

V7-MIRAGE

User Manual

Benutzerhandbuch

Manuel d'emploi

Manual del usuario



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FCC Compliance

This board 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 residential installation. This device 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 communications. However, there is no guarantee that interference will not occur in a particular installation.

Installing the Software from the SPEA Media-Gallery CD

It is possible that you have received the SPEA software on CD rather than on diskette. If this is the case, then please note that the descriptions in this manual should be changed accordingly. For example, the instructions "Put the disk 'Drivers for Windows' in drive A:" would be exchanged with the following steps: "Switch to the CD drive (e.g. D:) and enter the path of the desired driver, e.g.

```
D:\SPEA\INSTALL\MERCURY.P64\WIN
```

for the Windows driver for the V7-MERCURY P-64 board.

Other subdirectories could be 'DOS&UTIL' (for utilities and DOS tools) and 'OS2' (for OS/2 driver software).

Important Note

You **must imperatively** read the README file on your 'Utilities' disk and all the documentation supplied with your graphics board **before** installing it! If you fail to do so SPEA can not accept any responsibility for claims that may be caused as a consequence.

To see the README file, put the 'Utilities' disk in your floppy drive and type:

```
A:
```

```
SHOW README.ENG
```

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Quick Installation

This Quick installation is for **experienced users only!** Other readers should take the time to read the manual.

1. Make a backup copy of the disks supplied with the board.
2. Check that your monitor and system configuration support the SPEA graphics card (e.g. correct bus type and version).
3. Disconnect your computer from the mains power and peripheral equipment.
4. If your system main board incorporates a video adapter deactivate it.
5. Change the jumper settings if required. The jumper settings on the board can normally remain unchanged. There are however conditions (e.g. if combining boards in a system) when changes should or must be made. Read the relevant section in the README file to be sure.
6. Install your SPEA graphics board in a free extension slot.
7. Reassemble your PC, connect peripheral equipment and reconnect the power cable.
8. Switch on your monitor first, then the computer.
9. At the DOS prompt insert the SPEA disk 'Utilities' and start the software installation with:

A:
INSTALL

Windows Driver Quick Installation

1. Windows must already be configured for standard VGA (640 x 480) before the SPEA Windows driver can be installed.
2. Start Windows.
3. Put the SPEA 'Drivers for Windows' disk in your drive.
4. Start the Program Manager. Select the options 'File', 'Run' and then select A:\V7SETUP.EXE.
5. Select a language in the SPEA dialogue box which appears.
6. Select a screen video mode.
7. For future sessions: video modes can be set and changed using the V7SETUP dialogue box (SPEA Program Group).

Problems?

In the unlikely event of problems ...

1. Check the README file in your C:\SPEA\GDC directory again
2. Read *Appendix C: Troubleshooting*.
3. If you have installation and application problems with your SPEA graphics board you can obtain technical support via the SPEA Support Mailbox
4. Take note of your warranty - see *section Introduction*
5. Contact the SPEA ExpertLine (see extra pamphlet)

Your board is a complex electronic device and can only be repaired by authorized technical personnel with the required equipment. Do not attempt to change or repair any parts of this product. Doing so will render your warranty invalid.

General Information

around the clock and can be downloaded from the SPEA Bulletin Board (Mailbox).

Guide to this Manual

This manual is divided into five parts:

Part 1	Introduction
Part 2	Tells you how to physically install the graphics board.
Part 3	Provides information for installing the application drivers included on the SPEA Superdisk.
Appendices A-D	Contain other information that you should review.
Index	To enable you to find subjects in this manual quickly.

Symbols and Conventions

The following symbols and syntax conventions are used in this manual:

Warning: This section contains a warning or important information.

Note: This section contains useful hints.
DOS commands are written in capital letters, example:

```
A:  
INSTALL
```

If not defined in another way, all DOS commands must be confirmed with the ENTER or RETURN key.

Example: Examples e.g. for commands are indicated by this format.

Screen messages are shown in *Courier*.

Cross references to other parts of the manual are shown in *italic*.

Directory names mentioned in this manual are exemplary and written in capital letters.

This document refers to disk drive A:. Please enter B:, if your 3,5" disk drive is addressed with B:.

Delivery Scope Checklist

Your SPEA package should contain the following items:

- 1x V7-MIRAGE
- the following 3.5" disks:
 - 1x 'Utilities'
 - 1x 'Drivers for Windows'
 - 1x 'Drivers for OS/2 2.1x'
- SPEA ExpertLine Info sheet
- this manual

SPEA Superdisk Format

The SPEA software is supplied on high density (1.4 MB) 3,5" floppy disks. The current utility software and various drivers are available

Last-Minute Changes - README file

Our software is constantly being improved and updated. This means that it may not have been possible to document the most current software changes. The latest information is contained in a file README.

The README file appears on the screen automatically at the end of the software installation. You can also read this file at any time from your hard disk (after the installation) with the command:

SHOW README

or from your diskette with:

A:

SHOW README.ENG

Warranty

You have a 3 year warranty for your SPEA graphics card. To ensure your warranty, it is necessary that you keep the invoice of the graphics card. If your graphics card is damaged, contact your local retailer first. Your board is a complex electronic device and can only be repaired by authorized technical personnel with the required equipment. Do **not** attempt to change or repair any parts of this product. Doing so will render your warranty invalid.

Support

The following support services are offered by SPEA Software AG:

- technical support (telephone, SPEA ExpertLine)
- Online information and software updates per modem (SPEA Mailbox)
- software updates on disk via the SPEA UpdateService

Further information concerning these support services can be found in the 'SPEA ExpertLine' pamphlet (colored info sheet) enclosed with your board.

Company Address

SPEA Software AG
Moosstr. 18B
D-82319 Starnberg

Tel: +49 81 51 26 60
Fax: +49 81 51 21 258

Part 1

Introduction

Your SPEA board is a high-resolution, VGA compatible graphics accelerator specially designed to speed up applications running in graphics-intensive environments such as Windows and OS/2.

Graphics Board Features

- advanced S3 801 (ISA) or 805 (VL) graphics processor (with graphics engine) for VESA Local Bus and ISA bus systems
- standard of 1 MB DRAM onboard
- TrueColor (16.7 million simultaneous colors displayed) for resolutions up to 640 x 480 pixels
- maximum (non-interlaced) display resolution of 1280 x 1024
- chip-integrated drawing functions to optimize graphics oriented applications
- Power management (DPMS) software included to use the VESA specified modes to reduce power consumption
- enhanced driver software for most major applications

Software for your Board

Various software drivers for standard applications as well as useful utilities are supplied with your board. Additional software (drivers for specific applications) are also available, but not a part of the standard delivery scope.

Standard Software Delivery

- Intuitive menu-guided installation program
- SPEA BigWin enhanced accelerator driver for Windows 3.x
- SPEA Windows tools
- SPEA BigBlue driver for OS/2.x
- SPEA utilities (e.g. hardware test program)
- Driver software for the following applications:
 - 3D-Studio 1.0/2.0
 - AutoCAD 11 & 12
 - AutoShade
 - CADkey
 - CADvance
 - DataCAD
 - Generic CADD
 - Lotus 1-2-3
 - MicroStation
 - Word 5.0
 - VersaCAD
 - Word Perfect 5.1

Optional Software

This software is available free of charge via SPEA's Mailbox (and partially via CompuServe)

- SPEA BigWinNT enhanced accelerator driver for Windows NT
- SPEA BigFocus 12 driver for AutoCAD 12 (DOS) and AutoCAD for Windows

Part 2

Hardware Installation

Graphics Card Installation

Requirements

1. IBM compatible computer (80386/486/586) with ISA or VESA local bus system.
2. One free ISA or VL Bus system expansion slot
3. MS-DOS or PC-DOS operating system, version 3.3 or higher
4. Screwdriver

Warning!

Prevent static electric damage. Static charges can cause severe damage to microcircuits, but here are some easy ways to see that it doesn't happen:

1. Hold the SPEA card on its edges only. Don't touch edge connectors or exposed circuitry.
2. Leave the SPEA card in the anti-static protective bag until ready to install it in your computer.
3. If possible, ground your body when handling the SPEA card. The metal power supply housing is generally considered the best place to ground yourself.
4. Do not place the SPEA card on a metal surface.
5. Make the least possible movement to avoid building up static electricity from your clothing, carpets and furniture.

Monitor Compatibility

The boards of the SPEA series offer high performance in resolutions, refresh rates and colors. Especially the ergonomic SPEA refresh rates up to 100 Hz give absolutely flicker free performance. The SPEA boards are optimally configured to be combined with the SPEA MultiSync monitors.

Of course SPEA boards can also be connected to other VGA or high resolution MultiSync monitors. Please be aware of the fact, that you can only get use of the full power of the graphics board if the horizontal (kHz) and vertical (Hz) refresh rates of your monitor are as high as required by the graphics board.

Example: The technical specifications of a multisync monitor could be as follows: max. resolution 1280 x 1024; max. horizontal frequency 50 kHz; max. vertical frequency (refresh rate) 90 Hz.

If you wish to use one of the video modes listed in the file BIOS.TXT included with this product, then all three of the above mentioned parameters may not exceed the specifications of this monitor.

In our example, the mode 1024 x 768 with a horizontal frequency of 48.5 kHz and a refresh rate of 60 Hz may be selected, whereas the next higher refresh rate of 70 Hz (at the same resolution) is not possible, as the required horizontal frequency is 56.5 kHz in this case, which exceeds the specifications of the monitor.

Warning!

If you permanently use your monitor with frequencies that are too high you may damage the monitor. Therefore before you start to change the refresh rate with programs described in this manual (e.g. SPTUNE, V7SETUP), have a look in your monitor manual about its technical data (horizontal and vertical refresh rate, possible resolutions).

Set your monitor to analog mode. You may need a new cable or a 9- to 15-pin cable adapter to use this mode. Check your monitor owner's manual for further information.

If you're using COM 4

If you are using COM 4, e.g. for a **modem** or another peripheral device, then note that your SPEA graphics board uses the same I/O address, namely 02E8 hex.

For this reason it is **vital** that you reconfigure the other device to another port. Failing to do so will cause an address conflict and problems with both devices up to a system crash.

Typical System Configuration

A typical configuration environment your board is described as follows:

- Colani Tower 486DX-40, VL bus, 40 MHz, 4 MB or InduS-Desk 486SX-25, ISA bus, 25 MHz, 4 MB
- SPEA 2185 MS Monitor

Preparing your Computer

Please note, that the applications you want to install SPEA drivers for have to be already completely installed (for Standard VGA (640 x 480, 16 colors) on your system prior to using the SPEA software. It is a good idea to do this before removing an existing graphics adapter as not every application permits the configuration of the video mode used from the DOS plane.

Changing your PC's BIOS SETUP

If a board other than a VGA board was previously installed, it is necessary to change the PC's hardware configuration. This is sometimes done by changing a jumper on the motherboard after removing the old board (check your motherboard or PC manual) although it more common to change your PC's BIOS SETUP.

Exception:

If you have a system with a EGA/VGA display adapter built onto the motherboard. In this case, the on-board EGA/VGA display adapter **must** be disabled before installing the SPEA card.

Please check your PC manual to find the location of the corresponding switch.

Warning

Simultaneously using two active VGA/EGA units in one PC will inevitably lead to system failure!

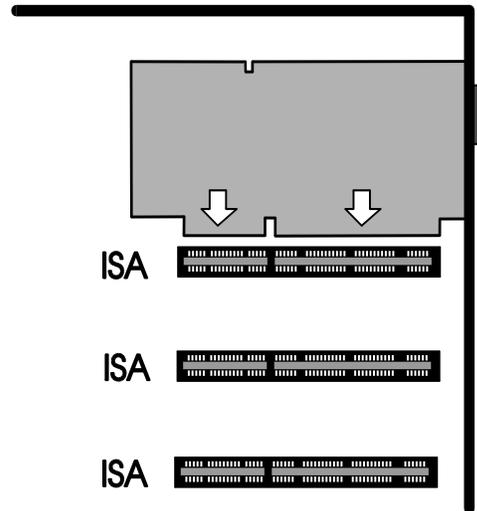
If your system doesn't have to be re-jumpered for a VGA board then first proceed with the following installation steps and then run your BIOS SETUP program and select 'VGA' (else 'IBM VGA') as your graphics board type. Check your PC manual for information on its BIOS SETUP.

1. Switch off your computer and all external options (printer, display, and others) and unplug all power cords from the electrical source.
2. Remove the cover mounting screws and save them for later.
3. Remove the cover of the computer.

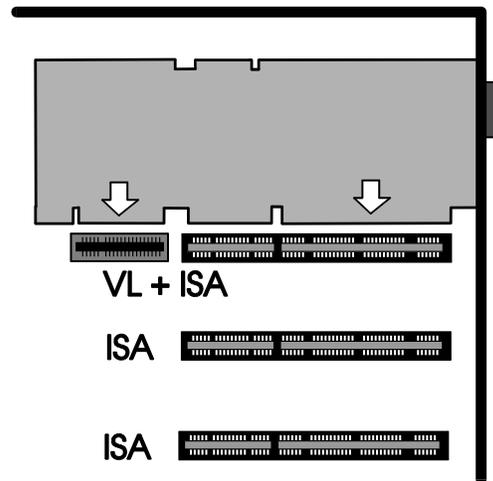
Installing the SPEA Board

The SPEA card is installed in an expansion slot corresponding to the bus type (VL local bus or ISA bus).

1. Select a free expansion slot and remove its metal slot cover. Save the screw to secure the graphics card later.
2. Hold the card by the edges and press it firmly into the expansion slot.



Installation in an ISA expansion slot



Installation in a VESA Local Bus expansion slot

Important!

The following step is very important in order to ground your SPEA graphics card properly.

3. Align the slot in the mounting bracket of the SPEA card with the screw hole in the rear

panel of the computer case. Use the screw you removed from the expansion slot cover or the previously installed video adapter to secure the SPEA card in place.

4. Secure ribbon cables and gently push them down and out of the way before you replace the system cover.
5. Replace the computer cover. Secure it with the screws you removed earlier.
6. Reconnect any peripheral equipment cables you may have disconnected.
7. Securely attach your monitor cable to the 15-pin VGA output connector on the board. The other end is hooked up to the monitor as described in the manual of the monitor manufacturer.

Additional Instructions

Please switch on your monitor before you switch on your computer. Doing it the other way around could damage your monitor.

The SPEA board has been designed to 'plug & play' without any modifications being made to the default switch or jumper settings. If however, it appears that the card is not performing optimally, you can change the settings. Refer to *Appendix B: Technical Details* for more information.

Note that your monitor is running in standard modes and that higher refresh rates etc. are not available at this stage of the installation! It is necessary to run the programs SPTUNE.EXE (for DOS applications) and V7SETUP.EXE (for Windows) in order to optimize the board's output signals for use with specific monitors. These programs are described further on in this manual.

Hardware Compatibility: the VL Bus and the Graphics Board

The functionality of a graphics system depends mainly on two components: the graphics board and the mainboard.

If either the design of the VL bus or mainboard is not compliant with the approved VESA specifications you may experience problems with the graphics board.

SPEA has successfully tested the SPEA VL bus graphics boards in VL bus mainboard with a clock rate of 40 MHz.

After Installing the SPEA Board

If you have correctly installed the SPEA board, the DOS prompt will then appear on your monitor when the boot procedure is finished. If your system does NOT boot it should, check again to see that the installation instructions were properly followed, or refer to *Appendix C (Troubleshooting)*.

Important!

Before installing the supplied software, make a backup of the SPEA installation disks. Use the backup copy for your installation and store the originals in a safe place.

Part 3

Software Installation and Configuration

Please note, that the applications you want to install SPEA drivers for have to be already completely installed (for Standard VGA (640 x 480, 16 colors) on your system prior to using the SPEA software. It is a good idea to do this before removing an existing graphics adapter as not every application permits the configuration of the video mode used from the DOS plane.

Note:

Our software is constantly being improved and updated. This means that it may not have been possible to document the most current changes in this manual. The latest information is contained in a file named README.

Please check the exact directory names and paths of your applications, as you will be asked for these during the software installation of the SPEA drivers.

1. Put the SPEA disk 'Utilities' in drive A:
2. Make drive A: active and begin the installation program by the following commands:
A:
INSTALL
3. Choose a language for the installation program.
4. Follow the instructions on the screen. You will be presented a menu for selecting the desired software applications.
5. Make your selection of software drivers and also select the option 'Utilities'.
6. After you have made your choice, confirm it by pressing the ENTER key. You will be asked about the disk drive and directory names where the SPEA drivers should be copied.
7. Enter the disk drive and directory names and follow the instructions on the screen. All files are copied into the defined directories automatically now.

A README file appears on the screen during the installation.

Important

Most applications require you to reconfigure them to use your SPEA graphics board. Please refer to the sections of the relevant software application to complete your installation correctly.

Before you start to configure the software applications, you may wish to change the monitor settings, resolutions or number of colors used. This is handled by the program SPTUNE.EXE for DOS applications and V7SETUP.EXE (within Windows) for Windows applications.

Windows 3.1x (BigWin Driver)

If Windows is not installed on your system yet, install it for standard VGA with the user defined setup (from the DOS command prompt) before continuing.

1. Start Windows and put the SPEA disk 'Drivers for Windows' in drive A:
2. Start the Program Manager (if not automatically started) and select the options 'File', 'Run' and then select the file V7SETUP.EXE from drive A:
3. Select 'English' in the SPEA dialogue box which appears.
4. Select a monitor and screen video mode and when finished, click on OK.
5. Restart Windows as suggested in the next dialogue box. This ends the installation.

You can reconfigure your graphics display from now on using the SPEA V7SETUP menu and various Windows tools.

SPEA V7SETUP

What is SPEA V7SETUP?

SPEA V7SETUP is a program with various options to set the monitor used, resolution, colors, refresh rates etc. for **Windows applications** (the monitor settings used for DOS applications are made using the program SPTUNE - see Index).

How is SPEA V7SETUP used?

Double click on the SPEA V7 icon, the dialog box then will appear.

Configure your system keeping the specifications of your monitor in mind.

Warning

You can damage your monitor if you select a refresh rate that is too high for it! Read your monitor manual refresh rate information. Changes made via SPEA V7SETUP are only activated after Windows has been restarted. The test button is only active for the current mode. If you change the settings it will be deactivated. Restart Windows with the new settings and call SPEA V7SETUP again, the button will be active again.

SPEA WinTools

SPEA offers its customers various tools which can be used to simplify or enhance the use of Windows.

SPEAenergy (DPMS)

What is SPEAenergy?

SPEAenergy is a power management utility (DPMS) for Windows.

DPMS is a specification set by VESA which defines modes for reducing the power consumption of monitors and video devices. You can use SPEAenergy to reduce power consumption by defining timeout values, e.g. for the deactivation of certain circuit elements which reduce the power consumption level in stages (e.g. from 120 W to 100 W to 30 W to 5W).

Note:

You must have a monitor that supports DPMS. Via a dialog box you can activate 4 different DPMS modes.

The 4 DPMS modes are: ON, STAND-BY, SUSPEND and OFF.

How can you install SPEAenergy?

1. Put the installation disk with 'SPEAenergy' on the label in drive A: and start Windows.
2. In the Program Manager select 'File' 'Run'.
3. Select the file SPENERGY.EXE from drive A: and confirm your selection with OK.

The SPEAenergy icon will be placed in the SPEA program group.

How can you work with SPEAenergy?

Start SPEAenergy by double clicking on the SPEAenergy icon. A self-explanatory dialog box appears for defining your settings. If you need help, consult the online help integrated in this program.

If you want to finish SPEAenergy you have to close the SPEAenergy icon that is resolutely placed at the bottom of your monitor display.

SPEAview

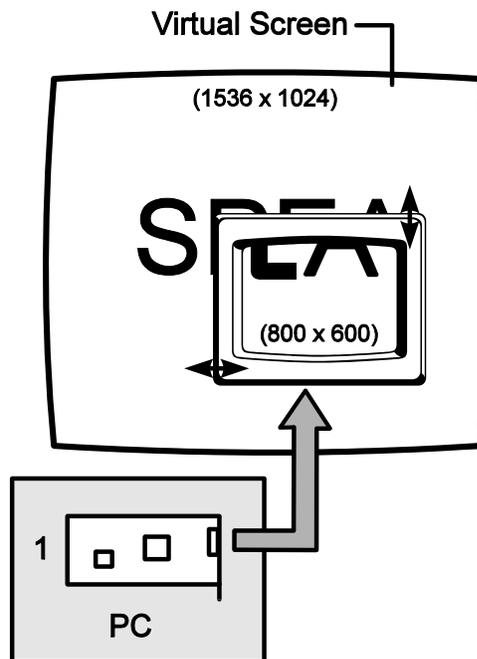
What is SPEAview?

SPEAview is a SPEA utility for Windows which can be used to setup the graphics display for Windows applications in some aspects. The program is automatically installed in connection with the V7SETUP. You will find it in the SPEA program group. To start the program, double click on the SPEAview icon.

How Can SPEAview be Used?

With SPEAview you can:

- change the resolution without leaving Windows (Set button)
- assign various resolution and number of colors to different Windows applications (Set button)
- use the `Virtual` button to activate the virtual screen option. When activated, the visible section can be changed by moving the mouse cursor to one of the edges of the monitor display.
- use the `Camera` button (Bird's eye) to see or control which part of the active image you have displayed on the screen when working with the Virtual Screen feature.
- define which of the offered features you want to display in the menu bar of SPEAview and where the menu bar should appear when the program is activated (with the `Set` button in the menu bar).
- use the `?` button to call online help about the program.



Windows NT (BigWinNT Driver)

SPEA's BigWinNT driver for Windows NT is optionally available (SPEA UpdateService, SPEA Mailbox, CompuServe). Please read the SPEA ExpertLine info sheet enclosed with your board for more details.

AutoCAD 11 & 12 AutoCAD for Windows

ADI drivers are currently available for AutoCAD for DOS and Windows:

- Aquila ADI driver 4.2 (description see next sections)
- SPEA BigFocus 12 driver (see below)

The BigFocus 12 driver offers the following features: (for AutoCAD for DOS and Windows)

- Extensive online help
- Hotkeys - a large number of hotkeys can be defined
- Automatic Display list administration
- DOS Fileviewer - simplifies the identification and loading of a DWG file immensely
- New dynamic zoom - mouse controlled zooming and panning

BigFocus 12 is optionally available (SPEA UpdateService, SPEA Mailbox, CompuServe). Please read the SPEA ExpertLine info sheet enclosed with your board for more details.

Aquila ADI Driver 4.2 Features

The Aquila driver is a professional quality PADI (Protected mode Autodesk Driver Interface) driver to be used with AutoCAD Release 11/12, 3D Studio 1.0/2.0, and AutoShade 2.1.

The driver includes the following features:

- Protected mode operation, PADI 4.2 specification
- bit display list for 'no regen' operation
- Display list operation with 16 active viewports, including pspace viewports
- Birds-Eye and Edge-Pan functions for convenient zooms and pans
- Partial redraws on overlapping vports
- Redraw list for maximum redraw speed
- Intelligent erase buffer to eliminate 'flashing'
- Display list memory meter
- AutoCAD memory usage statistics
- Paging Alarm
- Reliable dual screen operation
- Variable font support - allows fonts up to 16 by 30 in size
- International font support
- User configurable screen colors
- and 16 bit 'Band-Free' rendering support
- bit Rendering support
- Text screen emulation window for Rel. 12

The following modes are supported:

Resolution	Colors	Mode
640 x 480	256	
640 x 480	32768	Render Mode
640 x 480	65536	Render Mode
640 x 480	16.7 mill.	Render Mode
800 x 600	16	
800 x 600	256	
800 x 600	65536	
1024 x 768	256	Render Mode
1024 x 768	65536	Render Mode
1280 x 1024	16	

Font File for AutoCAD 11/12 and AutoShade

The SPEA driver for AutoCAD Rel.11 and Rel.12 uses either an existing font file, or the 8 bit international font in the VGA BIOS (8x16) if a font file is not present. Font files may contain any size up to 16x30.

The driver searches for font files in the following order:

1. Looks for the file AQUILA.FNT in the current directory.
2. If not found, searches for the file specified in the variable AQUILA_FONT found in the DOS environment.
3. If the font file is readable, it will be used, otherwise Aquila will borrow font data from the VGA BIOS.

Example:

If you want to change the font size later, you can change the font file which is assigned to the variable AQUILA_FONT in the batch file V7ACAD.BAT.

```
SET AQUILA_FONT=  
C:\SPEA\GDC\FONTS\6X9.FNT
```

There are seven font files provided with the SPEA driver. They will be copied into the C:\SPEA\GDC\FONTS directory.

```
6X9.FNT  
8X16.FNT  
9X15.FNT  
12X20.FNT  
12X24.FNT  
15X25.FNT  
16X30.FNT
```

Important!

All font files can be used in AutoCAD and AutoShade, while 3D Studio will only use the internal 8x16 VGA font.

Note:

The international font is only supported with the font 8x16.

AutoCAD Rel. 11 Protected Mode Driver

The batchfile V7ACAD.BAT is created during the driver installation for AutoCAD Rel. 11. This sets the required environment variables for AutoCAD, AutoShade and 3DStudio as chosen.

1. Select a font size as described in the previous section.
Note:
If you want to change the font size later, you can do that manually. For more information about changing the font files see previous section *Font File for AutoCAD 11/12 and AutoShade*.
2. **Always** start the batchfile V7ACAD.BAT before you activate AutoCAD in order to set the environment variables.
Note:
In order to make sure that the environment variables are always set before starting AutoCAD, we recommend that you enter a call in your AUTOEXEC.BAT file.
3. Start AutoCAD with the following command
CD \ACAD11
ACAD
4. Select option #5 `Configure AutoCAD`.
5. You receive a display of your current configuration. Confirm this by pressing the ENTER key.
6. Select option #3 `Configure video display`.
7. You will be asked if you want to make another selection. Enter 'Y' for YES and press ENTER.
8. Select the driver option `ADI P386 v4.0/4.1 display`.
9. Continue to configure AutoCAD as described in the section *Configuring the Aquila Driver*.

AutoCAD Rel. 12 Protected Mode Driver

The batchfile V7ACAD.BAT is created during the driver installation for AutoCAD Rel. 12. This sets the required environment variables for AutoCAD, AutoShade and 3D Studio as chosen.

1. Select a font size as described in the previous section.
Note:
If you want to change the font size later, you can change the font file which is assigned to the variable AQUILA_FONT in the batchfile V7ACAD.BAT. More information about changing the font files see previous section *Font File for AutoCAD 11/12 and AutoShade*.
 2. **Always** start the batchfile V7ACAD.BAT before you activate AutoCAD in order to set the environment variables.
Note:
In order to make sure that the environment variables are always set before starting AutoCAD, we recommend that you enter a call in your AUTOEXEC.BAT file.
 3. Go to the directory \ACAD and start AutoCAD with the -R option:
CD \ACAD
ACAD -R
 4. You'll see a display of your current configuration. Confirm it by pressing ENTER.
 5. Select the option #3 `Configure Video display`.
 6. You will be asked if you want to make another selection. Press 'Y' for Yes and confirm this with ENTER.
 7. Select the video display driver `S3 ADI v4.2 Display and Rendering by ATC graphics`.
- Continue to configure AutoCAD as described in the next section *Configuring the Aquila driver*.

Configuring the Aquila Driver

The Aquila driver shows you the following configuration menu for AutoCAD:

1. `Display mode`: Choose the display mode for your AutoCAD session.
2. `Menu colors`: Choose the menu colors if desired.
3. `Flip Screen on/off` (only Rel. 12): If you activate Flip Screen, a VGA text screen is emulated.
4. `Enable Display List?`: Answering 'No' will end the display list configuration choices; you need not configure it further. During configuring, you must choose a method of memory management for the display list information. Which method you use will depend upon the type and number of drawing you work with during an AutoCAD session.

Dynamic Memory keeps on growing as it is needed. This requires the least amount of operator interaction, and is the most carefree.

Static Memory is a fixed amount that you will specify. When the display list grows bigger than memory limits, the display list will be shut off.

The static option is a little bit faster, but requires a knowledge of how much memory your drawings will consume.

If you are configuring for Release 12, you will be asked 'Enable 32 bit regens?'. Enabling this feature will greatly reduce regenerations, providing faster operation. The negative aspect of this choice is that Aquila will use more memory for the display list.

Select a memory management scheme:

`Dynamic dlist (automatic)?` :
Answering 'Yes' will select the dynamic scheme. You would then be prompted to select a performance level:
`Miserly (1)` if you have very little memory in your system,
`Normal (2)` if you have a normal amount of memory,
`High Performance (3)` if you have a lot of memory.

If you selected static management (by answering 'No'), then you will be asked to provide a memory size to use. If this is the first time being configured, Aquila will make a suggestion based upon the amount of

memory in your system.

`Enable redraw list?` allows you to enable a faster redraw method. This will consume some additional memory, but it does improve redraw speeds.
If you selected static memory management earlier, then you will be asked to select a memory size for the redraw list. Usually this can be 1/2 to 1/4 of the amount you specified for display list usage.

5. `Enable erase buffer?` Answering 'Yes' brings up a second question: `Erase buffer size?`. This will determine the number of erased objects it takes before Aquila will start an automatic cleaning cycle to remove them from the display list. Select a higher value if you plan on doing many large drawing editing.
6. `Enable Page-Alarm?`: Answering 'Yes' will bring up a second prompt about the sensitivity setting for the Page-Alarm.
7. `Edge Pan on/off`: Herewith you can activate edge pan. Detailed information about this feature see next section.
8. `Birds Eye on/off`: Herewith you can activate the Birds Eye feature. Detailed information about this feature see next section.
9. `Double click button`: Herewith you can define, if a certain feature should be started when double clicking the right mouse button. As default the birds eye feature will be activated.
10. With entering '0' you will leave the configuration menu.

Special Aquila Driver Features

Graphics Flip Screen

When enabled this will emulate the VGA text window. Use the F1 key to toggle between modes. If you wish to execute any DOS commands, however, Aquila will switch the screen to a full screen text mode. This allows for full DOS compatibility.

Important!

If you are using a plot spooler or other TSR that requires a compatible pop-up window, then this option must be disabled.

Birds Eye View

This feature provides an overall view of the drawing, showing you exactly where you are in that drawing. Without entering any AutoCAD

commands, the zoom factor and offset (panning) can be modified. This birds-eye will work in multiple viewport drawings, and will appear in the aspect ratio of the currently active viewport.

When activated, the birds-eye view will appear under the current cursor location. In this window will appear a small overall view of the amount of the drawing that AutoCAD has currently placed in Aquila's display list. A highlighted rectangle will appear within this window indicating the currently viewed area. Also within this window is an outline rectangle which indicates the area that will be shown if a birds-eye zoom is completed. If this rectangle contains an 'X' in the middle, then the birds-eye is in pan mode. If this rectangle contains an arrow, then the birds-eye is in zoom mode. Pressing the pick button on your mouse or digitizer (usually the left button for a mouse) allows you to toggle between zoom and pan modes in the birds-eye window. Pressing the selection button on your digitizer causes the selected view to be used in the currently active viewport. The birds-eye will disappear, and new zoom will be executed. Moving the cursor outside the birds-eye window cancels the function and does not change the current view.

Edge Pan

Edge-pan is used to move around while zoomed into a drawing.

By leaving the cursor near the border of the currently active viewport, Aquila will automatically begin to pan in that direction. This only begins if the cursor is left idle for a predetermined length of time. There are a number of configuration settings to use, and they can be changed within AutoCAD. Experimentation will yield the best results for your needs.

Paging Alarm

When AutoCAD's memory requirements exceed the amount of physical memory available in your machine, it begins paging, in order to gain extra memory.

Paging means that certain memory areas are traded back and forth with a swap file on the hard drive. Due to the difference in access speed between main memory, and this virtual memory that is on the hard drive, AutoCAD begins to slow down, often to the point of being unusable. To combat this, memory is used very sparingly, and only when absolutely necessary. As a second line of defense against paging, when the amount of memory paged out to disk exceeds several preset thresholds, Aquila begins shutting down extra functions, and returns the memory to AutoCAD.

When paging activity exceeds the first threshold, the screen-list feature is disabled

and all associated memory is returned to AutoCAD. At this point, the screen list status line will disappear from the status window. Should paging activity continue, Aquila will disable the display list feature and return all of that memory to AutoCAD. When that has been done, the second line of the status window will say 'Disabled', to indicate that all display list functionality has been terminated.

The driver will continue to function as normal, but redraws will be slower. However, AutoCAD itself will now be much faster than it was without paging.

Erase Buffer

When AutoCAD erases objects from the drawing database, it erases them from the screen as well. Sometimes this action causes other objects to appear erased as well. The redraw command has no effect, but a regen causes the objects to appear correctly.

This problem can be solved by using the erase buffer to correct the display corruption that occurs when objects are erased from the drawing. Normally, AutoCAD will request that the driver erases a line from the screen by drawing it in black. This causes the erased object to flash on and off the screen during redraws.

Another side-effect is that objects near the erased one may appear to be incomplete. To correct this in the fastest manner possible, Aquila will keep a list of erased vectors, and erase them only when the buffer fills. This speeds up block erasures considerably.

Note:

There are certain after market software packages for AutoCAD, such as CAD Overlay, which rely upon the ability to draw objects in black (background color). If you are using one of these packages and the screen images keep coming up funny, then you need to disable the erase buffer.

Band-Free Rendering

When using the 15 or 16 bit rendering modes, often times the images appear banded. This banding or staircasing occurs most often on objects with large sloping or gently curving surfaces. Band-Free rendering improves the image quality in these modes.

The Band-Free effect can be controlled as well. It may be set to 'Low', 'Medium', or 'High', depending upon how much of the banding you want to eliminate.

Note:

This feature will be of limited use to users of AutoShade, but is beneficial to users of Autodesk RenderMan and 3D Studio.

AutoCAD Screen Layout

1. **Current Color Display:** The rectangle in the top left of the screen displays the current drawing color.
2. **Logo:** This is used to display the manufacturers logo.
3. **Display Status Area:** This area is present only when display list has been enabled.
4. **Memory Status:** This provides a percentage of total system memory that is being used by AutoCAD. AutoCAD may start to slow down when this display exceeds 100%. After this figure exceeds 150%, paging will occur.
5. **Display/Screen Lists Memory Status:** Amount of memory being used by the display list and screen list. When this line reads `Empty`, this means that there is no drawing in memory (new drawing).
6. **Display List Status:**
 - D 32 bit display list data is in use.
 - d 16 bit display list data has been selected.
 - Z Zooming from the display list is allowed.
 - z Pspace and perspective zooms by AutoCAD. Birds-eye will not work in viewport.
 - S Redraw list is enabled.
 - s Redraw list is turned off.
 - P Page alarm enabled and paging occurred recently.
 - p Page alarm enabled and no paging has occurred.
 - E Edge-pan enabled. Edge pan is impending.
 - e Edge-pan enabled but none impending.

Aquila Driver Commands

- | | |
|-------------|---|
| AQHLP | The help screen function displays a list of all local driver commands and gives a brief description of each. |
| AQDLQ | Displays a text or flip screen all the viewports currently in use, along with some useful statistics about each one. |
| AQDRQ | Displays current display resolution and memory allocation statistics (CTRL + L provides the same function). |
| AQCLN | Removes objects from display list. |
| AQBIRD | Displays birds eye window underneath current cursor location. |
| AQEPAN | Toggles on and off the Edge-pan feature. |
| AQPL | Pan to the left by 25 percent. |
| AQPR | Pan to the right by 25 percent. |
| AQPU | Pan up by 25 percent. |
| AQPD | Pan down by 25 percent. |
| AQZI | Zoom in by 50 percent. |
| AQZO | Zoom out by 50 percent. |
| AQZX | Zoom to full screen. |
| AQZWI | Zoom way in while using the same scale factor. Only available in AutoCAD 12. Zooms in as much as possible before another regen will occur. |
| AQZWO | Zoom way out. Only available in AutoCAD12. |
| AQBESZ=xx | Resize the birds-eye window. Valid percentage of the graphics screen size. |
| AQPANSCR=xx | Amount of the viewport scrolled by the edge-pan feature. Valid number must be between 10 and 80, and it is a percentage of the viewport size. |
| AQPANBRD=xx | Width of the edge-pan border given in number of pixels. Valid number must be between 5 and 50. |

AQPANTM1=xx Amount of initial delay given in number of 'clicks' or fractions of a second used before the edge-pan begins. Valid range is 10 to 64.

AQPANTM2=xx Amount of time before another edge-pan begins. Valid numbers are between 1 to 18.

AQEBUF=xx Size of the erase buffer. Using 0 turns off the buffer.

AQCKTM=xx Amount of delay in 'clicks' or fractions of a seconds within there must be a double click with the mouse. Valid range is 1 to 36.

AutoShade 2.1

The batchfile V7ACAD.BAT is created during the driver installation for AutoShade. This sets the required environment variables for AutoCAD, AutoShade and 3DStudio as chosen.

1. **Always** start the batchfile V7ACAD.BAT before you activate AutoShade in order to set the environment variables.
Note:
In order to make sure that the environment variables are always set before starting AutoShade, we recommend that you enter a call in your AUTOEXEC.BAT file.
2. Start AutoShade, with the special configuration command: SHADE -R
3. Select the correct pointing device.
4. Select option P386 Autodesk Device Interface display driver.
5. Choose a display resolution mode. This is the display mode that will be used for the interactive screen.
6. Choose the colors to use in the various parts of the screen. (Menus, Pop-ups, Back-ground, etc.)
7. Save and exit the colors menu when finished selecting colors.
8. Select option P386 Autodesk Device Interface Rendering driver.
9. Choose a rendering resolution mode. This is the display mode that will be used for the rendering (shading and RenderMan) screen.
10. If you select the 32.768 or 65.536 color modes, you will be asked if you wish to enable Band-Free mode. This allows the best color quality possible in a 15 or 16 bit device. Select Low, Medium or High. (The higher the Band Free the slower the speed.)
11. Answer the next 3 questions with 'Yes', since only one screen is used, and must be redrawn upon switching.
12. Select a hard copy device option.
13. At this point, AutoShade will be configured, and you will find yourself in the interactive screen.

3D Studio 1.0

The batchfile V7ACAD.BAT is created during the driver installation for 3D Studio. This sets the required environment variables for AutoCAD, AutoShade and 3DStudio as chosen.

1. Go to the \3DS directory and edit the file 3DS.SET file.
2. Replace:
DEFAULT-DISPLAY = VGA320X200
with:
DEFAULT-DISPLAY = RCPADI
3. Replace:
MAIN-DISPLAY =
with:
MAIN-DISPLAY = RCPADI
4. Replace:
MATERIAL-DISPLAY = VGA320X200
with:
MATERIAL-DISPLAY = RCPADI
5. Remove any leading semicolons from a modified line, save the file and exit the editor.
6. Delete the file 3DADI.CFG, if present.
7. **Always** start the batchfile V7ACAD.BAT before you activate 3D Studio in order to set the environment variables.
Note:
In order to make sure that the environment variables are always set before starting 3D Studio, we recommend that you enter a call in your AUTOEXEC.BAT file.
8. Start 3D Studio and select a resolution mode for the Main Display. This is the mode that will be used for the 2D Shaper, 3D Loftter, 3D Editor, and the Keyframer.
9. Select a resolution for the Materials Editor.
Important!
This must be a 256 color mode.
Note:
Using a resolution greater than 640x480 will not increase the usefulness of the Materials Editor at all.
10. You should now find yourself inside the 3D Editor of 3D Studio.
11. The first time that you try to render a drawing or view an image, you will be asked to select a resolution for the Rendering device.
12. If you select the 32.768 or 65.536 color modes, you will be asked if you wish to enable Band-Free mode. This allows the best color quality possible in a 15 or 16 bit device. Select Low, Medium or High.
13. Configuration is now complete.

3D Studio 2.0

The batchfile V7ACAD.BAT is created during the driver installation for 3D Studio. This sets the required environment variables for AutoCAD, AutoShade and 3DStudio as chosen.

1. Go to the \3DS directory and edit the 3DS.SET file.
2. Replace:
RENDER-DISPLAY = VGA320X200
with:
RENDER-DISPLAY = RCPADI
3. Remove the leading semicolon (or REM) from
MAIN-DISPLAY = RCPADI
4. Replace:
MATERIAL-DISPLAY = VGA320X200
with:
MATERIAL-DISPLAY = RCPADI
5. Remove any leading semicolons from a modified line, save the file and exit the editor.
6. Delete the file 3DADI.CFG, if present.
7. **Always** start the batchfile V7ACAD.BAT before you activate 3D Studio in order to set the environment variables.
Note:
In order to make sure that the environment variables are always set before starting 3D Studio, we recommend that you enter a call in your AUTOEXEC.BAT file.
8. Start 3D Studio with the following command:
3DS
9. Answer the question about having a VGA or SVGA card with 'Yes'.

Select a resolution mode for the `Main Display` by pressing the ENTER key and then selecting a mode. This is the mode that will be used for the 2D Shaper, 3D Loft, 3D Editor, and the Keyframer. Confirm your choice by pressing ENTER three times.
Select a resolution for the Materials Editor (MEDIT).

Important!

This must be a 256 color mode.

Note:

Using the resolution 640x480 will increase the speed of the Materials Editor. You receive this mode by pressing the ENTER key three times.

10. Answer 'no' to the question Will RDPADI render to a separate screen?
11. Select a resolution mode for the Rendering RDPADI Device.
12. If you select the 32.768 or 65.536 color modes, you will be asked if you wish to enable Band-Free mode. This allows the best color quality possible in a 15 or 16 bit device. Select Low, Medium or High. (The higher the Band Free level the slower the speed).
13. Answer 'no' to the question Will RCPADI render to a separate screen?
Note:
If you use a 8514/A monitor answer 'yes'.
14. Select a resolution mode for the Rendering RCPADI Device.
Note:
With 3DS 2.0 it is possible to use two different display modes for rendering. Switching between them must be done from the Renderer/Setup/Configure menu. Select either RCPADI or RDPADI to make the selection.
15. If you select the 32.768 or 65.536 color modes, you will be asked if you wish to enable Band-Free mode. This allows the best color quality possible in a 15 or 16 bit device. Select Low, Medium or High.
16. You should now find yourself inside the 3D Editor of 3D Studio.
17. Configuration is now complete.

CADkey

1. Start the program CONFIG and select the following:

```
Select Graphics options and then the  
Graphics device S3 86C911
```
2. Select a resolution for your monitor.
3. Select other graphics options as required.
4. Leave CONFIG with the changes just made.

Before starting CADkey you must first load the driver.

We recommend you to place an entry in your AUTOEXEC.BAT to automate this procedure.

You should be familiar with the following 3 driver options to use this:

- removes a previous driver version:

```
ck_911 -r
```
- changes the standard interrupt number:

```
ck_911 -f62
```


installs the driver with the interrupt 62(hex).
Standard setting: 60(hex)
- return to standard setting:

```
ck_911
```

CADvance

The driver is loaded into memory by CADvance and therefore doesn't require any additional steps by the user. CADvance also removes the driver from memory at the end of a session.

CADvance is started in the highest possible resolution by default. If you wish to change this then you must set an environment variable in the following way:

```
SET S31_911=mode number
```

mode number is:

0	640 x 480, 256 colors
1	800 x 600, 16 colors
2	800 x 600, 256 colors
3	1024 x 768, 16 colors
4	1024 x 768, 256 colors
5	reserved
6	reserved
7	1280 x 1024, 16 colors
8	reserved

Note:

Please note that not every video mode may be available.

If you have enough system memory, you can use this driver as a rendering unit. The resolution is the same as for the 2D and 3D modes. Please note however, that rendering will only work if the driver is currently using a 256 color mode.

DataCAD

Start the configuration program CONFIG and select the driver `S3 86C911`.

This is a TSR driver, i.e. it remains resident in system memory.

Note that there are 2 drivers for DataCAD: DL_911, if you are using EMS, CK_911, if you are **not** using EMS,

If EMS is active, then you must decide whether to use it or not. If not, then the correct driver will automatically be loaded during installation.

Before starting DataCAD you must first activate the driver.

We recommend you to place an entry in your AUTOEXEC.BAT to automate this procedure

You should be familiar with the following 3 driver options: (CK_911 was used for the following examples, but the options also apply to DL_911)

- - removes a previous driver version:
`ck_911 -r`
- - changes the standard interrupt number:
`ck_911 -f62`
installs the driver with the interrupt 62(hex).
Standard setting: 60(hex)
- return to standard setting:
`ck_911`

Generic CADD 5.0 and 6.0

In order to configure the driver correctly start the Generic CADD program CONFIG. If you are using a 3D design program then start the program 3DCONFIG.

Select Option Other VDG'files(s) and then `LGEN911.VGD` oder `SGEN911.VGA` and confirm with ENTER.

The driver is automatically loaded into system memory by Generic CADD and later removed. The user doesn't have to undertake any additional steps.

If you are not using the screen saver from Generic CADD then we recommend that you use the smaller driver. You will then gain an additional 11K without EMS and approximately 88K with EMS.

Generic CADD is started in the highest resolution by default. If you wish to change this then you must set an environment variable from the DOS prompt:

```
SET CADD_INIT=mode number
```

mode number is::

0	640 x 480, 256 colors
1	800 x 600, 16 colors
2	800 x 600, 256 colors
3	1024 x 768, 16 colors
4	1024 x 768, 256 colors
5	reserved
6	reserved
7	1280 x 1024, 16 colors
8	reserved

Note:

Please note that not every video mode may be available.

Lotus 1-2-3 / Symphony 2.0

1. Start the Lotus 1-2-3/Symphony installation program:
CD \123
INSTALL

or

CD SYM
INSTALL
2. A menu is displayed. Follow the instructions on the screen in the following sequence:.
3. Start with ENTER.
4. Select `Advanced Options`.
5. Select `Add New Drivers to the Library`.
6. Confirm with ENTER.
7. Select `Modify Current Driver Set`.
8. You will be shown a list of the current configuration. To change an item mark it with the highlight bar. Make your selections from the list. Several new SPEA drivers have been added to the list; 4 for graphics and 3 for text.
9. Select `Graphics Driver` and select a single or dual screen configuration. Select a resolution for the SPEA board.

Note:
If dual screen is selected text (not the S3 driver) then the text output must be on the text monitor.
10. Select `Text Driver` and pick a SPEA text driver. If your configuration is correct, press ESC to return to the menu.
11. Terminate the installation program:
Select `Save Changes`.
Press ENTER twice
Select `Yes`, in order to exit the installation program.

MS-Word 5.0

1. Start Microsoft Word 5.0
2. Press ESC, to open the main menu.
3. Press O for `Options`..
4. Highlight the line that reads `Display Type: value`.
5. Press F1, to see a selection list on the screen.
6. Highlight your choice and press ENTER.
7. Press ESC three times in order to leave the Microsoft Word configuration program.

MS-Flight Simulator 5.0

To run Microsoft Flight Simulator 5.0 you should select '`SVGA > VESA 1.2 compatible`' when configuring the display preferences. Note that it is vital that you have loaded the VESA mode TSR program `V7MIRVBE.EXE` first (see VESA Modes).

MicroStation 4.0x & 5.0 (SPEA BigMicro Driver)

If you intend to use board combinations with MicroStation then please check the specific README file for this driver for detailed information.

Driver Selection via USCONFIG

1. Go to the \USTATION directory.
2. Run the USCONFIG program to select the new device driver.
3. Select 'Display Adapters', 'Vendor Supplied driver', and then 'SPEA Prot. Mode'.
4. Select a second adapter if needed.
Note:
You will be asked if you want to disable the virtual graphics page. If you disable the 2nd graphics page you can choose resolutions up to 256 colors. If you enable the 2nd graphics page, all possible resolutions are displayed with 16 colors only.
5. Select 'Exit' and 'Save'.

Note:

You must reboot your system for changes to take effect.

6. The SPEA driver is automatically loaded when you start MicroStation.

Configuration of the MicroStation device driver via the environment variable MSPEAPM

In order to configure the MicroStation device driver with the environment variable MSPEAPM and the corresponding parameters you must be aware of the possible video modes of your graphics board.

To see a list of the video modes for your primary board change to your SPEA\GDC directory and enter:

```
VMODE
```

Once you know the modes available you can use them in the following environment variable call:

```
SET MSPEAPM=-Ccardr -Vx
```

-Ccardr defines the card number for a single screen of the graphics board for the right screen.

Values for cardr:

10= V7-MIRAGE with enabled VGA part.

-Vx whereby x=video mode main (right) screen

Example:

```
SET MSPEAPM=-C10 -V0
```

If your monitor flickers ...

If your monitor flickers, you may be using your monitor with a refresh rate that is too low.

Check your monitor's maximum parameters and then select another refresh rate from the DOS level using the utility SPTUNE.EXE (described in this manual). Make sure that your monitor is capable to run the selected refresh rate first.

OS/2 2.1 & 2.11 (SPEA BigBlue Driver)

Installation Requirements

OS/2 has to be installed and runs with standard VGA driver with the board in the OS/2 environment and in a Windows session as well. The installation from the 'Utilities' disk should have been completed.

Note:

You need the Superdisk for the installation.

Features of the Driver

This driver supports the following in the OS/2 Workplace shell:

Resolutions and number of colors:

640 x 480	256
800 x 600	256
1024 x 768	256

The BigWin driver can be installed in the Windows Session in all available resolutions and also with color depth higher than 256 colors.

Also if the BigWin is configured in another resolution than the OS/2 environment it is possible to switch between both desktops without any problems.

Installation

1. Start OS/2 and open a DOS session in full screen.
2. Insert the disk 'Drivers for OS/2' into drive A:
3. Open an OS/2 window. Enter at the prompt:

```
V7INST A: C:
```

(whereby A: is the installation drive and C: is the boot drive).

The installation now demands the BigWin disk in order to install the necessary files for the Windows session. After this the 'drivers for OS/2' disk will be needed again.

4. Finish OS/2 and reboot your system.
5. Insert the disk 'Drivers for OS/2' into drive A: again.
6. Open the 'OS/2 System' and 'System Setup' windows and start the program 'Display Driver Install'.

7. Click OK (neither 'Primary' nor 'Secondary Display' selected!).
If several drivers are now offered, then select 'BigBlue for V7-MIRAGE'.

SPTUNE is now started. Choose a frequency, that is supported by your monitor and test this adjustment using the test image.

Note:

User-defined modes should not be installed in SPTUNE.

8. After finishing this program click on 'Install' and reboot the system again.
9. The driver now starts with a resolution of 640*480*256.
It is now possible to set any other resolution using the program System in the System Setup. The program System in the System Setup can also be called immediately after the installation. The system then boots directly in the selected resolution.

Installation of the BigWin Drivers

If the OS/2 drivers have been installed as described in the previous chapter the Windows Session will start with the same resolution as OS/2.

Use V7SETUP to change the resolution or refresh rate.

Note:

The program SPEAview will not work on an OS/2 system.

VersaCAD

Start the program ENVIRO in the VersaCAD-directory and select 'S3 96C911'.

You can choose between single and dual screen configurations and different resolutions.

This driver must be resident in system memory before calling VersaCAD. We recommend you automate this process using a call in your AUTOEXEC.BAT.

Note that the driver for the Real Mode version of VersaCAD (VersaCAD Design is called VC2_911.COM.

VersaCAD 386's driver is VC3_911.COM.

Note:

The SPEA driver uses the resolution set using the configuration program ENVIRO. If this resolution is not available then VersaCAD can not be started.

Note:

Further information about the installation and configuration of VersaCAD can be found in the file VCREADME.DOC in your VersaCAD directory.

Working with EMS

If installed and activated, this driver reserves 512K of EMS memory by default. This is used to store the display list which is necessary to speed up the display of drawings on the screen. Whereas 512K is normally enough for most drawings, it is possible to assign more EMS memory to the driver when loading it.

Use the environment variable VCAD_EMS to assign the number of 16K EMS pages to the driver in the following way:

Example:

```
SET VCAD_EMS=64
```

This reserves 1024K (i.e. 64 x 16) for EMS memory.

If this variable is set to 0 then no EMS will be reserved and the display list therefore deactivated.

Display Lists

One of the main advantages of this driver is the integrated display list support. In order to use this feature you must inform VersaCAD that the driver display list is supported and that you wish to use it.

1. Start ENVIRO.
2. Select `Screen options`.
3. Select the option `built-in` under Display List.

In order to minimize the number of screen regenerations (each line is regenerated by VersaCAD) you must first zoom into the drawing and then out again. This causes the display list to be immediately updated. Sketching, zooms and pans are then executed much quicker.

Zooming in and out of a drawing can be done using the functions Full and Out in the display list menu (LIST).

To increase the speed of the panning option, you need a program which increases the scan rate of your keyboard. The panning rate is then increased.

Word Perfect 5.1

1. Start Word Perfect.
2. Press the Shift and F1 keys simultaneously in order to obtain access to the SETUP menu. There, select either Graphics or Text display. You'll see a list of all the drivers including the SPEA drivers (= S3 86C911 drivers). If you select the SPEA graphics driver, you will be able to choose between resolutions from 1024 x 768 and 800 x 600. If you select a SPEA text driver you can choose between options of 132 x 25 and 132 x 43 characters.
3. Select the desired resolution and leave the SETUP menu.

Appendix A

Utilities

The SPEA Utilities help you to configure or optimize your system environment to get full use of all features supported by SPEA. These utilities are not mandatory, but very useful in many cases.

SPEAtune - Monitor / Graphics Board Tuning

Who is SPEAtune intended for?

If you use a SPEA graphics board and you do not have a SPEA monitor, you can use SPEAtune to test the display on your multiscan monitor to save up to 6 optimized monitor settings (if your monitor does not offer this facility).

SPEAtune is not needed if you are using a SPEA multiscan monitor as these devices are already optimized (tuned) for harmonized use with a SPEA graphics board and therefore already give the best performance possible.

What can you use SPEAtune for?

SPEAtune enables you to match the maximum screen refresh rate (vertical frequency) of your monitor. You can test the different values (Hz) with a test image to find the best results before saving one value.

You can test and save one monitor frequency value (x kHz horizontal frequency, x Hz vertical frequency) for each video mode the graphics board supports. For example:

- 79.1 kHz (horizontal) / 74 Hz (vertical) for 1280 x 1024 x 256
- 80.8 kHz (horizontal) / 100 Hz (vertical) for 1024 x 768 x 256

Using SPEAtune

1. Start SPEAtune from the DOS level and the directory C:\SPEA\GDC with the following call:

```
SPTUNE
```

You will see a menu driven program for selection.

Via the help button you can receive context sensitive help to all menu options.

2. Adjust monitor frequency - monitor frequency setup
start the option `Monitor frequency setup`
select a vertical refresh rate your monitor is

capable of
with the option `Test image` you can check the display quality of various test images and resolutions with the chosen refresh rate.

Save the new setting and exit the monitor frequency setup.

3. Image tuning - Tuning Setup

Note:

This menu item is only necessary if your monitor is not able to store various display settings with different resolutions.

You may want to modify some of the parameters that define the display of your monitor (e.g. change sync polarity) or change the display position or increase or decrease the display size. These changes can be done in the Tuning Setup menu.

Start the Tuning Setup. Select a refresh rate and the number of colors. The optimal refresh rate is selected automatically (shown in yellow), it depends on the monitor frequency you selected in the monitor frequency setup.

Start the Tuning image via the tuning button. Modify some parameter - if necessary - (e.g. change sync polarity, change display position). Save the new setting by exiting the tuning image via the RETURN key. If you have modified the parameter and saved the new setting this entry appears at the end of the list in yellow with the remark `user`.

Note:

You can store a maximum of 6 user-defined settings.

Proceed as shown above for all resolutions and number of colors you want to work with and exit the Tuning Setup afterwards via the `Save` button to save all modifications.

If you change the monitor

Please note that you have to readjust the vertical refresh rate (via the menu `Monitor frequency setup`) in case you change your monitor.

Warning!

If you permanently activate your monitor with a refresh rate that is too high for your monitor, you may damage it!

If you are not sure about the monitor frequencies your monitor supports, inform yourself about the resolution and refresh capabilities in your monitor manual.

The vertical refresh rates are automatically assigned to the chosen monitor frequencies (see also VGA table in the file BIOS.TXT on the Superdisk or in your SPEA directory).

Important!

If you have stored user defined settings with a former monitor these user defined settings remain even if you change the monitor. The current version of SPEAtune does not allow the user to simultaneously reset all the settings made.

Delete obsolete settings as follows:

1. activate the Tuning Setup after you have changed the monitor frequency.
2. search the user defined setting and activate the frequencies list.
3. click to the lowest possible frequency in the active list, start the tuning image and save the tuning image without any changes by the RETURN key.

The user defined setting is now deleted and the optimal refresh rate for your monitor is selected (in yellow).

MNTMIR.BAT - Set refresh rate

The program is located in your SPEA\GDC directory and is started from there from the DOS prompt with the following call:

MNTMIR *n*

whereby *n* stands for a number from 0 to 4 which represents the maximum refresh rate frequency that your monitor can handle.

n = 0	up to 38 kHz
n = 1	up to 48 kHz
n = 2	up to 56 kHz
n = 3	up to 58 kHz
n = 4	up to 64 kHz

Read the file BIOS.TXT to see which mintor classes can handle which frequencies.

SMODE.EXE - Setting the Video Mode for DOS Applications

SMODE manually sets the display mode and emulation on the DOS plane. You can either enter parameters on the command line, or wait to be prompted. The syntax, entered from DOS is

```
SMODE ## vga
```

where ## is any valid BIOS mode number in hex mode and *vga* is the desired emulation (See table *Standard VGA modes* in the file BIOS.TXT of the Superdisk or in your SPEA directory). Other possible emulations are EGA, CGA, and MDA.

Available Video Modes

The graphics cards of the SPEA V7 series support all Standard VGA, VESA, Extended and Enhanced VGA modes. See all supported modes on the tables in the file BIOS.TXT in your SPEA\GDC directory.

VESA Modes

VESA support is provided by the TSR program V7MIRVBE.EXE which is installed in your SPEA directory during the software installation if you selected 'Utilities'. The program is then called via a line in your AUTOEXEC.BAT and thereafter enables you to use VESA modes without additional measures.

V7HFREQ - Higher Refresh Rates under DOS

The utility V7HFREQ.COM allows you to set higher refresh rates than 60Hz under DOS. If you selected the utilities option during the software installation, you will find the program in your SPEA\GDC directory.

Start the program from this directory with the call:

```
V7HFREQ ?
```

You will be shown an overview of all the possible parameters and options available.

S3TEST.EXE

S3TEST allows you to test your hardware. Start the program with the following call:

```
C:\  
CD \SPEA\GDC  
S3TEST
```

You'll see colored stripes for about 7 seconds, then a list with the checked parts of your system appears.

To continue the program, press the space bar. You receive about 15 different screen displays to show you the various resolution and color abilities of your SPEA graphics card.

To cancel the program at any time press the CTRL + C keys.

Using more than one Board

Some of the features of some SPEA drivers (e.g. BigMicro) can only be used with board combinations.

SPEA offers detailed information about combining boards in an additional publication titled 'Dual Screen Configurations' (also available via the SPEA Mailbox). Further details can be found in the README file supplied with this board.

There are however, some basic rules which you must know when installing 2 graphics boards in one system.

You may not simultaneously use 2 active VGA boards in one system.

If two VGA boards or parts (e.g. boards with an extra VGA part or motherboard with VGA chip) are combined in one system, one of them MUST be deactivated and be set-up as the secondary board, or switched off completely.

Note for VL users: some motherboards define the first board found as master, the next board as slave. If the board with the deactivated VGA part is defined as master then you will have to change the physical order of the boards to be able to use the combination.

Appendix B Technical Details

Technical Data

Processor: S3 801 (ISA) or 805 (VL)
1 MB DRAM
RAMDAC: 110 MHz
HighColor (65,536 simultaneous colors) up to 800x600, 60 Hz n.i.
TrueColor (16.7 mill. simultaneous colors) up to 640x480, 73 Hz n.i. (2 MB boards only)
Dotclock: according to video mode (see BIOS.TXT in your SPEA\GDC directory).
Current consumption: +5V, typ. 750 mA, + 12V typ. 40 mA

V7-MIRAGE (ISA) Jumpers

Jumper No. 3 (=JP3 on the board)
Enables or disables the VGA unit on the board.
Jumper position 1-2 (default):
VGA enabled.
Jumper position 2-3:
VGA disabled.

Jumper No. 4 (=JP4 on the board)
Enables or disables IRQ 2/9 on the board.
Jumper position 1-2:
disabled
Jumper position 2-3 default):
enabled

V7-MIRAGE (VL) Jumpers

The V7-MIRAGE P-32 (VL) also has **two** jumpers.
Jumper No. 1 corresponds to jumper 3 on the ISA board.
Jumper No. 2 corresponds to jumper 4 on the ISA board.

Memory Addresses of the V7-MIRAGE

It is necessary to make sure that all I/O and memory addresses reserved for the graphics board are not used by other hardware devices.

Your board uses the following addresses:

I/O addresses:

Standard VGA I/O	3B0-3DF
Graphics Engine	x2E8-x2EA

Memory addresses:

Video RAM	A000-BFFF
-----------	-----------

Video ROM	C000-C7FF
-----------	------------------

Note:

Please note that some fax and modem cards also use the address 2E8 (COM#4). In this case deactivate COM#4 and use another address for the corresponding hardware device.

Video Modes

Tables containing the video modes your board can handle can be found in the file BIOS.TXT on the Superdisk. This file is installed in your new SPEA directory during the software installation if you selected the option 'Utilities'.

VGA Output Connector

Pin	Function
1	Red
2	Green
3	Blue
4	Not used
5	ground
6	Red Return (ground)
7	Green Return (ground)
8	Blue Return (ground)
9	Key (no pin)
10	Sync Return (ground)
11	not used
12	not used
13	Horizontal Sync (+)
14	Vertical Sync (-)
15	Not used

VESA-Compatible Feature Connector

The auxiliary VESA-compatible connector can be used to allow pass-through VGA to a coprocessor card that does not directly support VGA. Such cards include Texas Instruments 34010- and 34020-based cards and IBM 8514/A compatible adapters.

Pin	Function	Pin	Function
1	Ground	2	Pixel Data 0
3	Ground	4	Pixel Data 1
5	Ground	6	Pixel Data 2
7	(See Note)	8	Pixel Data 3
9	(See Note)	10	Pixel Data 4
11	(See Note)	12	Pixel Data 5
13	Unused	14	Pixel Data 6
15	Ground	16	Pixel Data 7
17	Ground	18	Pixel Clock
19	Ground	20	Blanking
21	Ground	22	Horizontal Sync
23	Unused	24	Vertical Sync
25	No Pin (key)	26	Ground

Note:

7, 9, and 11 are inputs to the DAC. All are active LOW.

7: External Pixel data

9: External Sync and Blanking

11: External Pixel Clock

Appendix C Troubleshooting

General Considerations

Make sure the SPEA board is firmly seated in its expansion slot, and that it is not touching other boards in your system.

Be sure your monitor cable is properly connected to the SPEA board and that your monitor power switch is on. You may also need to verify your cable pinout, since some monitors use a non-standard configuration. Recheck your computer's switch and jumper settings.

Run the SPEA board Diagnostics Program (S3TEST.EXE). It is located in the directory C:\SPEA\GDC.

Make sure other peripherals such as EMS cards, disk controllers or LAN cards are not using the same memory address as the SPEA board. Check with the manufacturer or your user's manual for information about designating exclusions for memory locations when invoking your device driver.

Some other things to think about

Your AUTOEXEC.BAT or CONFIG.SYS file may contain commands that are interfering with the operation of the SPEA board. Try booting your system without these files. If the SPEA board works properly, identify and remove the conflicting command(s).

Systems with motherboard VGA controllers

If your system has a display controller on the motherboard, be sure to disable it before trying to run the SPEA board. Consult your computer's User Manual for the correct switch or jumper settings your motherboard requires.

Commonly Asked Questions

General problems

Q: The system does not work properly, some problems occurred during installation.

The system beeps when booting or the graphics board cannot be initialized.

Problems with network systems occur.

A: Check again, if all connections are correct and if the graphics board is placed secure in the expansion slot.

Be sure that you have installed the most up to date software driver. (You can find

them in the SPEA mailbox. If you don't have a modem, please contact your local dealer).

Remove all other hardware (e.g. Soundboard, networking card) from your system in order to find out possible hardware conflicts.

The following I/O addresses may not be used from hardware devices as these are the addresses the graphics board uses:
03B0 - 03DF, 02E8 - 02EA(hex).

Deactivate COM#4 (COM#4=DISABLED) via the system setup. This address must be free, but many fax and modem cards use it. In this case use another I/O address for the corresponding hardware.

Deactivate all other VGA components in your system (in case a VGA part is built onto your motherboard or several graphics boards are installed in your system). Only one VGA part can be active in a system.

Install the graphics board in another slot or - if possible - in another PC.

BIOS system setup:
Install SHADOW RAM for the Video BIOS.

Minimize the clock rate of your system.

Q: DOS 6.0 (5.0): General Problems with Windows

A: Check the following entries in the CONFIG.SYS file:

HIMEM.SYS, QEMM386.SYS or 386MAX.SYS must stand at the first position.

For memory management no INCLUDE command is allowed. Instead you have to exclude memory areas which are used by other hardware devices (e.g. Scanner, Soundboard a.s.o.) with the EXCLUDE command. For the graphics board this is the area x=A000-C7FF.

Reduce the cache from 2048kB to 1024kB.

Q: Is it possible to run DOS with more than 60 Hz?

A: Yes, using the program V7HFREQ located in your SPEA\GDC directory (if you installed the utilities).

Q: The SPEA Utilities are not available.

A: The SPEA Utilities are packed (and not visible) on the SPEA Superdisk. To use them you have to install them via the SPEA installation program from the SPEA Superdisk. Select the option 'Utilities' to copy the utilities into the \SPEA\GDC directory.

Q: The Fax or Modem card does not work any longer.

A: Deactivate COM#4 (COM#4=DISABLED). This address must be free, as the graphics board uses it. Use another I/O address for the Fax or Modem card.

Q: When executing S3TEST.EXE the error message '80 errors' occurs.

A: Change the entry 'ALE' or 'SINGLALE' in the AMI Advanced Setup - if available - to 'disabled' or 'enabled'.

Q: The installation program of the SPEA Superdisk does not work correct.

A: Add the following entry to the AUTOEXEC.BAT file and restart your system:

```
SET COMSPEC=  
C:\DOS\COMMAND.COM
```

Problems with Windows

Q: The Windows startup lasts very long. Is the V7SETUP logo responsible for that?

A: No, the V7SETUP logo does not have any influence on the Windows startup. Create a permanent swap file. Defragment your hard disk regularly (e.g. with Norton SpeedDisk).

Remove unnecessary entries from your WIN.INI file (e.g. fonts, programs).

Q: Fonts are displayed incorrectly.

Icons or Windows are displayed unclear or not complete.

The image scrolls through when clicking on the scroll bar.

Pixels remain on the screen.

The image flickers.

The system crashes.

A: Add the following entry to the SYSTEM.INI file under the section [CARLK.DRV] :
CHIPSYNC=1

Reduce the refresh rate via the V7SETUP

Reduce the clock rate of the system via the System-BIOS Setup.

Q: Windows or applications under Windows crash.

Mouse functions or icons are not correct.

Wrong colors are displayed.

A: Set - depending on the SETUP of your system - DEQUOPLE REFRESH, REFRESH=HIDDEN, REFRESH=AT-STYLE or REFRESH to 'disabled'.

Use COM port #2 for your mouse.

Q: Working with QEMM 6.x: Windows cannot be started.

A: If you get the message 'no UMBs free' set the following entry into the CONFIG.SYS:

```
C:\QEMM386.SYS R1:ST:M RAM  
X=C000-C7FF
```

Q: The Test button of the V7SETUP is not active.

A: The Test button is only active with the actual settings. If you change any setting in the V7SETUP the Test button becomes inactive. Restart Windows (with the saved new settings) and call V7SETUP again. The Test button is now active for the new setting.

Q: No DOS prompt appears after the termination of Windows.

A: Delete the additional remark 'V7START.DLL' from the entry DRIVERS=MMSYSTEM.DLL in the boot block [boot] of the SYSTEM.INI file.

Appendix D

Glossary

ANSI: American National Standards Institute.

ASCII: American Standards Committee on Information Interchange. A standard used by IBM and compatible computers to represent numbers and characters in binary form.

Analog Display: A monitor that uses variable color control voltages to display a very large number of colors but requires very few inputs.

AUTOEXEC.BAT: A batch file that directs the activities performed by the computer during system startup.

BIOS: Stands for Basic Input-Output System. Code in your computer's ROM (Read Only Memory) that provides the power-on self test and other operating functions.

Booting/Booting Up: Starting the computer. There are two types. Warm Booting is accomplished by simultaneously pressing the CTRL/ALT/DEL keys and can occur only when the computer is running. A cold boot requires activation of the ON/OFF switch.

CGA: The IBM Color Graphics Adapter.

Color Display: A type of monitor capable of displaying information in color. It is often called an RGB (red, green, blue) monitor, referring to the signals needed to drive it.

CONFIG.SYS: An ASCII file that is created to provide the computer with special information about applications and hardware.

Default Mode: The capabilities, resolutions and display mode the system operates with when you start your computer.

Digital Display: Also called TTL. A type of monitor that switches signals ON or OFF to determine display color. Types of digital displays include the IBM Enhanced Color Display or Monochrome Display.

DIP Switch: Dual Inline Package switch; a series of tiny, two position switches which allow users to select and change options on computer boards, printers, and other peripherals.

Driver: Part of a software program that interacts with a particular piece of equipment in your computer system (i.e. video boards, printers, and keyboards). Drivers are often loaded by your config.sys at system boot.

EGA: The IBM Enhanced Graphics Adapter.

EMS: Enhanced Memory Specification. Originally developed to break the DOS 640K limit, it is now used as a general term for types of add-in memory.

Enhanced Color Display (ECD): The IBM Enhanced Color Display capable of 640 x 350 resolution.

Expansion Slot: An electrical connection within the computer used for the addition of expansion boards (such as video adapters).

Fixed Frequency Monitor: An analog monitor which can only sync to a very narrow range of scan frequencies.

Hercules Graphics Card (HGC): A video adapter that provides bit mapped single color graphics.

Hexadecimal Notation: A base-16 numbering system that uses numbers and letters. The hexadecimal sequence begins: 1 2 3 4 5 6 7 8 9 A B C D E F, then 10, 11 etc.

Horizontal Frequency: The rate at which a monitor displays each scan line. Usually measured in kilohertz (kHz).

I/O Port: Input/Output port. An address used to access a hardware device.

Interlaced Display: A monitor that refreshes every other scan line every other pass of the screen. A non- interlaced monitor refreshes the entire screen (every scan line) every pass of the screen.

Interrupt Request (IRQ): Signal used by a device, such as a mouse, to inform the CPU that it is present and functioning.

Jumper: A small plastic plug that fits over a pair of pins. When the plug straddles two pins it makes an electrical connection. The computer makes decisions based on whether the connection is made or not. A group of jumper pins is called a jumper block.

Monochrome Display: Monitor that displays information in one color only; sometimes called a black & white display.

MDA: The IBM Monochrome Display Adapter.

Multi-frequency Monitor: A type of monitor that supports a wide range of horizontal scanning frequencies and vertical refresh frequencies. This type of monitor accepts inputs from many different video display adapters.

Palette: A selection of colors from which to choose. The V7-MIRAGE P-32 provides as many as 16.7 million simultaneous colors from a palette of 16.7 million. This capability is sometimes referred to as TrueColor. It is believed that the human eye can discern no more than 16.7 million colors.

Peripheral Equipment: Auxiliary equipment connected to a computer (e.g. monitor, printer, keyboard, etc.).

Pixel: Short for picture element; the smallest field displayed on the monitor; could be compared to the dots which form images in photos printed in newspapers. Also called pel.

Primary Display: The monitor that is active when you power on your system.

PS/2 Display Adapter: The IBM VGA board for Industry Standard Architecture (AT bus) computers.

RAM: Random Access Memory; memory that can be read from and written to.

ROM: Read Only Memory; memory space in your computer for storing permanent operating instructions.

Resolution: Number of pixels displayed on the monitor. The higher the resolution, the crisper and sharper the images appear.

Secondary Display: The monitor connected to the graphics card that is co-resident with another card/monitor in your computer system. Is not active upon booting your system.

Sync: The stable condition that exists when two repetitive events maintain a constant time relationship; your monitor is in sync with the signals from your board when the display is correct and stable.

Terminate and Stay Resident (TSR): Programs that are run once then remain in memory in order to be activated by a sequence of key strokes or a 'hotkey.' It is possible that a TSR may take up too much memory and cause conflicts with other programs.

TrueColor: The ability to display 16.7 million simultaneous colors. It is believed that the human eye can discern no more than 16.7 million colors. See 'palette'.

Variable Frequency Display (VFD): A monitor that is capable of displaying a wide range of resolutions through its ability to sync to a wide range of horizontal and vertical scan frequencies.

Vertical Frequency: The rate at which the monitor screen is refreshed. Usually measured in hertz (Hz).

VGA: The IBM Video Graphics Adapter.

Video Connector: The standard 15-pin monitor output connector located on the board,

Video Electronics Standards Association (VESA): industry-wide consortium organized to standardize graphic modes Your graphics board supports the VESA standards.

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