HIPPO VL+
486

The material in this manual is for information only and is subject to change without notice.

REVISION: 3.0

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 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.

Note

- Electronic components are sensitive to dust and dirt. Do inspect and clean the computer system regularly.

- Turn off the power whenever you install or remove any connector, memory module and add-on card. Before turning on the power, make sure that all the connectors, memory modules and add-on cards are secured.

- After power is on, wait for a minute. The system BIOS are going through a self-test during this period and nothing is shown on the screen. After the self-test, the system BIOS will initialise the display adaptor and show messages.

- The SIMM sockets are fragile device. Do not force the SIMM modules into the sockets. It may break the locking latches.

Preface

The manual provides information about the installation and maintenance of OCTEK HIPPO VL+ 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 4 chapters. Chapter 1 contains a brief introduction and specification of OCTEK HIPPO VL+ motherboard. In the Chapter 2, the functions of OCTEK HIPPO VL+ are explained. It also outlines many advanced features of the CPU and the system architecture. Chapter 3 explains the installation of coprocessor, DRAM modules and jumpers. Technical information is provided in the Chapter 4.

System BIOS is described in the attached BIOS Manual. Additional information is given in the Appendix B and C for maintenance purpose.

Table of Content

Chapter 1
General Features

SPECIFICATION

Processor : *80486DX, 80486DX2, 80486SX or 80486SX CPU*

Speed : *Turbo/normal speed*

I/O Slot : *Compatible to standard AT bus*
Six 16-bit slots
Three VESA VL-BUS slots

Cache : *8KB four way set associative internal cache*

Memory : *4 level deep write buffer with byte gathering*
Shadow RAM for system and video BIOS
Page mode and hidden refresh
Flexible configuration
SIMM sockets for 256KB, 1MB or 4MB modules

System Support Functions :

- *8-Channel DMA (Direct Memory Access)*
- *16-level interrupt*
- *3 programmable timers*
- *CMOS RAM for system configuration*
- *Real time clock with battery back-up*
- *Fast A20 gate and fast reset*

Other Features :

- *On board POWERGOOD generation*
- *External battery connector*

Chapter 3
Overview

CPU SUPPORT

DX/SX and DX2 CPUs are supported at 25/33MHz clock speed. The processoer can be upgraded to Overdrive CPU, P24T and other upgradeable processors operating at 25/33MHz. Jumper settings need to be adjusted and BIOS will automatically set up appropriate system parameters.

A heatsink with fan is recommended when using 50MHz & 66MHz CPU to improve heat dissipation. A +5V header located beside the CPU socket provides power for a +5V fan.

VESA LOCAL BUS

VESA local bus standard is defined by the Video Electronics Standards Association (VESA) to establish a high speed data path for PC system. It is a 32-bit wide bus running at CPU clock speed, much faster than the standard 8MHz 16-bit ISA bus. Performance is greatly improved for VGA display and mass storage operations. Bus mastering is supported to allow peripheral to become the master of the system and to transfer data under its own control. Some SCSI controllers and LAN controllers make use of bus mastering. They can be plugged in the MASTER slots. VGA cards and IDE controllers are slave devices and can be installed into all VL-bus slots.

ON BOARD I/O

XXXX includes an local bus IDE controller, floppy disk controller, serial ports, parallel port and game port.

DYNAMIC CACHE ARCHITECTURE (DCA)

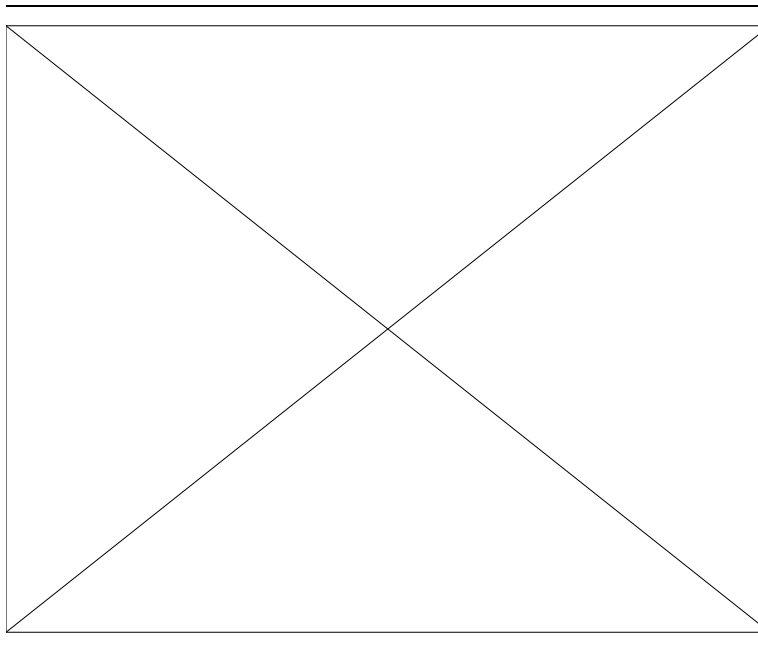
DCA (dynamic Cache Architecture) is a new Cache Memory DCA literally boosts the cache memory efficiency by as much as 300 percent over conventional external cache! It is integrated as part of the high speed logic of the motherboard.

A 486 system, until now, moves information in the same manner because the software written to take full advantage of the 486's 32 bit wide BUS has usually been restricted to CAD/CAM, Expert Systems, Virtual Simulations and other High End applications. DCA, and it's Byte Gathering Write Buffers collect 8 and 16 bit "packets" of information until a single 32 bit "packet" is formed. Using Burst Mode, it then "Writes" this single informational "string" back to RAM in one operation, rather than in several time consuming ones. This is a tremendous improvement on the efficiency of data transfer, as the information is handled solely through the CPU, the High Speed Chipset and the lightning fast Internal Cache of the 80486.

Chapter 4
Configuring The System

INSTALLING PROCESSOR

There is a 238-pin PGA socket. To install processor, be sure to line up pin 1 of the CPU with pin 1 of the socket as shown below.



Before installing the processor, make sure that all the pins are straight. The pins are very fragile. Once these pins are bent, the processor may be damaged.

CPU Type

	486DX\DX2	486SX	487SX
JP6	1 - 2	2 - 3	1 - 2
JP8	2 - 3	NO	1 - 2
JP9	2 - 3	1 - 2	2 - 3

System Speed (Only for clock chip version)

	33MHz	25MHz
JP4	1 - 2	2 - 3
JP5	1 - 2	2 - 3

INSTALLING RAM MODULES

OCTEK HIPPO VL+ has eight sockets on board for 30-pins SIMM modules. Whenever you add memory to the motherboard, install four modules at the same time.

To install a module, the module edge is angled into the socket's contact and then the module is pivoted into position, where the locking latches will secure it. If the module edge is not completely inserted into the socket, it cannot be pivoted to be in vertical position and should be dragged out and re-inserted again. Do not force the module into the SIMM socket. It will damage the locking latches.

The modules should be locked by the locking latches of the sockets firmly. Please check carefully before turning on the power. Otherwise, the system will not work properly.

CONFIGURATION OF MEMORY

The configuration of the memory is very flexible. There are several combinations of DRAM types you may consider. 256KB, 1MB or 4MB SIMM are acceptable. There are two banks of DRAM on the motherboard and another two banks on a memory expansion board. 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.

70ns SIMM modules has to be used.

DRAM CONFIGURATION

Bank 0 Simm (1-4)	Bank 1 Simm (5-8)	Total Memory
256K	---	1M
256K	256K	2M
1M	---	4M
256K	1M	5M
1M	1M	8M
4M	---	16M
1M	4M	20M
4M	4M	32M
16M	---	64M

SIMM without parity check RAM (x8) is supported. BIOS will detect the presence of the parity check RAM.

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 slow speed and press **`Ctrl' `Alt'** and **`+'** for fast speed.

Connect P1 to the turbo switch of the case and P5 to the turbo LED of the case. When the turbo mode is selected, the turbo LED of the case will be turned on.

Whenever the system speed is set to be slow 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 set JP10 to 2-3 for a while. The internal CMOS status register is reset. Then set the jumper to 1-2 of JP10 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.

SYSTEM BOARD JUMPER SETTING

There are several options which allows user to select by hardware switches.

Display Selection

JP7	
1-2	CGA, EGA, VGA
2-3	Monochrome display *

SYSTEM BOARD CONNECTORS

Under typical conditions, these connectors should be connected to the indicators and switches of the system unit. The functions of connectors on the motherboard are listed below.

	Description
P1	Turbo switch
P2	Speaker connector
P3	Hardware reset connector
P4	Power LED & Ext-lock connector
P5	Turbo LED
P6,P7	Power supply connector
P8	External battery connector
P9	Cooling fan connector
KB1	Keyboard connector

Pin assignment of the connector are illustrated as follows:

P1 - Turbo Switch Connector

Pin	Assignment
1	Selection Pin
2	Ground

P2 - Speaker Connector

Pin	Assignment
1	Data out
2	+5 Vdc
3	Ground
4	+5 Vdc

P3 - Hardware Reset Connector

Pin	Assignment
1	Selection Pin
2	Ground

P4 - Power LED & Ext-Lock Connector

Pin	Assignment
1	+5 Vdc
2	Key
3	Ground
4	Keyboard inhibit
5	Ground

P5 - Turbo LED Connector

Pin	Assignment
1	+5Vdc
2	LED signal

P6,P7 - Power Supply Connector

Pin	Assignment
1	POWERGOOD
2	+5 Vdc
3	+12 Vdc
4	-12 Vdc
5	Ground
6	Ground

Pin	Assignment
1	Ground
2	Ground
3	-5 Vdc
4	+5 Vdc
5	+5 Vdc
6	+5 Vdc

P8 - External Battery Connector

Pin	Assignment
1	+ Vdc
2	not used
3	Ground
4	Ground

P9 - Cooling Fan Connector

Pin	Assignment
1	+ 5Vdc
2	Ground

KB1 - Keyboard Connector

Pin	Assignment
1	Keyboard clock
2	Keyboard data
3	Spare
4	Ground
5	+5 Vdc

Chapter 5
Technical Information

SYSTEM INTERRUPTS

Sixteen levels of system interrupts are provided on OCTEK HIPPO VL+. 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
	IRQ8	Real-time Clock Interrupt
	IRQ9	Software Redirected to INT 0AH (IRQ2)
	IRQ10	Reserved
	IRQ11	Reserved
	IRQ12	Reserved
	IRQ13	Coprocessor
	IRQ14	Fixed Disk Controller
	IRQ15	Reserved
IRQ3		Serial Port 2
IRQ4		Serial Port 1
IRQ5		Parallel Port 2
IRQ6		Diskette Controller
IRQ7		Parallel Port 1

DIRECT MEMORY ACCESS (DMA)

OCTEK HIPPO VL+ supports seven DMA channels.

Channel	Function
0	Spare (8 bit transfer)
1	SDLC (8 bit transfer)
2	Floppy Disk (8 bit transfer)
3	Spare (8 bit transfer)
4	Cascade for DMA Controller 1
5	Spare (16 bit transfer)
6	Spare (16 bit transfer)
7	Spare (16 bit transfer)

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

I/O Channel (B-Side)

I/O Pin	Signal Name	I/O
B1	GND	Ground
B2	RESET DRV	I
B3	+5 Vdc	Power
B4	IRQ9	I
B5	-5 Vdc	Power
B6	DRQ2	I
B7	-12 Vdc	Power
B8	0WS	I
B9	+12 Vdc	Power
B10	GND	Ground
B11	-SMEMW	O
B12	-SMEMR	O
B13	-IOW	I/O
B14	-IOR	I/O
B15	-DACK3	I
B16	DRQ3	O
B17	-DACK1	I
B18	DRQ1	O
B19	-Refresh	I/O
B20	CLK	O
B21	IRQ7	I
B22	IRQ6	I
B23	IRQ5	I
B24	IRQ4	I
B25	IRQ3	I
B26	-DACK2	O
B27	T/C	O
B28	BALE	O
B29	+5 Vdc	Power
B30	OSC	O
B31	GND	Ground

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

I/O Channel (D-Side)

I/O Pin	Signal Name	I/O
D1	-MEM CS16	I
D2	-I/O CS16	I
D3	IRQ10	I
D4	IRQ11	I
D5	IRQ12	I
D6	IRQ15	I
D7	IRQ14	I
D8	-DACK0	O
D9	DRQ0	I
D10	-DACK5	O
D11	DRQ5	I
D12	-DACK6	O
D13	DRQ6	I
D14	-DACK7	O
D15	DRQ7	I
D16	+5 Vdc	Power
D17	-MASTER	I
D18	GND	Ground

The following table summery pin assignments for VESA VL-bus connector.

VL-bus (side A)

I/O Pin	Signal Name
A1	CD1
A2	CD3
A3	GROUND
A4	CD5
A5	CD7
A6	CD9
A7	CD11
A8	CD13
A9	CD15
A10	GROUND
A11	CD17
A12	POWER
A13	CD19
A14	CD21
A15	CD23
A16	CD25
A17	GROUND
A18	CD27
A19	CD29
A20	CD31
A21	CA30
A22	CA28
A23	CD26
A24	GROUND
A25	CA24
A26	CA22
A27	POWER
A28	CA20

VL-bus (side A)

I/O Pin	Signal Name
A29	CA18
A30	CA16
A31	CA14
A32	CA12
A33	CA10
A34	CA8
A35	GROUND
A36	CA6
A37	CA4
A38	WBACK-
A39	BEO-
A40	POWER
A41	BE1-
A42	BE2-
A43	GROUND
A44	BE3-
A45	ADS-
A46	LRDY-
A47	LDEV-
A48	LREQ-
A49	GROUND
A50	LGNT-
A51	POWER
A52	ID2
A53	ID3
A54	ID4
A55	LKEN-
A56	LEADS-

VL-bus (side B)

I/O Pin	Signal Name
B1	CD0
B2	CD2
B3	CD4
B4	CD6
B5	CD8
B6	GROUND
B7	CD10
B8	CD12
B9	POWER
B10	CD14
B11	CD16
B12	CD18
B13	CD20
B14	GROUND
B15	CD22
B16	CD24
B17	CD26
B18	CD28
B19	CD30
B20	POWER
B21	CA31
B22	GROUND
B23	CA29
B24	CA27
B25	CA25
B26	CA23
B27	CA21
B28	CA19

VL-bus (side B)

I/O Pin	Signal Name
B29	GROUND
B30	CA17
B31	CA15
B32	POWER
B33	CA13
B34	CA11
B35	CA9
B36	CA7
B37	CA5
B38	GROUND
B39	CA3
B40	CA2
B41	n/c
B42	RESET-
B43	D/C-
B44	M/IO-
B45	W/R-
B46	RDY-
B47	GROUND
B48	IRQ9
B49	BRDY-
B50	BLAST-
B51	ID0
B52	ID1
B53	GROUND
B54	VLCLK
B55	POWER
B56	LBS16-

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 stable, 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 would be better to install another fan inside the case. Using a larger case is recommended if there are a number of add-on cards and disk drives in the system.

For very high speed CPU, place a heatsink and fan on the top of the CPU.

CLEANING THE "GOLDEN FINGER"

Whenever inserting an add-on card to the motherboard, make sure that there is no dirt on the "golden finger" of the add-on card. If not, the contact between the "golden finger" and the slot may be poor and thus the add-on card may not work properly. Use a pencil eraser to clean the "golden finger" if dirt is found.

CLEANING THE MOTHERBOARD

The computer system should be kept clean. Dust and dirt is harmful to electronic devices. To prevent dust from accumulating on the motherboard, installing all mounting plates on the rear of the case. Regularly examine your system, and if necessary, vacuum the interior of the system with a miniature vacuum.

Appendix B
SUMMERY OF
JUMPER SETTING

	486DX/DX2	486SX	487SX
JP6	1-2	2-3	1-2
JP8	2-3	NO	1-2
JP9	2-3	1-2	2-3

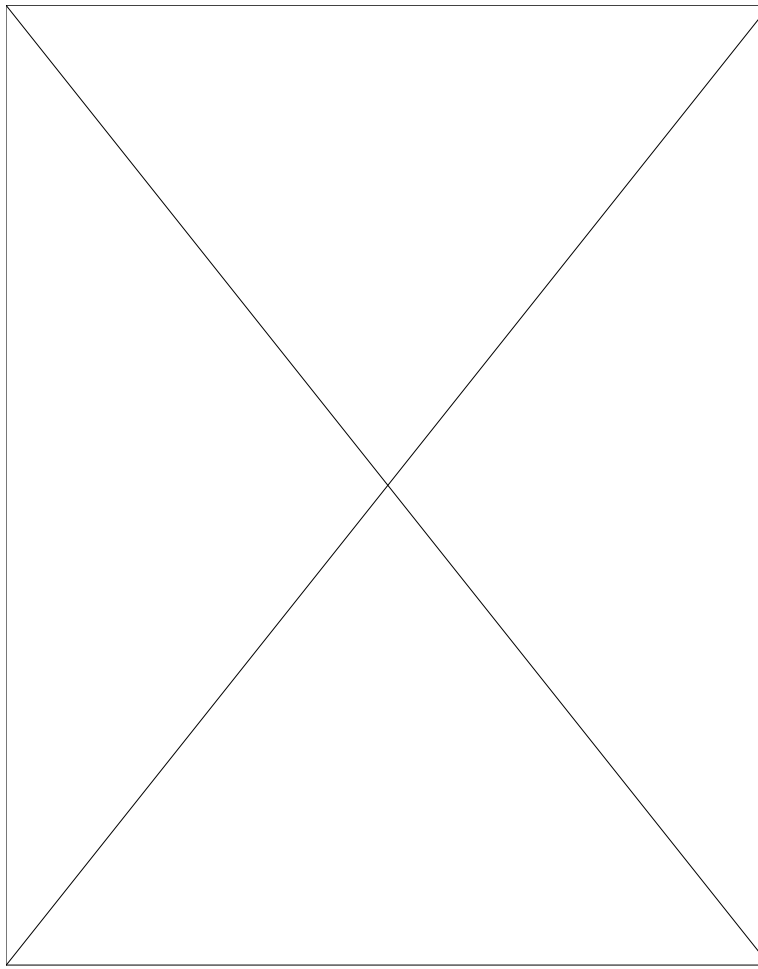
JP7	
1-2	CGA,EGA,VGA *
2-3	MONOCHROME DISPLAY

JP10	CMOS CONTAIN
1-2	NORMAL *
2-3	CLEAR / RESET

	33MHz	25MHz
JP4	1-2	2-3
JP5	1-2	2-3

RESERVED JUMPER	
JP13,14,15	2-3
JP16	1-2
JP1	ON
JP3	OFF

Appendix C
System Board Layout



HIPPO VL+ BOARD LAYOUT