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SPEA V7-MIRAGE P-64 Retro Graphics Card User Manual

V7-MIRAGE P-64
User Manual
Part Number 1740 2050.5
Rel. 0795.6
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Contents

Quick Installation (Hardware)

This quick installation is for experienced users only. Detailled installation information can be found in the respective sections of this manual.

1. Check that your monitor and system configuration support the SPEA graphics card (e.g. correct bus type and version).
2. Disconnect your computer from the mains power and peripheral equipment.
3. If your system main board incorporates a video adapter deactivate it.
4. 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.
5. Install your SPEA graphics board in a free extension slot.
6. Reassemble your PC, connect peripheral equipment and reconnect the power cable.
7. Switch on your monitor first, then the computer.

Quick Installation (Software)

The respective application (e.g. Windows) must already be configured for standard VGA (640 x 480) before the corresponding SPEA driver can be installed.

1. Insert the Media Gallery CD and start the software installation (from the CD drive) as follows:

   DOS:

   Enter SPEA.BAT at the DOS prompt

   Windows 3.x:

   Enter SPEA.BAT at the DOS prompt

   Windows NT:

   Open a DOS window, call SPEA.BAT

   OS/2:

   Open an OS/2 window, change to the CD drive and start SPEAOS2.CMD
2. Follow the instructions on the screen and select English (E) as the language for the installation.
3. A window will be displayed with a list of the boards on the left and the options 'Installation' and 'Manuals' on the right. Select your board, if not already automatically selected.
4. Click on the option 'Installation' (you may have to confirm your board once more).
5. You will next see a list of software for installation. You must select the first option ('Utilities').
6. Select other drivers as necessary (e.g. BigWin for Windows 3.x).
7. Some drivers (e.g. Windows 3.x) require a batch file (called after this program) to continue the installation. If this file is necessary, you will be asked to confirm the default name CONTINUE.BAT. Accept the name and follow the instructions on the screen.

Problems with the Installation?
In the unlikely event of problems …

1. Check the README file on your CD (see page 2) or in your C:\SPEA\GDC directory after the installation.
2. Read Appendix C: Troubleshooting.
3. Check the technical support information on offer via the SPEA Support Mailbox
4. Contact the SPEA ExpertLine

Important:
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
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 CD.
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 conventionsare 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:
E: SPEA.BAT
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 your CD drive as E: Please enter the relevant letter for your system.
Delivery Scope Checklist
Your SPEA package should contain the following items:
– 1x V7-MIRAGE P-64
– the Media Gallery CD
– this manual
SPEA Media Gallery CD
The SPEA software is supplied the Media Gallery CD. The current utility software and various drivers are available around the clock and can be downloaded from the SPEA Bulletin Board (Mailbox) or CompuServe (GO SPEA).
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 during the software installation.
You can also read this file at any time from your CD with the command: E:\SPEA\INSTALL\MIRP64 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 via the SPEA Media Gallery CD

Further information concerning these support services can be found in the 'SPEA ExpertLine' section at the end of this manual.

Company Address
SPEA Software AG
Moostr. 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 Trio64 graphics processor (64 bit Graphics Engine) for VESA Local Bus and PCI 2.0 bus systems
- standard of 2 MB DRAM onboard offering TrueColor video modes and a resolution of 1280 x 1024 with 256 colors
- TrueColor (16.7 million simultaneous colors displayed) for resolutions up to 800 x 600
- 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, Windows® 95
- SPEA BigWinNT enhanced accelerator driver for Windows NT
- SPEA Windows tools
- SPEA BigBlue driver for OS/2
- SPEA utilities (e.g. hardware test program)
- Driver software for the following applications:
  – 3D-Studio 1.0/2.0
  – AutoCAD 11 & 12
  – AutoShade
  – MicroStation
- SPEA BigFocus driver for AutoCAD 12 (DOS) and AutoCAD for Windows

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

Part 2 Hardware Installation

Graphics Card Installation
Requirements

1. IBM compatible computer (80386/486/586)with PCI version 2.0 or VESA local bus system.
2. One free PCI or VL Bus system expansion slot
3. MS-DOS operating system, version 5.0 or higher or Windows NT or OS/2.
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.
Before you start to change the refresh rate with programs described in this manual (e.g. SPTUNE, V7SETUP, V7SETNT, V7SETOS2), check your monitor manual for 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 Colani Tower 486DX2-66, PCI bus, 66 MHz, 8 MB
- SPEA 2085 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) 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 modeused 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 PCI 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.
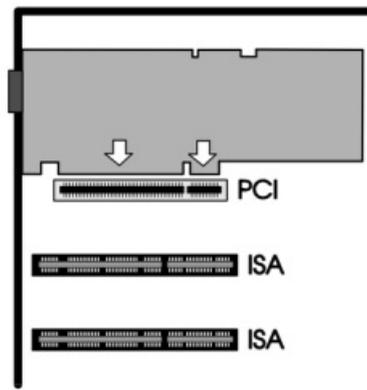
Installation in a PCI expansion slot
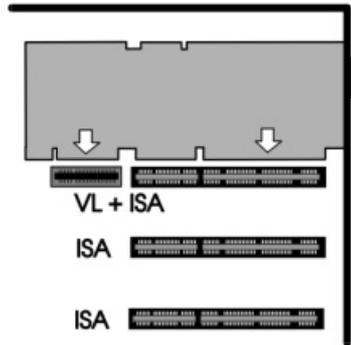
Installation in a VESA Local Bus expansion slot

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 decribed 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 tuning programs (SPTUNE.EXE, V7SETUP.EXE, V7SETNT orV7SETOS2 – see below) 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/PCI 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 the PCI mainboard is not compliant with the approved VESA or PCI 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 and PCI bus mainboards with a clock rate of 66 Mhz.

After Installing the SPEA Board

If you have correctly installed the SPEA board, the DOS prompt will 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) 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.

Installing the Basic Software and Utilities (all Operating Systems)

In order to use your board in your PC it is necessary to install a package of basic programs, regardless of the operating system in use. Please execute the following steps in order to install the basic software.

1. Put the Media Gallery CD in drive E: and start the installation (from E:) as follows:

   DOS:

   call SPEA.BAT from the DOS prompt

   Windows 3.x:

   call SPEA.BAT from the DOS prompt

   Windows NT:

   open a DOS box and enter SPEA.BAT

   OS/2:

   open an OS/2 window, change to drive E: and then call SPEAOS2.CMD

2. Choose English (E) as your language for the installation.

3. A new desktop is displayed. The board is normally automatically detected (see the left of the screen). If not, click on the V7MIRAGE P-64 button.

4. Click on the Installation button (on the right of the screen).

5. Confirm that you are installing for a V7MIRAGE P-64.

6. You will see a list software drivers available for installation.

7. Select the first option 'Utilities'.

8. You will now be asked for the disk drive and directory names where the SPEA software should be copied (default: C:\SPEA\GDC).

9. Accept the default name and follow the instructions on the screen. The installation program will automatically copy all the necessary files onto your hard disk.

10. A README file appears on the screen during the installation. Please read this file!

The basic software is now installed. To install and configure the drivers you need for the different operating systems and applications you are using, please read the relevant sections that follow (in this chapter).

Please note that the respective applications will still be shown in 640×480 resolution. Higher resolutions or color

depths are set using a corresponding tuning program (SPTUNE.EXE for DOS applications, V7SETUP.EXE for Windows applications, V7SETNT for Windows NT and V7SETOS2 for OS/2).

Windows 3.1x (BigWin Driver)

Note:

You must have already installed the basic software from the CD before continuing (see page 14).

1. Put your Media Gallery CD in drive E:
2. Change to this drive and type: SPEA.BAT from the DOS command prompt.
3. If not already marked, select your board in the list which appears.
4. Click on the Installation button (on the right).
5. Confirm your board again.
6. Select the Windows driver option shown.
7. Accept the name CONTINUE.BAT for the batch file as proposed.
8. End the primary installation and change to the root of your hard disk.
9. Type CONTINUE.BAT. Windows and the installation program V7SETUP are automatically started.
10. Select a monitor and screen video mode and when finished, click on OK.
11. 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 3.x applications. V7SETUP exists in different versions for the main operating systems (V7SETNT for Windows NT and V7SETOS2 for OS/2). Monitor settings for DOS applications are made using the program SPTUNE).

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.

Windows NT (BigWinNT Driver)

Note:

You must have already installed the basic software from the CD before continuing (see page 14).

1. Put your Media Gallery CD in drive E:
2. Start WindowsNT and login as Administrator.
3. Open a DOS box, change to your CD drive and type: SPEA.BATfrom the DOS command prompt.
4. If not already marked, select your board in the list which appears.
5. Click on the Installation button (on the right).
6. Confirm your board again.
7. Select the WindowsNT driver option shown.
8. Read the README file shown.
9. End the primary installation and close the DOS box.
10. Select the WindowsNT options File and then Run.
11. Select the installation program from the CD as follows: E:\SPEA\INSTALL\NT\V7SETNT.EXE
12. Select a monitor and screen video mode and when finished, click on OK.

13. Restart WindowsNT as suggested in the next dialogue box. This ends the installation.
14. You can reconfigure your graphics display from now on using the SPEA V7SETNT menu and various Windows tools.

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?
The SPEAenergy icon will be automatically placed in the SPEA program group during the Windows installation routine.
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 residently 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, thevisible 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.

Virtual Screen (1536 x 1024)

SPEA (800 x 600)

PC
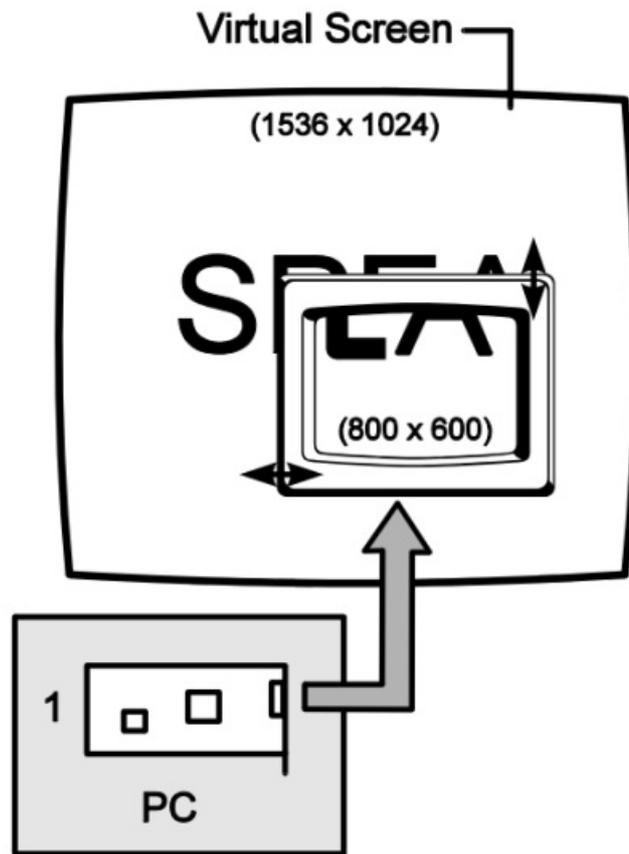
OS/2 (SPEA BigBlue Driver)
Installation Requirements
OS/2 has to be installed and runs with standard VGA driver with the board in the OS/2 environment and in a Windows session as well.
Features of the Driver
This driver supports the following in the OS/2 Workplace shell:
Resolutions and number of colors:

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 256colors.
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.

2. Put the Media Gallery CD in your CD drive.

3. Open an OS/2 window.

4. Change to the CD drive.

5. Enter at the prompt: SPEAOS2

6. Select English (E) as your language.

7. Select the option 'Drivers and utilities for SPEA Software products'.

8. In the following lists confirm that you are installing software for the V7-MIRAGE P-64 board.

9. Select the OS/2 driver listed.

10. Accept the name CONTINUE.CMD as proposed.

11. Follow the instructions on the screen.

12. The program CONTINUE.CMD starts the program V7SETOS2, which is very similar to the Windows configuration program V7SETUP. The menu is self-explanatory. If you have any doubts about the function of any of the menu options, consult the integrated online help.

Note:
SPEAview (see WinTools) will not work on an OS/2 system.
AutoCAD 11 & 12
AutoCAD for Windows
Two drivers are currently available for
AutoCAD:

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

  The BigFocus 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

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	Render Mode
640 x 480	32768	Render Mode
640 x 480	65536	Render Mode
800 x 600	16	
800 x 600	256	Render Mode
800 x 600	65536	
1024 x 768	256	Render Mode
1024 x 768	65536	Render Mode
1152 x 870	256	Render Mode
1280 x 1024	256	Render Mode

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 (8×16) if a font file is not present. Font files may contain any size up to 16×30.
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 8×16 VGA font.
Note:
The international font is only supported with the font 8×16.

AutoCAD Rel. 11 Protected Mode Driver
Note:
You must have already installed the basic software from the CD before continuing (see page 14).

1. Put the Media Gallery CD in drive E:

2. Change to E: and enter the following command from the DOS prompt: SPEA.BAT

3. If your board is not automatically detected (see the left of the screen) click on the V7MIRAGE P-64 button.

4. Click on the Installation button (on the right of the screen).

5. Confirm that you are installing for a V7MIRAGE P-64.

6. In the list of drivers, select the option for AutoCAD 11 and follow the instructions on the screen. The batchfile V7ACAD.BAT is created during the driver installation for AutoCAD Rel. 11. This sets the requiredenvironment variables for AutoCAD, AutoShade and 3DStudio as chosen.

7. Select a font size as desribed 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.

8. 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.

9. Start AutoCAD with the following command CD \ACAD11 ACAD

10. Select option #5 Configure AutoCAD.

11. You receive a display of your current configuration. Confirm this by pressing the ENTER key.

12. Select option #3 Configure video display.

13. You will be asked if you want to make another selection. Enter 'Y' for YES and press ENTER.

14. Select the driver option ADI P386 v4.0/4.1 display.

15. Continue to configure AutoCAD as described in the section Configuring the Aquila Driver.

AutoCAD Rel. 12
Protected Mode Driver
Note:
You must have already installed the basic software from the CD before continuing (see page 14).

1. Put the Media Gallery CD in drive E:

2. Change to E: and enter the following command from the DOS prompt: SPEA.BAT

3. If your board is not automatically detected (see the left of the screen) click on the V7MIRAGE P-64 button.

4. Click on the Installation button (on the right of the screen).

5. Confirm that you are installing for a V7MIRAGE P-64.

6. In the list of drivers, select the option for AutoCAD 12 and follow the instructions on the screen. 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.

7. 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.

8. 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.

9. Go to the directory \ACAD and start AutoCAD with the -R option: CD \ACAD ACAD -R

10. You'll see a display of your current configuration.

    Confirm it by pressing ENTER.

11. Select the option #3 Configure Video display.

12. You will be asked if you want to make another selection. Press 'Y' for Yes and confirm this with ENTER.

13. 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 emory 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 planon 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 wellIt 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
Note:
You must have already installed the basic software from the CD before continuing (see page 14).

1. Put the Media Gallery CD in drive E:
2. Change to E: and enter the following command from the DOS prompt: SPEA.BAT
3. If your board is not automatically detected (see the left of the screen) click on the V7MIRAGE P-64 button.
4. Click on the Installation button (on the right of the screen).
5. Confirm that you are installing for a V7MIRAGE P-64.
6. In the list of drivers, select the option for AutoShade and follow the instructions on the screen. 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.
7. 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.
8. Start AutoShade, with the special configuration command: SHADE -R
9. Select the correct pointing device.
10. Select option P386 Autodesk Device Interface display driver.
11. Choose a display resolution mode. This is the display mode that will be used for the interactive screen.
12. Choose the colors to use in the various parts of the screen. (Menus, Pop-ups, Back-ground, etc.)
13. Save and exit the colors menu when finished selecting colors.
14. Select option P386 Autodesk Device Interface Rendering driver.
15. Choose a rendering resolution mode. This is the display mode that will be used for the rendering (shading and RenderMan) screen.
16. 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.)
17. Answer the next 3 questions with 'Yes', since only one screen is used, and must be redrawn upon switching.
18. Select a hard copy device option.
19. At this point, AutoShade will be configured, and you will find yourself in the interactive screen.

3D Studio 1.0
Note:
You must have already installed the basic software from the CD before continuing (see page 14).

1. Put the Media Gallery CD in drive E:
2. Change to E: and enter the following command from the DOS prompt: SPEA.BAT
3. If your board is not automatically detected (see the left of the screen) click on the V7MIRAGE P-64 button.
4. Click on the Installation button (on the right of the screen).
5. Confirm that you are installing for a V7MIRAGE P-64.
6. In the list of drivers, select the option for 3D Studio and follow the instructions on the screen. 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.
7. Go to the \3DS directory and edit the file 3DS.SET file.
8. Replace: DEFAULT-DISPLAY = VGA320X200 with: DEFAULT-DISPLAY = RCPADI
9. Replace: MAIN-DISPLAY = with: MAIN-DISPLAY = RCPADI

10. Replace: MATERIAL-DISPLAY = VGA320X200 with: MATERIAL-DISPLAY = RCPADI

11. Remove any leading semicolons from a modied line, save the file and exit the editor.

12. Delete the file 3DADI.CFG, if present.

13. 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 callin your AUTOEXEC.BAT file.

14. 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 Lofter, 3D Editor, and the Keyframer.

15. Select a resolution for the Materials Editor.

    Important!

    This must be a 256 color mode.

    Note:

    Using a resolution greater than 640×480 will not increase the usefulness of the Materials Editor at all.

16. You should now find yourself inside the 3D Editor of 3D Studio.

17. 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.

18. 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.

19. Configuration is now complete.

3D Studio 2.0
Note:
You must have already installed the basic software from the CD before continuing (see page 14).

1. Put the Media Gallery CD in drive E:

2. Change to E: and enter the following command from the DOS prompt: SPEA.BAT

3. If your board is not automatically detected (see the left of the screen) click on the V7MIRAGE P-64 button.

4. Click on the Installation button (on the right of the screen).

5. Confirm that you are installing for a V7MIRAGE P-64.

6. In the list of drivers, select the option for 3DStudio and follow the instructions on the screen. 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.

7. Go to the \3DS directory and edit the3DS.SET file.

8. Replace: RENDER-DISPLAY = VGA320X200 with: RENDER-DISPLAY = RCPADI

9. Remove the leading semicolon (or REM) from MAIN-DISPLAY = RCPADI

10. Replace:

    MATERIAL-DISPLAY = VGA320X200 with: MATERIAL-DISPLAY = RCPADI

11. Remove any leading semicolons from a modified line, save the file and exit the editor.

12. Delete the file 3DADI.CFG, if present.

13. 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.

14. Start 3D Studio with the following command: 3DS

15. 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 Lofter, 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 640×480 will increase the speed of the Materials Editor. You receive this mode by pressing the ENTER key three times.

16. Answer 'no' to the question Will RDPADI render to a separate screen?

17. Select a resolution mode for the Rendering RDPADI Device.

18. 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).

19. Answer 'no' to the question Will RCPADI render to a separate screen? Note: If you use a 8514/A monitor answer 'yes'.

20. 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.

21. 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.

22. You should now find yourself inside the 3D Editor of 3D Studio.

23. Configuration is now complete.

MS-Flight Simulator 5.x
Note:
You must have already installed the basic software from the CD before continuing (see page 14).
To run Microsoft Flight Simulator 5.x you should select 'SVGA > VESA 1.2 compatible' when configuring the display preferences.

MicroStation 4.0x & 5.0 (SPEA BigMicro Driver)
Note:
You must have already installed the basic software from the CD before continuing (see page 14).

1. Put the Media Gallery CD in drive E:

2. Change to E: and enter the following command from the DOS prompt: SPEA.BAT

3. If your board is not automatically detected (see the left of the screen) click on the V7MIRAGE P-64 button.

4. Click on the Installation button (on the right of the screen).

5. Confirm that you are installing for a V7MIRAGE P-64.

6. In the list of drivers, select the option for MicroStation and follow the instructions on the screen.

7. After the primary installation, change to the directory \USTATION

8. Run the USCONFIG program to select the new device driver.

9. Select 'Display Adapters', 'Vendor Supplied driver', and then 'SPEA Prot. Mode'.

10. 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.

11. Select 'Exit' and 'Save'.

   Note:

   You must reboot your system for changes to take effect.

12. 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 P-64 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.

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 Select a vertical refresh rate your monitor is capable of (Monitors)

   Use the option Test image to 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 Monitors) 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).

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 in the on-board BIOS. Applications and games can be executed without any further steps.

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

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
SPEA offers special dual screen packages with hardware and software included. If you are interested in using Windows with double-width resolutions or AutoCAD with a secondary graphics monitor, please ask your distributor for more information about the SPEA dual screen packages.

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. The V7-MIRAGE P-64 VL can not be installed as a secondary board in a system.

Appendix B Technical Details

Technical Data
Processor: S3 Trio64 (PCI or VL)
2 MB DRAM
Integrated RAMDAC: 135 MHz
HighColor (65,536 simultaneous colors) up to 1024×768, 75 Hz n.i.
TrueColor (16.7 mill. simultaneous colors) up to 800×600, 75 Hz n.i.
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 P-64 (PCI) Jumpers
The V7-MIRAGE P-64 (PCI) has one jumper.
Jumper No. 2 (=JP2 on the board) is placed on the left next to the S3 chip. With this jumper you can enable or disable an Interrupt request from the S3 chip to the PCI bus.
Jumper position 1-2 (default):
The interrupt is disabled
Jumper position 2-3:

The interrupt is enabled.

V7-MIRAGE P-64 (VL) Jumpers

The V7-MIRAGE P-64 (VL) also has one jumper.

Jumper No. 2 (JP2) is identical to that on the PCI-Version of the V7-MIRAGE P-64 (see previous description). The only difference is that Jumper No. 2 is not located on the left, but on the right, below the S3 processor. On the VL local bus version this jumper enables or disables IRQ 2/9.

Memory Addresses of the V7MIRAGE P-64

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
VL Bus: Video ROM	C000-C7FF
PCI Bus: Video ROM	C000-C7FF*

* During the boot procedure the board uses a 64k memory block (C000 – CFFF)!

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.

PCI bus version users:

In contrast to an ISA or VL bus graphics board, the PCI version of the V7-MIRAGE P-64 requires double the amount of memory (64 kB instead of 32 kB Video ROM) during the boot procedure. It may occur that memory areas are occupied which are also addressed by other devices.

If you install devices with an own BIOS-ROM (e.g. SCSI-, ESDI controller or network card) please be aware of the fact that the memory area from C000 – CFFF may not be addressed. In this case it is necessary that you change the BIOS address of the other device (depending on the corresponding device via jumper or DIP switch).

Example: With VL bus graphics boards it is possible to set the BIOS of an ESDI controller to C800. With the PCI version of the V7MIRAGE P-64 the address of the ESDI controller may onlystart atD000.

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.

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 them in the SPEA mailbox.

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

: CHIPSYNC=1 Reduce the refresh rate via the V7SETUP Reduce the clock rate of the sytem via the System-BIOS Setup. " image-8="" headline-9="p" question-9=" Q: Windows or applications unter Windows crash. Mouse functions or icons are not correct. Wrong colors are displayed." answer-9="A: Set – depending on the SETUP of your system – DEQUOPLE REFRESH, REFRESH=HIDDEN, REFRESH=ATSTYLE or REFRESH to 'disabled'. Use COM port #2 for your mouse. " image-9="" headline-10="p" question-10="Q: Working with QEMM 6.x: Windows cannot be started." answer-10="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 " image-10="" headline-11="p" question-11=" Q: The Test button of the V7SETUP is not active." answer-11=" 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. " image-11="" headline-12="p" question-12="Q: No DOS prompt appears after the termination of Windows." answer-12="A: Delete the additional remark 'V7START.DLL' from the entry DRIVERS=MMSYSTEM.DLL in the boot block [boot] of the SYSTEM.INI file. " image-12="" count="13″ html="true" css_class=""]

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 duringsystem 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 withwhen 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-64 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 it's 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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FCC Compliance

This board has been tested and found to comply with the limits for a Class B digital device, persuant 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

You have received the SPEA software on CD. It is also possible that your package also includes 3.5″ diskettes. This manual describes the installation from the Media Gallery CD as this is the most common method. If you intend to install from the diskettes, please take note of the README files on these disks and the starting instructions on the diskette labels.

Important Note

You must imperatively read the README file on the Media Gallery CD 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 CD in your drive and change to the …\SPEA\INSTALL\MIRP64 directory. Then type: SHOW README.ENG

Documents / Resources

SPEA V7-MIRAGE P-64 Retro Graphics Card [pdf] User Manual
1740 2050.5, Rel. 0795.6, V7-MIRAGE P-64 Retro Graphics Card, V7-MIRAGE P-64, Retro Graphics Card, Graphics Card, Card

References

- **Redirecting to Command Brand**
- **User Manual**