

the utility files. Confirm this selection or make any necessary changes.

Step 3 The root directory of your hard disk [C:\] is selected as the default destination for the file RAMBIOS.SYS. Confirm this selection or make any necessary changes.

Step 4 When the source and destination drives have been confirmed, SETUP will automatically install RAMBIOS.SYS. The message "Type any key to continue" will appear when the action is completed. Press any key to return to the SETUP main menu.

Step 5 Continue with SETUP to install software or exit the program.

The changes made to your CONFIG.SYS file will not take effect until you re-boot your computer.

Install Software

Step 1 Select the Install Software option from the main SETUP menu.

Step 2 Use the up and down arrow keys to move the cursor through the Product Category window to select which software drivers you wish to install and press [Enter].

Step 3 For each software driver, a list of the resolutions supported is given. Highlight a resolution to be installed by using the up and down arrow key to move the cursor.

Step 4 Press [Enter] to select a resolution. A ">" appears in front of selected resolutions, [Enter] also deselects a resolution if you find you've made an error. [Esc] exits you from the current windows without saving any settings.

Step 5 Once your selections have been made, move the highlight to "Done Selecting" and press the [Enter] key to copy the files to your hard disk. SETUP provides default paths to the source and destination drives. You can use the default selections or provide your own. Press [Y] to confirm, [N] to change, or [Esc] to

THE UTILITY PROGRAM (HTVGA.EXE)

The Utility program, HTVGA.EXE, is a menu-driven program which allows you to set:

- Monitor type
- Compatibility modes
- Screen Saver options.

You can also run HTVGA.EXE by entering a command at the DOS prompt.

Since HTVGA.EXE can change the mode your display is operating in, you should not run HTVGA.EXE from a DOS shell.

Using The HTVGA Menu

- Step 1 Use the SETUP program to copy the file HTVGA.EXE (select Video Seven Utilities) to your hard disk.
- Step 2 Make the Drive with HTVGA.EXE the current Drive/directory.
- Step 3 At the DOS prompt, type:
HTVGA <Enter>
- Step 4 Highlight an option by using the up and down arrow keys to move the cursor. Use the [Enter] key to make a selection.

The available options and their functions are detailed below. While running SETUP you can press the [F1] key at any time for context sensitive help.

Help

briefly explains how to use the program.

Install RAMBIOS

adds the device driver RAMBIOS.SYS to your CONFIG.SYS file. Refer to the RAMBIOS.SYS section below for details.

Install Software

provides a list of software packages which VGA controller supports in extended modes. From the Install Software menu you can select which resolution drivers you wish to enable your software applications to run in. Refer to the Install Software section below for details.

Exit Now

returns you to DOS.

In order to make the proper choices in the Menu Program, refer to the following sections for complete descriptions and information on the utility programs and application software drivers.

DU.COM

Directory Listing Utility - displays directory information in as can be accommodated on the screen in the selected mode.

CLR.COM

Clear Screen Utility - is used to clear the entire screen when you are using extended text modes.

ESU.COM

Enhancement Selection Utility - allows you to set text and graphics modes.

HTDIAG.EXE

Diagnostics Program - helps you spot problems that may occur with the Video Controller.

ALTPARM.EXE

Alternate Display Parameter Utility - provides display parameters in addition to those included in the Video BIOS.

HTVESA.COM

Provides support for the VESA BIOS Extensions (VBE) standard.

Exit Now

returns you to DOS.

In order to make the proper choices in the Menu Program, refer to the following sections for complete descriptions.

Running HTVGA.EXE From The DOS Prompt

For ease of use you can bypass the menu program and run HTVGA directly from the DOS prompt.

Step 1

Make the Drive with HTVGA.EXE the current Drive/directory.

Step 2

At the DOS prompt, type:

HTVGA [mode command] <Enter>

Compatibility Modes

It will run most programs written for any of the popular graphics standards: VGA, EGA, CGA, MDA, and HGC.

HTVGA must be run and a compatibility mode must be enabled before you run any Hercules or CGA compatible software.

Hercules Compatibility

Hercules Compatibility Mode, or Momochrome Mode, allows you to configure the VGA controller to emulate the Hercules Graphics Card (HGC).

The HGC has 64K of video graphics memory. The VGA controller can run software written to utilize the graphics capabilities of the Hercules Graphics Card in two ways:

- FULL mode, configured to use the full amount of memory (two graphics pages, or 64K).
- HALF mode, configured to use half that amount (one graphics page, or 32K) of memory. Use this mode if you have a CGA co-resident.

By using the HTVGA MONO:LOCK command, Hercules compatibility will remain enabled through one warm boot. To disable Hercules compatibility you must use the HTVGA MONO:OFF command.

HTVGA MONO:ON Configures the VGA controller for HGC compatibility.

HTVGA MONO:LOCK Enables HGC compatibility through one warm boot.

HTVGA MONO:OFF Disables a current configuration for HGC compatibility.

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I/O Channel (C-Side)

I/O Pin	Signal Name	I/O
C1	SBHE	I/O
C2	LA23	I/O
C3	LA22	I/O
C4	LA21	I/O
C5	LA20	I/O
C6	LA19	I/O
C7	LA18	I/O
C8	LA17	I/O
C9	-MEMR	I/O
C10	-MEMW	I/O
C11	SD8	I/O
C12	SD9	I/O
C13	SD10	I/O
C14	SD11	I/O
C15	SD12	I/O
C16	SD13	I/O
C17	SD14	I/O
C18	SD15	I/O

Pure VGA Compatibility

The Video BIOS implements many extended functions beyond standard VGA. Sometimes, a software application may not function properly if it detects these extended functions. You can disable the WIN.VGA extended functions with the HTVGA PURE command.

HTVGA PURE:ON Configures the VGA controller for only pure IBM VGA standard modes - disables all the extended modes.

HTVGA PURE:OFF Enables all the extended functions.

Screen Saver

Screen Saver can extend the life of your monitor by preventing images from being "burned" into your screen due to long periods of inactivity such as when you are away from your computer.

Screen Saver "shuts off" your screen display if no key is pressed on your keyboard for some period of time. (The default setting for time elapsed is five minutes.)

Generally, your screen display is returned by pressing any key on your keyboard. Pressing the "SHIFT" key is thought to be one of the best choices because this key usually has little or no effect on a program in progress.

The following tables summarize pin assignments for the I/O channel connectors.

I/O Channel (A-Side)

I/O Pin	Signal Name	I/O
A1	-I/O CH CK	I
A2	SD7	I/O
A3	SD6	I/O
A4	SD5	I/O
A5	SD4	I/O
A6	SD3	I/O
A7	SD2	I/O
A8	SD1	I/O
A9	SD0	I/O
A10	-I/O CH RDY	I
A11	AEN	O
A12	SA19	I/O
A13	SA18	I/O
A14	SA17	I/O
A15	SA16	I/O
A16	SA15	I/O
A17	SA14	I/O
A18	SA13	I/O
A19	SA12	I/O
A20	SA11	I/O
A21	SA10	I/O
A22	SA9	I/O
A23	SA8	I/O
A24	SA7	I/O
A25	SA6	I/O
A26	SA5	I/O
A27	SA4	I/O
A28	SA3	I/O
A29	SA2	I/O
A30	SA1	I/O
A31	SA0	I/O

Using Screen Saver

Step 1 Make the Drive with HTVGA.EXE the current Drive/directory.

Step 2 At the DOS prompt, to:

- Enable the Screen Saver feature, type:

HTVGA SAVE:ON <Enter>

- Change the number of minutes before Screen Saver turns off the display, type the following command substituting the number of minutes you want for [n]:

HTVGA SAVE:[n] <Enter>

Screen Saver can be automatically invoked every time you boot your system by placing the HTVGA SAVE:ON or HTVGA SAVE:n command in your AUTOEXEC.BAT file.

- Disable Screen Saver, type:

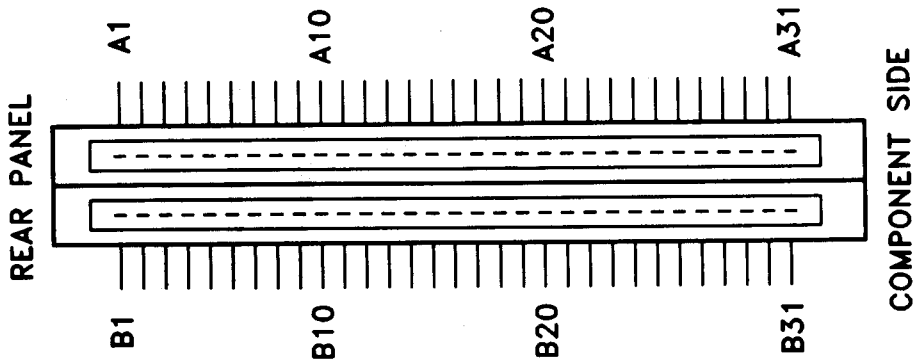
HTVGA SAVE:OFF <Enter>

or

HTVGA NOSAVE <Enter>

TECHNICAL INFORMATION

The following figure shows the pin numbering for I/O channel connectors (A-side and B-side).



To stop Screen Saver from being automatically enabled at startup, delete "HTVGA SAVE:ON" from your AUTOEXEC.BAT file and reboot your system.

To automatically disable Screen Saver when you use a program that doesn't work with Screen Saver, use a batch file to invoke the program and include "HTVGA SAVE:OFF" or "HTVGA NOSAVE."

Refer to your DOS Manual if you need instructions for creating/editing a batch file.

REAL TIME CLOCK INFORMATION

The following table describes real-time clock bytes and specifies their addresses.

Byte	Function	Address
0	Seconds	00
1	Second alarm	01
2	Minutes	02
3	Minute alarm	03
4	Hours	04
5	Hour alarm	05
6	Day of week	06
7	Date of month	07
8	Month	08
9	Year	09
10	Status Register A	0A
11	Status Register B	0B
12	Status Register C	0C
13	Status Register D	0D

DIRECTORY LISTING UTILITY (DU.COM)

The Directory Listing Utility takes full advantage of the screen by displaying directory information in as many columns as can be accommodated. It can be used in any mode and can display from 50 to 129 entries at a time as opposed to the 25 entries available through the DOS "DIR" command.

Using DU.COM

Step 1 Use the SETUP program to copy the file DU.COM to your hard disk.

You may wish to include the directory in the search path if you place DU.COM in other than your root directory.

Step 2 At the DOS prompt, to display a list of:

- All files in the current directory, type:

DU <Enter>

- All files in a directory other than the current directory, specify the full DOS directory name and use wildcards as in these examples:

DU \MYFILE*. * <Enter>
 DU \MYFILE\LETTERS*. * <Enter>

TECHNICAL INFORMATION

The following shows the addresses for the page register.

Page Register	I/O Address (HEX)
DMA Channel 0	0087
DMA Channel 1	0083
DMA Channel 2	0081
DMA Channel 3	0082
DMA Channel 5	008B
DMA Channel 6	0089
DMA Channel 7	008A
Refresh	008F

REAL TIME CLOCK AND CMOS RAM

Real time clock and CMOS RAM are contained on board. Real time clock provides the system date and time. CMOS RAM stores system information. Both are backed up by battery and will not lose information after power off. The following page shows the CMOS RAM Address Map.

ENHANCED MODE CLEAR SCREEN UTILITY (CLR.COM)

The Enhanced Mode Clear Screen Utility clears the entire screen in any text mode. Enhanced modes display information on as much of the screen as possible for the mode chosen. The DOS command, CLS, only clears the portion of the screen used by standard modes. To clear the entire screen in any text mode, type:

CLR <Enter>

ENHANCEMENT SELECTION UTILITY (ESU.COM)

The Enhancement Selection Utility allows you to change text and graphics modes easily.

* *Do not attempt to set a text or graphics mode that your monitor is not capable of supporting. See "Technical Information / Programmer's Information" for monitor requirements.*

Setting Text Modes With The ESU Menu

- Step 1 Use the SETUP program to copy the file ESU.COM to your hard disk.
- Step 2 Make the Drive containing ESU.COM the current Drive/directory.

SYSTEM INTERRUPTS

Sixteen levels of system interrupts are provided on OCTEK HIPPO-IV. The following shows the interrupt-level assignments in decreasing priority.

Level	Function
Microprocessor NMI	Parity or I/O Channel Check
Interrupt Controllers	
CTLR 1	CTLR 2
IRQ0	Timer Output 0
IRQ1	Keyboard (Output Buffer Full)
IRQ2	Interrupt from CTLR 2
	Real-time Clock Interrupt
	Software Redirected to INT 0AH (IRQ2)
	Reserved
	Reserved
	Reserved
	Coprocessor
	Fixed Disk Controller
	Reserved
IRQ3	Serial Port 2
IRQ4	Serial Port 1
IRQ5	Parallel Port 2
IRQ6	Diskette Controller
IRQ7	Parallel Port 1

DIAHNOSTICS PRPGRAM (HTDIAG.EXE)

The Diagnostics Program will help you spot problems that may occur with your display adapter. The program is run from the DOS prompt by typing:

HTDIAG (Enter>

HTDIAG is provided uncompressed on the Utility Disk and can be run directly from the disk.

First, the Diagnostics program will display:

- Amount of video memory available on the system.
- The Video BIOS version.
- Switch settings.
- Co-resident (if installed) graphics adapter.
- Memory location(s) used by other devices.

Next, you will be prompted for the type of monitor connected to your VGA adapter. This determines which resolutions, attributes, and capabilities of the WIN.VGA the diagnostics program will test.

Finally, use the up and down arrow keys to select which of the diagnostic tests you wish to run.

SYSTEM TIMERS

OCTEK HIPPO-IV has three programmable timer/counters controlled by 82C206 and they are defined as channels 0 through 2:

Channel 0	System Timer
Gate 0	Tied on
Clk in 0	1.190 Mhz OSC
Clk out 0	8259 IRQ 0

Channel 1	Refresh Request Generator
Gate 1	Tied on
Clk in 1	1.190 Mhz OSC
Clk out 1	Request Refresh Cycle

Step 2 Make the Drive containing ALTPARM.EXE the current Drive/directory and type:

ALTPARM <Enter>

Step 3 Highlight an option by using the up and down arrow keys to move the cursor. Use the [Enter] key to make a selection.

The available options and their use are detailed below.

Change Screen Parameters

lets you select which extended text and/or graphics modes of the current parameter file you wish to modify. You can modify standard VGA modes only if the current parameter file uses the 72 Hz modes. Follow the instructions on the screen to position or size the display.

Load Parameter File

provides you with a selection of parameter file (either custom or default) from which to choose.

Save Parameter File

allows you to save a customized parameter table. ALTPARM will automatically save the file with a ALT extension. Caution should be used when modifying and saving parameter files as it is possible to write over existing files which you may want to keep.

I/O ADDRESS MAP

I/O Address Map on System Board

I/O address hex 000 to 0FF are reserved for the system board I/O.

Many variable frequency monitors are microprocessor controlled, that is, you can set the size and position of the display by controls on the monitor. If you have a monitor such as the NEC MultiSync 4D or the Nanao/Eizo Flexscan 9080i, you may need to use a combination of monitor settings and ALTPARM to obtain the optimum display.

ADDRESS (HEX)	DEVICE
000-01F	DMA Controller 1, 8237
020-03F	Interrupt Controller 1, 8259, Master
040-05F	Timer, 8254
060-06F	Keyboard Controller
070-07F	Real Time Clock, NMI (non-maskable interrupt) mask
080-09F	DMA Page Register, 74LS612
0A0-0BF	Interrupt Controller 2, 8259
0C0-0DF	DMA Controller 2, 8237
0F0	Clear Math Coprocessor Busy
0F1	Reset Math Coprocessor
0F8-0FF	Math Coprocessor Port

SOFTWARE UTILITY - APPLICATION SOFTWARE

The capabilities of the VGA controller go beyond the VGA standard. To use the extended modes, support must be provided in the software through the use of drivers to allow you to choose the extended graphics resolutions, colors, or text modes.

Software Support

The system is packaged with software drivers for several popular software programs. It is compatible with the VESA (Video Electronics Standards Association) standard. If your software has a "VESA driver" you can select it to use this mode. This section describes the procedures necessary to configure these programs and/or install special drivers to give you the best performance from your software.

The pages that follow cover the installation of software drivers for the following programs:

AutoCAD
AutoShade
Cadvance
Lotus 1-2-3 and Symphony
Generic CADD
P-CAD
Presentation Manager
VersaCAD Design
Windows
Word
WordPerfect

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CONFIGURING THE SYSTEM

P8 - External Battery Connector

Pin	Assignment
1	+ Vdc
2	Key
3	Ground
4	Ground

KB1 - Keyboard Connector

Pin	Assignment
1	Keyboard Clock
2	Keyboard Data
3	Spare
4	Ground
5	+5 Vdc

1024 x 786 interlaced resolution requires a Variable Frequency Display such as the NEC MultiSync 3D or a Dual Frequency Display such as the Seiko CM-1430.

1024 x 796 non-interlaced resolution requires a Variable Frequency Display such as the NEC MultiSync 4D or Nansor/Eisor Flexscan 9070U.

Not all monitors capable of displaying the 1024x768 interlaced resolution are capable of displaying the 800x600 resolution. See "Technical Information / Monitor Timings for the Extended Graphics Modes" for information on scan frequency requirements.

You may have to run ALTPARM to adjust the horizontal and vertical size and position controls when using extended resolution modes.

CONFIGURING THE SYSTEM

P2 - Speaker Connector

Pin	Assignment
1	Data out
2	No Connection
3	Ground
4	+5 Vdc

P3 - Turbo LED Connector

Pin	Assignment
1	LED Anode
2	LED Cathode

P4 - Turbo Switch Connector

Pin	Assignment
1	Selection Pin
2	Ground

driver be placed in your AUTOEXEC.BAT file.

To install the ADI driver, type:

VGAREL11 <Enter>

This command will load the ADI driver into the computer's memory. The driver will then display identification information on the screen, and confirm that it has been installed. The driver will also notify you as to which interrupt vector will be used to communicate with AutoCAD.

The VGAREL11.COM driver supports ADI version 4.0. It supports Fast Vector mode and Packet modes. The VGAREL11.COM driver also supports AutoShade and AutoSketch.

AutoCAD ADI Configuration

AutoCAD need only be configured for the ADI General Display Driver once. Even if you turn off your computer or reboot it, AutoCAD will remember that the ADI General Display Driver has been installed. Follow the procedure outlined below to configure AutoCAD:

- Step 1 Start AutoCAD as described in the AutoCAD documentation.
- Step 2 When AutoCAD's Main Menu appears, select "Configure AutoCAD." This

CONFIGURING THE SYSTEM

Display Memory Size

	256KB	512KB	1MB
JP7	OUT	OUT	IN
JP8	OUT	IN	OUT

CPU Speed

	JP12	JP13
25/50	2 - 3	1 - 2
33/66	1 - 2	2 - 3

Note : Alteration to setting of these jumpers are required when the motherboard is installed with OverDrive processor operating at frequency different than the on board 486SX.

Step 1

Use the SETUP program to copy the AutoCAD drivers to the AutoCAD sub-directory of your hard disk. At the DOS prompt, type:

VGAINST <Enter>

The install program will prompt you several responses. Text displayed between brackets is the default response. To accept the default response simply press the <Enter> key.

Step 2

Enter name of driver to be modified. The default is VGAREL11.COM. Press <Enter> to accept.

The name of the driver is required because the install program will modify both the memory resident version of the ADI driver and the file on your hard disk. This way any changes you make will be remembered for future sessions with AutoCAD.

You may wish to create several different versions of the driver to support different resolutions or colors. To do this simply copy the supplied driver to a file with a different name and then modify it to the desired settings.

CONFIGURING THE SYSTEM

SYSTEM BOARD JUMPER SETTING

CPU Type

JP1	
1-2	486SX
3-4	486DX, 486DX2, 487SX OverDrive Processor



On Board VGA Enable / Disable

JP2	
1-2	Disable
2-3	Enable

Step 5 Configure AutoShade rendering resolution. Your screen will look similar to the following:

AutoShade 256 color rendering

Display Resolution

Current resolution is:

0: 640 x 400 by 256 colors

Available resolution are:

1: 320 x 200 by 256 colors

2: 640 x 400 by 256 colors

3: 640 x 480 by 256 colors

4: 720 x 540 by 256 colors

5: 800 x 600 by 256 colors

Enter selection [0]:

- The resolution you can select depends upon type of monitor and/or the memory configuration.

Step 6 Select the AutoCAD color model, either Release 9 or Release 10 (for both 10 and 11) depending on your version of AutoCAD.

Step 7 Select Configuration Data.

You will be presented with the options of changing the:

- number of command lines
- screen colors
- palette colors
- 256 color settings

CONFIGURING THE SYSTEM

CONTROL OF SYSTEM SPEED

System speed can be controlled by keyboard and turbo switch. To change the speed by keyboard, use '.' and '+' of the numeric keypad. Press 'Ctrl' 'Alt' and '.' for normal speed and press 'Ctrl' 'Alt' and '+' for fast or turbo speed.

Connect P4 to the turbo switch of the case and P3 to the turbo LED of the case. When the turbo mode is selected, the turbo LED of the case will be turned on. System run at turbo speed if P4 is open.

Whenever the system speed is set to be normal by turbo switch, it cannot be changed by the keyboard, and vice versa.

RESET CMOS SETUP INFORMATION

Sometimes, the improper setting of system setup may make the system malfunction. In this case, turn off the power and put jumper JP6 into 2-3 position for a while. The internal CMOS status register is reset. Then replace JP6 to 1-2 position and turn on the power. The BIOS finds the CMOS status register is reset and regards the setup information is invalid. So it will prompt you to correct the information.

AutoCAD Protected Mode Installation

The WIN.VGA supports protected mode AutoCAD (releases 10/386 and 11) in the following resolutions:

640 x 480	16 and 256 colors
720 x 540	16 and 256 colors
800 x 600	16 and 256 colors
1024 x 768	16 and 256 colors (256 requires 1MB)

256 color modes are for AutoCAD release 11 only. The protected mode driver, ADIDISP.EXP also supports 3D Studio and AutoShade 2.0

AutoCAD need only be configured for the ADI General Display Driver once. Even if you turn off your computer or reboot it, AutoCAD will remember that the ADI General Display Driver has been installed. Follow the procedure outlined below to configure AutoCAD:

- | | |
|---------------|--|
| Step 1 | Use the SETUP program to copy the protected mode AutoCAD driver, ADIDISP.EXP to the AutoCAD sub-directory of your hard disk. |
| Step 2 | Start AutoCAD as described in the AutoCAD documentation. |

CONFIGURING THE SYSTEM

CONFIGURATION OF MEMORY

The configuration of the memory is very flexible. There are several combinations of DRAM types you may consider. 1 MB, 4 MB or 16 MB SIMM are acceptable. So, a basic system can be equipped with fewer memory and later more memory can be installed when upgrading the system. The memory size is detected automatically by system BIOS and indicated during memory test after reset. No jumper is needed to be set for the memory size and DRAM type.

To determine what DRAM speed rating should be used depends on the systems speed and wait state. The highest performance is accomplished by using zero wait state, but high speed DRAM has to be used. If zero wait state is selected, fast page mode DRAM is needed. The wait state setting is applied to all banks of memory. Therefore make sure to install DRAM with the same speed rating, or accommodate the wait state setting to the slow DRAM type.

Because of the shadow RAM function, the 386 KB memory between 640 KB to 1 MB cannot be accessed. So, the memory size found by the system BIOS is not equal to the actual memory size. For example, when there is 4 MB on board, the BIOS will show 3712 KB

Step 8 Make selections to use either the 16 or 256 color driver and set background color.

Step 9 Follow the instructions provided on the screen to complete and save your changes to the AutoCAD configuration.

AutoCAD Dual Screen Mode

Both the real and protected mode AutoCAD drivers support a dual screen mode of operation. If you have a monochrome monitor and display adapter in your system along with the setup program you can operate AutoCAD in a mode which uses both monitors. The graphics screen will be displayed on your color monitor and the text screen will appear on the monochrome monitor.

To use the dual screen mode your monochrome monitor and display adapter must be active before starting AutoCAD. If it is not already active type:

```
MODE MONO <Enter>
```

The AutoCAD driver will automatically configure AutoCAD for dual screen mode.

In dual screen mode, it must be configured for a resolution other than 1024 x 768 with 2 colors. You cannot have a monochrome display adapter co-resident when the it is configured for this mode.

CONFIGURING THE SYSTEM

Important Note :

When the motherboard is installed with OverDrive processor operating at frequency different than that on board 486SX, it is important to make alteration to the setting of jumpers JP12 and JP13. Otherwise, the system may either be not function or operating at its maximum performance. Please refer to the related jumper setting table.

Use the default "7Ah" interrupt driver as outlined above.

- Step 3** When presented with the question: "Do display and rendering devices share a single screen?", respond with "Yes."
- Step 4** Follow the instructions for installing the real mode AutoCAD driver to configure AutoShade's resolution.

CADVANCE

The VGA Driver supports Cadvance in the following resolutions:

800 x 600 16 colors
1024 x 768 16 colors

Drivers support Cadvance versions 3.0 and 3.5.

- Step 1** Use the SETUP program to copy the Cadvance drivers to the Cadvance sub-directory of your hard disk.
- Step 2** Change from the default to a high resolution driver by typing:

GENERAL FEATURES

In addition to the local bus capabilities, the HT216 contains limited number of hardware assist functions to enhance performance in GUM environments. These include implementations of Windows defined 256-raster operations, fast page mode memory support, a hardware cursor, fat pixel color-expansion, automatic source alignment to destination, page look-ahead and single operation read-modify-write.

The local bus VGA support display memory of 256 KB, 512 KB and 1 MB, 60 ns 256Kx4 DRAM.

LOTUS 1-2-3 and SYMPHONY

The VGA Driver supports 1-2-3 and Symphony in the following resolutions:

132 x 25	16 colors
132 x 43	16 colors
100 x 60	16 colors
80 x 60	16 colors
720 x 540	16 colors
800 x 600	16 colors

Drivers supports 1-2-3 versions 2.x and Symphony version 1.2.

Installing 1-2-3 or Symphony

Step 1 The following files are the Lotus driver files. Use the SETUP program to copy the files you wish to use from the Utility Disk to the 1-2-3 and/or Symphony subdirectory of your hard disk.

FILE NAME	RESOLUTION	MONITOR TYPE
VD132x25.DRV	132x25 - Text	VFD,AD
VD132x43.DRV	132x43 - Text	VFD,AD
VD100X60.DRV	100x60 - Text	VFD,AD
VD80X60.DRV	80x60 - Text	VFD,AD
GD720V20.DRV	720x540 - Graphics	VFD
GD800V20.DRV	800x600 - Graphics	VFD

GENERAL FEATURES

The DRAM refresh logic is redesigned to improve the overall system performance and power consumption. In the original PC/AT design, the DRAM refresh operation will suspend the CPU operation because it has to access the DRAM. In high speed system like HIPPO-IV motherboard, the CPU indeed can process a large amount of data during the DRAM refresh period.

By implementing hidden refresh, the refresh operations for expansion card on the AT slot and for the DRAM are separated. To be compatible with AT bus add on card, the refresh operation for AT bus is same as that found in the original PC/AT. But the refresh operation for the DRAM will be carried out individually and will be done when there is no access to the DRAM.

Local Bus VGA

The on board VGA attains a significant performance increase over standard super VGA controllers. This is possible by relocating the VGA controllers from the standard 8 MHz 16 bit ISA bus to the 25/33 MHz 32 bit 486 local bus and run at the CPU's clock speeds. The relocation means 6 to 8 times increase in the speed of moving data between CPU and the display memory.

Without the I/O bottleneck, 486 CPU's full performance is made available to support high performance super-VGA graphics with little difficulty. In some new PC system, display

P-CAD

The VGA Driver supports P-CAD in the following resolutions:

640 x 480	16 colors
720 x 540	16 colors
800 x 600	16 colors
1024 x 768	16 colors

Drivers support P-CAD versions 3.0, 4.0, and 5.0.

Installing P-CAD

- Step 1 Install P-CAD choosing "IBM VGA" as the display adapter.
- Step 2 Use the SETUP program to copy the P-CAD drivers to your P-CAD Driver sub-directory [PCAD\DRV].

FILE NAME	RESOLUTION	NO.OF COLORS
DPCAD640.DRV	640 x 480	16
DPCAD720.DRV	720 x 540	16
DPCAD800.DRV	800 x 600	16
DPCAD1K.DRV	1024 x 768	16

- Step 3 Use an editor to modify the P-CAD configuration file "PCADDRV.SYS." Change "DIBMVGA.DRV" to the name

processed before any write unload. And the write buffer is able to respond from its buffers to a write buffer read hit. If only a part of the data requested is presented in the write buffer, the remainder is fetched from the DRAM before further write buffer unload.

486 comes with an internal write through cache. So, 486 find most of its read data reside in its internal cache. It usually need to go outside the chip for write data. Thus, it is the excellent write buffer architecture that help most in boost HIPPO-IV's performance.

Step 3 Change the display resolution by typing the following:

RENAM DISPLAY .DLL DISPLAY .OLD
COPY VGAXxxx .DLL DISPLAY .DLL

(where VGAXxxx . DLL = V7 driver filename)

Step 4 Load the appropriate monitor file by typing:

RENAM MONITOR .DLL MONITOR .OLD
COPY MONxxxx . DLL MONITOR . DLL

(where MONxxxx . DLL = V7 monitor filename)

If a MONITOR . DLL file does not currently exist in your OS2/ DLL sub-directory, simply rename the appropriate Video Seven monitor filename to MONITOR . DLL.

Step 5 Reboot your system for the changes to take effect.

Proper operation of OS/2 Presentation Manager requires the line IOPL=yes be in your CONFIG.SYS file.

GENERAL FEATURES

for 487SX, OverDrive processor has more processing power by doubling its internal clock. On the other world, a motherboard installed with a 25 MHZ OverDrive processor becomes running at 50 MHZ and having processing power resembling a true 50 MHZ 486DX motherboard. Some OverDrive processor also enhance their internal cache structure, integer unit design to further enhance its raw processing power.

HIPPO-IV allow installed of an OverDrive processor operating at different frequency with its main CPU. For example, a 33 MHZ OverDrive processor is allowed to installed onto a 25 MHZ 486SX HIPPO-IV to convert it to a 66 MHZ motherboard. Or, a 25 MHZ OverDrive processor is allowed to installed onto a 33 MHZ 486SX HIPPO-IV to convert it to a 50 MHZ motherboard. Please refer to Chapter 3 to installation an OverDrive processor.

OverDrive Socket prolong the life time of a motherboard. As more and more advanced software emerge, more and more processing power is demanded. In order to run advanced software, people used to upgrade the whole system to improve processing power. Over-Drive socket prevent your motherboard become outdated by future processing power demanding software such as WINDOW NT. Simply select a suitable OverDrive processor available today and future to match with your software needs.

Note : OverDrive socket only comes with motherboard with PQPF 486SX CPU.

Step 2 Use an editor to modify the VersaCAD batch file (usually in the root directory of your hard disk) to include the driver name of the resolution you've selected. For example, if using VersaCAD

```
EDLIN VCAD53 . BAT <Enter>
CD \ VCAD53
VCAD800 [or VCAD1024]
VRUN
```

Save your changes.

Step 5 Change to the VersaCAD directory and start VersaCAD.

Step 6 Select [E] to change the screen configuration.

Step 7 Select the desired resolution.

When the CPU writes data to the main memory, the data is first stored in a write buffer. There are four write buffers. When the external bus is idle, data will be sent to main memory. If all buffers are filled, it can start write operation in burst mode. Since the internal cache is updated immediately, the CPU need not suspend its operation and there is no need to wait or the external device to update the main memory.

Many often used instructions are executed in a clock cycle and some instructions are modified to take fewer cycles than in 80386. On the contrary, 80386 may take two to three more cycles for the same instruction. The CPU contains an advanced instruction pipeline structure and a 32-byte code queue to speed up the execution.

80486 includes all the functions of 80386 and is able to support sophisticated software and operation systems which are widely employed now. It is able to operate in real mode, protected mode and virtual 8086 mode.

Internal memory management unit provides a flexible addressing scheme for the next generation operation system. Multitasking, concurrent operation and manipulating huge data base can be accomplished with excellent performance. Paging mechanism is employed to allow powerful operating system to implement virtual memory. Each segment is divided into several pages which are 4K bytes per page. Page mechanism is transparent to software and allows software to address 64 terabytes.

Step 3 Start Microsoft Windows.

Step 4 Use the FILE-RUN command and type:

```
C:\ WINDOWS\ SYSTEM\ HTSETUP <Enter>
```

Be sure to type the correct path name if you have installed Windows using a different directory name.

HTSETUP modifies your SYSTEM.INI file based upon the selection you make.

Step 5 HTSETUP will identify your VGA board and will prompt you for the path to the Video drivers. Type:

```
C:\ WINDOWS\ SYSTEM <Enter>
```

Step 6 A dialogue box will appear which allows you to select the resolution you wish to run. The default is the current resolution is not supported by your card or by the amount of memory you have on your system then the selection appears greyed out.

Step 7 Select the resolution. If you choose a 1024 x 768 resolution then you also have the option to choose large or small fonts. Large fonts are recommended for easier readability.

Choosing "Install" at this point allows you to redirect the path to the Video drivers. Use this option if you get an

80486 is a 32-bit microprocessor with 32-bit external data bus and 32-bit external address bus. It not only contain a central processing unit, but also integrates a numeric processor and a four-way set associate cache memory. It is fully binary compatible with 80386 and 80387. All existing software for PC XT/AT can be used on HIPPO-IV. However, due to the new internal architecture, the performance of 80486 is two or four times of 80386.

The overall performance of computer system can be improved by cache memory. Nevertheless, if the cache memory is separated from CPU, CPU still needs to fetch code and data through external bus. That means the data transfer rate should not be too fast so that the external device are able to keep pace with the CPU. In 80486, the cache controller and cache memory are integrated into the chip. Most of the operations can be carried out inside the CPU, which reduces the bus operations on external data and address bus and thus speeds up the internal execution.

The internal cache memory is a 8K bytes, 16 bytes line size, four-way set associative configuration. The hit rate of this configuration in a multitasking and multi-processor environment is much higher than direct mapped or two-way set associative external cache.

Bus snooping feature keeps the cache memory consistent with the main memory. When an external processor overwrites the content in main memory, the corresponding data in the

WORD 5.0 and 5.5

The VGA Driver supports Microsoft Word in the following resolutions:

132 x 25	16 colors
132 x 43	16 colors
100 x 60	16 colors
80 x 60	16 colors
720 x 540	16 colors
800 x 600	16 colors
1024 x 768	16 colors

Drivers support Microsoft Word versions 5.0 and 5.5.

Installing Word Drivers

- Step 1 Rename the SCREEN.VID file in your Microsoft Word subdirectory to SCREEN.OLD.
- Step 2 Use the SETUP program to copy the Word driver files, SCREEN.VID and VIDSETUP.EXE, from the Utility Disk to your Word subdirectory.
- Step 3 Run the Video driver setup utility by typing:
VIDSETUP <Enter>
- Step 4 Select which resolutions you wish to have available. Use the up and down

Slot :

- 7 AT slot and 1 local bus VGA extender slot

System Support Functions :

- Real time clock
- 7 DMA channels
- Fast A20 gate and fast reset

Other Features :

- 4 layer, baby AT size

WORDPERFECT 5.0 and 5.1

The VGA Driver supports WordPerfect in the following resolutions:

132 x 25	16 colors
132 x 43	16 colors
100 x 60	16 colors
80 x 60	16 colors
800 x 600	16 colors
1024 x 768	16 colors

Installing WordPerfect 5.0 Graphics Drivers

- Step 1** Use the SETUP program to copy the WordPerfect 5.0 graphics drivers from the Utility Disk to the WP50 directory of your hard disk.
- Step 2** Bring up the WordPerfect Setup Menu.
- Step 3** Chose selection #3 "Display," then select #5 "Graphics Screen Type."
- Step 4** Select the resolution you wish to use.

Installing WordPerfect 5.1 Text and Graphics Drivers

- Step 1** Use the SETUP program to copy the WordPerfect 5.1 drivers from the Utility Disk to your WP51 subdirectory.

Every HIPPO-IV comes with a VGA port, which is hooked to 486 local bus to communicate a CPU full speed instead of the tradition 8 MHZ AT bus speed. The high performance VGA means HIPPO-IV the perfect choice for today GUM oriented software such as WINDOWS and CAD/CAM applications.

HIPPO-IV has an carefully architected 4 level deep write buffer in its core logic. Internal to 486 is 8 KB 4 way set associative cache. When this cache is enabled. Typically, 75 to 80 percent of memory access are writes. It is more important to improve 486 write performance with a good write buffer than to improve the 486 read performance by an expensive large external cache. As a matter of fact, although the HIPPO-IV has no external cache, it outperform a 486 motherboard with a trivial large external cache in many occasions.

Fast A20 and fast reset generations are incorporated to improve the performance of advanced operating system and expanded memory managers.

Compatibility and reliability are important issues. Expansion slot is compatible to standard AT bus and any peripheral may be used. On board POWER GOOD generator is essential to ensure the reliability of the system and is well-designed to work with all power supplies.

- If your second display adapter/monitor combination is color, then the color capability of the Local BUS VGA/ monitor will not be available.

- If your second display adapter/monitor combination is monochrome, then the monochrome capability of the Local BUS VGA/ monitor will not be available.

To switch between the color and monochrome screens, use the DOS MODE commands as follows:

To make the monochrome screen/display adapter active type:

```
MODE MONO <Enter>
```

To make the color screen/display adapter active, type:

```
MODE CO80 <Enter>
```

IMB DRAM Configuration:

Mode	Resolution	Colors	Monitor		Timings	
			Vertical	Horizontal	Horizontal	Vertical
6A*	1024 x 768	256	43 Hz	36.5 KHz	48.5 KHz	
6A+	1024 x 768	256	60 Hz			

* Interlaced
+ Non-interlaced

The Video Seven mode 6Ah should not be confused with the VESA 800 x 600 16-color mode which uses the same mode number.

These lists reflects the monitor timings which are programmed in the VGA BIOS. The ALTPARM.EXE utility can be used to customize the display on monitors that have different horizontal and/or vertical scan rates.

Monitor Timings For The Ergonomic Graphics Modes

It is capable of displaying many resolutions with a refresh rate of 72 Hz and some modes as high as 76 Hz. These refresh rates eliminates almost all monitor flicker detectable by the human eye and provides a more visually stable display. Standard refresh rates for VGA range between 60 Hz and 70Hz as listed in the above chart. Your monitor must be capable of running at the higher vertical and horizontal sync rates the ergonomic

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PROGRAMMER'S INFORMATION

Text And Graphics Modes

Modes are listed in hexadecimal notation.

512K DRAM Configurations:

Mode	Resolution	Colors	Monitors	Type
0.1	40 x 25	16	VFD,AD	Text
2.3	80 x 25	16	VFD,AD	Text
4.5	320 x 200	4	VFD,AD	Graphics
6	640 x 200	2	VFD,AD	Graphics
7	80 x25	4	VFD,AD	Text
D	320 x 200	16	VFD,AD	Graphics
E	640 x 200	16	VFD,AD	Graphics
F	640 x 350	4	VFD,AD	Graphics
10	640 x 350	16	VFD,AD	Graphics
11	640 x 480	2	VFD,AD	Graphics
12	640 x 480	16	VFD,AD	Graphics
13	320 x 200	256	VFD,AD	Graphics
40	80 x 43	16	VFD,AD	Text
41	132 x 25	16	VFD,AD	Text
42	132 x 43	16	VFD,AD	Text
43	80 x 60	16	VFD,AD	Text
44	100 x 60	16	VFD,AD	Text
45	132 x 28	16	VFD,AD	Text
60	752 x 410	16	VFD	Graphics
61	720 x 540	16	VFD	Graphics
62	800 x 800	16	VFD	Graphics
63	1024 x 768	2	ID	Graphics
64	1024 x 768	4	ID	Graphics
65*	1024 x 768	16	ID	Graphics
65+	1024 x 768	16	HVF	Graphics
66	640 x 400	256	VFD,AD	Graphics
67	640 x 480	256	VFD,AD	Graphics
68	720 x 540	256	VFD	Graphics
69	800 x 800	256	VFD	Graphics

Preface

The manual provides information about the installation and maintenance of the OCTEK HIPPO-IV motherboard. In-depth explanations of the functions of this motherboard are provided. In the appendix, the system BIOS setup is explained.

The content in this manual is only for reference and is intended to provide the basic information for the general users. There are also technical information for hardware and software engineers.

In this manual, there are five Chapters. Chapter 1 contains a brief introduction and specification of OCTEK HIPPO-IV motherboard. In the Chapter 2, the functions of the HIPPO-IV are explained. It also outlines many advanced features of the CPU and the system architecture. Chapter 3 explains the installation of various options such as OverDrive processor, DRAM module, on board local bus VGA and jumpers settings. Technical information is provided in the Chapter 4. Chapter 5 explains the software utility for the on board local bus VGA.

Information in Appendix A, B, C are for maintenance purpose.

Appendix A Operation and Maintenance

STATIC ELECTRICITY

When installing or removing any add-on card, DRAM module or coprocessor, you should discharge the static electricity on your body. Static electricity is dangerous to electronic device and can build-up on your body. When you touch the add-on card or motherboard, it is likely to damage the device. To discharge the static electricity, touch the metal of your computer. When handling the add-on card, don't contact the components on the cards or their "golden finger". Hold the cards by their edges.

KEEPING THE SYSTEM COOL

The motherboard contains many high-speed components and they will generate heat during operation. Other add-on cards and hard disk drive can also produce a lot of heat. The temperature inside the computer system may be very high. In order to keep the system running stably, the temperature must be kept at a low level. A easy way to do this is to keep the cool air circulating inside the case. The power supply contains a fan to blow air out of the case. If you find that the temperature is still very high, it

Appendix B

System Board Layout

RADIO FREQUENCY INTERFERENCE STATEMENT

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference with radio and television reception.

If this equipment does cause interference to radio or TV reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient the receiving antenna.

Relocate the computer away from the receiver.

Move the computer away from the receiver.

Plug the computer into a different outlet so that computer and receiver are on different branch circuits.

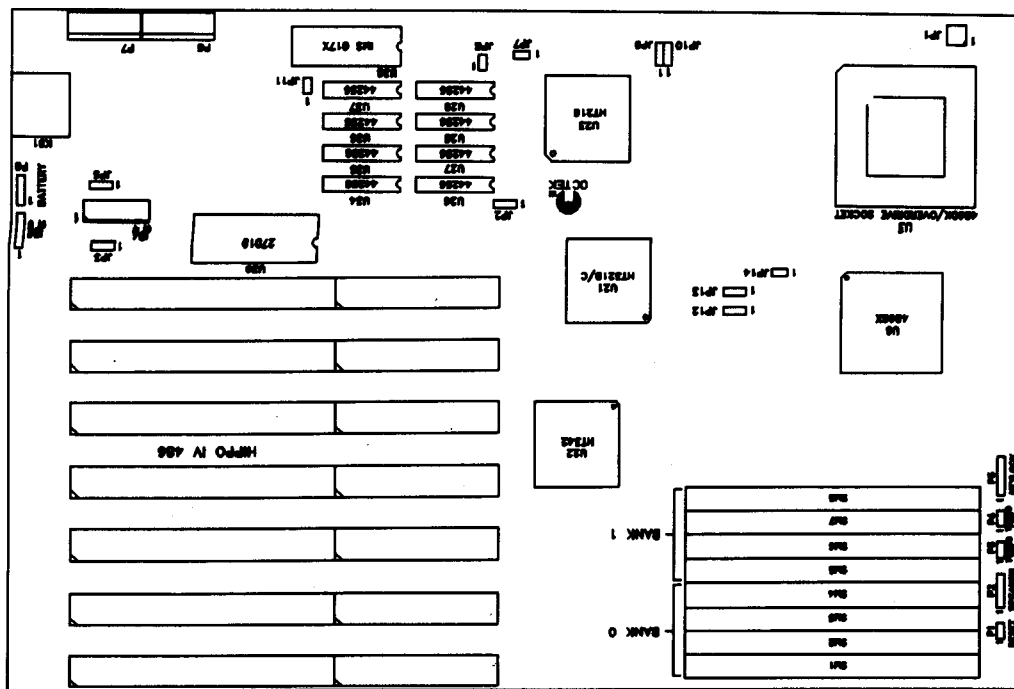
Ensure that card slot covers are in place when no card is installed.

Ensure that card mounting screws, attachment connector screws, and ground wires are tightly secured.

If peripherals are used with this system, it is suggested to use shielded, grounded cables, with in-line filters if necessary.

If necessary, the user should consult the dealer or service representative for additional suggestions.

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. It is the responsibility of the user to correct such interference.



Appendix C

Video Adapter Layout

