

V7-MERCURY P-64

User Manual

Benutzerhandbuch

Manuel d'emploi

Manual del usuario



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Rel. 0395
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The installation program used to install the SPEA Superdisk, INSTALL, is based on the licensed software provided by Knowledge Dynamics Corp., Highway Contract 4, Box 185-H, Canyon Lake, Texas 78133-3508 (USA), 1-512-964-3994.

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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. The Basic Installation with the 'Utilities' disk has to be finished before the Windows driver installation.
3. Start Windows.
4. Put the SPEA 'Drivers for Windows' disk in your drive.
5. Start the Program Manager. Select the options 'File', 'Run' and then select A:\V7SETUP.EXE.
6. Select a language in the SPEA dialogue box which appears.
7. Select a screen video mode.
8. 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)

Warning!

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 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-MERCURY P-64
- the following 3.5" disks:
 - 1x 'Utilities'
 - 1x 'Drivers for Windows'
 - 1x 'Drivers for OS/2'
- 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 around the clock and can be downloaded from the SPEA Bulletin Board (Mailbox).

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

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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 Vision 964 graphics processor for VESA Local Bus and PCI 2.0 bus systems
- State-of-the-art 64-bit graphics processor technology
- standard of 2 MB VRAM onboard
- TrueColor (16.7 million simultaneous colors displayed) at 800 x 600
- maximal resolution as high as 1280 x 1024
- Refresh rates as high as 100 Hz non-interlaced give absolutely flicker-free performance.
- the board supports hardware assisted BitBLTs, raster operations, line drawing, area fills, image transfers and hardware cursor
- 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 Windows tools
- SPEA BigBlue driver for OS/2.x
- SPEA utilities (e.g. hardware test program)
- Driver software for the following applications:
 - 3D-Studio 3.0 & 4.0
 - AutoCAD 12 & 13
 - MicroStation 4.x/5.x

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

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 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 fre-

quency 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 Colani Tower 486DX2-66, PCI bus, 66 MHz, 8 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.

Has a CGA or Monochrome board been installed before?

If a board other than a VGA board (CGA or Monochrome 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 is more common to change your PC's BIOS SETUP.

Exception:

If you have a system with a VGA display adapter built onto the motherboard. In this case, the on-board 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!

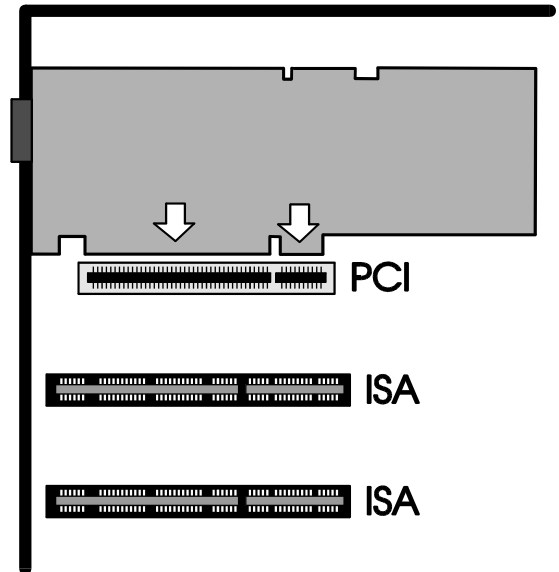
If your system doesn't have to be re-jumpered for a VGA board then first proceed with the following installation steps and then run your BIOS SETUP program and select 'VGA' (else 'IBM VGA') as your graphics board type. Check your PC manual for information on its BIOS SETUP.

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.

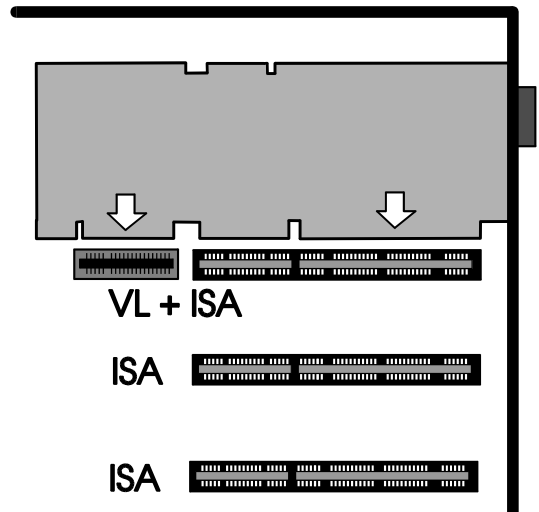
Installing the SPEA Board

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 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/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 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)*.

Warning!

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. 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.

Warning!

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). More information about DPMS and SPEAenergy as update installation can be found in the Readme file DOMS147e.TXT on the 'Utilities' disk.

Warning!

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 residently placed at the bottom of your monitor display.

WinTune

WinTune is a utility used to change the display position and size quickly and easily. The program is installed automatically during the installation of SPEA's BigWin driver for Windows and is self-explanatory. You can use the online help available if you need assistance with the program.

SPEAview

What is SPEAview?

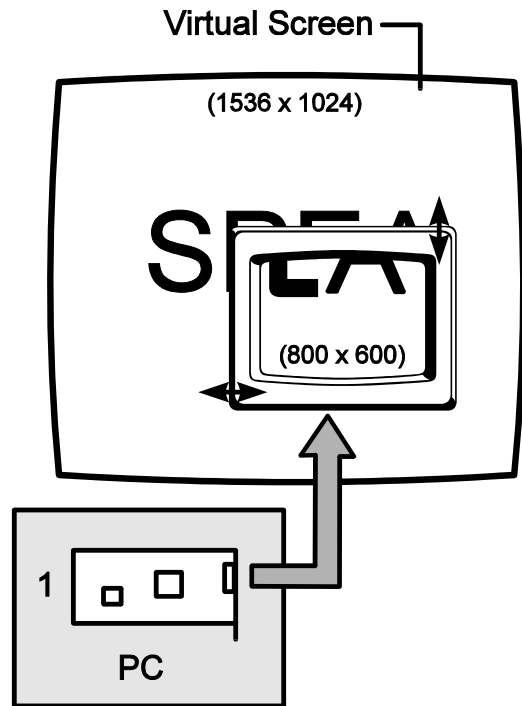
SPEAview is a SPEA utility for Windows which can be used to setup the graphics display for Windows applications in some aspects. The program is automatically installed in connection with the V7SETUP. You will find it in the SPEA program group. To start the program, double click on the SPEAview icon.

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 12 & 13 AutoCAD for Windows

SPEA's BigFocus driver (see separate manual) is currently available for AutoCAD

The BigFocus driver offers - among others - the following features:

- Dual Screen features - menus can now be deposited on the secondary monitor.
- Online help
- Hotkeys - a large number of hotkeys can be defined
- automatic Display list administration
- Fileviewer - simplifies the identification and loading of a DWG file immensely
- New dynamic zoom - mouse controlled zooming and panning

You can find more details in the separate SPEA BigFocus manual.

3D Studio 3.0 & 4.0

1. To work with 3D Studio the VESA modes must be loaded. Load them residently into your PC's memory (e.g. with a command line in the AUTOEXEC.BAT file) with the following command:

```
V7MEPVBE.EXE
```

(You will find this file in your SPEA directory C:\SPEA\GDC).

2. Configure 3D Studio with the program VIBCFG.
Change to the \3DS3 or \3DS4 directory and start the program with the following command:

```
3DS VIBCFG
```

3. During the configuration select the option 'VIBRANT' for the following items:

```
MAIN-DISPLAY  
MATERIAL-DISPLAY  
RENDER-DISPLAY
```

4. Select the corresponding graphics board at the entries 'Graphics board'.

Example:

```
'S3 864/964' for the V7-MERCURY  
P-64
```

5. Exit the program VIBCFG.

MS-Flight Simulator 5.0

To run Microsoft Flight Simulator 5.0, proceed as follows:

1. Load the file V7MEPVBE.EXE from your SPEA directory (VESA modes will be loaded residently into your Pcs memory).
2. Select 'SVGA > VESA 1.2 compatible' when configuring the display preferences.

MicroStation 4.0x & 5.0 (BigMicro)

Driver Selection via USCONFIG

1. Change to your \USTATION directory.
2. Run the USCONFIG program to select the new device driver.
3. Only MicroStation Version 5.0:
In the 'Generate for:' dialogue box select 'DOS' at 'DOS' or 'Windows'.
4. Then select 'Display Adapters'
5. A list of drivers available for the Right Graphics Adapter is then shown. It should now include the following option 'SPEA S3 Prot. Mode driver'- select it-.
6. If you do not use a second graphics adapter select the option 'No second adapter' in the dialogue box for the Left Screen.
7. If you work with a second graphics adapter you will now be asked 'Do you want to disable the virtual graphics page?' [Y/N]. If you disable the virtual graphics page you can use 256 of 16.7 million colors. If you enable it then only 16 colors can be used.
8. Select 'Exit and Save' in the menu list that appears.
9. The SPEA driver will automatically be loaded.

If MicroStation refuses to load and you see the following error message:

```
\GDCINI.DAT:  
There is no MicroStation graphics  
display handler loaded C:\  
USTATION>
```

then check that C:\SPEA\GDC is in the PATH line of your AUTOEXEC.BAT file.

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 (see also MSPEAPM.BAT in your SPEA directory). 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 the graphics board for the right screen.
10=	Primary board
-Vx	Video mode primary screen

Example:

SET MSPEAPM=-C10-V0

Warning!

The BigMicro driver exclusively supports 8 or 32 bit color modes.

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 SPEAtune. Make sure that your monitor is capable of running 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
1280 x 1024	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-MERCURY P-64'.

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.

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:

- 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).

Warning!

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

If VESA support is required, the small TSR program V7MEPVBE.EXE should be executed. If you have selected the 'Utilities' option during the software installation of the V7-MERCURY P-64, this program will automatically be loaded via a call in the AUTOEXEC.BAT. Applications and games can then be executed without any further steps.

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.

Appendix B Technical Details

Technical Data

Processor: S3 Vision964(PCI or VL)
2 MB VRAM
HighColor (65,536 simultaneous colors) up to 1024x600, 100 Hz n.i.
TrueColor (16.7 mill. simultaneous colors) up to 800x600, 90 Hz n.i. (2 MB boards only)
Dotclock: according to video mode (see BIOS.TXT in your SPEA\GDC directory).
Current consumption: +5V, max. 1,5A

V7-MERCURY P-64 (PCI) Jumpers

The V7-MERCURY P-64 (VL) has **two** jumpers, the PCI version has **one** jumper.

Jumper No. 1 (only VL, shown as **JP1** on the board) activates or deactivates the VGA part on the graphics board.

Jumper position 1-2 (default):
VGA part enabled

Jumper position 2-3:
VGA part disabled (as secondard board in the system)

Jumper No. 2 (as **JP2** on the board) activates or deactivates the Interrupt Requests.

Jumper position 1-2 (default):
IRQ is disabled

Jumper position 2-3:
IRQ is enabled.

Memory Addresses of the V7-MERCURY 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-MERCURY 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 V7-MERCURY P-64 the address of the ESDI controller may only start at D000.

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

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. Sound-board, 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 [CAR1K.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-MERCURY 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 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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