

Elpin Systems' VGA BIOS

Overview

The VGA BIOS is a ROM-based library of functions providing a basic interface to a VGA adapter. These functions are well documented such that most DOS programs use these routines for basic screen I/O. Most applications and systems software that "go direct" to video memory even call the BIOS to initialize the state of the VGA ("Set Mode").

Historically, the video BIOS has been around since the first IBM PC. The motherboard ROM BIOS contained a set of functions for screen I/O on both the Color Graphics Adapter (CGA) and the Monochrome Display Adapter (MDA). With the introduction of the Enhanced Graphics Adapter (EGA) in 1985, and then the Video Graphics Array (VGA) in 1987, more functions were added to handle the new capabilities of each adapter.

More recently, the Video Electronics Standards Association (VESA) has defined a set of extensions to the BIOS. Two major revisions to the standard have occurred since the original standard was released: VBE 2.0 was ratified in 1994 and VBE 3.0 was ratified in 1998. The newer capabilities include virtual screen areas and access to a linear frame buffer. VESA has also defined methods – and therefore, BIOS functions – for controlling the monitor. These extended functions (Display Power Management Signaling [DPMS] and Display Data Channel [DDC]) are expected to reside in the VGA BIOS ROM.

Elpin Systems, Inc. supplies a legal (violates no known copyrights), fully functional, VGA-compatible, VBE 2.0 and VBE 3.0 compliant, ROM BIOS that fits into a 32K ROM.

VGA BIOS

Features

- Standard BIOS functions
 - CGA/EGA/VGA functions 00h through 0Fh
 - EGA/VGA functions 10h through 13h
 - VGA functions 1Ah through 1Ch
 - Compatibility standard is the IBM PS/2 Model 70
 - Uses standard VGA parameter tables and font tables
- Power On Self Test (POST) with optional "sign-on" message
- VBE 3.0 compliant
 - VBE 1.2 compatible functions 00h through 07h
 - VBE 2.0 DAC control functions 08h and 09h
 - VBE 2.0 Protected mode interface function 0Ah
 - VBE 3.0 Clock control function 0Bh and enhancements to function 00h
- Display Power Management Signaling (VBE function 10h)
- Optional support for adapters that support Display Data Channel (DDC 2B) (VBE function 15h)
- OEM Extensions are available (extended modes, initialization of memory and pixel clocks, memory testing)

Description

"VGA compatible BIOS" is defined as equivalent behavior of a given function to the VGA BIOS on the IBM PS/2 Model 70. This specifically refers to **return values** of information functions (e.g. Function 0Fh - Get Mode Information) and **side effects** of all other functions (e.g. Function 00h - Set Mode). Due to the size constraints of the ROM, the BIOS code is optimized for size where possible.

All standard VGA functions must pass several Elpin Systems, Inc. internal compliance tests before release. One such test, "TBIOS", has been used by several vendors to test BIOS compatibility since 1987. Another set of tests, the "**VGA BIOS Test Specification**", is also available for purchase. After each OEM specific implementation, the VBE functions are tested via a suite of VBE tests including current DOS applications.

Description (cont.)

The BIOS source code is supplied as approximately 30 source files and a "MAKE" script. The BIOS is implemented using the 80386 instruction set. MAKEIMG.EXE, a tool for converting the compiled code to a ROM image (complete with checksum) is provided. The BIOS is assembled using the following Microsoft tools: MASM, LINK, EXE2BIN, and NMAKE.

Acquiring the VGA BIOS

For pricing, software license agreement, and other delivery terms regarding the VGA BIOS, contact Elpin Systems, Inc. at the address listed below. *The VGA BIOS will be customized for any specific chip set requested.* Depending on the complexity of the chip set, this customization may take between two to six weeks.

If the BIOS is to be used on an existing product, please be prepared to supply a couple of adapters and the appropriate technical reference manual(s). If the BIOS is to be used on a new or future product, please be prepared to supply a prototype adapter when available and any written product specifications that may exist. If this information must be supplied under non-disclosure agreement ("NDA"), then Elpin Systems, Inc. will gladly execute an NDA to expedite development.

After the initial development and delivery, Elpin Systems, Inc. offers a maintenance agreement to clients who do not have in-house staff to modify and maintain the VGA BIOS for current and future products.

Other Elpin Systems, Inc. Products

- VGA Core Test Suite
- VGA Core Sample Implementation
- VGA BIOS Test Specification
- ANSI.SYS (DOS 6.0 compatible)
- VGA Diagnostics Tool
- VGA Core RTL Model

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