Boca Voyager™

WITH VIDEO CACHING

PRODUCT CODES:
SVCXL1
SVCXL2

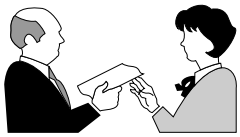
Installation Guide

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

Technical Support Fax
407-997-0918

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

Automated *Fax Retrieval System*
407-995-9456

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.

On-Line Support!

***CompuServe*: GO BOCA**
***Internet*:**
***email:* support@boca.org**
on the World Wide Web:
http://www.boca.org

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.

Contents

Section One: Introduction **6**

Section Two: Compatibility & Requirements **8**
2.1 Installation Requirements 8
2.2 Monitor Compatibility 8
2.3 System Compatibility 9

Section Three: Physical Installation **10**
3.1 Removing the System Cover 10
3.2 Inserting the Boca Voyager 11
3.3 Replacing the System Cover 12

Section Four: Display Drivers **13**
4.1 Microsoft Windows 15
4.2 DOS 17
4.3 AutoCAD 12 ..... **19**

Section Five: Utilities **22**
5.1 Microsoft Windows 22
5.2 DOS 26

Appendix A: Troubleshooting **28**
Appendix B: Servicing Your Boca Product **32**
Appendix C: Technical Specifications **34**
Appendix D: Upgrading Video & Cache RAM **37**
FCC Compliance **38**
Glossary **39**
Suggested Reference Works **43**

Section One: Introduction

Congratulations on the purchase of your Boca Voyager VGA board. The Boca Voyager is designed to work with any VESA Local Bus (VL Bus) compatible computer. Information is provided for installing software drivers which provide enhanced video display with many popular applications. Drivers are included on diskettes shipped with your Boca Voyager, but it is ***NOT*** necessary to install these drivers for normal VGA operation.

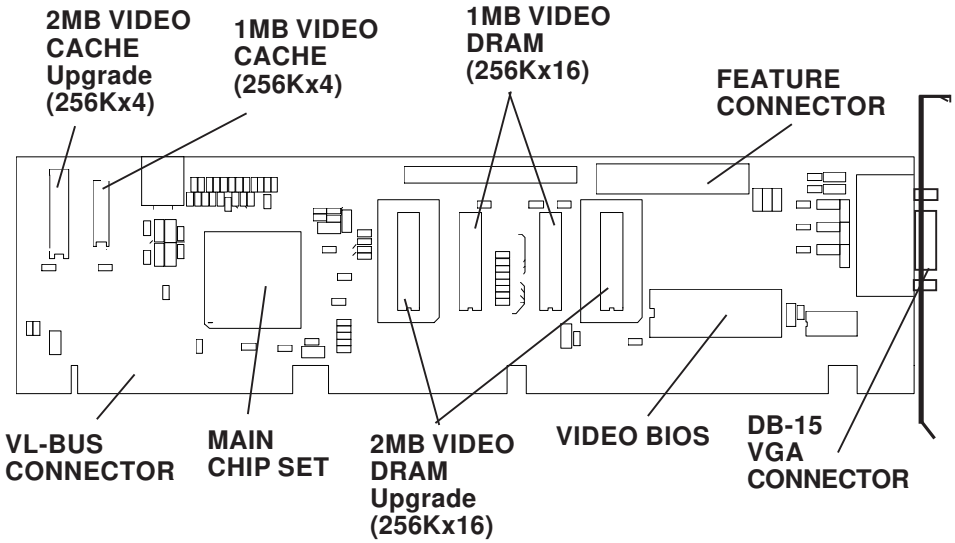
Features:

- 32-bit VL-bus
- easy installation
- uses state-of the-art video caching to provide the fastest video performance
- designed for peak performance with multi-media applications and CD-ROM video
- 1MB DRAM video memory
- 15/16 Bit High Color and 24-bit True Color
- Hardware graphics cursor and bit block transfer (BitBLT)
- Supports both interlaced and non-interlaced monitors
- Feature connector for use with multi-media products

Benefits:

- Revolutionary video caching using XRAM technology provides VRAM performance at DRAM pricing*.
- Designed to provide fast performance for multi-media applications
- 16 million colors provide brilliant, lifelike photographic images
- Five-year warranty
- Developed and manufactured in the U.S.A.
- Future software drivers available free of charge, downloadable from Boca's BBS.

* In a traditional graphics system, the CPU must wait while video memory (DRAM) processes screen refreshes. With video cache-based system, screen refresh cycles are accessed from the XRAM video cache. This allows the CPU clear access to main video memory and as a result better overall system performance.



Section Two: Compatibility & Requirements

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

2.1 Installation Requirements

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

2.2 Monitor Compatibility

The Boca Voyager board is compatible with VGA Color and monochrome analog monitors. TTL monochrome monitors with 9-pin connectors are NOT compatible with the Boca Voyager. 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 Boca Voyager uses the same 15-pin (DB15) cable available from monitor manufacturers to interface with IBM and compatible computers. Using the wrong cable could cause 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 with VESA Local Bus slots are compatible with the Boca Voyager. If you are uncertain, refer to your system's guide to operation or check with the dealer or manufacturer of your computer. The Boca Voyager board is compatible with the IBM Video Graphics Array and Enhanced Graphics Adapter.

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

NOTE: **Drivers are not necessary for normal VGA operation.** Drivers are included on 1.44MB 3.5-inch high-density diskettes 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).

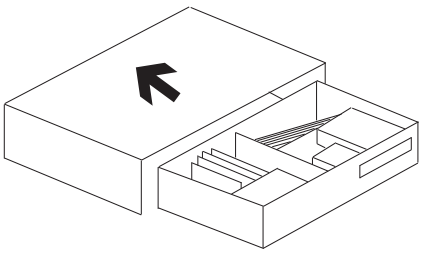
If, however, you decide to use the drivers, refer to Section Four for driver installation. Section Five provides information on additional utilities.

Section Three: Physical Installation

Installation 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.

3.1 Removing the System Cover

Turn the power switch to the OFF position. Remove the power cord from the back of the computer and unplug the keyboard cable found in the lower middle of the computer's rear panel. Then use a small screwdriver to remove the screws that attach the computer's cover to the rear panel. Carefully slide the cover forward—away from the rear panel.



The Boca Voyager board must be installed in a VL-bus compatible connector. This connector slot consists of a standard 16-bit ISA connector plus one extension connector. The Boca Voyager board will NOT function if it is plugged into a standard 16-bit connector slot.

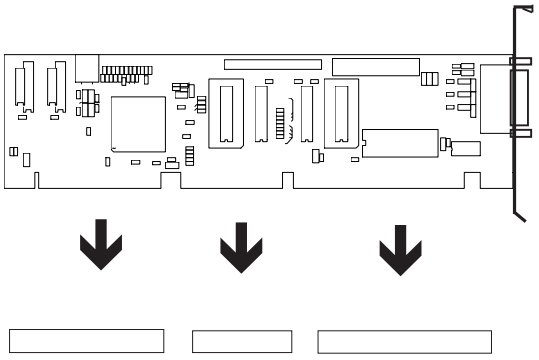
3.2 Inserting the Boca Voyager Board

1. Select any available VL-Bus expansion slot.

2. Remove the screw and the metal plate that covers the external access to the slot you have selected.

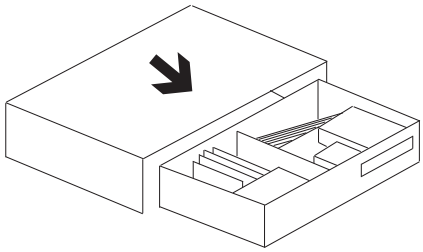
   NOTE: If there are two local bus slots in your system ("master" and "slave"), the Boca Voyager may be placed in either. If you have a bus-mastering card already installed, it must be in the "master" slot and the Boca Voyager must be in the "slave" slot.

3. Insert the Boca Voyager in the slot that you have selected, so that the three edge connectors on the bottom rear of the board mate with the socket on the motherboard. Press firmly on the board and ensure that it seats properly into the slot. Now, secure the board with the screw you removed in step 2.

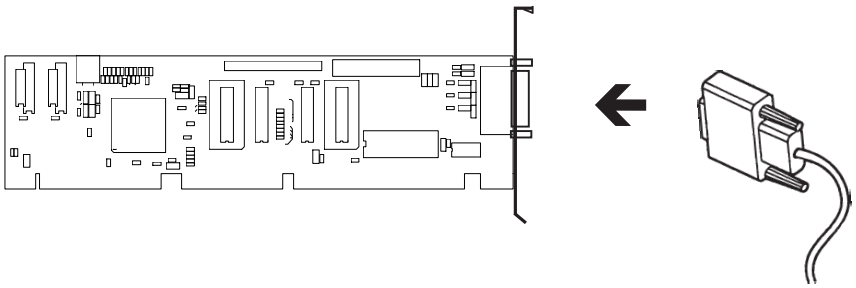


3.3 Replacing the System Cover

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 Boca Voyager.



Physical installation is complete. Proceed to Section Four.

Section Four: Display Drivers

This section describes the installation and operation of the display driver programs for Microsoft Windows and AutoCAD 12 driver diskettes shipped with your 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. You may also check our BBS for additional drivers. Highlights include:

Resolutions/Colors	1MB	2MB	Refresh
1280x1024/256 colors		x	87Hz (i)
1280x1024/16 colors	x	x	87Hz (i)
1024x768/65,000 colors		x	87Hz (i)
1024x768/256 colors	x	x	60/70/75Hz (N) 87Hz (I)
1024x768/16 colors	x	x	60/70/75Hz (N) 87Hz (I)
800x600/65000 colors	x	x	56,60Hz (N)
800x600/256 colors	x	x	56,60,72,75Hz (N)
640x480/16.7M colors	x	x	60Hz(N)
640x480/65,000 colors	x	x	60,72, 75Hz (N)
640x480/256 colors	x	x	60,72, 75Hz (N)

(i=interlaced; n=non-interlaced)

If you intend to use your Boca Voyager 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	Lotus 1-2-3
AutoCAD 12	Lotus Symphony
Utilities	Microsoft Windows NT
	Microsoft Word
	WordPerfect 5.0/5.1
	OS/2

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.*

- Make sure the Boca Voyager is present (physically installed) BEFORE installing any drivers.

- If you are installing drivers **under Microsoft Windows, go to section 4.1**

- If you are installing drivers **under DOS, go to section 4.2**

- For a list of monitor types, refer to the README.TXT file on the driver diskette.

4.1 Microsoft Windows 3.1

The Boca Voyager has features that dramatically improve the performance of Windows 3.1. The Boca Voyager drivers make it possible to use those special features with Windows.

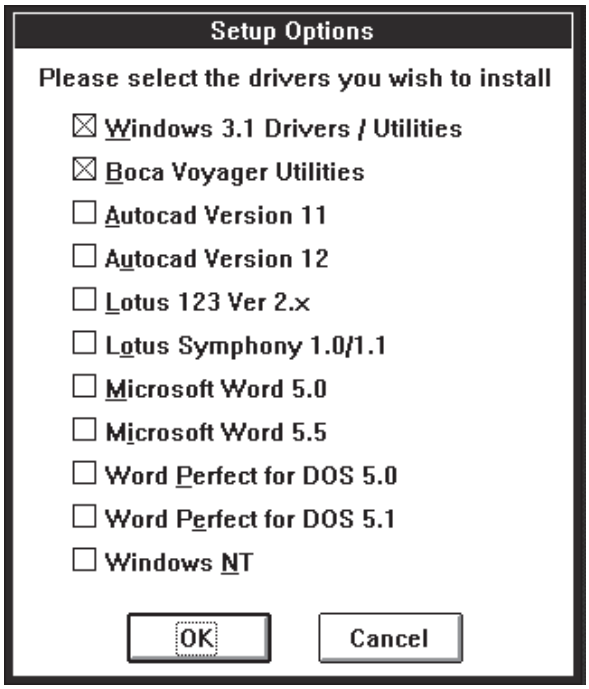
Installing the Windows Drivers

IMPORTANT. Before installing the Voyager Windows 3.1 drivers, run Windows SETUP and set the display driver for VGA. At the C:\WINDOWS prompt, type SETUP and press [ENTER]. Be sure the Voyager works with the Windows VGA driver before installing any high-resolution drivers from the Boca driver diskette.

1. Make sure that Windows 3.1 is installed. Verify that Windows will run with the standard VGA display. If there are any problems, correct them now before attempting to install the new Windows drivers. Refer to Appendix A on troubleshooting if you encounter any problems.

2. When you have Windows running with the VGA display, insert the Voyager installation diskette into your A: or B: as appropriate. Select File... and then Run... from the Program Manager menu bar. Then type A:SETUP or B:SETUP and click OK.

3. After initialization, a Voyager backdrop screen appears followed by a list of setup options as shown on the following page.

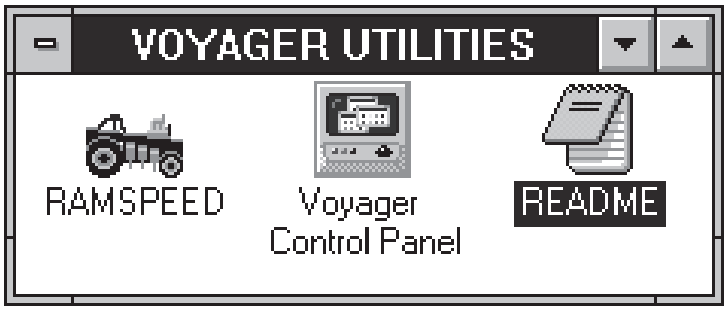


The default selections are Windows 3.1 Drivers/Utilities and Boca Voyager Utilities. Make any additional selections and click OK. To quit, you can select Cancel or click on the Exit button.

4. You are then asked for the name of the directory which contains your Windows program files (e.g., C:\WINDOWS, which is the default). Accept the default or change it and click OK.

5. The SETUP program will now copy all necessary files to the chosen subdirectories. Follow all on-screen directions. Refer to your Windows documentation for additional assistance.

6. Installation is now complete. The Setup program installs a group and set of icons as shown below:



Using Windows Setup to Select a Voyager Driver

Once the drivers are installed on your hard disk, one of them must be selected as the current driver before it can be used. This is done by using the Voyager Control Panel. See Section 5.1 for details.

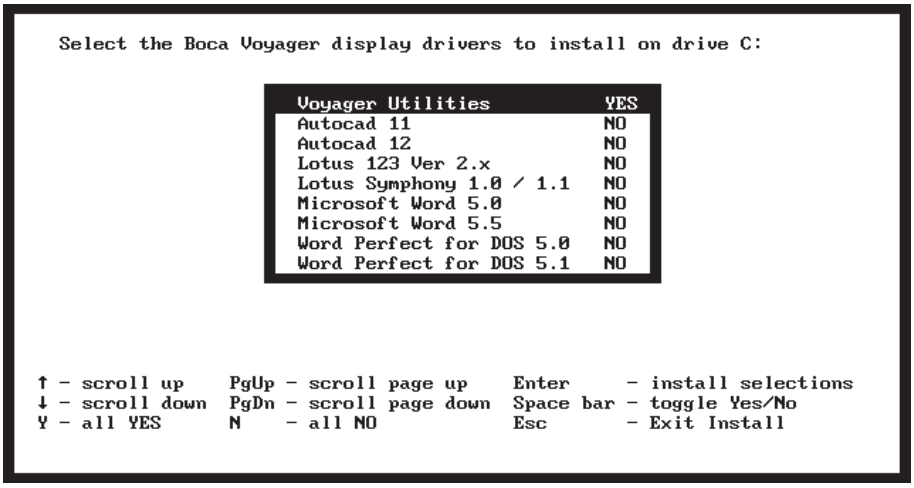
4.2 Installing Drivers with DOS

1. The Windows setup (section 4.1) is for Windows users. The DOS install is for DOS users. If you run applications in both Windows and DOS, the Windows setup contains drivers for both operating systems. If you are just running in DOS, use the DOS install only. There is no need to use both setup and install.

2. Insert the Voyager diskette in your A: (or B:) diskette drive and type INSTALL.

3. Read the introductory screen and press any key to continue.

4. You are presented with a list of drivers for selected popular applications. Follow on-screen directions and make your selection(s) with the SPACE BAR.



5. Next, you are asked to indicate the drive where you wish to install the selected driver(s).

6. The installation program will suggest a subdirectory. Accept it or change it and press [ENTER]. You are notified when the installation is complete. Press any key to exit to DOS.

4.3 AutoCAD 12

NOTE: Refer to the README.TXT file for AutoCAD 11 instructions.

1. Go to your DOS prompt (C:\) and place the Boca Voyager Display Drivers for DOS driver diskette into your A: or B: drive. Make A: or B: drive the working drive, by typing A: or B: at the C:\ prompt, and then pressing [ENTER].

2. Type **INSTALL**, then [ENTER].

3. Read all the introductory screens, pressing [ENTER] to view each succeeding screen

4. At the MENU choices screen, Highlight the **AutoCAD 12** option and press the [SPACE BAR] to make your choice. Then press [ENTER].

5. The installation will copy the AutoCAD 12 drivers to your **\ACAD\DRV** subdirectory, by default. If AutoCAD drivers are in another directory, type that directory name in the space provided instead.

6. When the installation process is done, it will prompt you to press [ENTER] to return to the A: or B: prompt.

7. If AutoCAD 12 is already installed on your system, the change to the C:\ drive by typing C: then press [ENTER].

8. At the C:\ prompt, type **Acadr12 -r**, to start AutoCAD 12 with the batch file ACADR12.BAT that was created when AutoCAD was installed. The -r option tells AutoCAD that you want to reconfigure AutoCAD.

9. The next screen shows the **Current AutoCAD Configuration**, if it was previously configured. Press [ENTER] to continue.

10. On the next screen, Configuration Menu, select **option #3** to reconfigure the Video Display.

11. The current video display choice is then shown. Type **Y (yes)** to change the current video display choice.

12. From the next screen, Available Video Displays, choose the number that corresponds to the option that says **TurboDLD Lite by Panacea, Inc**. After you make this choice, you will be taken into DLDSETUP for the TurboDLD driver.

13. The next screen is the **TurboDLD Lite Main Menu/ Display Device Configuration**. Here you will choose the number of colors and the resolution in which you want AutoCAD to work.

14. Press [ENTER] to choose the first option, **Select Graphics Board/Resolution**. From the Graphics Board Selection Menu that next appears, highlight **Select Display Graphics Board**.

15. From the list of choices, choose one of the following:

    SVCXL1/2 Non-Linear
    SVCXL1/2 Linear[1]

16. After you make a choice, you are taken back to the **Graphics Board Selection Menu**. Highlight **Select Display Resolution**, and press [ENTER].

17. From the **Resolution Selection Menu**, choose your desired resolution, e.g., 640 by 480 by 16 colors, or 800 by 600 by 256 colors, etc.

18. Once you have made a choice for the resolution, you are taken back to the **Graphics Board Selection Menu**. Choose **Return to Previous Menu**, then choose **Save and Exit**.

19. Follow all succeeding AutoCAD prompts, making choices to suit your needs. If you have difficulty making choices, consult your AutoCAD documentation or Autodesk's technical support.

[1] Non-linear drivers use paging for display memory access. Linear drivers use a linear (1MB or 2MB) block of system memory address space for display memory access. The linear driver provides higher performance.

Section Five: Utilities

5.1 Microsoft Windows

Along with drivers for many popular operating systems and applications, the Boca Voyager also comes with a number of utility programs which allow you to obtain optimal display characteristics such as resolution, color depth, and refresh rates. Drivers are discussed in Section Four. If you are not running Windows, please turn to section 5.2 for DOS-based utilities. The Windows-based utility programs supplied are as follows:

- Voyager Control Panel
- RAMspeed

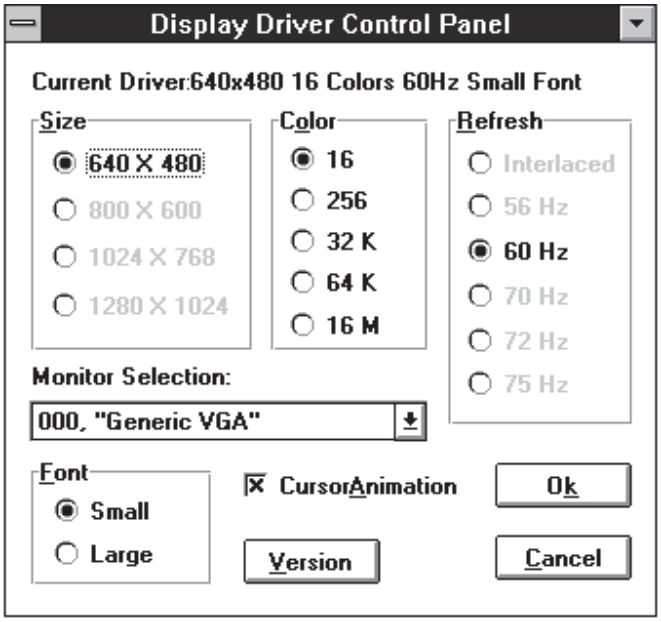
Make sure the Boca Voyager is present (physically installed) BEFORE installing any utilities.

The Voyager Control Panel

This utility program is designed to work with Microsoft Windows version 3.1

Installing the Utility

The Voyager Control Panel is a Windows-based utility to select resolutions, color depth, and refresh rates. It is automatically installed when installing Windows 3.1 drivers. Simply click on the icon in the Voyager group to activate the control panel. Note that driver resolution and color depth take effect only after Windows is re-started with the new driver.



Running the Utility

CURRENT MONITOR. Lets you select the monitor type from a list of monitors supported by the drivers. If you cannot find your monitor on the list, select “Generic Monitor”.

SIZE (ALT S) allows you to select from the following resolutions:

640x480
800x600
1024x768
1280x1024

Selecting the resolution first determines the allowable selections for color depth and refresh rate.

COLOR (ALT O) allows you to select the number of colors from the following:

16 (4 bits per pixel)
256 (8bpp)
32K (15bpp)
64K (16bpp)
16M (24bpp)

Selecting the color depth first determines the allowable selections for resolution and refresh rate.

REFRESH RATES (ALT R) allows you to select the refresh rate for the monitor from the following:

interlaced	70Hz
56Hz	72Hz
60Hz	75Hz

These refresh rates depend upon the allowed range for your monitor. If you selected a monitor type which has a higher refresh capability than the one you are using, selecting that higher refresh rate will make your display unreadable. Should this occur, press the ESC key and the refresh rate will revert to the default value.

FONT (ALT F). Allows you to select a large or small font.

VERSION (ALT V). Displays version information about the current driver.

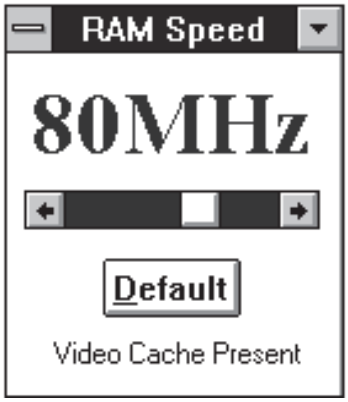
CURSOR ANIMATION (ALT A). Allows you to select an animated cursor instead of the “hour glass” cursor whenever it is displayed.

RAMSpeed Utility

The RAMSpeed utility is used to tune the performance of the Boca Voyager. It allows you to program the board's memory access speed. By adjusting the memory access speed the performance of the Boca Voyager can be increased.

The RAMSpeed utility is located in the Voyager Utilities program group. To start the RAMSpeed utility, double click on the RAMSpeed icon. A window will be displayed which contains a slider bar and a default button. The current memory access speed and video cache status is also displayed in the window.

The slider bar indicates the current RAMSpeed setting. The RAMSpeed can be increased by clicking on the right hand arrow of the slider bar and decreased by clicking on the left hand arrow of the slider bar. The default button will set the memory access speed to the BIOS default.



To save a new RAMSpeed setting, click the system box at the upper left corner of the RAMSpeed window and select save settings.

5.2 DOS Utilities

The DOS-based utility programs supplied are as follows: CENTER and MODETEST.

Center

CENTER is a setup utility which allows you to choose a monitor type and to manually adjust the vertical refresh rates and screen centering for the video modes supported by the Boca Voyager. It consists of four files:

CENTER.EXE. Setup utility

MONSETUP.INI. Setup information used by CENTER.

CHPSCPL.INI. Monitor type and vertical refresh rate informational file in the format used by the Voyager Control Panel which runs under Microsoft Windows.

MONTSR.EXE. TSR program which initializes the vertical refresh rates for all modes and adjusts screen centering after changing modes.

To run the utility, simply type: CENTER at the C:\VOYAGER prompt and follow all on-screen directions. Screen display may vary based on the monitor type selected. In the first screen, you are prompted for the path name of the directory in which Microsoft Windows is installed **(if you are going to use the Voyager Control Panel)**. This utility comes with the driver package and allows you to select the monitor type and vertical refresh rate along with other elements defining the video modes **if you are using Windows**. If the path name is given, the CENTER utility will attempt to find and use the same copy of CHIPSCPL.INI used by the control panel.

This allows changes made in one environment, either DOS or Windows, to be preserved when the same mode is used in another environment. Note: any change to the vertical refresh rate will require new screen centering information to be set (if desired) with CENTER. **Leave the path name blank if the Voyager Control Panel will NOT be used, or if you do not have Microsoft Windows.**

The next screen allows you to choose a monitor type from a list of previously defined types. CENTER uses the monitor type to choose the highest available refresh rate that the monitor will support for each mode. If these settings are acceptable and no screen centering is needed, simply exit the utility by pressing ESC. A prompt will appear asking if you want to save any changes made up to that time before exiting to DOS.

Next, a screen appears for each resolution and color depth category. The monitor timing values for each available refresh rate are shown and you may adjust the highlighted selection. The initial selection is either calculated from the newly selected monitor type, or was selected previously with CENTER or the Voyager Control Panel. Press ENTER to confirm the selection and then use the arrow keys to center the screen image, pressing ENTER again when centering is complete for each mode.

Modetest

The modetest utility checks the operation of the standard VGA modes. For each mode, a test pattern is displayed along with information on the current mode, the default horizontal and vertical scan rate, and the default dot clock. Color bars also display the colors available for each mode.

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 Boca Voyager 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 Boca Voyager must be the primary video adapter (using two video adapters is not recommended).
The computer seems to boot, but there is no display.	• Confirm that your computer and monitor are plugged in. Check all power cables. • 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 Boca Voyager must be the only or primary adapter. • Verify motherboard switch and jumper settings for VGA operation. • 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. • Make sure your Boca Voyager is installed in a VL-Bus slot.
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.

SYMPTOM	POSSIBLE REMEDY
Your monitor's display appears somewhat distorted when running a graphics application (contd).	• Ensure that your monitor is capable of displaying the graphics mode you are using. Refer to your monitor specifications. • 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 CENTER (Section Five) to match the monitor to the Boca Voyager.
You are unable to get the Boca Voyager to work in your computer, but have found that it works well in another.	• Refer to the preceding suggested remedies. If the Boca Voyager functions properly in another system, it is likely the problem lies elsewhere. • Ensure that your computer is compatible with the VESA Local Bus specifications. • Ensure that your computer is completely compatible with IBM standards. Some machines do not support IBM-standard video BIOS requirements.

SYMPTOM	POSSIBLE REMEDY
You are having difficulty configuring the Boca Voyager on a network.	• Generally speaking, when configuring a network system avoid the following areas the Boca Voyager occupies: memory addresses A000 -C7FFh, I/O addresses 03B0h - 03DFh, and in some instances 02E0h - 02EFh. The Boca Voyager 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 address. The Boca Voyager has a global setup 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 you 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 Boca Voyager board requires service, first contact the authorized Boca Voyager 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 model**
- **Operating system and version**
- **Computer manufacturer**
- **Peripherals in the system**
- **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.

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. Be sure to include your receipt as proof of purchase for all warranty repairs.

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 Boca Voyager **(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:

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

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 Boca Voyager uses the same 15-pin (DB15) cable available from monitor manufacturers to interface with IBM and compatible computers. Using an incorrect cable could cause 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.

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
DCC Data	12
Horizontal Sync	13
Vertical Sync	14
DCC CLK	15

Pin-Out Assignments for the DB15 Video Cable Connector

Technical Specifications

- 32-bit VL-bus
- Video caching using XRAM technology
- Chips and Technology 64300 Chip Set
- Standard DB15-pin VGA Connector
- Size: 9.5"x 3.375"

Video Modes

Resolution	SVCXL2(2MB)	SVCXL1 (1MB)
1280x1024	Up to 256 colors	Up to 16 colors
1024x768	Up to 65K colors	Up to 256 colors
800x600	Up to 65K colors	Up to 65K colors
640x480	Up to 16.7M colors	Up to 16.7M colors

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 Pins	Feature Connector Pin
Pixel Data 0	y1	2
Pixel Data 1	y2	4
Pixel Data 2	y3	6
Pixel Data 3	y4	8
Pixel Data 4	y5	10
Pixel Data 5	y6	12
Pixel Data 6	y7	14
Pixel Data 7	y8	16
Pixel clock	y9	18
Blanking	y10	20
Horz. Sync	y11	22
Vert. Sync	y12	24
ground	y13	26
ground	z1	1
ground	z2	3
ground	z3	5
Enable External Pixel Data[1]	z4	7
Enable External Sync[2]	z5	9
Enable External Pixel Clock[3]	z6	11
not used	z7	13
ground	z8	15
ground	z9	17
ground	z10	19
ground	z11	21
not used	z12	23
(clipped)	z13	25

[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 VESA 8514/A Standard VS890803, July 18, 1989.

Appendix D: Upgrading Video Display and Cache RAM

The upgrade display memory chips **MUST** be the same brand and speed as the chips already installed on the board. Boca Research uses the following brands:

DISPLAY MEMORY (256Kx16) - 2 required	
BRAND	**Part Number**
Micron Technology	MT4C16257DJ-7
Toshiba	TC514260BJ-7
CACHE MEMORY (256Kx4) - 1 required	
BRAND	**Part Number**
Vitelic	V53C104FP70

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

24-bit. The number of bits which represent each pixel, or point on the screen. An 8-bit per pixel card can generate 256 colors; 24 bits per pixel yields 16.7 million colors.

8514. An IBM color monitor capable of resolutions of 720x400 non-interlaced with a refresh rate of 70MHz; 640x480 non-interlaced at 60MHz; 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 Super X also has a BIOS for display features.

Bit Block Transfer. A method of holding a block of graphics, such as Windows dialogue box, in memory so that it can be moved and redrawn quickly by memory-to-memory operations.

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. 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.

Video Cache (XRAM). 256Kx4 memory that caches display data which is used to update the display during refresh.

Suggested Reference Works

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

• *VESA Super X Standard* #VS911022 Revision A, Video Electronics Standards Association, October, 1991.

• *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 specified in the original sales contract ("the Warranty Period"). Should the product fail to be in working order at any time during the specified period, BRI, will at its option, repair or replace this product as described below, provided that in BRI's sole determination the part or product has not been abused, misused, repaired, or modified.

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

All returns for limited warranty service require a Return Merchandise Authorization (RMA). All customers are required to demonstrate proof of purchase when requesting an RMA. The period of warranty commences on the date of purchase. A dated 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 shown below in the Appendix (Servicing Your Boca Product) with proof of purchase, copy of canceled check (if any), and the Return Merchandise Authorization (RMA) number provided by BRI Technical Support. Refer to the Appendix in this manual. Replacement parts or complete products will be furnished on an exchange basis only. Replaced parts and/or products become the property of BRI.

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