UniVBE™ 5.1
User's Guide

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Section   **10:**

Introduction

UniVBE - The Plug & Play Solution

The Universal VESA BIOS Extension, "UniVBE" extends the Video BIOS of just about any SuperVGA card, making it compatible with the Video Electronics Standards Association (VESA) Video BIOS Extensions (VBE).   Many popular programs like The 7th Guest and Microsoft Flight Simulator 5 rely on a fully functioning VBE in order to obtain the highest performance possible.   UniVBE gives you the latest VBE 2.0 standard so you can be sure these programs will not only work correctly, but will run as fast as possible on your system. Using UniVBE has many advantages:

Benefits of UniVBE

- **Plug & Play.**   UniVBE will automatically detect your graphics card and make your software work correctly in high resolution modes. You don't have to try and figure out what kind of chip you have and then try to locate your vendor for a possible software upgrade.

- **Compatibility.** It will make your graphics compatible with the latest VESA standards. If you have bugs in your current firmware, it can fix them and make it so you can run your favorite graphics applications without errors.

- **Performance.** It will generally increase the performance of existing software that uses the VESA standards. For software that uses VBE 2.0, you will get significant additional performance improvements.

- **Money and Energy Saving.** UniVBE can save you money and help the environment at the same time. UniVBE fully supports the VESA VBE/PM and DPMS standards for Energy Star compliance, and comes with the UniPOWER™ power management screen savers. If you have an Energy Star compliant monitor, the UniPower DOS and Windows screen saver programs allow you to power down the monitor to use as little as 5 watts when not in use.

- **New Modes.** UniVBE will automatically create new high performance modes on your graphics card that allows software, especially interactive games and digital video,   to run faster and with better quality than before.

- **Diagnostics.** UniVBE also includes the VBETest and Profile utilities which will fully test your card for compliance with VESA standards, as well as testing the performance of your graphics card.

Why You Should Replace Your Existing VBE Driver

You may already have a vendor supplied VESA VBE TSR or built in VBE support and want to know if you still need UniVBE.

The simple answer is yes. Your graphics card probably implements an older version of the VESA VBE interface (if any at all), or it is just plain buggy. For this reason, many of the latest games

and graphics related programs that use the advanced features of the new VBE 1.2 and 2.0 standards will probably not work with the TSR or BIOS that you currently have.

UniVBE fully implements the VBE Core 2.0 standard, which supports the features listed in Appendix E. It is better than the one that may have come with your graphics card for several reasons:

- **Compatibility.** We have developed the defacto test for VBE compliance, VBETest. Many VBE drivers cannot pass VBETest and thus will probably experience problems when trying to run real world software. UniVBE will make your graphics compatible with the latest VESA standards. If you have bugs in your current firmware, it can automatically fix them and make it so you can run your favorite graphics applications without errors.

- **VBE Core 2.0 Compatibility.** Very few cards have implemented the new VBE 2.0 standard yet. VBE 2.0 has a high speed 32 bit protected mode interface. Many of the latest programs are being developed will support VBE 2.0's 32-bit protected mode interface giving you as much as 2-3 times the performance of VBE 1.2 programs.

- **Speed.** The code in UniVBE generally runs much faster than the routines embedded in the ROM BIOS of most video cards. Not only that, but on many systems UniVBE is able to obtain the maximum performance from the video card.

- **Small Memory Footprint.** When the UniVBE is resident in your computer, it requires around 8K bytes of high memory and is smaller than most vendor supplied TSR's which support only a single video card.

- **New Game and Digital Video Modes**. UniVBE enables your existing graphics card to display new high performance modes that will be used by many upcoming high performance games and digital video applications.

- **Monitor Centering.** Includes the UniCenter™ program for adjusting the supported video modes for optimum performance on your monitor. UniCenter allows you to adjust the centering and sizing for all video modes supported by UniVBE. It's great for getting those video modes to look just right on your monitor.

- **Power Management.** Supports the new VBE/PM 1.0 standard for correctly signaling power management states (standby, suspend, off) to Energy Star (VESA DPMS) compliant video monitors.

- **Mode Control** - UniVBE supports mapping out video modes that don't work on your particular display. This can eliminate the chance that you can damage your monitor.

What's New in this Version?

If you are using UniVBE 5.0, here are some of the features that we have added in UniVBE 5.1:

- Support for the new VBE 2.0 Core standard including linear frame buffer modes
- Support for many additional graphics cards and chips
- Creation of high performance game and digital video modes

- Addition of a menu driven configuration program
- Many other additional enhancements

Hardware Requirements

UniVBE will run on any 386 or higher based PC compatible running MS-DOS, Windows, or an OS/2 2.x DOS shell. Currently UniVBE supports all of the VGA cards listed in Appendix A and more are being added in each new revision of UniVBE.

File Descriptions

If you received the complete UniVBE/Pro Shareware, you should have the following files before you begin installation:

```
FILE_ID.DIZ          BBS Archive Description
README.TXT           Extended Archive Description
ORDER.TXT            Product ordering information
INSTALL.EXE          DOS Installation & Setup Program
BIN.001              A zipped library of UniVBE utilities
DOC.001              A zipped file containing the documentation
DOS.001              A zipped library with UniCenter
DOS.002              A zipped library with DOS DPMS utilities
WIN.001              A zipped library with Windows screen saver
UNZIP.EXE            Unzip program used by INSTALL
```

If any of these files are missing or corrupted, you should try and download a new version from the places listed in the following section.

After installation, you will see the following files in the \UNIVBE51 subdirectory:

```
FILE_ID.DIZ          BBS Archive Description
README.TXT           Extended Archive Description
ORDER.TXT            A printable mail/fax order form.
UNICENTR.EXE         Screen centering utility
UNINSTAL.BAT         Batch file to uninstall UniVBE
UNIPOWER.EXE         DPMS screen saver for DOS
UNIVBE.DRV           A driver for your graphics card
UNIVBE.TXT           Text version of this manual
UNIVBE.RTF           Rich Text Format version of this manual
UNIVBE.EXE           The main UNIVBE program
UVCONFIG.EXE         UNIVBE.DRV generation/configuration program
VBETEST.EXE          Program to test VESA VBE compliance
PROFILE.EXE          VBE Performance profiling program
PROFILE.LOG          Performance measurements for common cards
```

The following files will appear in your Windows directory:

```
UNIPOWER.SCR         Windows Energy Star Screen Saver
UNIPOWER.HLP         Help for UniPower/Windows
CTL3DV2.DLL          File used by UniPower/Windows
```

Getting the Latest Full Version

The best places to download new versions of UniVBE are from the following locations:

World Wide Web	: http://www.scitechsoft.com
Internet/FTP	: ftp.scitechsoft.com
Compuserve	: GO VESA (file library 12)
America Online	: Keyword VESA

You can also contact SciTech Software and order a disk to be sent via mail for a nominal fee.

Section   **11:**

Installation & Setup

Installing UniVBE for the First Time

Installing UniVBE on your system is a snap. Simply following these simple steps:

1. If you are running a pre-Windows 95 version of Windows, exit Windows and return to DOS. Installing UniVBE from within those versions of Windows could cause unpredictable results. If you encounter problems installing under Windows 95 or OS/2, try rebooting your machine to run real DOS and install it from there. Once you have UniVBE installed and configured you can then use it from any DOS box.

2. Insert the UniVBE distribution diskette into your floppy drive   and type 'A:INSTALL' or 'B:INSTALL' (depending on which drive you inserted the diskette into), and then press the Enter key.

The installation program will start, and the first thing you will be asked is if you have a DPMS compliant video monitor. If you dont, click 'No' and INSTALL will disable the Power Management options. You will then be presented with a screen describing the installation configuration similar to the following:

```
_____
_____
_____
_____
_____
+-[_]----------------- UniVBE(tm)/Pro 5.1 Installation ----------------------+
¦ + Installation Directories -------------------------------------------+ ¦
¦ ¦  Source       C:\INSTALL                                            ¦ ¦
¦ ¦  Destination  C:\UNIVBE51                                           ¦ ¦
¦ ¦  Windows      C:\WIN95                                              ¦ ¦
¦ +---------------------------------------------------------------------+ ¦
¦   Install Utilities                 Options                             ¦
¦     [X] UniCENTER                    [X] Run UVConfig after install     ¦
¦     [X] UniPOWER for Windows         [X] Update AUTOEXEC.BAT            ¦
¦     [X] UniPOWER for DOS             [X] Update Windows config          ¦
¦                                                                         ¦
¦             Install _                            Cancel _               ¦
¦             _____                            _____               ¦
+-------------------------------------------------------------------------+
_____
_____
_____
_____
_____
_____
      UniVBE(tm) - Copyright (C) 1995 SciTech Software. All Rights Reserved.
```

3. Verify the installation directories for installing UniVBE into, and change them if necessary. If you are installing the UniPower screen saver for Windows, verify that the Windows directory points to the place where you have installed Windows. By default INSTALL will attempt to find where Windows is located on the path.

4. INSTALL provides you a list of installation options. Select the options for the utilities that you wish to install. If you're not sure what to do, you should use the default options.

If you deselect the 'Update AUTOEXEC.BAT' option, you will have to manually run UniVBE each time you need to use it (instead of it being automatically loaded when you boot your machine).   If you deselect the 'Update Windows Config' option, you will have to go to the Windows Control Panel to setup the UniPower DPMS screen saver manually.

5. Click the 'INSTALL' button, and the installation program will begin the installation process.

Follow the instructions on the screen, and eventually you will be asked to register your copy of UniVBE:

```
_____
+-[_]------------------ Installing UniVBE(tm)/Pro 5.1 -----------------------+
¦+ Progres+-[_]--------- Registering UniVBE(tm)/Pro 5.1 ------------+-------+ ¦
¦¦ Creatin¦                                                         ¦       ¦ ¦
¦¦ copy C:¦  Please enter your name and Registration ID code. You   ¦       ¦ ¦
¦¦ unzippi¦  can purchase your Registration ID code with your       ¦       ¦ ¦
¦¦ unzippi¦  Visa/Mastercard by calling 1-800-4UNIVBE (USA & Canada ¦       ¦ ¦
¦¦ unzippi¦  only), or by sending in the Shareware registration     ¦       ¦ ¦
¦¦ unzippi¦  form.                                                   ¦       ¦ ¦
¦¦ unzippi¦                                                          ¦       ¦ ¦
¦¦ Updatin¦  Click 'Trial' to install UniVBE/Pro as shareware.       ¦       ¦ ¦
¦¦ Updatin¦                                                          ¦       ¦ ¦
¦¦ Registe¦  Full name of owner                                     ¦       ¦ ¦
¦¦        ¦  Registration Id                                         ¦       ¦ ¦
¦¦        ¦                                                          ¦       ¦ ¦
¦¦        ¦          OK   _                           Trial  _       ¦       ¦ ¦
¦¦        ¦         _____                         _____         ¦       ¦ ¦
¦¦        +--------------------------------------------------------+         ¦ ¦
¦¦                                                                            ¦ ¦
¦¦                                                                            ¦ ¦
¦+--------------------------------------------------------------------------+ ¦
+----------------------------------------------------------------------------+
_____
     UniVBE(tm) - Copyright (C) 1995 SciTech Software. All Rights Reserved.
```

6. Enter your full name and registration ID and hit the Enter key.   Simply click the "Evaluate" button to install UniVBE as an unregistered trial version.

The next stage in the installation process it to configure UniVBE for use with your video card. This is done with the UVCONFIG program, which INSTALL automatically runs for you. When UVCONFIG runs, you will be greeted with a configuration screen as follows:

```
_____
_____
_____
_____
_____
+-[_]----------------- UniVBE(tm)/Pro 5.1 Configuration ---------------------+
¦ + Detected Video Configuration --------------------------------------------+ ¦
¦ ¦  SuperVGA ID   ATI                                                        ¦ ¦
¦ ¦  Chipset ID    Mach64 88800-GX                                           ¦ ¦
¦ ¦  Video memory  2 Mb                                                       ¦ ¦
¦ ¦  RAM dac ID    SGS/Inmos STG1702 24 bit DAC                              ¦ ¦
¦ +------------------------------------------------------------------------+ ¦
¦                    Options                                                  ¦
¦                    [ ] Ignore old VBE BIOS                                  ¦
¦                    [ ] Disable VBE 2.0 extensions                           ¦
¦                    [ ] Disable Linear Framebuffer                           ¦
¦                                                                             ¦
¦               Ok   _                           Cancel _                     ¦
¦              _____                         _____                     ¦
+----------------------------------------------------------------------------+
_____
_____
_____
_____
     UniVBE(tm) - Copyright (C) 1995 SciTech Software. All Rights Reserved.
```

6

7. Verify that the installation matches your video card, and hit enter to accept the configuration. If you hit cancel at this stage, you will not have generated a valid UNIVBE.DRV file, and you will need to re-run UVCONFIG at a later date to create the driver file.

When UVCONFIG is run for the first time, it runs through the list of available video modes to verify that they are working correctly and to automatically map out modes that are not available on your system. While this is underway, your video monitor will go blank and may emit mode switching noises and flicker somewhat, which is normal. Also note that this operation can take up to 30 seconds or so to complete, so be patient before you hit that reset button! UVCONFIG wont need to re-run this test unless you change some of the configuration options such as the amount of installed memory, chipset ID or RAMDAC.

That's it! When the installation is completed, you will be returned into the directory that you installed UniVBE into (by default C:\UNIVBE51). In order to install UniVBE you will need to reboot your machine before the changes will take effect.

What Happens During Installation?

When you install UniVBE it will perform several functions and make changes to a couple files on your hard disk. This section allows you to review those changes before you run the install program. If you do not want to perform one of these operations at installation time, you will be presented with check boxes to enable or disable the various options. If you use the defaults, the following things happen:

1. The UniVBE files are automatically uncompressed in the directory you specify.
2. The UniPower screen saver is copied to your Windows directory.
3. It will run the UVCONFIG utility so that you can verify the type of graphics card detected.
4. It will generate the approriate UNIVBE.DRV file for driving your video card.
5. Backups are made of your AUTOEXEC.BAT, SYSTEM.INI and WIN.INI in case you decide to run the UNINSTAL.BAT utility later.
5. One or two lines are added to your AUTOEXEC.BAT file to automatically runs UniVBE and UniPower when your system starts.
6. The Windows SYSTEM.INI file is modified to make UniPower your default screen saver in Windows
7. You will need to reboot the system for all changes to take effect.

Configuring Your Software to Use UniVBE

Once UniVBE is installed, you need to make sure that your application software is configured to use the VESA VBE standard. If your application has a option to change hardware settings you should change that setting to use "VESA" or "VESA VBE". UniVBE 5.1 works with any software that is compatible with any version of VESA VBE. The most common setting is VBE 1.2 -- this will work fine. If your software has a driver for VBE 2.0, you should definitely use that to take advantage of all the performance features of UniVBE.

Changing the Settings of UniVBE After Installation

If you need to change any of the settings of UniVBE, you can run the UVCONFIG.EXE program and this will allow you to change most of UniVBE's settings including the type of graphics card you have, installed RAM and other options. For more information on modifying your configuration, refer to the 'Advanced Configuration Options' section.

Changing your Video Card After Installation

When the time comes to replace the video card in your system with a new one, rest assured that UniVBE will probably work just as well with the new video cards as with your old one. However when you do so, you will need to run the UVCONFIG program to reconfigure UniVBE for your new graphics card. If you used UniCenter, you will also want to re-center your video modes.

Registering Your Software

SciTech allows you to use UniVBE for 21 days before we ask that you register your software. If you have an unregistered shareware version of UniVBE, you have determined that it solves your problems and you would like to continue to use it, you should register it with SciTech Software.

Why You Should Register Your Software

By registering your shareware version of UniVBE, you will be supporting SciTech so that we can continue to offer new, innovative products that support your graphics card. Shareware is based on a "try before you buy" concept, but it is not free software. You are required to register your software if you continue to use it past the 21 day evaluation period. *You also will get rid of the message reminding you to register!*

Instant Registration by Credit Card

To register instantly by credit card, you can call our toll free number and we can give you a registration code over the phone. When you get your registration code, you can enter it in (see process below) and you will have a fully registered version.

Registration by Mail or FAX

To register by mail or fax, simply print out the file ORDER.TXT, or type "P" when you get the opening registration reminder and one will be printed for you. If you mail in your registration, make sure to include a check or money order for the proper amount or include your credit card number. If you fax your order in, make sure you also include your credit card number.

Entering Your Registration Code

Once you get your registration code from SciTech Software, there are two ways to enter it and register your software.

1. Go to the directory where you installed UniVBE and run the REGISTER.EXE program or;
2. When first run UniVBE, and get the message to register, you can hit the "R" key.

You will be asked to enter your full name and hit [Enter]. After you enter your name, hit the [Enter] key and then you will be asked for your registration id. Enter the number that you received from SciTech, hit [ENTER] and you will be fully registered.

What Happens If You Don't Register?

Your software will not "self-destruct" or anything similar to that. If the 21 day evaluation period ends before you get a chance to register, your full   version of UniVBE will become UniVBE/Lite, which will have the following feature disabled:

- High-performance VBE 2.0 (only VBE 1.2 will be supported)
- VESA DPMS signaling
- VESA VBE/PM Interface
- Windows and DOS screen savers
- Screen centering
- High speed game/digitial video modes

Most programs will continue to run, but they will run better if you register your software. If you decide to register after your 21 day evaluation period expires, all of these features will be automatically re-enabled.

Upgrading from Previous Versions

When you upgrade to UniVBE 5.1 from previous versions, you should install UniVBE 5.1 in a different directory. By default it will use the \UNIVBE51 subdirectory. Make sure when your computer reboots that only version 5.1 loads (this should happen automatically).

In the price of our registration fee, SciTech allows you to upgrade to any minor revisions. For instance, if you have registered your version of UniVBE 5.1 and we release a 5.2 version, you can download that version and enter your registration code and you will be all set. When we release UniVBE 6.0 or its an equivalent major release, registered users will be entitled to significant discounts on new versions of UniVBE and other SciTech products.

Uninstalling or Disabling UniVBE

If you determine that UniVBE does not meet your needs, you can disable it by the using one of the following two procedures:

Automatic Uninstall with UNINSTAL.BAT

UniVBE comes with a utility called UNINSTAL.BAT. This utility should only be used shortly after you have installed UniVBE. It will copy back all of your original configuration files before you installed UniVBE.

WARNING: All changes to your system configuration that you made from the time you installed UniVBE until you ran UNINSTAL.BAT will be lost. You should only use this option if you have not made any changes to your system configuration.

Manual Unistall

If some time has elapsed since you installed UniVBE and you wish to uninstall it, you can do it with the following procedures:

1. Edit your AUTOEXEC.BAT file and remove the line that contains UNIVBE.EXE and/or UNIPOWER.EXE.

2. If you installed the UniPower/Windows screen saver, you can go to the Windows Control Panel, select the Desktop icon and select a screen saver other than UniPower DPMS, or you can simply disable the screen saver option.

3. Finally, if you want to completely remove UniVBE from your system. You can erase all of the files in the \UNIVBE51 subdirectory or whatever you named the primary UniVBE subdirectory.

Your system will now no longer load UniVBE.

Section **12:**
Supplemental Utility Programs

UniVBE includes several useful utilities for testing, configuring and managing your graphics display. The description and the function of the utilities are described in this section.

VBETest

UniVBE is also installed with the VBETEST.EXE programs for testing the operation of UniVBE. This programs will allow you to fully test all the different video modes that UniVBE supports. The VBETest program is a stress test and conformance testing program to full test the VESA VBE implementation for compliance. You might want to test your current VBE BIOS or TSR vs. UniVBE by toggling the Enable/Disable UniVBE choice.

When you run VBETest, you will be greeted with a set of main menu options as follows:

```
VBETest - VESA VBE/Core 2.0 Compliance Test
         Release 5.1 (Mar 27 1995)

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Currently running in 32 bit protected mode

VBE OEM string: Universal VESA VBE 5.1
VBE Version:    2.0
Memory:         2048k

Select test to perform:

    [0] - Interactive Visual Compliance Tests
    [1] - Quick Compliance Test
    [2] - Full Compliance Test (long)
    [3] - Enable/Disable UniVBE
    [4] - VBE/PM Power Management Tests
    [Q] - Quit

Choice:
```

This main menu will provide you with the Vendor OEM string for you VBE implementation (in this case UniVBE 5.1), version number and amount of video memory available to VBE applications (note that on some boards, not all video memory is available for VBE applications to use). Valid version numbers are 1.0, 1.1, 1.2 and 2.0. Some vendors have used version numbers other than these, which are incorrect and can cause confusion with application programs intending to use the VBE interface.

Interactive Visual Compliance Test

This option allows you to test a specific mode to see if it is compatible with the VBE standard. This is good if you know what mode a program may be having problems with and you want to go right to that mode. Once you select this option, you will be presented with a menu requiring you to select the color depth that you wish to test:

```
VBETest - VESA VBE/Core 2.0 Compliance Test
        Release 5.1 (Mar 27 1995)

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Interactive Visual Tests

Extended CRTC addressing:   Yes
8 bit wide DAC support:     Yes
Linear framebuffer support: Yes (located at 4032 Mb)

Select color mode to test:

    [0] - 4 bits per pixel modes
    [1] - 8 bits per pixel modes
    [2] - 15 bits per pixel modes
    [3] - 16 bits per pixel modes
    [4] - 24 bits per pixel modes
    [5] - 32 bits per pixel modes
    [Q] - Quit

Choice:
```

This screen provides you with information about the capabilities of your video card and your VBE implementation. It tells you whether the following features are supported:

- **Extended CRT Addresssing;** If your video card supports extended CRTC addressing (most video cards do) then software will be able to perform double buffering techniques to produce high quality smooth animation for games and other real-time and interactive applications.

- **8 bit wide DAC;** If your video card supports an 8 bit wide DAC, it means that the DAC provides 8 bits per primary (24 bits total) palette entries for generating color values in 256 color video modes. This means that applications can choose 256 colors out of a palette of 16.7 million where you can have 256 individual shades of Red, Green and Blue color channel information. The standard VGA DAC only provided 6 bits per primary (18 bits total) for a palette of 256,000 colors.

- **Linear Framebuffer Support;** If your video card supports a linear framebuffer, high performance 32 bit protected mode applications can use this to access the video cards memory without needing to perform slow bank switching operations. This allows 32 bit applications to run at absolute maximum speed.

  Also note that on new PCI bus systems, the linear framebuffer modes are often the only modes that provide the full PCI burst mode operation to the video card. In these cases the linear framebuffer modes can provide over 2 times the speed of the normal VBE banked framebuffer modes!

Once you select the color depth that you wish to test (say 8 bits per pixel) you will be required to select the resolution of the video mode that you wish to test such as the following:

```
VBETest - VESA VBE/Core 2.0 Compliance Test
        Release 5.1 (Mar 27 1995)

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Which video mode to test:

    [0] -  320 x  200 8 bit (16 page, Banked+Linear)
    [1] -  360 x  200 8 bit ( 8 page, Banked+Linear)
    [2] -  320 x  240 8 bit ( 8 page, Banked+Linear)
    [3] -  360 x  240 8 bit ( 8 page, Banked+Linear)
    [4] -  320 x  400 8 bit ( 8 page, Banked+Linear)
    [5] -  360 x  400 8 bit ( 5 page, Banked+Linear)
    [6] -  640 x  350 8 bit ( 8 page, Banked+Linear, NonVGA)
    [7] -  640 x  400 8 bit ( 8 page, Banked+Linear, NonVGA)
    [8] -  640 x  480 8 bit ( 6 page, Banked+Linear, NonVGA)
    [9] -  800 x  600 8 bit ( 4 page, Banked+Linear, NonVGA)
    [A] - 1024 x  768 8 bit ( 2 page, Banked+Linear, NonVGA)
    [B] - 1280 x 1024 8 bit ( 1 page, Banked+Linear, NonVGA)
    [Q] - Quit

Choice:
```

This menu shows you all video mode resolutions available, along with the number of physical display pages available (for double buffering and smooth animation techniques). It also provide information about whether the mode can support banked framebuffer access, linear framebuffer access or both. Note also that some modes are marked as 'NonVGA'. These modes are coming out on new video cards, and they are not fully VGA compatible. These modes may have problems with applications that are not designed to support VBE 2.0 video modes.

Once you select a video mode, if you have the choice of either banked and linear framebuffer modes, you will be presented with one last menu to choose which one you wish to test. Hit a key at any time during the testing process to cut the tests short and move onto the next test.

Quick/Full Compliance Tests

These compliance tests will first run a suite of low level conformance tests to ensure that your BIOS conforms to the proper VBE specifications. Each time you run a compliance test, VBETest will generate a log file with the results of the test. That log file will be stored in a file called VBETEST.LOG and will saved in the same directory as VBETest. This log can be very helpful for SciTech or your hardware and software companies for tracking down problems.

The Quick version of the test will simply test all the major features of the VBE Core 1.2 or 2.0 specifications. It will not test every mode, but it will test a representative sample of the modes so that you can quickly test if your graphics is VBE compatible. The full version is a comprehensive test that will run through every mode that your graphics card can display and see if it is working properly. The full version can take a considerable amount of time to run to completion.

Enable/Disable UniVBE

This options will allow you to temporarily disable UniVBE and re-enable it again from within VBETest. This will allow you to run the tests with and without UniVBE active to see what sort of performance benefits and extra features UniVBE provides compared to your current VBE implementation.

VBE/PM Power Management Tests

This will allow you to test your video card and monitor for VBE/PM and DPMS compatibility. It will tell you what DPMS modes that the graphics card supports and allow you to try and set them as follows:

```
VBETest - VESA VBE/Core 2.0 Compliance Test
        Release 5.1 (Mar 27 1995)

Copyright (C) 1994-95 SciTech Software, All Rights Reserved.

VBE/PM version 1.0 active. Supports the following states:

  STAND BY
  SUSPEND
  OFF

Enter which mode (ESC to quit):

    [0] - ON
    [1] - Stand-By
    [2] - Suspend
    [3] - Off
    [Q] - Quit

Which:
```

Note that if you attempt to set a mode that is not supported by your video card, VBETest will simply do nothing. *Remember that the display will be blanked when you are testing a power down mode, so remember to hit '0' to bring the display back to life again!!*

Profile

Profile is a performance profiling program that SciTech Software has developed for profiling the performance of different types of graphics operations. Profile is a 32 bit protected mode program so will use the VBE 2.0 32 bit extensions for maximum performance. Running Profile without any command line options will provide a usage message similar to the following:

```
Profile - UniVBE Performance Profiling Program
        Release 5.1 (Feb 28 1995)

Copyright (C) 1993-95 SciTech Software, All Rights Reserved.

Options are:
    -t       - Thrash the system memory cache during BitBlt's (32 bit only)

Usage: profile [-t] <mode> [video card name [logfile]]

Press a key for list of video modes.

Available modes are (add 4000 for Linear Framebuffer version):
    100 -  640 x  400  8 bits per pixel
    101 -  640 x  480  8 bits per pixel
    etc...
```

To run Profile, simply select the number for the video mode you wish to test and add it to the command line. So if you wanted to profile 640x480x8, you would enter:

```
PROFILE 101
```

To profile the linear framebuffer version you would add a 4 to the front of the mode number, or 4101 in this case. Profile will then display lists of the results after running the tests, as sample of which is as follows (using the linear framebuffer mode for maximum performance):

```
Profiling results for mode 4101h, 640x480 256 color.
Running in 32 bit protected mode with linear framebuffer

 0.0862s for    1000 lines   =>   11603.89 lines/s
 1.9568s for     300 clears  =>     153.31 clears/s,   44.91 Mb/s
 1.4058s for     150 bitBlts =>     106.70 bitBlt/s,   31.26 Mb/s

Baseline values:

REP STOSD in system memory:   30.87 Mb/s
REP MOVSD in system memory:   24.43 Mb/s

No cache thrashing.
```

Note that Profile also times the memory clearing and copying operations in normal system memory as a performance comparison. Note that with the fast test card used above, the memory on the video card is actually faster than the normal system memory which is common for high performance PCI and VLB video cards.

SciTech Software has logged the performance profiling results for a significant number of PCI and VLB video cards, and the results are stored in the file PROFILE.LOG in the directory where you installed UniVBE into. You might want to have a look in this file to see how your video card stacks up against the best cards on the market.

UniPower

UniPOWER is a power management screen saver that will shut down any DPMS compliant video monitor via the VESA VBE/PM interface (provided by UniVBE/Pro). UniPOWER comes in two flavors, the UNIPOWER.EXE screen saver for DOS and the UNIPOWER.SCR screen saver for Windows. By default the installation program for UniVBE will install both UniPOWER for DOS and UniPOWER for Windows.

Is Your Monitor Compatible with DPMS?

If you monitor has an "Energy Star" logo, or was manufactured after January 1994, then is probably compatible with the VESA DPMS standard. When in a DPMS mode, a compatible monitor will usually give some indication, such as a green power light turning to amber or a message will appear on displays with LED status displays.

UniPower For Windows

The UNIPOWER.SCR program is a standard Windows screen saver, so you can use it just like you use all your normal Windows screen savers. By default the installation program will have installed and activated the UniPOWER for Windows screen saver. However you can change the way that UniPOWER for Window operates. First you need to open up the Windows Control Panel, and then hit the 'Setup' button for the installed screen saver (which should be 'UniPOWER DPMS'). This will bring up a dialog box allowing you to modify UniPOWER's configuration. Extensive online help is provide for UniPOWER for Windows (just click 'Help' in the Setup Dialog Box), so please consult the online documentation for more information.

UniPower For DOS

The UniPOWER.EXE screen saver for DOS is a small Terminate and Stay Resident (TSR) program that hooks into the mouse and keyboard interrupts, and monitors them for activity. If no activity is sensed for a period of time, UniPOWER will begin shutting the monitor down into the power management states. When UniPOWER.EXE is installed, when you start Windows it will de-activate itself allowing the UniPOWER.SCR Windows based screen saver to take over. When you exit Windows back to the DOS prompt, UniPOWER.EXE will re-activate itself. Note that UniPOWER.EXE will not be active in a Windows DOS shell, even if the DOS shell is run full screen.

Command Line Options
Running UNIPOWER.EXE with the -h command line option will provide you with a usage list similar to the following:

```
UniPOWER(tm)/Shareware - DOS DPMS Screen Saver Utility
                   Release 5.1 (Mar 30 1995)

Copyright (C) 1994-95 SciTech Software, All Rights Reserved.

Usage: UniPOWER [-unsc] [STANDBY delay] <SUSPEND delay> <OFF delay>

The delay values passed on the command line specify how long UniPOWER will
wait until each of the specified states is enabled. Note that each delay is
cumulative. That is the time to reach the OFF state is the total delay for
the STANDBY, SUSPEND and OFF states. All delay times are specified in
minutes.

The STANDBY delay value is optional since many monitors do not support it.
Leaving it out will cause that state to be skipped. Note also that you can
set the off delay to -1 to disable this state as it can cause problems on
older VGA cards.

Options are:
    -u    - Unload UniPOWER from memory
    -n    - Disable screen saver and load only VBE/PM interface
    -s<x> - Force detection of SuperVGA (-s0 for list)
    -c<x> - Force detection of SuperVGA chipset (-c0 for list)
```

By default UniPOWER.EXE will have been installed into your AUTOEXEC.BAT file with a SUSPEND delay of 5 minutes, and an OFF delay of 15 minutes, and the STANDBY state disabled.

If you install UniPOWER before your mouse driver, it will automatically detect when the mouse driver installs itself and hook into the mouse driver interrupts after it is successfully installed.

Problems with the Standby State

When you installed UniPOWER, the Standby state was probably disabled. Many monitors do not support this particular state, and on some video card configurations, this state is impossible to signal correctly. You may notice that when the Standby state has been activated, the video monitor goes directly in the Off state, rather than the Standby state. If this happens then your video card was not able to correctly signal this state to the video monitor, and it should disabled.

If you wish to activate the Standby state, be sure to test it for correct operation with your video monitor using the provide TEST button in the UniPOWER for Windows configuration dialog box. If the state is not working correctly, you will not damage your video card or your monitor, but the monitor will incorrectly detect this state as the Off state.

UniCenter

If you have installed the UniCenter utility program, it will have been placed into the directory where you also installed UniVBE/Pro. To use UniCenter, first change to the directory where UniVBE is installed (the following example assumes the default installation):

```
CD \UNIVBE
```

Then run the UniCenter program with the following command:

```
UNICENTR
```

You will then be presented with a menu to first allow you to select color depth of the mode you wish to center as follows:

```
UniCENTER(tm) - Video Mode Centering Utility (Version 5.1)

Copyright (C) 1993-95 SciTech Software, All Rights Reserved.

Select modes to center:

    [0] - 4 bits per pixel modes
    [1] - 8 bits per pixel modes
    [2] - 15 bits per pixel modes
    [3] - 16 bits per pixel modes
    [4] - 24 bits per pixel modes
    [5] - 32 bits per pixel modes
    [Q] - Quit

Choice:
```

When you select the color depth you will be presented with a list of available video modes for that depth, such as the following:

```
UniCENTER(tm) - Video Mode Centering Utility (Version 5.1)

Copyright (C) 1993-95 SciTech Software, All Rights Reserved.

Which video mode to center:

    [0] - 320 x 200 256 color
    [1] - 360 x 200 256 color
    [2] - 320 x 240 256 color
    [3] - 360 x 240 256 color
    [4] - 320 x 400 256 color
    [5] - 360 x 400 256 color
    [Q] - Quit

Choice:
```

UniVBE 5.1 now includes our exclusive reverse mode mapping technology, which allows us to also center the NonVBE modes provided by your video card. This means that UniCENTER will not only center your VBE modes, but it will also center the modes used by other NonVBE applications such as Windows.   Note however that this will not work for cards that have NonVGA video modes, such as the ATI Mach32/64 and Weitek P9000.

Adjusting a video mode

To adjust a video mode, simply follow the instructions on the screen and using the arrow keys to move and size the image. Centering a mode is usually just a matter of moving the image with the arrow keys, but you may want to experiment with adjusting the horizontal size of the image as

well. Adjusting the horiztonal size will however change the vertical refresh rate for the video mode.

Adjusting the Sync Polarities

When you are adjusting a video mode, you can toggle the Horizontal and Vertical sync polarities with the 'h' and 'v' keys. The polarity of the sync lines were originally used by the video card to let the video monitor auto size the vertical dimensions of a video mode. For monitors without digital adjustments, this allows the monitor to recognise vertical sizes of 350, 400 or 480 lines in height.

However adjusting the sync polarities is actually very useful for centering your modes on new monitors with built in digital sizing adjustments. These monitors usually store sizing information for video modes based on their horizontal and vertical timings *and the sync polarities!* Hence it is sometimes possible for certain video modes to be recognised by the monitor as the same mode, but the sizing for the two modes is different. In this case, if you toggle one of the sync polarities for the problem mode, you will then be able to adjust and stores its settings independantly from the original mode.

Saving the settings for a mode

When you are finished hit the [Enter] key - if you adjust the image too far and it goes out of sync, hit the [ESC] key and you will be dropped back to the previous menu and the settings will not be saved. If you wish to revert back to the original settings, simply hit [Esc] and the changes you made will be discarded.

Saving the settings permanently

When you have finished adjusting all your video modes, exit UniCenter and the adjustments will be saved into the UNIVBE.DRV file. Note that if you have UniVBE currently installed, the centering values are automatically updated in the installed version so you dont need to re-install UniVBE for the changes to take effect. Note that UniCENTER will run even without UniVBE installed. If UniVBE is not installed, it will automatically loaded the UNIVBE.DRV file from the disk. However in this case the centered modes will not be available until UniVBE is installed.

Section   13:
Advanced Configuration Options

In most cases, you will not need to use the information contained in this section. It is meant for users that are experiencing problems or power users who would like more control over their display.

UVCONFIG Menu Options

UVCONFIG provides you with fine control over the way that the UNIVBE.DRV driver file is configured. When you run UVCONFIG, you are presented with a display similar to the folloowing:

```
_____
_____
_____
_____
_____
_____
+-[_]----------------- UniVBE(tm)/Pro 5.1 Configuration ---------------------+
¦ + Detected Video Configuration ------------------------------------------+ ¦
¦ ¦  SuperVGA ID  ATI                                                       ¦ ¦
¦ ¦  Chipset ID    Mach64 88800-GX                                          ¦ ¦
¦ ¦  Video memory  2 Mb                                                     ¦ ¦
¦ ¦  RAM dac ID    SGS/Inmos STG1702 24 bit DAC                             ¦ ¦
¦ +------------------------------------------------------------------------+ ¦
¦                    Options                                                  ¦
¦                    [ ] Ignore old VBE BIOS                                  ¦
¦                    [ ] Disable VBE 2.0 extensions                           ¦
¦                    [ ] Disable Linear Framebuffer                           ¦
¦                                                                             ¦
¦                                                                             ¦
¦                 Ok   _                          Cancel _                    ¦
¦                 _____                      _____                    ¦
+-----------------------------------------------------------------------------+
_____
_____
_____
_____
_____
       UniVBE(tm) - Copyright (C) 1995 SciTech Software. All Rights Reserved.
```

Ignore old VBE BIOS

This option is used to force UniVBE to ignore an underlying VBE BIOS if one is present. By default UniVBE will use pass through techniques to support functions provided by the underlying BIOS that UniVBE does not provide. In some severe cases the underlying BIOS is buggy and will cause UniVBE to behave incorrectly, so you will need to force UniVBE to ignore it.

If you are experiencing problems with your video card, you might like to check this option to see if it will clear up the problems.

Disable VBE 2.0 Extensions

This option is used to force UniVBE to install as a VBE 1.2 implementation, and to turn off all the VBE 2.0 extensions. If you have an application that is not working correctly with some of the 2.0 features of UniVBE, you might try reverting UniVBE back to VBE 1.2 to see if this will make the application work correctly. This option is also useful to see how much of a difference to performance VBE 2.0 can make to certain applications.

Disable Linear Framebuffer

This option is provided to disable the linear framebuffer support. Some older motherboards cannot correctly address physical memory locations high in extended memory where UniVBE locates the linear framebuffer, and hence the linear framebuffer memory map interfere with normal system memory locations. If VBETest or other VBE 2.0 applications hang when you attempt to use a linear framebuffer mode, this may be the case. Turning off this option will ensure that these application will not attempt to use the linear framebuffer modes.

UVCONFIG Command Line Parameters

UVCONFIG supports a number of different command line options. Running UVCONFIG.EXE with the -h command line option will provide you with a list similar to the following:

```
UniVBE(tm)/Pro - Universal VESA BIOS Extension (VBE)
            Release 5.1 (Mar 30 1995)

Copyright (C) 1993-95 SciTech Software, All Rights Reserved.

Usage: UVCONFIG [-scmdlE]

Options are:
    -s<x>    - Force detection of SuperVGA family (-s0 for list)
    -c<x>    - Force detection of SuperVGA chipset (-c0 for list)
    -m<size> - Force memory size to 'size'
    -d<x>    - Force DAC type (-d0 for list)
    -l<loc>  - Enable linear framebuffer at 'loc' Mb (0 to disable)
    -f       - Print full list of supported SuperVGA families and chipsets
    -E       - Force emulation of SuperVGA 320x200/240/400x8 modes
```

Most of the command line parameters for UVCONFIG are used to get complete lists of supported video cards (-F for instance prints out a complete list). Although you can force the detected id from the command line, you can change it just as easily from the menu options.

The -L command line option can be used to change the location of the linear framebuffer. If the default location that UniVBE uses conflicts in some way, you might try changing it to a different location. The locations that are generally used are 14Mb, 32Mb, 64Mb, 78Mb, 2048Mb and 4032Mb. Normally UniVBE will get the location of the buffer from the video card, either by reading the cards configuration registers or by looking for the location of the active linear buffer, so changing this may simply cause the linear buffer to stop working, or worse hang your system. If you change this option, be prepared to hit the reset button!

The -E command line option can be used to force emulation of SciTech low res SuperVGA Modes. This option should not be needed, but if you find that the low res SuperVGA modes do not work, you might try this command line option to see if the emulation techniques will work on your card. If this does work, please contact SciTech Software with information about your system so that we can do this automatically for your card in the next release.

UNIVBE Command Line Parameters

Running UNIVBE.EXE with the -h command line option will provide you with a list similar to the following:

```
UniVBE(tm)/Shareware - Universal VESA BIOS Extension (VBE)
                   Release 5.1 (Mar 30 1995)

Copyright (C) 1993-95 SciTech Software, All Rights Reserved.

Usage: UNIVBE [-ur] [[ON|OFF] [VBE20]]

Options are:
    -u      - Unload the Universal VESA VBE from memory
    -r      - Remove support for Low Res video modes
```

Enabling/Disabling UniVBE

You can enable and disable UniVBE from the command line with the ON and OFF command line options. This will allow you to temporarily disable UniVBE from batch files if you need to run programs that dont work with UniVBE installed. You can also temporarily disable VBE 2.0 support with the 'OFF VBE20' command line option.

The -U command line option can be used to unload UniVBE from memory. Note that this option will only work if no other TSR's have been loaded after UniVBE in memory. If UniVBE cannot be unloaded, it will exit with an error message to that effect.

The -R command line option can be used to map out support for the low res games modes if these modes are causing problems on your system.

Modifying the UNIVBE.INI File

For most installations, UniVBE will automatically determine the video modes that your card supports. However on some video configurations, some video modes that UniVBE provides may not be supported properly by your monitor, so the mode will be unsuable on your system. In ver rare instance, a mode may be set up with an incorrect bytes per line or TrueColor pixel format information. The UNIVBE.INI file is used to manually configure UniVBE in these situations.

By default there is no UNIVBE.INI file in the directory. To use it, you will have to manually create the file, delete the original UNIVBE.DRV file and then re-run UVCONFIG to generate a new driver file with the appropriate overrides read from the UNIVBE.INI file.

Manually removing video modes

All manually removed video modes are listed under the section '[Remove]' in the UNIVBE.INI file. They are listed as the hexadecimal internal mode numbers used by the TSR (see the section 'Video Modes supported by UniVBE' below for more information). An example UNIVBE.INI file might be:

```
[Remove]
10D
10E
```

Manually changing bytes per lines values

You can change the default bytes per line values for particular video modes in the '[BytesPerLine]' section in the UNIVBE.INI file. The mode number is listed first in hexadecimal (see the section 'Video Modes supported by UniVBE' below for more information) followed by the new bytes per line value in decimal. An example UNIVBE.INI file might be (setting 640x480x24 to 2048 bytes per line):

```
[BytesPerLine]
112 2048
```

Manually changing TrueColor pixel formats

You can change the default TrueColor pixel formats for the 15, 16, 24 and 32 bits per pixel modes. The pixel format information is used by the VBE application to determine how to pack the pixel information so that the color information will be interpreted correctly by the video card. If the 24 or 32 bits per pixel modes have colors swapped, then you will need to changes these values. The values are listed in the '[PixelFormat]' section of the UNIVBE.INI file, and consist of values in the following format:

```
<bits> <redSize> <redPos> <greenSize> <greenPos> <blueSize> <bluePos> <rsvdSize> <rsvdPos>
```

An example UNIVBE.INI file might be:

```
[PixelFormat]
24 8 0 8 8 8 16 0 0
```

Section **14:**
Troubleshooting Guide

If you are encountering problems with UniVBE, please carefully review this entire section and see if you can find the solution to your problem. Please also consult the 'Known Bugs and Problems' sections which may mention the problem you are having.

Linear framebuffer modes hang my machine

If when you attempt to use the linear framebuffer modes of UniVBE, and your application (or VBETest) hangs you machine, you most likely have a conflict with the location of the linear framebuffer and another device in your system. It is also possible with older motherboards that the motherboard cannot address the linear buffer where it is located, so you may need to move it lower down in memory.

The first thing to try is changing the location of the linear framebuffer with the -L command line option of UVCONFIG. The most compatible location appears to be 32Mb, so you might try forcing it to 32Mb with UVCONFIG -L32. It this does not work, you can try other locations above the end of your normal system memory (if you have 16Mb RAM, dont attempt to enable the buffer below 16Mb!).

If you still cannot get the linear buffer modes working, then disable the linear buffer with UVCONFIG so that no applications will attempt to use it.

The 15/16/24/32 bit TrueColor modes look wierd

This is caused by UVCONFIG possibly incorrectly identifying your RAMDAC configuration. First check to make sure that UVCONFIG really has detected the correct RAMDAC. If you dont know the part number of your RAMDAC, you can determine this by looking at your video card. The RAMDAC is generally the second or third biggest chip on the board, and you can check it against the list of parts the UniVBE supports to find the one that matches your system. Try forcing UniVBE to use the correct RAMDAC with UVCONFIG once you have determined what it is meant to be.

If it still does not work, try forcing the RAMDAC to the 'Generic 24 bit TrueColor DAC', which will not allow UniVBE to directly program the RAMDAC. If this does correct the problem, please let SciTech Software know about your card and the problems you had so that we can try and rectify it in a future release. If you select this RAMDAC however, you will not be able to use the low res HiColor game modes.

The 24/32 bit TrueColor modes have swapped colors

This is caused by UniVBE incorrectly determining the pixel format used in the 24/32 bits per pixel modes. The most common situation is for cards that have a DAC that sets up the 24 bit modes in BGR format rather than RGB format (UniVBE should normally automatically detect

this). To fix this, you will need to create a UNIVBE.INI file and re-run UVCONFIG to change the pixel format (see the section 'Manually Chaning TrueColor Pixel Formats' for more information. If you need to change the 24 bit format to BGR rather than RGB, you would create a UNIVBE.INI file with the following information in it:

```
[PixelFormat]
24 8 0 8 8 8 16 0 0
```

386 Memory Managers

Sometimes a 386 memory manager can conflict with the correct operation of UniVBE for certain video card configurations. If you have a 386 Memory Manager installed such as EMM386, QEMM, QRAM or 386MAX and when attempting the install UniVBE the machine just hangs, or an application attempting to use UniVBE hangs you possibly have a memory manager conflict. Specifically if you have an ATI Mach32 or Mach64 based video card (Graphics Ultra Pro, Graphics Ultra Turbo) you will need to exclude the video BIOS region for correct operation, so proceed to step 2. To attempt to solve this, try the following steps (you might also like to refer to the documentation on your memory manager - QEMM for instance has a long section on troubleshooting such installation problems):

1. First do a clean boot (with no memory managers or TSR programs installed apart from HIMEM.SYS and MSDOS) and attempt to install UniVBE. In newer versions of DOS, you can do this by booting your system and holding down the [F5] key after you see the message "Loading MS-DOS ..". If UniVBE works in this configuration, then you have a conflict, and proceed to step 2. If UniVBE still does not work, then you possibly have a video card that is not fully supported by UniVBE - please contact SciTech Software and let us know so that we can attempt to rectify this in a future release.

2. Edit your CONFIG.SYS file and use the EXCLUDE option of your memory manager to exclude the entire video BIOS region, reboot your machine and attempt to install UniVBE once again. For EMM386 and QEMM the command to put on the command line is:

```
X=C000-CFFF
```

3. If step 2 is successful, you can try to reduce the amount of memory excluded with the above option which will provide you with more high memory for TSR programs. To do this, lower the value in the second number from CFFF to a value such as C7FF and lower. C7FF will probably work with most configurations.

Common Questions and Answers

I just installed UniVBE, what does it do?
See the introduction of the manual for all of the features of UniVBE. One of the nice things about UniVBE is that you just run it and it takes care of things from then on. Rest assured that even if you can't see exactly what it is doing, it has added many new software features to your system.

I have a PCI graphics card, do I still need a VESA VBE driver?
This is a very common question. VESA VBE is a software standard from VESA, and should not be confused with VESA's popular VL-Bus. All graphics cards need the VESA VBE software interface regardless of whether they use the ISA, MicroChannel, VL or PCI busses. So the answer is that even though you have a PCI graphics card, you will still need a VESA VBE driver so the software can access the features of the card.

How do I know if my monitor is DPMS compatible?
The way to know for sure is to see look in your monitor's manual or to look for "Energy Star" logos on your system or monitor. A good rule of thumb is that if you purchased your monitor after January 1994, it is most likely DPMS compatible. If you install UniPower, you can test to see if your monitor is compatible. It is nearly impossible to damage a monitor by sending DPMS signals to it, so it won't hurt to try. Go to the Windows Control Panel and select Desktop. Under screen savers select UniPower DPMS and push the SETUP button. You will be given an option to test each power management mode. Usually if the monitor is DPMS compatible, the screen will go blank and the "power on" LED at the front of your display will turn to amber. If this happens, you know you have a DPMS monitor.

What happens if I don't register UniVBE?
If you don't register UniVBE, yet continue to use it, some of the performance features will shut off after 21 days. You computer will not "blow up" and nothing will be erased. If you decide to register, all of the features will be turned back on, it will load faster and you will no longer get the message asking you to register your software.

Will UniVBE work as a Windows driver?
SciTech has released a technology called WinDirect that will allow games and high performance applications to use VBE to directly access the frame buffer under Windows. When those WinDirect applications appear, you will be able to use UniVBE to support those Windows applications. Currently the more typical Windows drivers do not support a VBE compatible interface. This is not impossible, but it is something that Microsoft has chosen not to do at this time. SciTech is working with application and system software developers to allow them to use the VESA VBE interface properly.

How do I make my software recognize and use UniVBE?
It order for your software to use the VBE interface, you have to make sure that it is configured properly. Usually there will be a setup utility with your application that will ask you about the kind of hardware that you have installed. You should select the "VESA" or "VESA VBE" option in your software so that it can access the features of UniVBE. Please refer to your application's manual if you are not sure how to do this.

I have installed UniVBE and my application software still doesn't work properly.
Make sure you have reconfigured your application to use "VESA" or "VESA VBE" instead of a setting specific to your graphics chip. One of the best ways to see if UniVBE or the application is at fault is to run the VBETest program. If it passes, most likely there is something wrong with your application.

You don't support my graphics card in your program -- why not?
With version 5.1 of UniVBE, we are supporting almost every graphics card currently on the market. For various reasons there are a few that we were not able to support in this version. We are still working to support all of the cards on the market. The VESA standard does require a

certain kind of graphics architecture so we will never be able to support such boards as the IBM 8514/A or boards based on the TMS340x chips.

Should I load this in AUTOEXEC.BAT, or just when I need it?
Some people are concerned about loading UniVBE in their AUTOEXEC.BAT file. They are afraid that UniVBE might conflict with something or use a lot of memory. You should think of UniVBE like you think of a mouse driver -- they are both low level drivers that cause negligible impact to the system. Since UniVBE uses around 8K of RAM and can be loaded high, it doesn't use up many system resources in the process either. SciTech recommends installing UniVBE in your AUTOEXEC file so that VBE is available to all of your applications.

What other products does SciTech make?
SciTech's other products are currently focused on applications developers. We will be releasing other products such as UniVBE in the near future. Our developers tools include the free SuperVGA Kit with source code for writing programs compatible with VESA VBE. We also have a higher level graphics library call MGL. This library will transparently use the features of the hardware including VBE 2.0 and linear frame buffer support.

Technical Support

If you are experiencing problems running UniVBE, please do the following:

1. Read through the following sections of this manual to see if your problem has already been addressed:

    *   List of Supported Card (is yours on the list?)
    *   Troubleshooting
    *   Common Questions and Answers

2. Try running VBETest to determine if there is a bug in UniVBE.

    *   If VBETest Passes:

        Since VBETest is a very comprehensive test of the VBE interface, most likely there is a bug in the way that your program uses the VESA VBE standard. You should contact your software application vendor.

    *   Otherwise, If VBETest Fails

        a.) Try checking the "Ignore Old BIOS" parameter in the UVCONFIG.EXE and re-generate the UNIVBE.DRV file. This will allow UniVBE to ignore any bugs that may reside in your VGA BIOS.
        b.) Try running VBETest again and see if it passes this time. If it does, your problems should be solved, if not, please continue on:

3. Email or mail the file VBETEST.LOG to SciTech for further diagnosis at the address below:

    Internet: : support@scitechsoft.com
    Phone   : 916-894-8400

FAX   : 510-208-8026

Appendix A:
Supported Hardware

Following are lists of the various hardware that UniVBE will work with. Please note that this list refers to the actual chips being used, not a board-level implementation. Thus you will not see any products from Hercules or Orchid on the list, but their products are supported because they use S3, Cirrus, Tseng, etc. chips.

NOTE TO HARDWARE VENDORS: If your product is not on this list and you would like your product to be supported by SciTech Software and it's many OEM's, please send us technical specifications and sample boards and we can include support for your products in our future release. Call or email support@scitechsoft.com for more information.

Graphics Chips -- Standard Support

- Acer Labs ALi CAT-32/64
- Ark Logic ARK1000VL, ARK1000PV, ARK2000PV
- Avance Logic AL2101/2201/2228/2301/2302/2364 SuperVGA
- Ahead V5000A, V5000B
- ATI Technologies 18800, 28800, Mach32, Mach64
- Chips & Technologies 82c45x, 655xx, 643x0 WinGine
- Cirrus Logic CL-GD62xx, 5402, 5422/4/6/8/9, 5430/4
- Cirrus Logic LCD CL-GD64xx
- Compaq IVGS/AVGA, QVision QV1024/1280
- Diamond Viper P9000+W5186/OAK87 VLB and PCI
- Everex Viewpoint, Viewpoint/NI, Viewpoint/TC
- Genoa Systems GVGA
- Hualon HMC86304/14
- IIT AGX-010/11/14/15/16/17
- Matrox MGA Atlas
- MXIC 86000/86010 SuperVGA
- NCR 77C20/21/22E/32BLT
- OAK Technologies OTI-037C/057/067/077/087
- Paradise/Western Digital PVGA1A, WD90C1x/2x/3x
- Primus 2000 SuperVGA
- RealTek RTG3103/3105/3106 SuperVGA
- S3 86c911/924/801/805/928/864/964/866/868/968/Trio32/Trio64
- Sierra Semiconductor Falcon/64
- Trident 88/8900/9x00/8900CL/8900D/9200CXr/9400CXi/9420DGi/9440AGi
- Tseng Labs ET3000, ET4000, ET4000/W32/W32i/W32p
- UMC 85c408/18
- Video7 VEGA, HT208/209/216
- Weitek 5086/5186/5286, P9100

Graphics Chips -- Linear Frame Buffer Support

- Acer Labs ALi CAT-64
- ARK Logic ARK1000/2000
- ATI Mach32
- ATI Mach64
- Avance Logic ALG2302+
- Chips & Tech 65530+, 64300+
- Cirrus Logic 5426+
- Compaq QVision 1024/1280
- S3 86c805+
- Sierra Falcon/64
- Trident 8900CL+

- Tseng Labs ET4000W32i+
- Paradise/Western Digital WD90C1x+

DAC Chips

- Normal 8 bit DAC
- Sierra SC11481/6/8 15 bit DAC
- Sierra SC11482/3/4 15 bit DAC
- Sierra SC11485/7/9 16 bit DAC
- Music MU9c4870 16 bit DAC
- ATI68830 16 bit DAC
- Generic 24 bit DAC
- Music MU9C1880 (SS2410) 24 bit DAC
- AT&T ATT 20c490 24 bit DAC
- AT&T ATT 20c491 24 bit DAC
- AT&T ATT 20c492/3,WinBond 82c490 24 bit DAC
- AT&T ATT 21c498 24 bit DAC
- Acumos ADAC1 24 bit DAC
- Sierra SC15020 24 bit DAC
- Sierra SC15021 24 bit DAC
- Sierra SC15025 24 bit DAC
- Sierra SC15026 24 bit DAC
- Sierra Falcon/64 Internal 24 bit DAC
- Cirrus Logic 24 bit DAC
- Music MU9c4910 24 bit DAC
- SGS/Inmos STG1700 24 bit DAC
- SGS/Inmos STG1702 24 bit DAC
- SGS/Inmos STG1703 24 bit DAC
- ICS GENDAC 24 bit DAC
- S3 86c716 (SDAC) 24 bit DAC
- S3 Trio Internal 24 bit DAC
- Trident TDK8001 or Internal 24 bit DAC
- Avance Logic ALG1201 24 bit DAC
- Avance Logic ALG1301 24 bit DAC
- UMC UM70c188 24 bit DAC
- Chrontel CH8398 24 bit DAC
- BrookTree Bt481 24 bit DAC
- BrookTree Bt482 24 bit DAC
- BrookTree Bt484 24 bit DAC
- BrookTree Bt485 24 bit DAC
- BrookTree Bt477 24 bit DAC
- AT&T ATT 20c504 24 bit DAC
- AT&T ATT 20c505 24 bit DAC
- TI TVP3020 24 bit DAC
- TI TVP3025 24 bit DAC
- TLC34075,ATI68875,Bt885 24 bit DAC
- TLC34076 24 bit DAC
- ATI68860,ATI68880 24 bit DAC
- C&T 643xx Internal 24 bit DAC

DAC Chips -- 320x and 360x 15/16 bit modes

The following is a list of RAMDAC's that currently support the new SciTech low resolution 320x200/240/400 and 360x200/240/400 line 15 and 16 bits per pixel video modes. We are currently working on supporting many more RAMDAC's in the next release of UniVBE.

- Sierra SC1148x DAC
- Music MU9C1880 (SS2410) 24 bit DAC
- AT&T ATT 20c490/1/2/3 24 bit DAC
- Acumos ADAC1 24 bit DAC
- Sierra SC1502x 24 bit DAC
- Sierra Falcon/64 Internal 24 bit DAC
- Cirrus Logic 24 bit DAC

- Music MU9c4910 24 bit DAC
- SGS/Inmos STG170x 24 bit DAC
- ICS GENDAC 24 bit DAC
- Trident TDK8001 or Internal 24 bit DAC
- Avance Logic ALG1201/1301 24 bit DAC
- Chrontel CH8398 24 bit DAC
- C&T 643xx Internal 24 bit DAC

Known Bugs and Problems

This file documents known problems with the Universal VESA VBE. SciTech Software have done their best to try to fix all known problems, but some still persist and may well be limitations in the particular video controller hardware and may not be fixable.

Generic Problems:

Virtual scrolling tests:

Many chips have hardware problems that cause the extended CRTC scrolling functions to display erronous information when scrolled to certain locations when a wide virtual buffer is enabled.

Because the virtual scrolling tests in SVTEST are done without retrace enabled, horiztonal and virtual scrolling can cause intermittant interferance causing the display to 'jump' from location to location.This is normal.

320x200/240/400 8/15/16 bit SuperVGA video modes:

Because these modes are emulated using 640x480x256, on some chips if you have the refresh for 640x480x256 set to a very high value, these modes can get squished small vertically on non Multi-Scanning monitors.

Chipset Specific Problems:

S3 chipsets

On the newer S3 Vision 864/964 and above chips, the CRT controller causes massive interferences if displaying from the first Mb and writing to the second. This occurs in VBETEST, in the virtual scrolling tests while drawing the test image.

On the S3 86c805revP chip (Goldstar component) the 320x200/240/400 lines mode do not work so have been mapped out. We are searching for a solution at the moment.

On the S3 86c805 (all revs) the 320x200/240/400 line modes do not work with the linear buffer enabled, so the linear buffer is disabled for these modes.

Cirrus Logic 64xx chipsets

The CL-GD64xx LCD controller chipsets cannot currently display past 256k in 16 color modes.

Western Digital WD90C33 chipsets

320x200/240/400 line 8 bit modes are not supported on this chip. We are searching for a method that works (the other WD chips work, except this one).

On cards with 2Mb, the linear framebuffer mode can only access the first 1Mb of video memory. Hence it is disabled for this chip in 2Mb configurations. If you wish to use the linear buffer, force UVCONFIG to use only the first 1Mb of video memory.

Tseng Labs chipsets

ET3000 chips cannot display past 256Kb in 16 color video modes.

ET4000AX and ET4000/W32 chips do not support the linear framebuffer (a hardware problem prevents it from working). The ET4000/W32iRevA and above chips do however.

ET4000/W32pRevA&B chips do not support a linear framebuffer past 1Mb (hardware problem). Hence on this chip, the linear buffer is disabled if you have 2Mb video memory. To enable the linear buffer, force UVCONFIG to configure the card with only 1Mb video memory.

Weitek P9000 chipsets

All P9000 chipsets do not support extended CRTC addressing and hence cannot support double buffering as it is usually performed by VBE 1.2/2.0 applications. This is a hardware problem, and cannot be solved (this includes the Diamond Viper). All P9000's boards (execpt the Diamond Viper) do not have bank switching registers, so only the W5x86 support chips can be used for SuperVGA support, resulting in a lack of video memory and resolutions.

Weitek P9100 chipsets

All P9100 chipsets have built in Weitek 5286 SuperVGA support and can address 1Mb of shared video memory between the native P9000 core and the SVGA. However only 256 color modes are currently supported from DOS, and for some reason the extended page flipping code does not work properly.

ARK Logic ARK1000/2000PV

Currently UniVBE cannot display past 256k in the 16 color modes, so paging causes problems in these modes.

Acer Labs AliCAT-64

Currently UniVBE cannot display past 256k in the 16 color modes, so paging causes problems in these modes.

List of cards tested with UniVBE 5.1

Thoroughly tested by SciTech Software:

- Generic S3 ISA 1Mb (S3 86c911, Sierra SC11483 HiColor DAC)
- Actix GE32+ VLB 1Mb (S3 86c805revA/B, ATT 20c490 TrueColor DAC)

- Jayton VL-41 VLB 1Mb (S3 86c805revP, Chrontel CH8391 TrueColor DAC)
- Number Nine GXE64 VLB 2MB (S3 Vision 864, ATT 21c498 TrueColor DAC)
- Number Nine GXE64Pro PCI 2MB (S3 Vision 964, TI TVP3025 TrueColor DAC)
- Diamond Stealth 64 DRAM 2Mb VLB (S3 Vision 864, ICS GENDAC TrueColor DAC)
- Diamond Stealth 64 DRAM 2Mb PCI (S3 Trio764, built in TrueColor DAC)
- NCR 77C32BLT VLB 2Mb (ATT 20c490 TrueColor DAC)
- Cirrus Logic 5420 ISA 1Mb
- Cirrus Logic 5422 ISA 1Mb (Built in TrueColor DAC)
- Cirrus Logic 5424 ISA 1Mb (Built in TrueColor DAC)
- Cirrus Logic 5426 VLB 1Mb (Built in TrueColor DAC)
- Cirrus Logic 5428 VLB 2Mb (Built in TrueColor DAC)
- Cirrus Logic 5429 VLB 2Mb (Built in TrueColor DAC)
- Cirrus Logic 5430 VLB 2Mb (Built in TrueColor DAC)
- Cirrus Logic 5434 VLB 4Mb (Built in TrueColor DAC)
- Cirrus Logic 5434 PCI 2Mb (Built in TrueColor DAC)
- Cirrus Logic 6440 LCD 1Mb (Clone Laptop)
- Orchid Kelvin VLB 2Mb (Cirrus Logic 5434 Built in TrueColor DAC)
- Genoa GVGA 6400 ISA 512Kb
- Ahead V5000B ISA 512Kb
- Primus P2000 ISA 1Mb (ATT 20c491 TrueColor DAC)
- Hualon HMC86314 ISA 512Kb
- UMC UM86c418 ISA 512Kb (Sierra SC11483 HiColor DAC)
- Tseng Labs ET3000 ISA 512k
- Orchid Pro Designer II ISA 1Mb (Tseng Labs ET4000)
- Everex Viewpoint VRAM ISA 1Mb (Ev623 + Tseng ET4000AX)
- MegaEva/2 ISA 1Mb (ET4000 Sierra SC11486 HiColor DAC)
- MegaEva/32i/VL VLB 2Mb (ET4000/W32i, Winbond 82c490 TrueColor DAC)
- Tseng Labs VGA/32 PCI 2Mb (ET4000/W32p Rev C, STG1703 TrueColor DAC)
- Diamond Stealth 32 2Mb VLB (ET4000/W32pRevA, SGS STG1702 TrueColor DAC)
- Video 7 VRAM ISA 512Kb (HT208)
- Headland VRAM 2 ISA 1Mb (HT209/D)
- Headland Win.VGA ISA 1Mb (HT216/F)
- ATI VGA Wonder ISA 512k (18800)
- ATI VGA Wonder ISA 512k (28800-5)
- ATI Graphics Ultra Pro VLB 2Mb (Mach32 68800-6, ATI68875 TrueColor DAC)
- ATI Graphics Ultra Pro PCI 2Mb (Mach32 68800-6, ATI68875 TrueColor DAC)
- ATI Graphics Pro Turbo VLB 4Mb (Mach64 88800-GX, ATI68860 TrueColor DAC)
- ATI Graphics Xpression PCI 2Mb (Mach64 88800-GX, STG1702 TrueColor DAC)
- Trident 8900CL ISA 1Mb
- Trident 9000A ISA 512Kb
- Trident 9000B ISA 512Kb
- Trident 9400CXi VLB 1Mb (Built in TrueColor DAC)
- Oak OTI-037C 512Kb
- Oak OTI-067 512Kb
- Oak OTI-077 512Kb/1Mb
- RealTek RTVGA 3106 ISA 1M
- Paradise VGA Plus Card ISA 256k (8 bit PVGA1A)
- Paradise ISA 256k (16 bit PVGA1A)
- Paradise Windows Accelerator ISA 1Mb (WD90C31 Sierra SC11483 HiColor DAC)
- Cardex C33 VLB 2Mb (WD90C33 ATT 20c490 TrueColor DAC)
- Western Digital in Toshiba T4440C Laptop 512k (WD90C30)
- Dolch PIT Viper ISA 512k (C&T 65535)
- Spider 256 Cache VLB 1Mb/2Mb (C&T 64300, Internal 24 bit DAC)
- Boca Vortex ISA 1Mb (IIT AGX-014, SC15025 TrueColor DAC)
- Spider Black Widow Plus PCI 1Mb (IIT AGX-016, SC15021 TrueColor DAC)
- Sierra Falcon/64 PCI 2Mb (SC15064, built in TrueColor DAC)
- ARK Logic PCI 1Mb (ARK1000PV, UMC9591L (20c490 comp) TrueColor DAC)
- ALi CAT-64 PCI 2Mb (ALi M3145, STG1702 TrueColor DAC)
- Avance Logic ALG2228 VLB 1Mb (ALG1201 TrueColor DAC)
- Avance Logic ALG2301 PCI 2Mb (ALG1201 TrueColor DAC)
- Avance Logic ALG2302 PCI 2Mb (ALG1301 TrueColor DAC)
- GXA-9000 VLB 2Mb (Weitek P9000+5086, Bt486 TrueColor DAC)
- Diamond Viper VLB 2Mb (Weitek P9000+W5186, Bt485 TrueColor DAC)
- Diamond Viper VLB 2Mb (Weitek P9000+Oak87, Bt485 TrueColor DAC)
- Diamond Viper PCI 2Mb (Weitek P9000+Oak87, Bt485 TrueColor DAC)
- Diamond Viper SE 2Mb PCI (Weitek P9100, IBM RGB525 TrueColor DAC)
- Diamond Viper Pro Video 2Mb PCI (Weitek P9100, IBM RGB525 TrueColor DAC)
- Compaq QVision/1280 ISA 2Mb (QVision 1280, Bt485 TrueColor DAC)
- Media Vision Pro Graphics 1024 - uses Cirrus Logic SuperVGA modes

- Media Vision Pro Graphics 1280 - uses only Standard VGA modes
- Matrox MGA Ultima Plus 4Mb VLB (MGA Atlas, TVP3020 RAMDAC)

Reported to work from UniVBE users:

- Actix GE32+ ISA 1Mb (S3 86c801, ATT 20c490 TrueColor DAC)
- UMC 85c408 512k with HiColor DAC
- HMC 86304 256k, 512k
- Trident 9000i 512k with HiColor DAC
- Trident 8900C 1Mb
- Trident 8900B 1Mb
- Trident 9000B 512k
- MXIC 86000 512k
- Avance Logic ALG2101 1Mb with HiColor DAC
- Oak OTI-077 1Mb
- Oak OTI-087 1Mb with HiColor DAC
- Oak OTI-067 256k
- Western Digital WD90c31 1Mb with TrueColor DAC (AT&T 20c492)
- Western Digital WD90c33 1Mb with TrueColor DAC (Sierra SC15025)
- NCR 77C22E 4Mb
- Tseng Labs ET4000AX 1Mb with TrueColor DAC (SS24)
- Tseng Labs ET4000/W32 1Mb with TrueColor DAC (AT&T 20c490)
- Tseng Labs ET4000/W32i 2Mb with TrueColor DAC (Sierra SC15025)
- Tseng Labs ET4000/W32i 1Mb with TrueColor DAC (Sierra SC15025)
- Tseng Labs ET3000AX 512k
- Primus P2000 2Mb with TrueColor DAC (AT&T 20c492)
- Acumos AVGA2 512k (actually a Cirrus 5421 equivalent chipset)
- Cirrus Logic 5420 512k with HiColor DAC
- ATI Graphics Ultra Pro 2Mb with TrueColor DAC (TI34075)
- Weitek 5186 256k (on a P9000 board)
- Western Digital WD90c24 1Mb with HiColor DAC
- Western Digital in Toshiba T6600 Laptop 512k (WD90C26A)
- RealTek RTG3105 512k
- Trident 9000B 512k
- Cirrus Logic 5426 2Mb
- Chips & Technologies 82c450 in Macintosh Quadra 800 with DOS card.
- STB WINDX ISA 1Mb (S3 86c911)
- Diamond Stealth VRAM ISA 1Mb (S3 86c924)
- Diamond Stealth 24 VLB 1Mb (S3 86c805 TrueColor DAC)

Appendix   **B:**
VBE Compatible Applications

The following is a vastly incomplete list of products that use VBE standards. We are trying to create a complete listing of VBE 2.0 applications so if you know of applications that support VBE that are not on this list, please email the information to support@scitechsoft.com and will include them on future updates.

Vendor	Application
Access Software	Links/386
	Under a Killing Moon
AutoDesk	AutoCAD Release 12
	AutoShade
	Animator
	Animator Pro
Compton's Newmedia	Songs from Bear Country
Dyned	Dynamic English/Japanese/etc.
Electronic Arts	NHL Hockey 95
Interplay	The Sim City Series
Legend Entertainment	Deathgate
Maxis	The SimCity CD ROM
Novell	The WordPerfect Series
Strategic Simulations, Inc.	
Time Warner Interactive	Rise of the Robots
Trilobyte	The Seventh Guest
	The Eleventh Hour

Appendix   *C:*
Developer Information

UniVBE Programming Information

For information about how to program to the UniVBE and the VESA VBE standards in general, we suggest the following references:

- SuperVGA Kit
- SciTech MGL Graphics Library
- VESA VBE Spec (available directly from VESA at   408-435-0333)

Video Modes Supported by UniVBE

VBE 2.0 allows vendors to extend the video numbers to whatever values they wish, so we have taken the liberty to extend the mode numbers used by the UniVBE to include modes supported by a number of popular video cards on the market as well as some new modes that we have created. Depending on how well your applications have been written, they may or may not be able to use those modes.

If you are a developer wishing to take advantage of these modes, please consult the SuperVGA Kit (available from SciTech Software) for more information and programming examples. When you are using VBE, it is best to query the type of mode you want first (i.e. 800x600/256 color), find out the mode number, then use that mode number as a tag to set the mode. The video modes supported in UniVBE along with internal modes numbers used by UniVBE are as follows:

List of UniVBE Mode Numbers

Colors	Resolution	Mode	Colors	Resolution	Mode
16	640x350	150	65,536	320x200	10E
16	640x400	151	65,536	320x240	132
16	640x480	152	65,536	320x400	133
16	800x600	102	65,536	360x200	134
16	1024x768	104	65,536	360x240	135
16	1280x1024	106	65,536	360x400	136
16	1600x1200	123	65,536	640x350	11F
256	320x200	153	65,536	640x400	120
256	320x240	154	65,536	640x480	111
256	320x400	155	65,536	800x600	114
256	360x200	156	65,536	1024x768	117
256	360x240	157	65,536	1280x1024	11A
256	360x400	158	65,536	1600x1200	126
256	640x350	11C	16M	320x200	10F
256	640x400	100	16M	320x240	137
256	640x480	101	16M	320x400	138
256	800x600	103	16M	640x350	121
256	1024x768	105	16M	640x400	122
256	1280x1024	107	16M	640x480	112
256	1600x1200	124	16M	800x600	115
32,768	320x200	10D	16M	1024x768	118
32,768	320x240	12D	16M	1280x1024	11B
32,768	320x400	12E	16M	1600x1200	127
32,768	360x200	12F	16M+A *	640x350	142
32,768	360x240	130	16M+A *	640x400	143
32,768	360x400	131	16M+A *	640x480	128
32,768	640x350	11D	16M+A *	800x600	129
32,768	640x400	11E	16M+A *	1024x768	12A
32,768	640x480	110	16M+A *	1280x1024	12B
32,768	800x600	113	16M+A *	1600x1200	12B
32,768	1024x768	116			
32,768	1280x1024	119			
32,768	1600x1200	125			

* 32 Bits Per Pixel

UniVBE also fully supports the 32 BPP video modes popular on the latest video cards. These modes usually run much faster than the equivalent 24 bit modes, but take up considerably more memory (you need at least 2Mb to run 640x480x32bit).

Hardware Limitations

Note however that even though UniVBE may support a particular video mode, this mode will only be "valid" if there is enough video memory installed, and if the underlying video hardware can support it. UniVBE fully supports the 640x350, 640x400 and 640x480 modes with 256/32k and 64k colors on all video cards that have enough video memory, using proprietary emulation techniques if the underlying video BIOS does not directly support it.

Extended Text Modes

UniVBE does not provide support for any of the extended text modes that your video card may provide, but will provide support for any extended text modes supported by an underlying VESA VBE compliant BIOS or TSR. Thus if your video card already has a VBE compliant BIOS or you install your vendor supplied VESA VBE TSR for your video card before installing UniVBE, an automatic pass-through mechanism will be used to ensure the extended text modes still work correctly.

Distribution Licensing Information

If you are the author of a freeware, shareware or commercial application and wish to distribute a Shareware or Licensed copy of the Universal VESA VBE with your package, you must purchase a Software License Agreement from SciTech Software. The following conditions must also be met:

Please contact SciTech Software directly for Software Licensing information and pricing:

       Licensing Department
       SciTech Software USA
       5 Governors Lane, Suite D
       Chico, CA 95926
       USA

       Phone : (916) 894-8400
       Fax   : (510) 208 8026
       Email : sales@scitechsoft.com

See the Software License Agreement at the beginning of this manual for further Shareware Distribution information

Appendix   *D:*
Glossary

Bank Switching - Due to limitations of the PC architecture, application software can only access the graphics memory in 64K banks. When the software needs to change the image on the display, it must switch to the bank of memory on the video card that contains the image that it wants to change. Each graphic chip implements bank switching in a different way, so VESA created the VBE Core standard to provide a common way to do bank switching. Newer graphics chips fix this problem by implementing a "linear frame buffer" mode (see definition below).

BIOS - Basic Input Output System. This is the low level code that makes the graphics card start up and operates correctly. It is normally stored in a Read Only Memory chip on the graphics board and it can be upgraded or supplemented to provide additional functionality with a program like UniVBE.

BPP - Bits Per Pixel. It signifies how many colors can be displayed in a particular video mode. 8BPP=256 colors, 15BPP=32,768 colors; 16BPP=64,5536 colors; 24BPP=16.7 million colors.

Color Depth - This refers to how many colors are being displayed. The higher the color depth, the greater number of colors. The more colors, the more memory is required on the graphics card. Generally, the higher the color depth, the more realistic the image displayed.

DAC - Digital to Analog Converter. This is the chip that converts the digital signals in the graphics chip to the analog signals that a standard super VGA monitor requires. The DAC chip also generates all of the colors for a graphics chip. Generally, the better the DAC, the more colors you get.

Double Buffering - This is a programming technique that uses the fact that most graphics cards have more memory on them then is actually used to display an image. This extra, or "off screen" memory can be used to begin generating the next image that the user will instantly see the next frame. This way the user does not have to watch each frame get rendered by the computer. This technique is used extensively in computer games to produce flicker free animation.

DPMS - The VESA Display Power Management Signaling standard is the method that a graphics controller signals to the display to power down. These signals are generated differently on each graphics controller so VESA also created a standard software interface (VBE/PM) so that screen savers and operating systems wouldn't have to know about each graphics chip just to set the mode.

Energy Star Computers Program - This is an effort organized in 1993, by the US Environmental Protection Agency (EPA) to encourage manufacturers to create more energy conscious office products. VESA worked closely with the EPA in creating the DPMS and VBE/PM standards so that computers and displays could be the Energy Star requirements in a standard way. Most, if not all, DPMS monitors are Energy Star compliant. To meet the Energy Star guidelines a computer or display must use no more than 30 watts of electricity when idle.

Frame Buffer - This is the memory where a computer image is stored. This memory is usually located on the graphics card and is completely separate from the computer system's main memory. When you are looking at an image displayed on a computer screen, you are actually viewing the image stored in the frame buffer.

Linear Frame Buffer - This is a high performance replacement for bank switching whereby all of the graphics memory can be accessed in one contiguous block of memory. In order to use linear frame buffer mode, a graphics chip must support it, must be running VBE 2.0 or other specialized driver and must be running in protected mode. This is because the computer will map the graphics memory into the system memory address space. In order to do this, it must have access to more than the 640K that it would get in "real mode".

Paging - Another term for "bank switching" (see above definition).

Pixels - A pixel is an individual dot of light that the graphics card can turn on or off or change the color of. A monitor can display many thousands of pixels. The more pixels, the more defined a computer image becomes. Generally, as the number of pixels displayed increased, the performance of the computer reduces, thus many computer games run in lower resolutions with a higher (more realistic) color depth.

Protected Mode - Normally a PC can access 640K of RAM. By going into protected mode, software has full access to all of the memory in a computer system. The problem with protected mode is that when running in protected mode, the software no longer has access to some of the computers resources. This is why VBE 2.0 was created; software can jump down to "real mode" get the information from VBE and switch back to protected mode. Before VBE 2.0, an application had to do that each time that it wanted to access the graphics card. With VBE 2.0, it only has to do it at initialisation time, so VBE 2.0 is much faster then earlier versions of VBE.

Real Mode - This is the opposite of protected mode. In this mode of operation, a software application can only access 640K of RAM. If an application runs in real mode, it can only access the graphics card using bank switching. In order to access VBE, an application must be in real mode, therefore protected mode applications will switch to real mode, access VBE, then switch back to protected mode to continue executing. With VBE 2.0, this only has to happen at initisalisation time.

Resolution - This refers to the number of pixels that are displayed on the screen. For instance, 1024x768 means that 1024 pixels are display across and 768 pixels are displayed down for a total of 786,432 pixels.

ROM - Read Only Memory. This is a chip where the BIOS is stored on a graphics card.

SVGA - Super VGA. The original IBM Video Graphics Array, or VGA card had limited ability to display graphics. Quickly, other manufactures enhanced the original design of IBM's VGA, while still maintaining compatibility with IBM's original VGA card. These enhanced cards have come to be known collectively as "Super VGA" cards.

Thunk - This is when an application changes from protected mode back to real mode. Thunking will slow down an application considerably. By minimizing thunking, VBE 2.0 will dramatically increase the performance of a graphics application.

TSR - Terminate and Stay Resident program. This is a program that runs, loads itself into memory and then allows the user to run other programs. TSR have gotten a bad name because many early applications tried to be TSRs and they conflicted with many other applications. Low level drivers like UniVBE or mouse drivers are also TSRs. Since they operate at a very low level, they seldom if ever conflict with applications (as a matter of fact applications run better with these TSRs!)

VBE - VESA BIOS Extension. This is an extension of the BIOS defined in the original IBM VGA card. VESA added new functionality to the BIOS to provide software developers access to new features that have been added to SVGA cards. There are several VBE module that address new features that have been added over the years.

VBE/PM - VESA BIOS Extension/Power Management - This is a module of VBE that allows applications to issue standard calls to a SVGA card to power down the monitor. VBE/PM allows operating system and application vendors a standard interface to control the monitor. Without VBE/PM a screen saver would be required to write special software for every graphic card on the market.

VESA - The Video Electronics Standards Association is an organization that was formed in 1989 to standardise graphics and display hardware and device interfaces. It has over 200 member companies from the display, graphics chip, graphics board, system and software companies. They can be reached at: Video Electronics Standards Association, 2150 North First Street, Suite 440, San Jose, CA 95131. (408) 435-0333, (408) 435-8225 FAX

Appendix   *E:*
VESA Software Standards Overview

In order for you to better understand the features that UniVBE gives you, it is helpful to provide a brief overview of the various VESA standards that are relevant to UniVBE. Since all of the software interface specifications are built into the BIOS of the graphics card, they are all modules of the VESA BIOS Extension (VBE) standard.

VESA BIOS Extensions (VBE Core) 2.0 - This standard provides the primary functionality of the VESA BIOS Extensions. It allows applications to find out the capabilities of the graphics card and the ability to set the display modes that it finds. VBE 2.0 adds some new features above the prior VBE 1.2 standard including linear frame buffer access and protected mode banking. With VBE 2.0, many new graphics boards will be able to be supported in their relatively high performance modes. Some of the VBE Core 2.0 features include:

- *Linear Frame Buffer Access.* This allows the frame buffer to be accessed directly in protected mode as one large area of memory instead of in individual chunks.
- *Protected Mode Banking.* This allows access to the frame buffer from protected mode with out "thunking" down to real mode, thus slowing the computer down.
- *SuperVGA double buffering.* Allows high performance animation to provide for smooth animation for computer games and other high performance graphics programs.
- *SuperVGA virtual screens.* Programs may set up a huge virtual display resolutions, and smoothly scroll a window with less physical resolution around within this buffer.
- *High Color Modes.* Support for the 32,000, 64,000 and 16.7 million color video modes. As well as supporting the industry standard 16 and 256 color video modes for resolutions from 320x200 right up to 1600x1200.

VESA Display Power Management (DPMS) 1.0 - DPMS is a *hardware* standard that allows graphics card cards to communicate with DPMS compliant monitors via a special signaling system that can be used with existing graphics controllers and monitor cables. This signaling system allows the video card to tell the monitor to go into a number of different *power management* or *power saving* states, which effectively allow the monitor to turn itself off when it is not in use. The primary benefit of this is dramatically decreased (up to 90%!) power consumption when your computer is sitting idle, thus saving both energy and money.

There are four power management states. Each of the different states provides a tradeoff between power consumption and recovery time (the time it take before you can see the picture again!). The following table outlines the currently defined power management states, and how they relate to each other. Also included are some ballpark figures for power consumption and recovery times, but you should consult the documentation that comes with your video monitor for more accurate figures:

VESA DPMS Monitor Modes

State	Power	Recovery Time	Notes
On	100%	N/A	Normal use
Standby	< 80%	~1 sec	Minimal power reduction (optional)
Suspend	< 30 watts	~4 secs	Substantial power reduction
Off	< 5 watts	~8-20 secs	Lowest level or power - non operational

VESA BIOS Extensions/Power Management (VBE/PM) 1.0 - Once VESA created the DPMS standard for the electronic signal between the graphics card and the display, they realized that since DPMS is enabled differently on each graphics card, they needed to have a standard interface so that software and operating systems could control the signaling. They created VBE/Power Management for this purpose. The way it works is that a screen saver or operating system (such as Windows 95) makes a VBE/PM call to the graphics card. When the graphics card receives a VBE/PM function call, it then generates the DPMS signals to the monitor. This way, the application never has to know exactly how the graphics card generates those signals, it just make the VBE/PM calls and lets the graphics card handle it. Since VBE/PM is a relatively new standard, many older graphics cards do not support it. UniVBE automatically provides support for VBE/PM on all supported graphics cards.

Other VESA Software Standards and Proposals

VBE/Display Data Channel (VBE/DDC) 1.0 - This is the software interface to the "plug and play" monitor interface standard. It allows a graphics controller to determine what kind of display is connected so that it can configure itself correctly -- all without any intervention from the user.

VBE/Audio Interface (VBE/AI) - This is a VESA software standard for audio, similar to VBE Core that allows software to control audio hardware without having to write special drivers for every card on the market. Since it insulates the software vendor from worrying about interrupts, it is crucial for compatibly with the forthcoming plug and play compatible systems. These new systems will be able to switch interrupts on the fly and will cause software with hard coded interrupts to fail. The pending VBE/AI 2.0 standard will support protected mode access to the audio hardware.

VBE/Accelerator Functions (VBE/AF) - This is a proposal within the VESA Software Standards Committee to standardize common acceleration functions available on most hardware today. Some of the functions that are being considered for the standard are access to hardware cursors, Bit Block Transfers (BIT BLT), off screen sprites, hardware panning, drawing and other functions. This proposal has the potential to dramatically increase the baseline performance of games, operating systems and other applications.

VBE/Graphics Configuration (VBE/GC) - This proposal will allow applications, utility software and operating systems a standardized way to set numerous parameters of a graphics controller to optimize it with the display. One of the purposes of the specification will be to allow the user to change the refresh rates generated by the graphics card to better match the installed display and user preferences.

Appendix   *F:*
Order/Product Feedback Forms

Order/Registration Form

```
    SciTech Software                                  ___/___/___
    5 Governors Lane, Suite D                         MM/DD /YY
    Chico, CA 95926 USA
    Toll free/Phone/Fax: 800-4UNIVBE/916-894-8400/510-208-8026

PLEASE PRINT OR TYPE CLEARLY!

    Name: _____

    Company: _____

    Address: _____

             _____Zip/Postal Code_____

             _____ Country _____

    Phone: _____  Fax: _____

    Email: _____

    Register product(s) to: [ ] Company     [ ] Individual

    Pay By:   [ ] Check (USA only)  [ ] Money Order  [ ] Credit Card

    Credit Card Orders: MasterCard / Visa / American Express(circle one):

        Card Number _____ Expires ___/___

        Exact name on card (print) _____

SHIPPING CHARGES: If a disk & manual are ordered from outside of the
    USA, the shipping charge is US$8 and will be delivered via airmail.
    For orders within the USA, the shipping charge is US$4. Orders without
    disk & manual will receive a receipt and registration code via airmail
    for no additional shipping charge.

      Price List                              Cost      Qty   Price
      ----------------- -----------------     -----     ---   ------
      Upgrade from UniVBE/Pro 4.x (registered)  US$16*    ___   $ _____
      UniVBE/Pro 5.x                          US$28*    ___   $ _____
      Manual + Disk     [ ] 3.5"   [ ] 5.25"  US$10     ___   $ _____

    *Includes all 5.x upgrades (available online)

      Subtotal:                                         $ _____
      CA residents add 7.25% sales tax:                 $ _____
      Shipping Charges (See above for amount!):         $ _____

      Total Enclosed:                                   $ _____

    I have read and agree to abide by the enclosed license agreement and I
    agree to be bound by my credit card agreement.

      (Signature required) _____
```

Product Feedback Form

By taking a moment or two to fill out this form, you will enable us to serve you better in the future:

1. Where did find our program (please list forum/library or location downloaded)?
    [ ] America Online _____

    [ ] Compuserve _____

    [ ] Internet _____

    [ ] BBS _____

    [ ] Other (Please specify) _____

2. Which version of our software did you receive?

3. What type of board/chip do you have? _____

4. What feature(s) do you like the best about our software?

5. Which applications that you are using UniVBE with?

6. Do you have any comments or suggestions for future versions?

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