SuperX VGA by BOCA™

ACCELERATED PERFORMANCE

PRODUCT CODES:

SVGA25 (512K; non-upgradeable)
**SXVGA5 (upgradeable to 1MB)**
SXVGA1 (1MB)

Before You Begin your Installation

The product you have purchased is designed to be easily installed into most IBM PC or compatible systems. Many products have large, easy-to-read legends to allow for the easy configuring of the product. This installation manual contains detailed instructions. Most included software has automatic installation programs to place the software correctly onto your computer. However, as all computers are configured differently, you may be required to perform some basic DOS or Windows tasks. If you are not familiar with basic DOS commands such as DIR, CD, or EDIT, you should check your DOS manual, or seek assistance from you local computer dealer to install the product.

How to get Technical Assistance
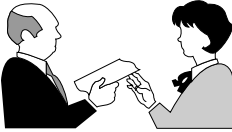
The dealer that you purchased this product or your computer from is the first place you should go for technical assistance. The dealer is usually the most qualified source of help, and is most familiar with your system and how this product should be installed. Many dealers have customer service and technical support programs, with varying levels of support offered, depending on your needs and computer knowledge. ***Please contact the dealer first whenever a problem occurs.***

If your Dealer Can't Assist you
If you can't get assistance from your dealer, the manufacturer provides varying levels of technical assistance as summarized on the following page.

Boca BBS
407-241-1601

Standard Free Technical Support
407-241-8088

Automated Fax Retrieval System
407-995-9456

Priority Service
900-555-4900
($2 per minute)

Technical Support Fax
407-997-0918

On-Line Support!
CompuServe: **GO BOCA**
Internet:
email: **support@boca.org**
on the World-wide WEB:
http://WWW@boca.org

The Standard Free Technical Support number is for quick answers to specific inquiries on product features and technical questions (call **407-241-8088**; M-F, 8 am to 6:30 pm EST). Direct access to technical support representatives is provided on a limited basis. If you require immediate attention or in-depth help with the installation of the product, please call our 900-priority support number for service. This number gives you immediate access to senior-level technicians. The number is **900-555-4900**. You will be charged $2.00 per minute. The charges will appear on your next phone bill.

Damaged or Missing Items
We use many world-class quality assurance programs to ensure the product you purchased is of the highest caliber. Sometimes, however, a component may be missing from the box, or is damaged or corrupt in some way. If this happens, immediately return the entire package to your place of purchase so you may exchange it for a new one. Your dealer should be able to provide you with an exchange far more quickly than by contacting us directly. If for some reason you are unable to return the product directly to its place of purchase, refer to the "Servicing Your Product" and "Warranty" sections in this manual for instructions.

SuperX VGA by BOCA

Contents

Section One: Introduction

Congratulations on the purchase of your SuperX VGA board. The SuperX VGA is IBM VGA compatible and is designed to work in all standard AT and compatible computers. This manual explains how to set up, install, and use the SuperX VGA board. Information is also provided for installing software drivers which provide enhanced video display with many popular applications. Drivers are included on the diskette shipped with your SuperX VGA, but it is *NOT* necessary to install these drivers for normal VGA operation.

NOTE: We recommend running the included CLMODE utility to achieve optimum performance with the SuperX and your monitor. Refer to Section Four: Preparing Your Monitor.

Features:
- Hardware graphics cursor
- Compatible with ISA and EISA bus systems
- 16-bit interface
- Integrated RAMDAC with a 262,144-color palette
- Extensive graphic mode support
- Feature connector for use with multi-media applications
- Supports 132-column text modes.

Your Package Includes:

- the SuperX VGA board
- display drivers on 3.5-inch high-density (1.44MB) diskette.
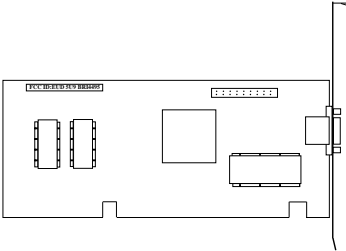
the SuperX
VGA board

3.5-inch
diskette

installation
guide

Section Two: Compatibility & Requirements

Please examine the SuperX VGA board and driver diskette to see if there is any damage which may have occurred during shipment. If damage exists or if anything appears to be missing, please contact the retailer from whom the SuperX VGA was purchased.

2.1 Installation Requirements

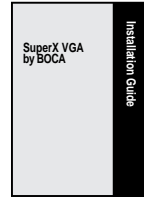This user manual is designed to answer questions you might have concerning the installation and use of the SuperX VGA, as well as provide descriptions of legitimate system configurations. Please take a little time to read through this manual before installing your SuperX VGA.

2.2 Monitor Compatibility

The SuperX VGA board is compatible with VGA Color and monochrome Analog monitors. TTL monochrome monitors with 9-pin connectors are NOT compatible with the SuperX VGA. It is also compatible with Multiple Frequency Monitors, provided the proper 15-pin cable adapter is used with the monitor and the monitor is set to analog.

IMPORTANT: The SuperX VGA uses the same 15-pin (DB15) cable available from monitor manufacturers to interface with the IBM PS/2 computers. Using an incorrect cable may result in damage to the monitor and/or adapter. Contact the monitor manufacturer for proper cabling and pin-outs if you have questions.

2.3 System Compatibility

Most clones are compatible with the SuperX VGA. If you are uncertain, refer to your system's guide to operation or check with the dealer or manufacturer of your computer. The SuperX VGA board is compatible with the IBM Video Graphics Array and Enhanced Graphics Adapter.

Most compatible systems support the IBM VGA or EGA standard. If your computer supports the IBM Enhanced Graphics Adapter, then the SuperX VGA board will work in your system.

Some systems may require a ROM BIOS upgrade to support VGA display. Consult your computer dealer regarding availability of such an upgrade for your particular system.

NOTE: Drivers are not necessary for normal VGA operation. Drivers are included on a 1.44MB 3.5-inch high-density diskette only. You may download drivers released after the printing of this manual from our BBS 24 hours a day at (407) 241-1601 (N, 8, 1). However, if you decide to use the drivers, run the utilities as described in Section Four.

FEATURE
CONNECTOR

MAIN CHIP SET

FCC ID:EUD 5U9 BRI4495

DB-15 VGA
CONNECTOR

VIDEO
DRAM

VIDEO
BIOS

| SXVGA1 (1MB) | SXVGA5 (512K) (upgradeable) | SVGA25 (512K) |
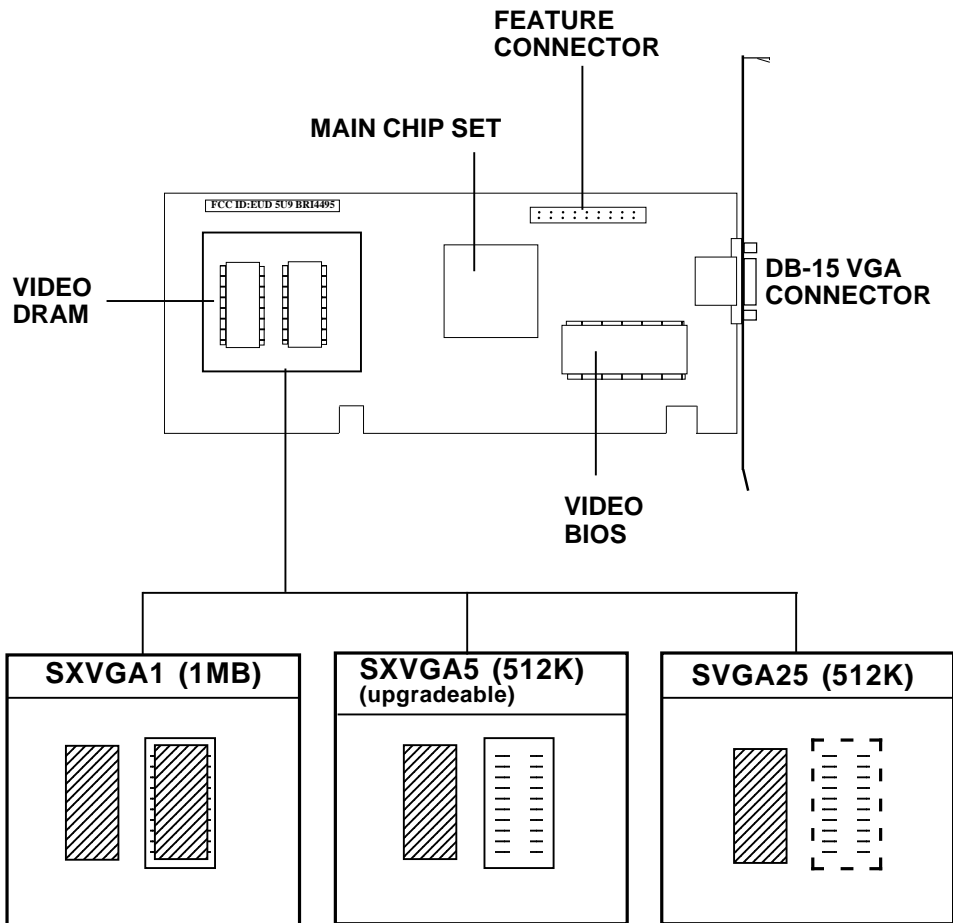
Section Three: Physical Installation

Installation of the SuperX VGA board is simple and quick for the expert and novice alike. The following instructions assume an AT-style or compatible machine. Obviously, locations and types of screws as well as type of case cover will vary based on your particular system. Refer to your computer system documentation for additional assistance.

1. Turn the power switch to the OFF position.

2. Remove the power cord from the back of the computer.

3. Unplug the keyboard cable found in the lower middle of the computer's rear panel.

4. Use a small screwdriver to remove the screws that attach the computer's cover to the rear panel.

5. Carefully slide the cover forward—away from the rear panel. Be careful not to let the cover catch on internal cables to the disk drive and power supply.

> ***The SuperX VGA board must be installed in any available 16-bit slot in your system.*** Adapter card connector slots normally reside in the rear of the system board adjacent to the power supply. There are usually anywhere from five to eight edge connectors, depending on the model of your system.

6. Select any available 16-bit expansion slot and remove the screw and the metal plate that covers the external access to the slot you have selected.

7. Insert the SuperX VGA board in the slot that you have selected, so that the edge connector on the bottom rear of the board mates with the socket on the motherboard. Press down firmly on the board. Secure the board with the screw which you just removed.
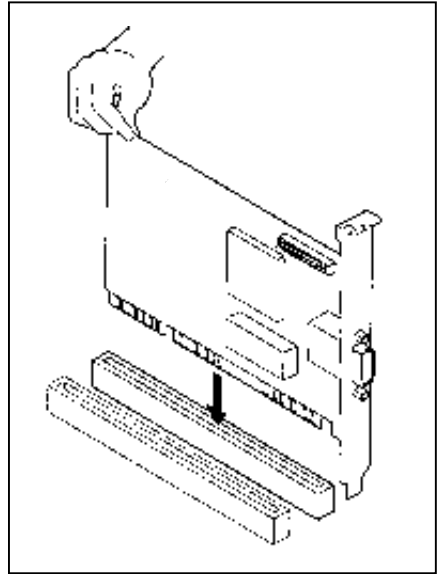
8. Some older motherboards require that switches or jumpers be set for VGA (EGA on still older machines). With newer systems, this is done through the system CMOS setup. Refer to your system documentation for instructions on either jumper settings or running CMOS setup.

9. Slide the computer cover back over the chassis taking care not to let it catch on the disk drive or power cables. Once the cover is in place, replace all the screws that you removed earlier. Re-attach all cables and power cords to their original positions. Attach the appropriate monitor cable to the SuperX VGA.

15-pin Connector
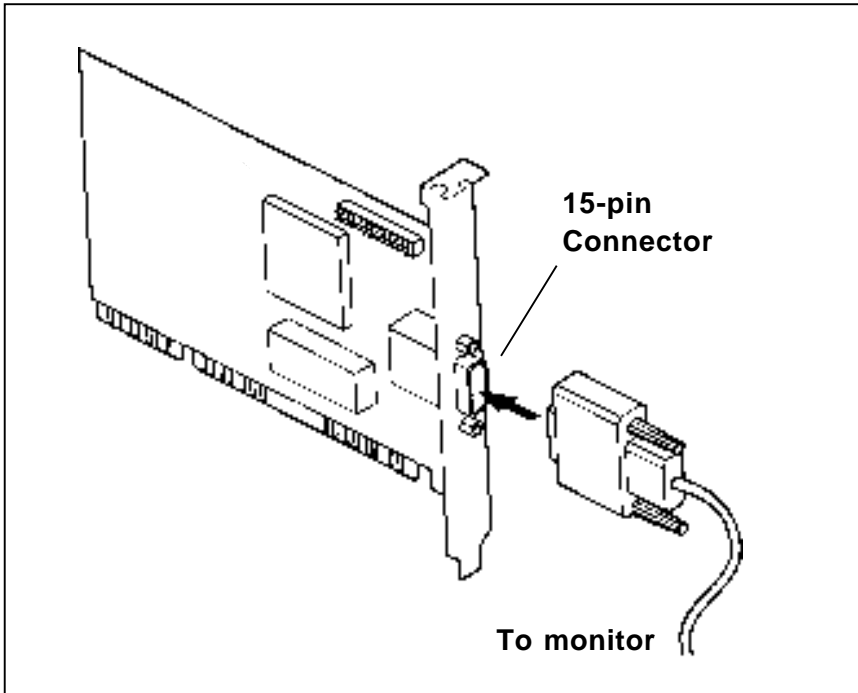
To monitor

Section Four: Preparing Your Monitor

The CLMODE utility allows you to define the type of monitor attached and preview the video modes supported by your monitor. CLMODE is installed by running INSTALL from the driver diskette and choosing "SUPERX VGA UTILITIES", the first selection on the menu. After installation, type the command CLMODE from the subdirectory in which CLMODE was installed (e.g., C:\CLUTIL\CLMODE). Refer to section 5.1 on "Installing Display Drivers" for more information.

```
┌──────────────────────────────────────────────────┐
│ ┌───┐                                              │
│ │ ─ │         CLMODE Utility Program               │
│ └───┘                                              │
│                                                    │
│  ┌─────────────────┐  ┌──────────────────┐         │
│  │  Monitor Type   │  │ Help on Monitor Type│       │
│  └─────────────────┘  └──────────────────┘         │
│                                                    │
│  ┌─────────────────┐  ┌──────────────────┐  ┌────────────────┐│
│  │  Video Modes    │  │ Help on Video Modes│  │ CL-GD5424      ││
│  └─────────────────┘  └──────────────────┘  └────────────────┘│
│                                             ┌────────────────┐ │
│  ┌─────────────────┐  ┌──────────────────┐  │ BIOS Version X.X│ │
│  │    About...     │  │ Help on Keyboard │  └────────────────┘ │
│  └─────────────────┘  └──────────────────┘  ┌────────────────┐ │
│                                             │1024K Video Memory│ │
│  ┌─────────────────┐  ┌──────────────────┐  └────────────────┘ │
│  │     Exit        │  │  Help on Mouse   │                     │
│  └─────────────────┘  └──────────────────┘                     │
│                                                    │
│  ┌──────────────────────────────────────────────┐ │
│  │To make a selection, press the underlined letter│ │
│  └──────────────────────────────────────────────┘ │
└──────────────────────────────────────────────────┘
```
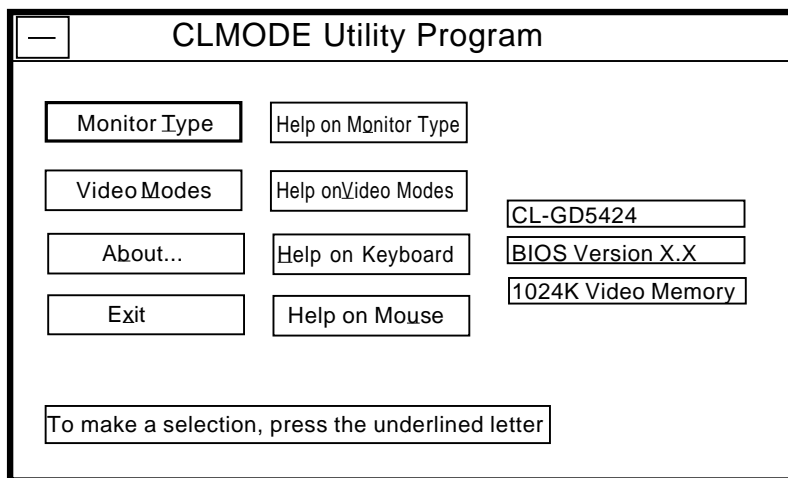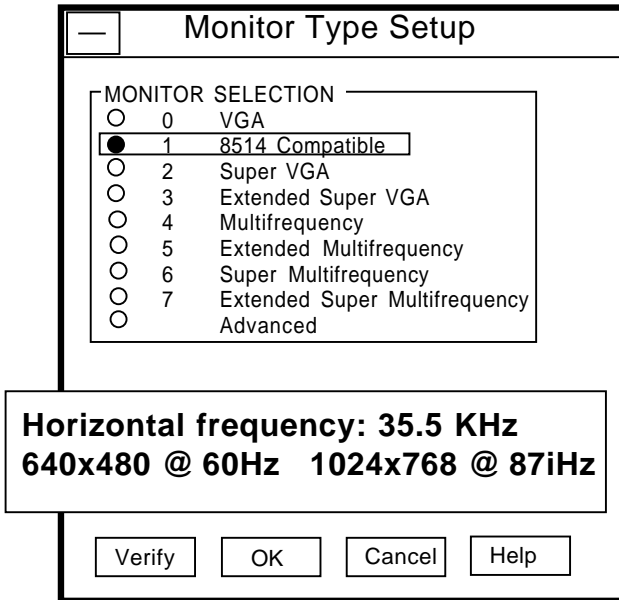
4.1 Choosing the Attached Monitor Type
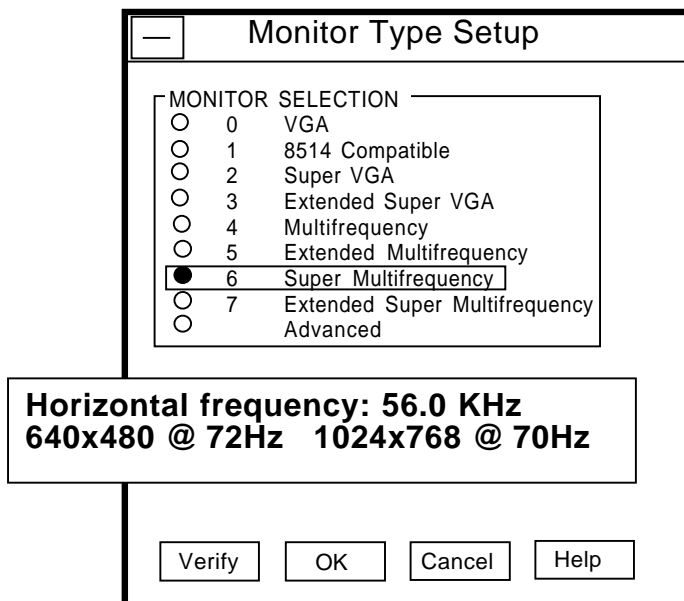
Selecting the proper monitor type will allow the Boca SuperX VGA to display the highest quality output that it is capable of with the attached monitor. The monitor type determines what video modes will be available to your system. It will also determine the vertical refresh rates available to your system. Generally, the higher the refresh rate, the better the screen will look.

Select **Monitor Type** to display the Monitor Type Setup window. The current monitor type and refresh rate will be highlighted initially. Use the keyboard or the mouse to choose the type of monitor attached. Press the OK button to set the new monitor type. Press the CANCEL button to discard any changes. Press HELP for an explanation of the monitor types and VGA refresh rates. For example, if you choose **monitor type 1**, CLMODE will restrict the maximum non-interlaced resolutions to 640x480 at 60Hz and the maximum interlaced resolutions to 1024x768 at 87hz, only. See sample screen below:

```
┌─────────────────────────────────────────────┐
│ ┌───┐                                        │
│ │ — │      Monitor Type Setup                │
│ └───┘                                        │
│  ┌─ MONITOR SELECTION ──────────────────┐    │
│  │  ○    0    VGA                        │    │
│  │  ● ┌ 1    8514 Compatible ┐           │    │
│  │  ○  2    Super VGA                    │    │
│  │  ○  3    Extended Super VGA           │    │
│  │  ○  4    Multifrequency               │    │
│  │  ○  5    Extended Multifrequency      │    │
│  │  ○  6    Super Multifrequency         │    │
│  │  ○  7    Extended Super Multifrequency │   │
│  │  ○       Advanced                     │    │
│  └───────────────────────────────────────┘   │
│ ┌─────────────────────────────────────────┐  │
│ │ Horizontal frequency: 35.5 KHz          │  │
│ │ 640x480 @ 60Hz   1024x768 @ 87iHz       │  │
│ └─────────────────────────────────────────┘  │
│     ┌───────┐ ┌──────┐ ┌────────┐ ┌──────┐   │
│     │ Verify│ │  OK  │ │ Cancel │ │ Help │   │
│     └───────┘ └──────┘ └────────┘ └──────┘   │
└─────────────────────────────────────────────┘
```

If you choose **monitor type 6**, CLMODE allows the maximum non-interlaced resolution to be 1024x768 at 70Hz. See sample screen which follows:

```
 ┌──────────────────────────────────────────┐
 │ ┌───┐                                     │
 │ │ — │       Monitor Type Setup           │
 │ └───┘                                     │
 │  ┌─ MONITOR SELECTION ─────────────────┐  │
 │  │  ○    0     VGA                      │  │
 │  │  ○    1     8514 Compatible          │  │
 │  │  ○    2     Super VGA                │  │
 │  │  ○    3     Extended Super VGA       │  │
 │  │  ○    4     Multifrequency           │  │
 │  │  ○    5     Extended Multifrequency  │  │
 │  │  ●    6     Super Multifrequency     │  │
 │  │  ○    7     Extended Super Multifrequency │
 │  │  ○          Advanced                 │  │
 │  └──────────────────────────────────────┘ │
 │ ┌────────────────────────────────────────┐│
 │ │ Horizontal frequency: 56.0 KHz         ││
 │ │ 640x480 @ 72Hz   1024x768 @ 70Hz       ││
 │ └────────────────────────────────────────┘│
 │                                            │
 │  ┌────────┐  ┌──────┐  ┌────────┐ ┌──────┐│
 │  │ Verify │  │  OK  │  │ Cancel │ │ Help ││
 │  └────────┘  └──────┘  └────────┘ └──────┘│
 └──────────────────────────────────────────┘
```

On some systems the monitor type is remembered from one session to the next. To test this, select a monitor type and exit the CLMODE program. Turn the computer off for approximately ten seconds.

After rebooting the computer, run CLMODE and verify whether or not the monitor you selected is still enabled. If it is, it should never be necessary to set the monitor type again during normal operation. If the monitor type was not kept, then it will be necessary for CLMODE to be added to your AUTOEXEC.BAT.

> **IMPORTANT: Never choose a selection that your monitor does not support. See the chart on page 20 for some examples.**

4.2 Using CLMODE's Menu-driven Interface

From the CLMODE directory, type the following at the DOS prompt:

CLMODE [Enter]

The main window, as shown on page 14 consists of the following selections: Monitor Type, Video Modes, and Help. Each selection contains one or more menu items. The underlined letter of a menu item specifies the hot keys combination for that item. For example, pressing the [T] key selects the Monitor option. Note that a mouse driver must first be installed prior to running the CLMODE utility in order to use the mouse pointer for menu selection.

4.3 Previewing the Video Mode

Select **Video Modes** from the main window. The Video Modes Preview window displays all the modes supported according to the monitor type selected and the video memory present. Use the mouse or the keyboard to move the highlighted bar to the video mode you wish to preview.

To preview the mode, press [ALT] and [P], or position the mouse cursor on the Preview button, and press the left mouse button. After CLMODE exits back to DOS, the desired video mode will be set.

Retrieving the current VGA controller status

The information in the main window displays the VGA controller type, the BIOS version number, and the amount of video memory present.

4.4 Getting Help

CLMODE provides Help for the following items: Monitor, Video Modes, Mouse, Keyboard and About. The Monitor help window explains the different capabilities of each monitor type. The Display help window gives a detailed description of the video modes and the VGA controller status. The Keyboard and Mouse help windows explain how to use the keyboard and the mouse to make selections. The About window displays the CLMODE version number.

Exiting the CLMODE Menu-driven Utility Program

To exit CLMODE at any time, select EXIT or press ALT X.

4.5 Using CLMODE's Command Line Options

When command line options for CLMODE.EXE are given at the DOS prompt, the menu-driven windows will not be displayed. Instead, monitor type, video mode, and refresh rate will be set at the DOS prompt. The command line options for CLMODE.EXE are as shown below:

CLMODE [[modenum][+*-]] [m[montype] | t6=x t8=x t1=x t2=x]

[modenum] =mode number (valid values listed in the Video Modes Preview window, when Video Modes is selected from the CLMODE main window.

[+*-]   + selects 400 lines (default)
                       * selects 350 lines
                       - selects 200 lines

[montype]=monitor type (valid values are listed in the table on page 20); the following are settings for advanced monitor type:

t6=x(Hz)   640x480   @ (0 = 60, 1 = 72)
t8=x(Hz)   800x600   @ (0 = 56, 1 = 60, 2 = 72)
t1=x(Hz)   1024x768 @ (0 = 87i, 1 = 60, 2 = 70, 3 = 72)
t2=x(Hz)   1280x1024 @ (0 = 87i, 1 = Not available)

For example, to select mode 3 for a SuperX VGA monitor (montype 2), type the following command at the DOS prompt:

CLMODE 3+ m2[Enter]

To select custom monitor timings with 640x480 at 60Hz and 800x600 at 72Hz refresh type:

CLMODE t6=0 t8=2[Enter]

Typing an invalid option will display the command line help text. Typing [S] as a command line option will display the current monitor setting e.g.,

CLMODE S [ENTER]

Following is a table of common monitor types and associated values that you should use for the [montype] option. Resolutions with more than one entry per line in the vertical frequency column signify availability of the high-refresh option.

VALID MONITOR SETTINGS

Valid Value*	Monitor Type	Horizontal Frequency	Vertical Frequency	Display Resolution
0	IBM 8512 IBM 8513 IBM 8503	31.5	**LOW or HIGH** 60	640x480
1	IBM 8514 IBM 8515	31.5 35.5	60 87i	640x480 1024x768
2	NEC 2A	31.5 35.1	60 56	640x480 800x600
3	NEC II	31.5 35.1 35.5	60 56 87interlaced	640x480 800x600 1024x768
4	NEC3D	31.5 35.5 37.8	60 87interlaced 60	640x480 1024x768 800x600
5	Sony CPD-1304 NEC 3FGx Nanao 9065S	31.5 48.0 48.0	72 72 60	640x480 800x600 1024x768
6	NEC 4D NEC4FG Nanao T240i	31.5 48.0 56.5	72 72 70	640x480 800x600 1024x768
7	NEC 5D NEC 5FG/6FG Nanao T560i	31.5 48.0 56.5	72 72 70	640x480 800x600 1024x768

Section Five: Display Drivers

This section describes the installation and operation of the display driver programs for the Microsoft Windows driver that is shipped with your SuperX VGA adapter. Information on drivers for other popular applications is provided in README files on the diskettes. These files may also contain information on new drivers which became available after the printing of this manual. The drivers allow you to use the extended features of the SuperX VGA board. You may also check our BBS for additional drivers. Highlights include:

SVGA25 Resolution	Colors	SXVGA5 Resolution	Colors	SXVGA1/A5 Resolution	Colors
1024x768	16	1024x768	16	1024x768	256
800x600	256	800x600	256	800x600	64K
640x480	256	640x480	256	640x480	16.7M

If you intend to use your VGA adapter in standard VGA modes, you DO NOT need to install any of these drivers.

Your display drivers support the following software applications and environments. For documentation:

In this Manual	On README
Microsoft Windows	AutoCAD Rel. 11,12 Autoshade 3d Studio Lotus 2.x, 3.0, 3.1 Microsoft Word 5.0, 5.5 WordPerfect 5.1

NOTE: To use the 800 x 600 or 1024 x 768 graphics display drivers, you must have a multiple frequency monitor capable of displaying that resolution. Standard VGA monitors (such as IBM's analog monitors) ***do not have*** *that capability.*

5.1 Installing the Display Drivers

IMPORTANT: If you are installing these drivers, make sure you also install the Utilities which include CLMODE.

• Make sure the Boca SuperX VGA is present (physically installed) BEFORE installing any drivers.

• Insert the diskette into your system drive A:. (or B:) and change to either A: or B: as necessary.

• Type INSTALL and follow all on-screen instructions.

• After an introductory screen, you will be presented with a list of available disk drives. Either accept the default disk drive of C: or choose any listed drive. You will then see a screen containing driver choices as shown on the following page.

- Select the drivers you want to install. Make sure you select UTILITIES so you are able to run CLMODE. Never choose a higher resolution than your monitor supports. You are offered a default subdirectory for the driver to be installed in (e.g., \WP51 for WordPerfect 5.1). The default may be changed if necessary. Make a note of the subdirectories that the drivers/ utilities were copied to for future reference.

- After your selected driver(s) have been installed, you are returned to the DOS prompt.

- Refer to the driver's associated README file for your particular application or environment for information.

```
Select the SXVGA1/SXVGA5/SVGA25 Display Drivers to install on drive C:

SXVGA1/SXVGA5/SVGA25 VGA Utilities                               NO
AutoCAD 11 & 12 / 3D Studio / Autoshade  Multi-res   Multi-color NO
Lotus 1-2-3                   Ver  2.x   Multi-res    16-color    NO
Lotus 1-2-3                   Ver  3.0   Multi-res    16-color    NO
Lotus 1-2-3                   Ver  3.1   Multi-res    16-color    NO
Word                         Ver  5.0   800x600      16-color    NO
Word                         Ver  5.5   800x600,1024x768 16-color NO
WordPerfect                  Ver  5.1   Multi-res    16-color    NO




↑ - scroll up      PgUp - scroll page up     Enter     - install selections
↓ - scroll down    PgDn - scroll page down   Space bar - toggle Yes/No
Y - all YES        N    - all NO             Esc       - Exit Install
```

NOTE: Additional drivers may appear on this screen as more applications are supported. REMEMBER TO RUN UTILITIES BEFORE YOU RETURN TO YOUR APPLICATION.

5.2 Installing Windows 3.1 Drivers

Installing the Windows 3.1 Drivers for the SuperX VGA

1. If you haven't done so already, install the SuperX VGA utilities.

2. At the DOS prompt, change to your Windows subdirectory.

3. Type **SETUP**.

4. Select the display resolution and press [ENTER].

5. Select "VGA" and press [ENTER].

6. Start Windows.

7. Go to Program Manager Main Menu, select "File", and then "Run".

8. Type **A:SETUP** (or B:**SETUP**) and follow all on-screen instructions. Setup copies the drivers to your Windows directory and adds the SETRES icon to the "VGA Utilities" group in the Program Manager.

9. Use the SETRES program to change the resolution and number of available colors for your Windows screen. See the next page, "Using the SETRES Utility under Windows 3.1".

5.3 Using the SETRES Utility under Windows 3.1

1. Click on Window in the Program Manager Main menu. Then click on "VGA Utilities"

2. Double click on the SETRES icon in the VGA Utilities desktop. The screen below will appear.

3. The Resolution button will be at 640x480, and the color button will be at 16 colors by default.

4. To select a higher number of colors, click on that color value (e.g., 256 colors).

Set Resolution

File   Help

Display Resolution
● 640 × 480
○ 800 × 600
○ 1024 × 768
○ 1280 × 1024

Font Size
● Normal
○ Large

Number of Colors
● 16 colors   ○ 65,536 colors
○ 256 colors   ○ 16,777,216 colors

OK   Cancel
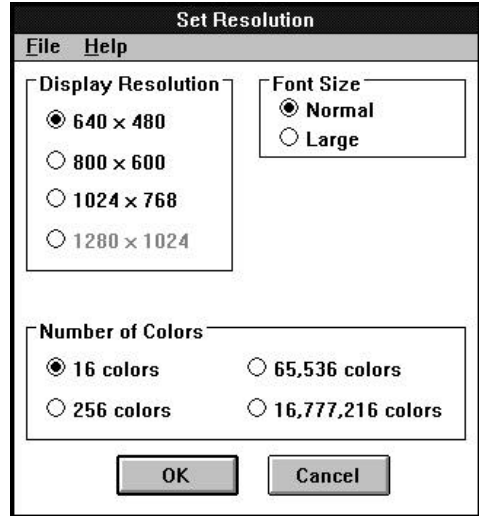
5. Only the options in the SETRES window that are bold (not grayed out) are available at that time.

6. For example; changing from 640x480/16 colors, to 1024x768/ 256 colors.

• click on the 256 color resolution button
• next, click on the 1024x768 resolution button

Follow all on-screen directions

Appendix A: Troubleshooting

This section lists common problems that may be encountered and their possible solutions.

SYMPTOM	POSSIBLE REMEDY
System does not power up and the screen is blank.	• Ensure the SuperX VGA is properly inserted in its slot. • Ensure you do not have another video card in the system using the memory address. If you do, you need to remove it from your system and try re-booting. Remember: the SuperX VGA must be the primary video adapter (using two video adapters is not recommended). • Verify that switch settings and/or jumpers are properly set on your motherboard. Refer to Section Two for compatibility requirements. • Confirm that your computer and monitor are plugged in. Check all power cables.
The computer seems to boot, but there is no display.	• Check all cable and power cable connections and verify that the monitor is powered on. Adjust brightness and contrast controls correctly.

SYMPTOM	POSSIBLE REMEDY
The computer seems to boot, but there is no display (contd).	• Verify that your monitor cable is the proper type. • Ensure you do not have another video memory card in the system using the same memory address; if you do, you may need to remove it from your system and try re-booting. Remember: the SuperX VGA must be the only or primary adapter. • Verify motherboard switch and jumper settings. • If your multi-frequency monitor has an Analog/Digital switch, make sure it is set to the Analog position. • Examine your monitor display cable for broken or bent pins.
Your monitor's display appears somewhat distorted when running a graphics application	• Set the vertical hold properly on your monitor. • Ensure that your current graphics application software has been properly installed. • Ensure that your monitor is capable of displaying the graphics mode you are using. Refer to your monitor specifications.

SYMPTOM	POSSIBLE REMEDY
Your monitor's display appears somewhat distorted when running a graphics application (contd).	• Ensure you are using the correct vertical refresh rate for your monitor. • If your monitor has vertical placement and size adjustment controls, try these controls to adjust the display. • Use CLMODE (Section Four) to match the monitor to the SuperX VGA.
You are unable to get the SuperX VGA to work in your computer, but have found that it works well in another.	• Refer to the preceding suggested remedies. If the SuperX VGA functions properly in another system, it is likely the problem lies elsewhere. • Ensure that your computer has a VGA-compatible BIOS. This may be absent in some older machines. If so, upgrade your BIOS. • Ensure that your computer is completely compatible with IBM standards. Some machines do not support IBM-standard video BIOS requirements.

SYMPTOM	POSSIBLE REMEDY
You're experiencing problems installing the SuperX VGA on a network.	• Generally speaking, when configuring a network system avoid the following areas the SuperX VGA occupies: Memory addresses A000h - C7FFh, I/O addresses 03B0h - 03Dfh and in some instances 02E0h - 02EFh. The SuperX VGA does not require an interrupt (IRQ). Some network cards do not fully decode a 16-bit I/O address; these cards deal only with 10-bits of a 16-bit I/O address. The SuperX VGA has a global set up register at an I/O base address of 46E8h. A network card that improperly decodes I/O addresses will see 46E8h in a 10-bit format as 02E8h. 02E8h may conflict with a network card in the 02E0h-02EFh range. The symptoms of this conflict manifest in the inability to access the Server. To alleviate this problem choose an alternative base I/O address for your network card and regenerate the shell; refer to your network documentation or network software vendor if you require additional assistance in this area.

Appendix B: Servicing Your Boca Product

If your SuperX VGA board requires service, first contact the authorized SuperX VGA dealer from whom you purchased the board. If the dealer is unable to assist you, and you must contact Boca Research, Inc., please follow the instructions below. Our electronic BBS is available 24 hours a day at (407) 241-1601 and will support data transmission speeds up to 28.8Kbps with settings of N, 8, 1. If you have a modem, the BBS may be helpful (especially during off hours) if you have a question about product settings or compatibility, or if you wish to download driver software or utilities.

> **NOTE: CALLING TECHNICAL SUPPORT WITHOUT COMPLETE AND ACCURATE INFORMATION CONCERNING YOUR PROBLEM MAY BE BOTH TIME-CONSUMING AND FRUSTRATING FOR YOU.**

1. When calling Boca Research Technical Support, have the following information available:

- **Exact board name/product code and board part number**
- **Software/driver revision level** • **Computer manufacturer**
- **Computer model** • **Peripherals in the system**
- **Operating system and version** • **Contents of system's CONFIG.SYS**

If you suspect a problem with a specific program or software package, make note of the name, version or release number, and manufacturer of the software. Also use CLMODE (see Section Four) to determine your SuperX VGA's BIOS revision.

2. Call Boca Research Technical Support Department between the hours of 8:00 a.m. and 6:30 p.m. Eastern time Monday through Friday at (407) 241-8088. A technical support specialist will be available to discuss the problem(s) you are experiencing. If it is determined that factory service is required, you will be given a Return Merchandise Authorization (RMA) number. **Please place this number on the outside of the package** when you return the item(s) for service and

reference it on any correspondence included in the package. Boca Research, Inc. will return any product which is not accompanied by an RMA number.

3. If the product is covered under the five-year Boca Research, Inc. Limited Warranty, refer to the Warranty Statement.

4. Certain parts (such as dealer installed RAM chips) will not be covered under the Boca Research, Inc. Limited Warranty. Dealer installed parts are warranted by the dealer. Parts which you have installed yourself are covered only by the supplier's warranties. In these cases, Boca Research, Inc. can identify which parts are defective, but will not replace such parts until specific written authorization is received from you. The cost of parts and labor involved in making such repairs will be billed to you C.O.D.

5. When sending a board to Boca Research, Inc. for repairs, please be sure to include:

   • **the SuperX VGA (board only)**
   • **a copy of the original invoice**
   • **your return street address (for UPS purposes)**
   • **phone number**
   • **the RMA number mentioned above**

   Package the product securely in a container equivalent to the original packaging, and insure the package to protect against loss or damage during transit. Shipping charges must be prepaid; C.O.D. shipments will not be accepted. Please use the address below for all correspondence:

<div align="center">

Boca Research, Inc.
RMA Department - RMA # _____
1601 Clint Moore Road
Boca Raton, FL 33487-2841

</div>

6. If the repairs performed on your board were covered by the warranty, Boca Research, Inc. will return it prepaid via UPS.

Appendix C: Technical Specifications

Connector Information

The following table shows the pin-out assignments for the DB15 video cable connectors.

IMPORTANT:

The SuperX VGA uses the same 15-pin (DB15) cable available from monitor manufacturers to interface with the IBM PS/2 computers. Using an incorrect cable may result in damage to the monitor and/or adapter. Note: some monitor manufacturers use slightly different naming conventions for the signal while retaining the same pin functionality. Do not be concerned. All that is required is PS/2 functionality.

Signal	Pin
Red	1
Green	2
Blue	3
Monitor ID bit 2	4
Ground	5
Ground	6
Ground	7
Ground	8
Ground	9
Not Used	10
Monitor ID bit 0	11
Monitor ID bit 1	12
Horizontal Sync	13
Vertical Sync	14
Monitor ID bit 3	15

Pin-Out Assignments for the DB15 Video Cable Connector

Technical Specifications

- Built-in monitor-type detection
- Programmable internal video clocks up to 80 MHz
- 50 MHz memory clock for high-speed performance
- Display memory of 512K (SVGA25) or 1MB (SVGA1) or 512K upgradeable to 1MB (SVGA5)
- Advanced memory write buffer and zero wait state request capability
- Internal asynchronous display data FIFO allows the system optimum access to the memory.
- Direct Mapping to system address space (selectable 1MB area)

Video Modes

Resolution	SXVGA1/A5 (1MB)	SXVGA5 (512K/1MB)	SVGA25 (512K)
1024 x 768	Up to 256 colors interlaced/ non-interlaced	Up to 16 colors interlaced/ non-interlaced	Up to 16 colors interlaced/ non-interlaced
800 x 600	Up to 64K colors non-interlaced	Up to 256 colors non-interlaced	Up to 256 colors non-interlaced
640 x 480	Up to 16.7M colors non-interlaced	Up to 256 colors non-interlaced	Up to 256 colors non-interlaced

VESA Standard VGA Pass Through Connector Specification

A 26-pin header stake connector is provided which maintains pin to pin compatibility with IBM's feature connector as shown in the table on the next page.

26 pin stake connector pinout:

Signal	Vesa Pin	IBM Feature Connector
Pixel Data 0	1	y1
Pixel Data 1	2	y2
Pixel Data 2	3	y3
Pixel Data 3	4	y4
Pixel Data 4	5	y5
Pixel Data 5	6	y6
Pixel Data 6	7	y7
Pixel Data 7	8	y8
Pixel clock	9	y9
Blanking	10	y10
Horz. Sync	11	y11
Vert. Sync	12	y12
ground	13	y13
ground	14	z1
ground	15	z2
ground	16	z3
Enable External Pixel Data (1)	17	z4
Enable External Sync (2)	8	z5
Enable External Pixel Clock (3)	19	z6
not used	20	z7
ground	21	z8
ground	22	z9
ground	23	z10
ground	24	z11
not used	25	z12
(clipped)	26	z13

(1) A low enables feature connector pixel data input to the RAMDAC.
(2) A low enables feature connector sync and blanking inputs.
(3) A low enables feature connector pixel clock input.

For additional information see the Auxiliary Video Connector description in the *IBM PS/2 Hardware Technical Reference Manual*.

FCC Compliance

This equipment has been tested and found to comply with the limits for a **Class B** digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

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.

(2) This device must accept any interference received, including interference that may cause undesired operation.

Shielded cables are required between the computer and the monitor with the shield properly grounded. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio or television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful 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 or relocate the receiving antenna.
• Increase the separation between the equipment and the receiver.
• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
• Consult the dealer or an experienced radio/TV technician for help.

CHANGES OR MODIFICATIONS TO THIS EQUIPMENT NOT EXPRESSLY APPROVED BY THE MANUFACTURER COULD VOID YOUR AUTHORITY TO OPERATE THE EQUIPMENT.

Glossary

8514. An IBM color monitor capable of resolutions of 720x400 non-interlaced with a refresh rate of 70Hz; 640x480 non-interlaced at 60Hz; or 1024x768 interlaced at 43.58 MHz. All of these resolutions are in 256 colors.

Analog Monitor. A monitor which uses an analog signal. Analog monitors can display an infinite number of shades for each primary color.

Autoswitch. The ability of a display adapter to automatically determine the display standard required by your software and to take action accordingly.

BIOS. Basic Input Output System. Provides fundamental services required for the operation of a computer. Permanently present in the machine, these routines are generally stored in ROM (Read Only Memory). The system board contains a ROM BIOS to support all of its standard functions. The SuperX VGA also has a BIOS for display features.

CGA. Color Graphics Adapter. Medium resolution IBM graphics standard capable of displaying 640 x 200 pixels in 2 colors, or 320 x 200 pixels in 4 colors.

Color Monitor. Any CGA, EGA, VGA color, or multiple frequency monitor.

Digital Monitor. Monitor which receives discrete binary signals. Digital monitors do not have as wide a range of color choices as analog types; digital EGA monitors can display just 64 colors.

DRAM. Dynamic RAM. RAM is random access memory.

ECD. Enhanced Color Display. An EGA specification. TTL monitor capable of displaying video signals with horizontal scan frequencies of 15.750KHz (CGA) or 21.850KHz (EGA) only.

EGA. Enhanced Graphics Adapter. High resolution IBM graphics standard capable of displaying 640 x 350 pixels in 16 colors out of a palette of 64 colors.

EGA Monitor. Any monitor capable of displaying both EGA and CGA standard modes. This includes ECD and multiple frequency monitors.

Extended EGA. Offered by proprietary chip sets on non-IBM adapter cards with 640 x 480 resolution or better.

Feature Connector. Used by graphics adapters to give compatibility with VGA text and graphics codes for use with multi-media applications.

GUI. Graphical User Interface.

Flicker. The wavering or unsteady image on some monitors. A major cause can be a low refresh rate.

Hardware Graphics Cursor. Provides a faster method of displaying/ moving a cursor (GUI arrow) on the screen. The video adapter's main chipset controls this function which resides in system memory, as opposed to slower handling by the application software.

HGC. Hercules Graphics Card. Compatible with MDA, but also capable of displaying 720 x 348 pixels in a 4-bank graphics mode.

Hi-res. Short for High Resolution, this term should be only applied to a minimum of 640 x 350 resolution and above.

Horizontal Scan Rate. The frequency in KHz (kilohertz) at which the monitor is scanned in a horizontal direction; high horizontal scan rates produce higher resolution. The EGA horizontal scan rate is 21.8 KHz, while the extended EGA horizontal scan rate is 30.1 KHz.

Interlaced. A method of scanning a screen which results in alternate lines being drawn with each full pass of the electron beam. The resulting display is less stable than a flicker-free non-interlaced display.

MDA. Monochrome Display Adapter. Early IBM Video display board designed for use with IBM monochrome text standard.

Monochrome Monitor. A TTL monitor which can display only 2 colors (generally green/black or amber/black).

Multiple Frequency Monitor. Monitor capable of displaying video signals over a wide range of horizontal scan frequencies. This may include a horizontal capture range from 5.5KHz to 35KHz or wider. Examples of monitors in this class are the NEC MultiSync and the Sony Multiscan. The Multiscan has a wide horizontal scan capture range which enables it to display monochrome signals.

Palette. The range of colors from which you can select the actual colors that the video adapter will display simultaneously.

Pixel. A single dot on the CRT display. This word is derived from the words 'picture' and 'element'.

RAMDAC. RAM Digital to Analog Converter.

Refresh Rate. Also called Vertical Scan Rate, the speed at which the screen is repainted. Typically, color displays must be refreshed at 60 times per second. Usually, the faster the refresh rate, the less flicker a monitor has (normally defined in Hz).

Register Level Compatibility. Complete compatibility to the hardware level.

RGB Monitor. Red/Green/Blue. A CGA compatible monitor limited to a 15.750KHz horizontal scan rate.

Scan rate. The frequency in Hertz (Hz) at which the monitor is scanned horizontally. Generally, the higher the scan rate, the higher the resolution.

TSR. Terminate and Stay Resident. A program that remains in memory after it has been loaded.

TTL. Transistor-Transistor Logic; a fast, reasonable-cost type of integrated circuit used in some monitors.

TTL Monitor. Video and synchronization signals (all digital) are on separate lines and have TTL compatible voltage levels.

VESA. Video Electronics Standards Association.

VGA. (Video Graphics Array) Analog graphics standard introduced with the IBM PS/2 series. Backwards compatible with EGA at the BIOS level, but provides higher resolutions. Supports a maximum resolution of 640 x 480 pixels in 16 colors out of a palette of 262,144 colors.

Suggested Reference Works

The following works provide additional technical information and advanced programming techniques for VGA graphics:

• *VESA Super VGA Standard* #VS900602 Revision A, Video Electronics Standards Association, June 1990.

• *IBM Personal System/2 Technical Reference for the Model 50/60 or 80.*

• *Programmer's Guide to the EGA and VGA Cards*, Richard F. Ferraro, Addison-Wesley Publishing Company, 1988.

• *Programmer's Guide to the EGA/VGA*, George Sutty and Steven Blair, Brady Books, 1988.

• *Programmer's Guide to PC & PS/2 Video Systems*, Richard Wilton, Microsoft Press, 1987.

• *Guide to Features, Phoenix View VGA-Compatible BIOS*, Phoenix Technologies, Ltd., 1990.

• *Technical Reference Manual, Phoenix View VGA-Compatible BIOS*, Phoenix Technologies, Ltd., 1990.

Limited Warranty

Boca Research, Inc. (BRI) warrants to the original buyer of this BRI product that the hardware is free of defects in materials and workmanship for a period of five (5) years from the date of purchase from BRI or its authorized dealer. Should the product fail to be in good working order at any time during the five-year period, BRI, will at its option, repair or replace this product as described below. This warranty does not cover defects resulting from misuse, abuse, negligence, accident, repairs, or alterations made by either the customer or another party. Boca Research reserves full rights to determine whether a defective product falls into this category.

The entire risk as to the quality and performance of the product rests with the customer. Any written or oral information or advice given by Boca Research dealers, distributors, agents, or employees will in no way increase the scope of this warranty. This warranty applies only to the product described in this manual and not to any other value-added software which may be included.

All products will be serviced and returned via UPS-ground at no charge to customers DURING the first year of service.

All customers are required to demonstrate proof of purchase when requesting a Return Merchandise Authorization (RMA). The period of service commences on the date of purchase. A copy of the sales slip must be included with the returned merchandise.

Products which require Limited Warranty service during the warranty period should be delivered to BRI at the address in the Appendix (Servicing Your Boca Product) with proof of purchase and the Return Merchandise Authorization (RMA) number provided by BRI Technical Support. Refer to the Appendix in your manual. Replacement parts or complete products will be furnished on an exchange basis only. Replaced parts and/or products become the property of BRI.

If the returned product is sent by mail, the purchaser agrees to prepay shipping charges, insure the product or assume the risk of loss or damage which may occur in transit, and to use a shipping container equivalent to the original packaging. ALL EXPRESS AND IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS OF PURPOSE FOR THE PRODUCT ARE LIMITED IN DURATION TO THE ABOVE FIVE- AND ONE-YEAR PERIODS, RESPECTIVELY.

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Boca Research reserves the right to make periodic changes or enhancements to any Boca Research product without prior notification, but has no obligation to modify or update products once sold.

This warranty gives you specific legal rights, and you have other rights which may vary from state to state. This warranty is valid only in the United States.

Software License Agreement for the Boca Research SuperX VGA

Boca Research, Inc. (BRI) grants the owner permission to use SuperX VGA software upon adherence to the terms and conditions of this agreement.

1. The use of SuperX VGA software will be limited to computers that contain the SuperX VGA board.

2. Any reproductions of the SuperX VGA software are also subject to this agreement.

3. SuperX VGA software is not to be modified in any way; it should be used in its original form.

4. Should a change in ownership occur, these three conditions MUST be met:

• the SuperX VGA board must also be transferred to the new owner.

• any copies of the SuperX VGA software which are not being transferred must be destroyed.

• the new owner must abide by the terms presented in this agreement.

5. BRI remains the copyrighted owner of the SuperX VGA software. The ONLY rights given to the licensee are those which have been provided for under this agreement.

6. UNDER NO CIRCUMSTANCES WILL BRI BE HELD LIABLE IN ANY WAY TO ANY PURCHASER FOR DAMAGES, LOST REVENUE, LOST WAGES OR FOR ANY OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND WHETHER COVERED UNDER THIS AGREEMENT OR OTHERWISE. THE SuperX VGA SOFTWARE IS NOT WARRANTED IN ANY WAY AND ITS USE IS THE SOLE RESPONSIBILITY OF THE LICENSEE FREE FROM ANY EXPRESSED OR IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

7. BRI provides a five year warranty for the media on which the SuperX VGA software is furnished. This warranty is limited to defects in materials and workmanship; it does not cover the functions provided by the SuperX VGA software. This license is subject to termination upon breach of this agreement. The SuperX VGA software and any copies must be destroyed or returned to Boca Research, Inc.

8. BRI reserves the right to make modifications to the software without any prior notice.

9. This license is governed by the laws of the state of Florida.

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