEXT 80 x 25, 720 x 400 resolution
EGA TEXT 80 x 66, 640 x 528 resolution
EGA TEXT 94 x 29, 752 x 406 resolution
EGA TEXT 100 x 75, 800 x 600 resolution
EGA TEXT 114 x 60, 912 x 480 resolution
EGA TEXT 132 x 25, 1056 x 350 resolution
EGA TEXT 132 x 29, 1056 x 348 resolution
EGA TEXT 132 x 32, 1056 x 352 resolution
EGA TEXT 132 x 44, 1056 x 352 resolution
EGA TEXT 132 x 60, 1056 x 480 resolution
CGA TEXT/GFX 80 x 25, 640 x 200 resolution

NOTE: Other modes cannot be selected

7. To begin the application type: VW

7.2 Vendor Supported Applications

7.2.1 WordStar Professional

WordStar Professional allows the user to select the height (row) and column (width) of a text mode. Using the SuperEGA HiRes+ Utility Diskette #1 you can select various text modes, such as 80x66 which requires a multifrequency monitor, 132x32, 132x44, etc.

An example of how to set this up for the 132x32 text mode follows:

1. Install WordStar Professional, release 4 according to the WordStar manual.
2. With the SuperEGA HiRes+ Utility Diskette #1 in drive A, copy SPEGA.EXE, FNT8X11.FNT, and FNT8X12.FNT to the WordStar subdirectory.
3. Create a batch file and data file in the WordStar subdirectory. Begin from the WordStar subdirectory and proceed as follows:

```
type: COPY CON: WS13232.BAT [Enter]
type: SPEGA E32<INSPEGA.DOT [Enter]
type: WS [Enter]
type: SPEGA E3 [Enter]
press: F6
```

The screen will display, "One file is copied"

```
type: COPY CON: INSPEGA.DOT [Enter]
press: [Enter]
press: F6
```

The screen will display, "One file is copied"

4. Set WordStar to the appropriate text mode. Begin at the DOS prompt from the WordStar Subdirectory and proceed as follows:

```

type:      WSCHANGE WS           [Enter]
select:    A (console)           [Enter]
select:    A (monitor)           [Enter]
select:    A (IBM Compatible using
           Video RAM directly)    [Enter]
select:    C (screen sizing)      [Enter]
select:    A (height)             [Enter]
type:      32                     [Enter]
select:    B (width)              [Enter]
type:      132                    [Enter]
press:     X
    
```

The WordStar subdirectory will be returned. This completes the installation. This procedure does not need to be repeated for subsequent WordStar sessions.

5. To subsequently run WordStar in 132x32 text mode from the WordStar subdirectory:

```

type:      WS13232 [Enter]
    
```

NOTE: When you are in the WordStar program, you can set the right margin to 132 by selecting ^O On-screen format.

```

select:    R, set right
enter:     132 [Enter]
    
```

7.2.2 WordPerfect

WordPerfect allows the user to select the height (rows) and width (columns) of a text mode. Using the SuperEGA HiRes+ Utility Diskette #1, you can select various text modes, such as 80x66 which requires a multifrequency monitor, 132x32, 132x44, etc.

An example of how to set this up for the 132x32 text mode follows:

1. Install WordPerfect release 4.1 according to the WordPerfect manual.
2. With the SuperEGA HiRes+ Utility Diskette #1 in drive A, copy SPEGA.EXE, FNT8X11.FNT, and FNT8X12.FNT to the WordPerfect subdirectory.
3. From the WordPerfect subdirectory:

```

type:      SPEGA E32 [Enter]
    
```

4. Press [Enter] a second time to return to the DOS prompt:

```

type:      WP/S [Enter]
    
```

5. While the screen will still display 80x25, proceed as follows:

```

press:     3 [Enter]
type:      32 [Enter]
type:      132 [Enter]
    
```

6. Select the 0 (zero) option accepts the configuration and returns to WordPerfect.

7. Create a batch file as follows in the WordPerfect subdirectory:

type: COPY CON: WP13232.BAT [Enter]
type: SPEGA E32<INSPEGA.DOT [Enter]
type: WP [Enter]
type: SPEGA E3 [Enter]
press: F6

The screen will display, "*One file is copied*"

type: COPY CON: INSPEGA.DOT [Enter]
press: [Enter]
press: F6

8. To subsequently run WordPerfect in 132x32 text mode from the WordPerfect subdirectory:

type: WP13232 [Enter]

7.3 VENDOR PROVIDED DRIVERS

The software applications programs listed below are some of those that have drivers written specifically for the advanced screen modes of the SuperEGA HiRes+. They are included in the most recent versions of the developers software.

OrCAD/STD by OrCAD
VersaCAD Design by Versacad
Energraphics, Enercharts by Enertronics
EGA Paint 2005 by Rix Software
Dr. HALO III by Media Cybernetics: This supports
CADKEY and Drafix II
MetaWINDOW-C, Turbo WINDOWS, Turbo PASCAL,
Font WINDOW BY Metagraphics

APPENDIX A: Limited Warranty

To the original purchaser only. Genoa Systems Corporation ("Genoa") warrants this SuperEGA HiRes+ (the "Product") to be free of defects in material and workmanship under normal use for a period of one (1) year from date of purchase from an authorized Genoa dealer.

Genoa makes no other express warranties on the Product. ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ON THE PRODUCT ARE LIMITED IN DURATION TO THE PERIOD OF ONE (1) YEAR. Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.

The purchaser's sole and exclusive remedy in the event of a breach of any warranty is expressly limited to repair or replacement of the defective Product or, if repair or replacement is not possible, a refund of the purchase price, at Genoa's option. Repair parts and replacement products will be provided on an exchange basis and will be either reconditioned or new. All replaced parts and Product(s) become the property of Genoa. This limited warranty does not cover damage to the Product resulting from accident, disaster, misuse, abuse, negligence, improper maintenance, or modification or repair of the Product other than by an authorized Genoa dealer.

If this Product fails during the warranty period, Purchaser shall notify Genoa and request return authorization. The defective product should then be returned in the original packaging (or equivalent) with a failure report and purchase receipt attached. If the Product is not returned with the original packaging (or equivalent) and hence damaged during shipping, the warranty will be voided.

This limited warranty gives you specific legal rights, and you may also have other legal rights which vary from state to state.

APPENDIX B: Limitation of Liability

GENOA SYSTEMS CORPORATION SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES, WHETHER IN AN ACTION IN CONTRACT OR TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY), SUCH AS, BUT NOT LIMITED TO, LOSS OF ANTICIPATED PROFITS OR BENEFITS RESULTING FROM THE USE OF THE PRODUCT OR ANY BREACH OF ANY WARRANTY, EVEN IF GENOA OR ITS AUTHORIZED DEALER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT WILL GENOA'S LIABILITY EXCEED THE PRICE PAID FOR THE PRODUCT. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusions or limitations may not apply to you.