

VIPer805

**486/5x86 SINGLE BOARD COMPUTER
TECHNICAL REFERENCE MANUAL
VERSION 3.0, MARCH 1997**

**TEKNOR INDUSTRIAL COMPUTERS INC.
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ref: M805S_3-0

FOREWORD

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READ ME FIRST

WARNING & IMPORTANT INFORMATION

Warning: CPU Voltage Selection

W3 jumper selects CPU voltage (shorted = 5V, open = 3.3V). Incorrect CPU voltage can damage your CPU!

Before operating your Single Board Computer, please note the following:

Battery Configuration

Your computer board is equipped with a standard non-rechargeable lithium battery. To preserve the useful life of the battery, **the jumper which enables the battery is not installed when you receive the board**. If you need a jumper cap, we suggest you use the one on the Watchdog Timer jumper since it is rarely needed; if you wish to purchase jumper caps, you can contact TEKNOR's Sales department to order them.

Preventing Viruses

TEKNOR INDUSTRIAL COMPUTERS takes every precaution against computer viruses. For your protection, we have *safety sealed* all utility diskettes. If the seal is broken, **do not use the diskette**. Destroy the diskette immediately and contact our Technical Support department for further instructions at (514) 437-5682 (Canada) or at +49 811 / 600 15-0 (Germany).

To safeguard against computer viruses in general, do not freely lend your utility diskettes and regularly perform virus scans on all your computer systems.

CHANGES BETWEEN REVISIONS OF THE BOARD

Changes Between Revision 1 and Revision 0 of the Board

Revision 1 has three new jumpers: W5A, W6A, W7A (used with W12 to select CPU type).

Revision 1 supports more CPUs: AMD 486DX2SV-66 (3.3V), AMD 486DX4SV-100 (3.3V), AMD 5x86-133 (3.3V), SGS 486DX2V-66 (3.3V) and SGS 486DX4V-100 (3.3V). Revision 1 also supports the Intel DX4 microprocessor with Write Back Cache.

Changes Between Revision 3 and Revision 1 of the Board

Revision 2 was never released. There are no major hardware changes.

INTRODUCTION

The VIPer805 Single Board Computer is a high performance, fully IBM AT compatible, PC/AT single board computer. VIP stands for Very Integrated Processor. This board includes the following features:

- The VIPer805 supports the following microprocessors (maximum internal CPU clock speed and CPU voltage are indicated):
 - AMD 486DX2SV running at 66 MHz (3.3V);
 - AMD 486DX4SV running at 100 MHz (3.3V);
 - AMD 5x86 running at 133 MHz (3.3V).
This processor is also referred to as a 486DX5;
 - Intel 486DX running at 33 MHz (5V);
 - Intel 486DX2 running at 66 MHz (5V);
 - Intel 486DX4 running at 100 MHz (3.3V);
 - SGS 486DX2V running at 66 MHz (3.3V);
 - SGS 486DX4V running at 100 MHz (3.3V).
- Each microprocessor has Internal Cache Memory.
- The VIPer805 board supports the 16-bit standard ISA bus.
- System memory can be configured from 1MB to 64MB (128MB when available) of Dynamic RAM (DRAM) with 36-bit modules installed on the board's two vertical, 72-pin SIMM sockets.
- The VIPer805 is a multi-purpose computer board:
 - It can be used as a single board computer in conjunction with a passive backplane;
 - Or as part of a stand-alone system with no backplane;
 - It can also operate without any mechanical disks by performing disk operations on solid state disks (Flash EPROM).
- The VIPer805 provides operating systems compatibility for: PC and MS-DOS, Windows 95, Windows NT, OS/2 Warp, SCO UNIX, QNX, NOVELL and UnixWare.

- The board is ideal for industrial applications; it is designed to operate in environments where a sturdy and compact system is essential with features like:
 - Compact half-card format (7.125" x 4.800");
 - Watchdog timer;
 - SMM (System Management Mode) support and full SMI (System Management Interrupt) interface for power management;
 - Power failure detector;
 - Low battery detector;
 - Shadow RAM BIOS support for fast execution;
 - Flash EPROM boot;
 - Real-Time Clock (RTC) with battery backup;
 - Solid state disks (optional): 2 or 4 MB of user Flash EPROM.
- The VIPer805 has a multi-function connector which provides all the necessary signals for connecting the keyboard, speaker, reset button, and hard disk LED.
- The VIPer805 includes a local bus IDE hard disk interface for a high performance disk subsystem.
- The VIPer805 includes an enhanced super Floppy Controller which supports two Floppy Disk Drives of up to 2.88MB each, 16 bytes of FIFO buffering and a 48mA drive buffer.
- The VIPer805 board has one Parallel Printer port (ECP and EPP modes are supported), incorporating ChipProtect™ circuitry to protect against damage due to printer power-on.
- Serial Port 1 and Serial Port 2 are 16550 compatible with internal 16-byte FIFO buffers and can be defined as two of the following: COM1, COM2, COM3 or COM4.
- The Ultra I/O Controller supports the Plug and Play standard and has a Serial EEPROM onboard for Plug and Play compatibility and configuration storage.
- The board also includes a PS/2 Mouse port.
- The board's PC/104 expansion header accepts any PC/104 mezzanine card.

The VIPer805 TECHNICAL REFERENCE MANUAL's Sections are divided into two parts. The first part - INSTALLING & SETTING UP VIPer - includes nine Sections which give a full overview of the VIPer805 board, plus installation and setup procedures. A topical index of these Sections is included below:

<u>TOPICS</u>	<u>SECTIONS</u>
Cable connections	5, 6 and 8
Cache	4
CPUs	4
Floppy Disk Drives	6
Hard Disk (IDE)	6
Jumpers	3
Memory	2
Mouse	4
Parallel port	5
Power Supply	1, 8
Serial ports	5
Solid State Disks (Flash)	7
Static electricity	1
Unpacking	1
VIPer software setups	9

Part Two - SPECIAL SOFTWARE & ONBOARD UTILITIES - contains information and instructions for using special software and onboard utilities; it has the following five Sections:

- Section 10: VFLASH SOFTWARE;
- Section 11: FLASH FILE SYSTEM II;
- Section 12: UPDATING BIOS;
- Section 13: VT100 MODE;
- Section 14: DOWNLOAD MODE.

Following the Sections are Appendices A to F which contain information you can consult when needed. These include:

- Appendix A: VIPer805 SPECIFICATIONS;
- Appendix B: MEMORY & I/O MAPS;
- Appendix C: MECHANICAL LAYOUT & BLOCK DIAGRAM;
- Appendix D: CONNECTOR PINOUTS;
- Appendix E: RECOMMENDED DEVICES & MATING CONNECTORS;
- Appendix F: ERROR CODES.

At the end of the manual, there is a GETTING HELP section which includes Technical Support information, the warranty and instructions on returning merchandise.

PART ONE

INSTALLING & SETTING UP VIPer

SECTION 1: INSTALLATION & SETUP

SECTION 2: INSTALLING MEMORY

SECTION 3: SETTING JUMPERS

SECTION 4: INSTALLING & WORKING WITH SYSTEM COMPONENTS

SECTION 5: INSTALLING PERIPHERALS (PARALLEL/SERIAL)

SECTION 6: INSTALLING IDE & FLOPPY DEVICES

SECTION 7: INSTALLING SOLID STATE DISKS (FLASH)

SECTION 8: POWER MANAGEMENT

SECTION 9: VIPer SOFTWARE SETUPS

SECTION 1 INSTALLATION & SETUP

1.01 GETTING STARTED

Part One of this manual (Sections 1 to 9) groups the various aspects of the VIPer805 board, with special emphasis put on installation and setup procedures. Wherever possible, technical information is given in these ten Sections to describe the various features of the board.

Depending on your level of experience and expertise, you will want to spend more or less time with the manual.

More experienced users will undoubtedly find Section 3 - SETTING JUMPERS - most helpful for locating the connectors and jumpers of the board and understanding how the board can be configured via the jumpers. Then, they can consult the TABLE OF CONTENTS at the beginning of this manual for specific information concerning the VIPer805 board, or refer to the topical index of Part One found on page 3 of the INTRODUCTION.

For less experienced users, it is recommended that they read through Part One of the manual as they install and set up the VIPer805 board. These Sections have been organized in a chronological order with respect to the steps that would be taken to install and set up the board. Certain Sections or sub-sections which deal with devices or peripherals that one wants to install can be studied in greater detail, while those describing devices that are not of interest can be skipped.

1.02 HOW THE BOARD CAN BE USED

The VIPer805 board is a multi-purpose computer board:

- The VIPer805 can be used as a **single board computer** in conjunction with a passive backplane. Power is drawn directly from the AT bus.
- The VIPer805 can be used as part of a **stand-alone system** with no backplane. The board has its own power connector, through which power can be drawn. The board has a PC/104 expansion header which accepts any PC/104 mezzanine card. The VIPer805 can also operate without any user interface.
- The VIPer805 can also operate **without any mechanical drives** by performing disk operations on solid state disks (user Flash EPROM). A Flash EPROM partition created with the VFLASH utility is a read-only disk, while an MS-Flash partition created with the FLASH FILE SYSTEM II utility is a read/write disk that can be accessed via the MS-DOS commands. You can even set up your board to boot from the VFLASH partition.

1.03 IMPORTANT PRECAUTIONS WHEN WORKING WITH A BOARD

1.03.1 STATIC ELECTRICITY PRECAUTIONS

Since static electricity can damage a board, the following precautions should be taken:

- Keep the board in its antistatic package, until you are ready to install it.
- Touch a grounded surface before removing the board from its package or wear a grounding wrist strap; this will discharge any static electricity that may have built up in your body.
- Handle the board by the edges.
- When handling the board, touch a grounded surface often or wear a grounding wrist strap.

1.03.2 POWER PRECAUTIONS

Before hardware setup and installation, make sure the board is completely powered down.

1.04 UNPACKING

Follow these recommendations while unpacking:

- Observe the Static Electricity Precautions in section 1.03.1.
- After opening the box, save it and the packing material for possible future shipment.
- Remove the board from its antistatic wrapping and place it on a grounded surface.
- Inspect the board for damage. If there is any damage, or items are missing, notify TEKNOR immediately.

SECTION 2 INSTALLING MEMORY

2.01 TYPES OF MEMORY ON BOARD

Various types of memory are installed or supported on the VIPer805 board.

2.01.1 SYSTEM MEMORY (DRAM)

Dynamic Random Access Memory (DRAM) is essential system memory. It can be configured from 1MB to 64MB using 36-bit SIMMs (Single In-line Memory Modules). This is the only type of memory which can be installed by the user. See section 2.02 for instructions on installing SIMMs.

The location of the two 72-pin vertical SIMM sockets appears on Diagram 2-1 and are labeled U13 and U14.

2.01.2 BIOS (FLASH EPROM & EPROM)

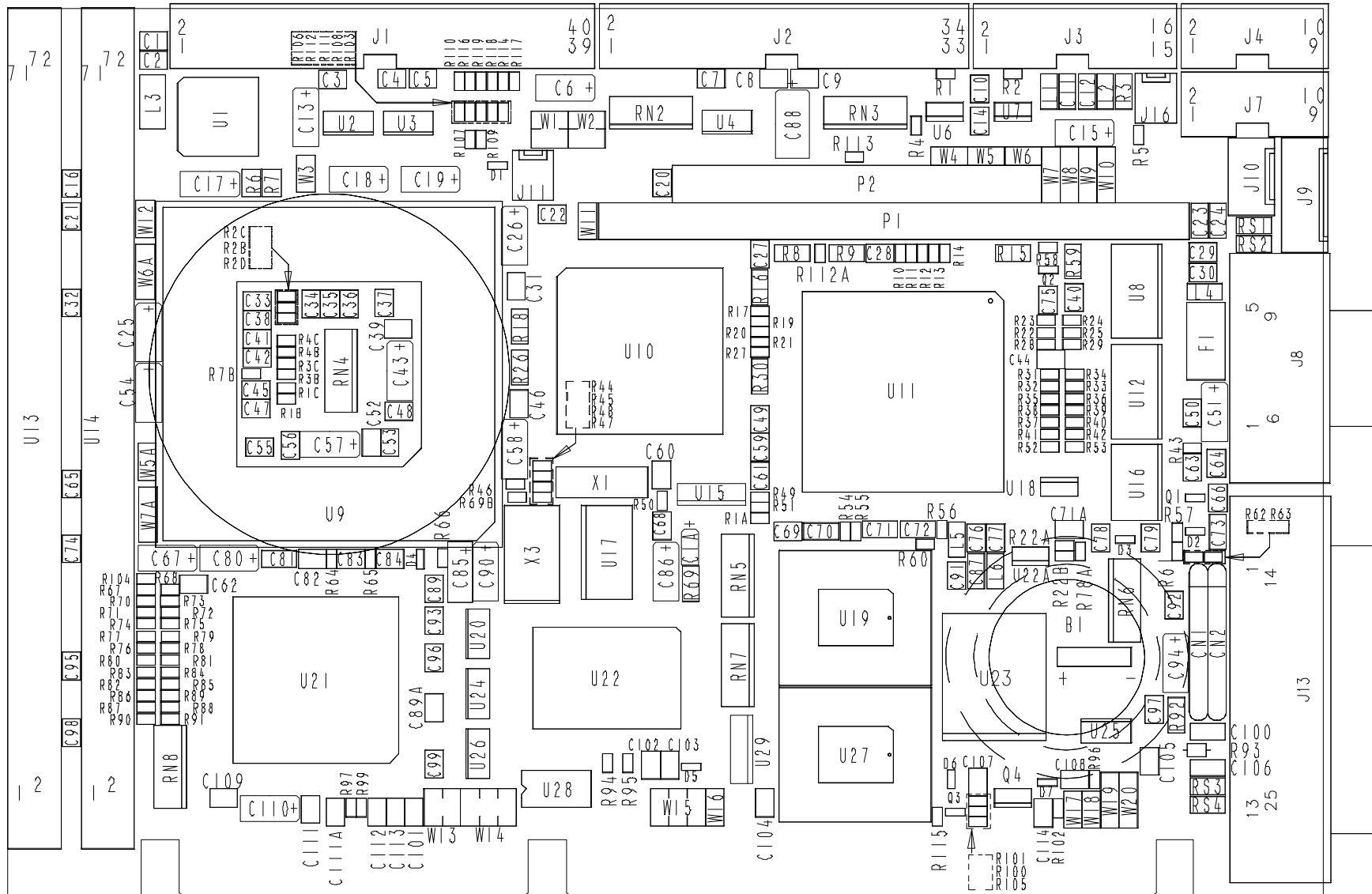
The Flash EPROM BIOS and the EPROM BIOS are also factory installed. The Flash EPROM BIOS appears at U19 and the EPROM BIOS at U27, both on Diagram 2-1.

2.01.3 SOLID STATE DISKS (FLASH EPROM DISKS)

Optional solid state disks can be ordered from TEKNOR; these are Flash EPROM (user) disks. See Section 7 for more information.

Two options exist for the user Flash EPROM: 2MB or 4MB. The device is located at U23 on Diagram 2-1.

DIAGRAM 2-1: Assembly



2.02 SIMM CONFIGURATION & INSTALLATION

At least 1MB of system memory must be installed on the VIPer805 for proper operation.

Total System Memory can be configured as 1MB, 2MB, 3MB, 4MB, 8MB, 12MB, 16MB, 32MB, 48MB or 64MB using 36-bit SIMM devices.

There are two SIMM (Single In-line Memory Module) sockets; these can accept the following 36-bit modules:

- 256K x 36-bit = 1MB module,
- 512K x 36-bit = 2MB module,
- 1M x 36-bit = 4MB module,
- 2M x 36-bit = 8MB module,
- 4M x 36-bit = 16MB module, and
- 8M x 36-bit = 32MB module.

Note: When 64MB modules are available, they will also be supported by the VIPer805 board, allowing a total of 128MB of System Memory.

Consult the table on the following page to see which SIMM configurations are available on the VIPer805.

DRAM devices with page mode at 70ns maximum access time is recommended. Please refer to Appendix E for a list of recommended devices.

When you are ready to install the SIMMs in the sockets, follow the steps outlined below.

- With the board flat on the table, turn it so that the end of the board with the sockets is near you.
- Hold the module with the notch on the bottom right facing you, and insert the connector into the socket at a 70° angle from the board (pin 1 on the module lines up with pin 1 on the socket).
- Snap the module forward to a vertical position in the socket. The module is fully inserted when the retaining pegs snap into the holes at each end of the module.

TABLE 2-1: SIMM Configuration

Total System Memory	U14 Socket - Bank 0 / 2 SIMM Module Installed	U13 Socket - Bank 1 / 3 SIMM Module Installed
1MB	1MB (256Kx36)	--
1MB	--	1MB (256Kx36)
2MB	1MB (256Kx36)	1MB (256Kx36)
2MB	2MB (512Kx36)	--
2MB	--	2MB (512Kx36)
3MB	1MB (256Kx36)	2MB (512Kx36)
3MB	2MB (512Kx36)	1MB (256Kx36)
4MB	2MB (512Kx36)	2MB (512Kx36)
4MB	4MB (1Mx36)	--
4MB	--	4MB (1Mx36)
8MB	4MB (1Mx36)	4MB (1Mx36)
8MB	8MB (2Mx36)	--
8MB	--	8MB (2Mx36)
12MB	4MB (1Mx36)	8MB (2Mx36)
12MB	8MB (2Mx36)	4MB (1Mx36)
16MB	8MB (2Mx36)	8MB (2Mx36)
16MB	16MB (4Mx36)	--
16MB	--	16MB (4Mx36)
32MB	16MB (4Mx36)	16MB (4Mx36)
32MB	32MB (8Mx36)	--
32MB	--	32MB (8Mx36)
48MB	16MB (4Mx36)	32MB (8Mx36)
48MB	32MB (8Mx36)	16MB (4Mx36)
64MB	32MB (8Mx36)	32MB (8Mx36)

SECTION 3

SETTING JUMPERS

This Section describes how to configure hardware options by setting jumper switches on the VIPer board.

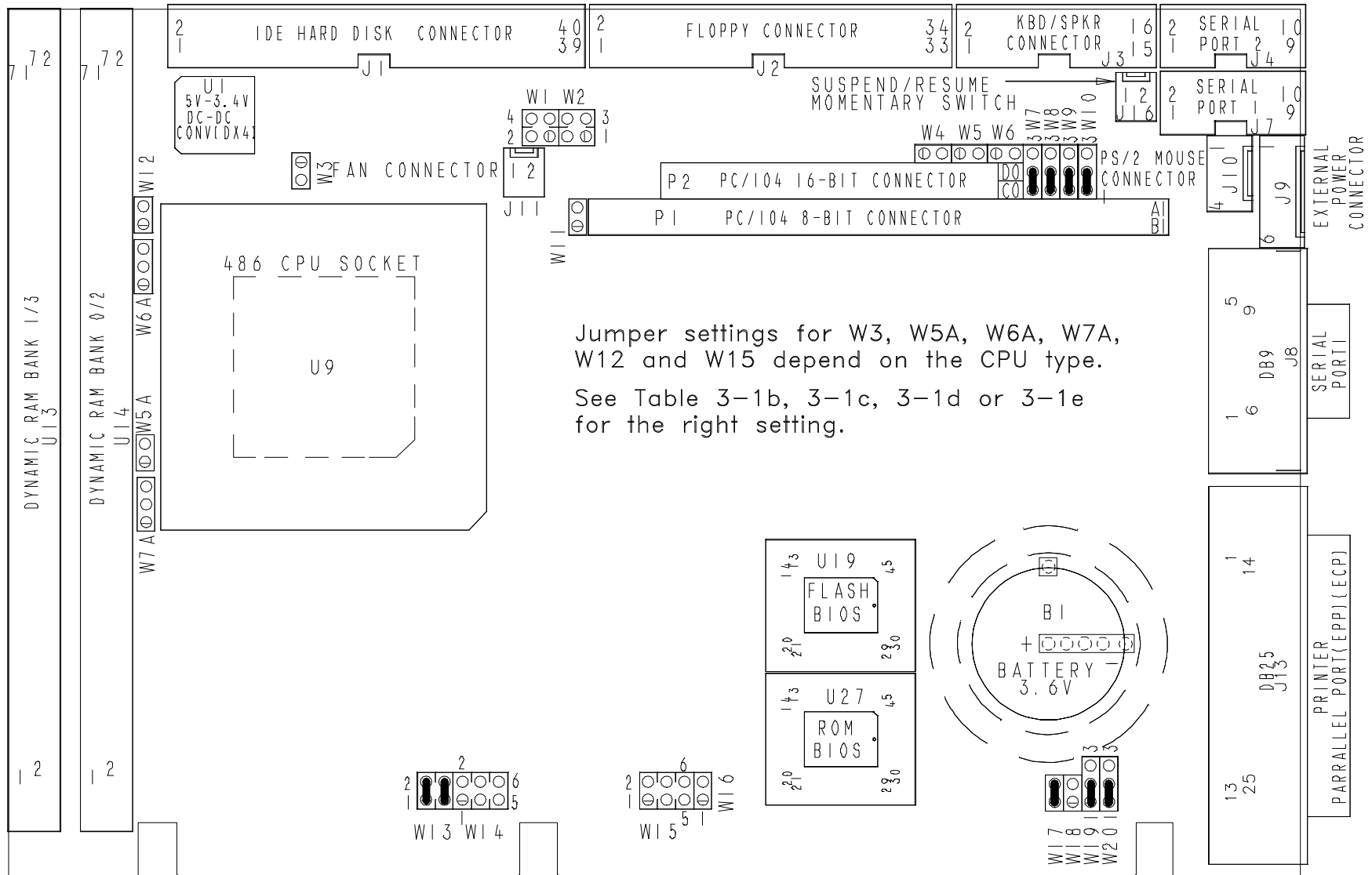
3.01 TERMINOLOGY

Jumper switches are small pins that you can set by using jumper caps. Two pins can be joined by a jumper cap, thereby closing or shorting a circuit. So you **short** (or close) a jumper by placing a plastic jumper cap over two pins of the jumper switch, and you **open** a jumper switch by removing a jumper cap.

3.02 JUMPER LOCATIONS ON THE BOARD

Diagram 3-1 on the next page shows 23 jumpers labeled from W1 to W20 (including W5A, W6A and W7A). These appear as rectangular boxes containing small circles which represent the pins. The jumpers are labeled on the board as well. When there are more than two pins in a jumper, then some of the pins are also numbered on the diagram and on the board, so that it will be possible to locate each pin and its number.

DIAGRAM 3-1: VPer805 Jumper Locations with Default Settings



3.03 JUMPER SETTINGS

Table 3-1a to 3-1g on the following pages 3-6 to 3-12 show the jumper settings for W1 to W20.

TABLE 3-1a: Jumper Settings: W1-W10

NAME	FUNCTION	CONFIGURATION (INITIAL SETTING: *)
W1 & W2	2.88MB High Density Floppy, HDOUT Signal EDOUT left to software*	<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>HDOUT left to software*</p> </div> <div style="width: 30%; border-left: 1px dashed black; padding-left: 10px;"> <p>OR: 1-3: HDOUT to Pin 33 (J2); 2-4: Ground to Pin 27 (J2)</p> </div> <div style="width: 30%; border-left: 1px dashed black; padding-left: 10px;"> <p>OR: 1-2: HDOUT to Pin 27 (J2); 3-4: Ground to Pin 33 (J2)</p> </div> </div> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>EDOUT left to software*</p> </div> <div style="width: 30%; border-left: 1px dashed black; padding-left: 10px;"> <p>1-3: EDOUT to Pin 29 (J2); 2-4: Ground to Pin 17 (J2)</p> </div> <div style="width: 30%; border-left: 1px dashed black; padding-left: 10px;"> <p>1-2: EDOUT to Pin 17 (J2); 3-4: Ground to Pin 29 (J2)</p> </div> </div>
W3	CPU Power	<p style="text-align: center;">WARNING: Incorrect CPU voltage can damage your CPU!</p>
W4 W7 W8 W9 W10	Serial Port 2 Configuration	<p>RS-232 *</p> <p>RS-485/RS-422</p>
W5 W6	Serial Port 2 RTS2-CTS2 Loopback (RS-485/RS-422) Serial Port 2 DSR2-DTR2 Loopback (RS-485/RS-422)	<div style="display: flex; justify-content: space-around;"> <div> Loopback </div> <div> Normal * </div> </div> <div style="display: flex; justify-content: space-around;"> <div> Loopback </div> <div> Normal * </div> </div>

TABLE 3-1b: AMD DX2-DX4 CPU Jumper Settings: W3, W5A, W6A, W7A, W12







NAME	FUNCTION	CONFIGURATION (INITIAL SETTING: *)
W3	CPU Type	 W3
W5A	AMD	
W6A	AMD 486DX2SV 3.3V	
W7A	Write Through Cache	
W12	Clock Speed 2X	
		 W3
	AMD 486DX2SV 3.3V	
	Write Back Cache	
	Clock Speed 2X	
		 W3
	AMD 486DX4SV 3.3V	
	Write Through Cache	
	Clock Speed 2X	
		 W3
	AMD 486DX4SV 3.3V	
	Write Back Cache	
	Clock Speed 2X	
		 W3
	AMD 486DX4SV 3.3V	
	Write Through Cache	
	Clock Speed 3X	
		 W3
	AMD 486DX4SV 3.3V	
	Write Back Cache	
	Clock Speed 3X	

TABLE 3-1c: AMD 5x86 CPU Jumper Settings: W3, W5A, W6A, W7A, W12






NAME	FUNCTION	CONFIGURATION (INITIAL SETTING: *)
W3	CPU Type	 W3
W5A	AMD (continued)	 W5A
W6A		 W6A
W7A		 W7A
W12		 W12
		AMD 5x86-133 (or 486DX5-133) 3.3V Write Through Cache Clock Speed 3X
		AMD 5x86-133 (or 486DX5-133) 3.3V Write Back Cache Clock Speed 3X
		AMD 5x86-133 (or 486DX5-133) 3.3V Write Through Cache Clock Speed 4X
		AMD 5x86-133 (or 486DX5-133) 3.3V Write Back Cache Clock Speed 4X

TABLE 3-1d: Jumper Settings: Intel CPU Jumper Settings: W3, W5A, W6A, W7A, W12


























NAME	FUNCTION	CONFIGURATION (INITIAL SETTING: *)
W3 W5A W6A W7A W12	CPU Type Intel	     <p>Intel 486DX/DX2 5V</p>
		     <p>Intel 486DX4 3.3V Write Through Cache Clock Speed 2X</p>
		     <p>Intel 486DX4 3.3V Write Back Cache Clock Speed 2X</p>
		     <p>Intel 486DX4 3.3V Write Through Cache Clock Speed 3X</p>
		     <p>Intel 486DX4 3.3V Write Back Cache Clock Speed 3X</p>

TABLE 3-1e: Jumper Settings: SGS CPU Jumper Settings: W3, W5A, W6A, W7A, W12









NAME	FUNCTION	CONFIGURATION (INITIAL SETTING: *)
W3	CPU Type	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">  W3 </div> <div style="width: 45%;">  W3 </div> </div>
W5A	SGS	
W6A	SGS 486DX2V 3.3V	
W7A	Write Through Cache	
W12	Clock Speed 2X	
W3	CPU Type	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">  W3 </div> <div style="width: 45%;">  W3 </div> </div>
W5A	SGS	
W6A	SGS 486DX2V 3.3V	
W7A	Write Back Cache	
W12	Clock Speed 2X	
W3	CPU Type	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">  W3 </div> <div style="width: 45%;">  W3 </div> </div>
W5A	SGS	
W6A	SGS 486DX4V 3.3V	
W7A	Write Through Cache	
W12	Clock Speed 3X	
W3	CPU Type	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">  W3 </div> <div style="width: 45%;">  W3 </div> </div>
W5A	SGS	
W6A	SGS 486DX4V 3.3V	
W7A	Write Back Cache	
W12	Clock Speed 3X	

TABLE 3-1f: Jumper Settings: W11, W13-15





















NAME	FUNCTION	CONFIGURATION (INITIAL SETTING: *)
W11	IOCHRDY Signal to IDE Interface	 Enabled  Disabled *
W13	Supervisor I/O: Base Address	 190H *  390H  290H  390H
W14	Extended BIOS Modes (These jumpers are configured separately, even though they are grouped together here)	1-2: Serial Download Mode 1-2: Normal Mode * 3-4: VT100 Mode 3-4: Standard Mode * 5-6: Disable TEKNOR Extension 5-6: Enable TEKNOR Extension *  
W15	External CPU Bus Speed	 25MHz  33MHz

TABLE 3-1g: Jumper Settings: W16-W20

NAME	FUNCTION	CONFIGURATION (INITIAL SETTING: *)			
W16	BIOS Boot Selection		Emergency boot (from EPROM BIOS)		Normal boot (from Flash EPROM BIOS) *
W17	Watchdog Timer		Enabled *		Disabled
W18	Non Maskable Interrupt on Power Fail Output		Enabled		Disabled *
W19	Battery Selection		Internal Battery *		External Battery
W20	Power Fail Detection Source		External Power Fail Input to Pin 6 of J9 *		Internal/external battery when less than 3 volts

SECTION 4 INSTALLING & WORKING WITH SYSTEM COMPONENTS

4.01 MICROPROCESSOR

The VIPer805 board supports the following microprocessors (maximum internal CPU clock speed and CPU voltage are indicated):

- AMD 486DX2SV running at 66 MHz (3.3V);
- AMD 486DX4SV running at 100 MHz (3.3V);
- AMD 5x86 running at 133 MHz (3.3V).
This processor is also referred to as a 486DX5;
- Intel 486DX running at 33 MHz (5V);
- Intel 486DX2 running at 66 MHz (5V);
- Intel 486DX4 running at 100 MHz (3.3V);
- SGS 486DX2V running at 66 MHz (3.3V);
- SGS 486DX4V running at 100 MHz (3.3V).

The Math Co-processor is internal to the CPU (Central Processing Unit).

The above processors also have Internal Cache Memory available. Internal Cache Memory is enabled and configured in the AMIBIOS Setup.

The following jumpers are related to the CPU:

- W3: Selects the voltage for powering CPU:
 - Shorted: 5V,
 - Or open: 3.3V.

WARNING: Incorrect CPU voltage can damage your CPU!

- W5A, W6A and W7A: These jumpers are used in conjunction with W12 to select CPU Type. See Jumper Setting tables in Section 3 for supported types and their settings.
- W12: Selects the desired multiplier to set the internal CPU clock speed (2, 3 or 4 times the external Bus speed):
 - Shorted: 2X (or 4X for AMD 5x86-133 only),
 - Or open: 3X.

W15: Selects the desired external CPU Bus speed:

- Pins 3 and 4 shorted: 25MHz,
- Or pins 1 and 2 shorted: 33MHz.

For DX microprocessors, external bus speed is set to the maximum CPU internal clock speed or less.

For DX2 microprocessors, external bus speed is set to half the maximum CPU internal clock speed or less.

For DX4 microprocessors, external bus speed is set to one third the maximum CPU internal clock speed or less.

For 5x86 microprocessors, external bus speed is set to one fourth the maximum CPU internal clock speed or less.

Jumper locations and settings appear in Section 3 of this manual.

4.02 CONFIGURING CACHE

The microprocessors have Internal Cache Memory available for faster execution of applications.

Cache copies the most recently accessed data and places it in its fast Internal Cache Memory. The CPU can then access this data at a very high speed. Since most program executions are sequential and repetitive, the likelihood is great that the CPU will find data already stored in Cache.

When the CPU retrieves data from Cache, a **Cache hit** occurs. On the other hand, when the CPU must access data from System Memory, a **Cache miss** occurs .

Internal Cache Memory is enabled or disabled in the Advanced Setup screen of the AMIBIOS Setup program. To run the AMIBIOS Setup program, boot-up your computer and hit the DELETE key before or when the message - "Hit if you want to run SETUP" - appears near the top of the screen. Set the Internal Cache option in the Advanced Setup screen to Enabled or Disabled.

4.03 SYSTEM CONTROLLER OVERVIEW

The PicoPower (Cirrus Logic subsidiary) PT86C768/PT86C718 System Controller used on the VIPer805 board is a two-chip solution packaged in 176-pin VQFP's. This chipset contains power management features making it ideal for designing energy efficient computer systems and high performance applications.

The System Controller was designed to support 32-bit 486 CPUs, capitalizing on the unique features found in the SL-Enhanced series. It incorporates PicoPower's Power On Demand™ technology, providing unsurpassed power management features (explained in section 8).

The System Controller also includes features like a high performance DRAM Controller, Clock and Reset Interface, a Local Bus IDE Drive Interface for high performance disk subsystem, and integrated 82C206 functions.

The System Controller is 100% IBM PC/AT compatible. It includes three 8254 Counter/Timers, two 8237 DMA Controllers and two 8259 Interrupt Controllers.

4.03.1 DMA CONTROLLERS

The VIPer805 supports seven Direct Memory Access (DMA) channels. The parallel port's ECP mode can be configured to use Channel 1 or 3. Channel 2 is reserved for the Floppy controller. Channel 4 is used to cascade Channels 0 through 7 to the microprocessor. Note that with Plug and Play, DMA channels for I/O devices can be modified via software per system requirements.

TABLE 4-1: 8237 DMA Controllers

DMA 0	Available
DMA 1	Available (ECP)
DMA 2	Floppy controller
DMA 3	Available (ECP)
DMA 4	Cascade controller # 1
DMA 5	Available
DMA 6	Available
DMA 7	Available

4.03.2 INTERRUPT CONTROLLERS

Two 8259 interrupt controllers handle the interrupts on the VIPer805. Six interrupt lines are directly linked to the keyboard controller, timer, the real-time clock, both serial ports and the parallel port. Note that with Plug and Play, interrupt lines for I/O devices can be modified via software per system requirements.

TABLE 4-2: 8259 Interrupt Controllers

CONTROLLER # 1		CONTROLLER # 2	
IRQ 0	Timer 0	IRQ 8	Real-time clock
IRQ 1	Keyboard	IRQ 9	Available
IRQ 2	Cascade controller # 2	IRQ 10	Available
IRQ 3	COM 2*	IRQ 11	Available
IRQ 4	COM 1*	IRQ 12	PS/2 Mouse
IRQ 5	Available (LPT2)*	IRQ 13	Coprocessor
IRQ 6	Floppy controller*	IRQ 14	IDE*
IRQ 7	LPT 1*	IRQ 15	Available

* All functions marked with an asterisk (*) can be disabled or reconfigured.

4.03.3 COUNTER/TIMERS

There are three independent 16-bit 8254 Counter/Timers: Counter/Timer 0 is tied to Interrupt 0, Counter/Timer 1 is used to generate the refresh with DMA Channel 0, and Counter/Timer 2 is used for the Speaker Port.

4.04 SUPERVISOR UTILITIES

The VIPer series incorporates features that are usually not found on commercial PCs. TEKNOR computers utilize address space 190H, 290H or 390H to enable these special features. The I/O address is jumper selectable (W13 jumper - Section 3).

TABLE 4-3: Register 190H, 290H or 390H

Bit #	Bit Value (Default)	Function:	
		WRITE	READ
0	0	Enable Watchdog 1=enable, R/W bit	Same
1	1	Watchdog activate 1-0-1 to toggle, R/W bit	Same
2	0	Flash VPP enable	Same
3	0	RS-485 direction control Refer to section 5.02 about RS-485 Serial Port	Power Detection Output or Battery Low output
4	0	Reserved	Not Used
5	0	Reserved	W14(5-6) Status
6	1	Reserved	W14(3-4) Status
7	0	Reserved	W14(1-2) Status

- ☞ **Not all bits are R/W. Therefore, be certain to keep a mirror image of the register when programming it.**
- ☞ **All bits are 0 after a hardware RESET or power up condition.**
- ☞ **Write the values shown in the "Bit Value (Default)" column if you are unsure.**

4.05 MULTI-FUNCTION CONNECTOR (KEYBOARD, SPEAKER, RESET & LED)

Connector J3 on the VIPer provides all the necessary signals for connecting the keyboard, speaker, reset, and keylock interface devices. The following diagram shows the signal connections at J3 (referred to as the Keyboard / Speaker Connector):

TABLE 4-4: Keyboard / Speaker Connector (J3)

Pin Number			Pin Number		
Signal Flow			Signal Flow		
Signal			Signal		
KBCLK	I/O	1	2	-	GND
KBDATA	I/O	3	4	-	GND
VCC (+5V)	-	5	6	-	VCC (+5V)
SPKR	O	7	8	-	VCC (+5V)
Not Used	-	9	10	-	GND
DOWNLD*	I	11	12	-	GND
PBRES*	I	13	14	-	GND
HDD ACTIVE*	O	15	16	-	VCC (+5V)

* Active low signal

The following functions are available on the connector:

- **Speaker:** An 8 ohm speaker can be directly connected to pins 7 and 8 of J3. All necessary drivers are on the VIPer.
- **Hard Disk LED:** The onboard IDE interface activates an external LED. The LED must be connected anode on pin 16 (J3) and cathode on pin 15 (J3). No external current limiting resistor is required since one is already present on the VIPer.
- **Reset:** The VIPer can be reset by shorting pins 13 and 14 of J3.

Note: The Keyboard Disable function is not supported on the VIPer805.

4.06 PC/104 EXPANSION CARDS

The VIPer accepts PC/104 Expansion cards. PC/104 offers full architecture, hardware and software compatibility with PC Bus, in ultra-compact stackable modules (3.6" x 3.8"). PC/104 is being advanced as a proposed Appendix to the IEEE-P996 draft specification. Products compatible with the PC/104 are already offered by over 70 companies.

If you require additional information on the PC/104 standard, please contact our Technical Support department.

4.07 PS/2 MOUSE

The board supports a mouse, through the PS/2 connector at J10. With the PS/2 Mouse Cable (available from TEKNOR), this feature is compatible with the standard IBM PS/2 mouse. The cable may be ordered by contacting our Sales department.

During installation of the mouse, you must install the driver provided by the mouse manufacturer.

To enable the mouse, set the Mouse Support Option (PS/2) to Enabled in the Advanced Setup screen of the AMIBIOS Setup program (see section 9.02 for more information).

SECTION 5 INSTALLING PERIPHERALS (PARALLEL/SERIAL)

5.01 PARALLEL PORT

5.01.1 MODES

The parallel port is a multi-mode parallel port supporting the following modes:

- Standard Parallel Port (SPP): This mode is IBM XT/AT compatible and PS/2 compatible (bi-directional);
- Enhanced Parallel Port (EPP);
- Extended Capabilities Port (ECP).

5.01.2 CONNECTOR

The parallel port connector (J13) is a DB25 female connector located at the top left side of the board.

The following table shows the pinout for this connector, when it is in Standard mode:

TABLE 5-1: Printer Parallel Port (J13) - Standard Mode

Pin Number			Pin Number		
Signal Flow			Signal Flow		
Signal				Signal	
STROBE*	O	1	2	I/O	D0
D1	I/O	3	4	I/O	D2
D3	I/O	5	6	I/O	D4
D5	I/O	7	8	I/O	D6
D7	I/O	9	10	I	ACK*
BUSY	I	11	12	I	PE
SELECT	I	13	14	O	AUTOFD*
ERROR*	I	15	16	O	INIT*
SELECTIN*	O	17	18	-	GND
GND	-	19	20	-	GND
GND	-	21	22	-	GND
GND	-	23	24	-	GND
GND	-	25			

* Active low signal

The following table shows the pinout for this connector, when it is in EPP mode:

TABLE 5-2: Printer Parallel Port (J13) - EPP Mode

Pin Number			Pin Number		
Signal Flow			Signal Flow		
Signal			Signal		
WRITE*	O	1	2	I/O	D0
D1	I/O	3	4	I/O	D2
D3	I/O	5	6	I/O	D4
D5	I/O	7	8	I/O	D6
D7	I/O	9	10	I	INTR
WAIT*	I	11	12	I	Not Used
Not Used	I	13	14	O	DATASTB*
Not Used	I	15	16	O	Not Used
ADDRSTRB*	O	17	18	-	GND
GND	-	19	20	-	GND
GND	-	21	22	-	GND
GND	-	23	24	-	GND
GND	-	25			

* Active low signal

The following table shows the pinout for this connector, when it is in ECP mode:

TABLE 5-3: Printer Parallel Port (J13) - ECP Mode

Pin Number			Pin Number		
Signal Flow			Signal Flow		
Signal				Signal	
STROBE*	O	1	2	I/O	D0
D1	I/O	3	4	I/O	D2
D3	I/O	5	6	I/O	D4
D5	I/O	7	8	I/O	D6
D7	I/O	9	10	-	ACK*
BUSY, PERIPHACK ³	I	11	12	-	PERROR, ACKREVERSE ³
SELECT	I	13	14	O	AUTOFD*, HOSTACK ³
FAULT* ^{1,2} , PERIPHRQST* ³	I	15	16	O	INIT* ¹ , REVERSERQST* ³
SELECTIN* ^{1,3}	O	17	18	-	GND
GND	-	19	20	-	GND
GND	-	21	22	-	GND
GND	-	23	24	-	GND
GND	-	25			

* Active low signal

¹ Compatible Mode

² High Speed Mode

Note: For more information on the ECP protocol, please refer to the Extended Capabilities Port Protocol and ISA Interface Standard (available from Microsoft Corporation) or contact our Technical Support department.

5.01.3 AMIBIOS SETUP

Follow these steps, from the AMIBIOS Setup program's main menu:

- From the Setup window, select the Peripheral icon. To modify settings, the PROGRAMMING MODE option must first be set to Manual.
- In the Peripheral Setup screen, the PARALLEL PORT option may be set to Disabled, 278h, 3BCh or 378h.
- Also in the Peripheral Setup screen, the PARALLEL PORT MODE option may be set to Normal, SPP (Standard Parallel Port), EPP (Enhanced Parallel Port), and Extended (ECP - Extended Capabilities Port).

For more detail, refer to section 9.02 - AMIBIOS SETUP PROGRAM.

5.02 SERIAL PORTS

There are two 16550 compatible serial ports. These have internal 16-byte FIFO buffers for more efficient data transfers.

5.02.1 CONNECTORS

Serial Port 1 (J7) RS-232

The Serial Port 1 is configured as RS-232, and is 100% compatible to the IBM-AT serial port, with the use of the IBM 9-pin DSUB Standard. The following tables show their pinouts:

TABLE 5-4a: Serial Port 1 (J7) RS-232

Pin Number			Pin Number		
Signal Flow			Signal Flow		
Signal			Signal		
DCD	I	1	2	I	DSR
RX	I	3	4	O	RTS
TX	O	5	6	I	CTS
DTR	O	7	8	I	RI
GND	-	9	10	-	Not Used

TABLE 5-4b: IBM 9-Pin DSUB Standard

Pin Number			Pin Number		
Signal Flow			Signal Flow		
Signal			Signal		
DCD	I	1	2	I	RX
TX	I	3	4	O	DTR
GND	-	5	6	I	DSR
RTS	O	7	8	I	CTS
RI	I	9			

TEKNOR offers a 10-pin header to 9-pin DSUB cable for IBM-AT compatibility. This can be purchased from TEKNOR or a cable can be made with a flat cable, a 10-pin flat cable crimp header and a 9-pin DSUB flat cable crimp connector. The use of Taiwanese adapter cables is not recommended, since the pinout is often incorrect. The direct crimp design offered by TEKNOR allows the simplest cable assembly. All these cables are available from TEKNOR by contacting the Sales department.

Serial Port 1 (J8) RS-232 - Standard IBM Serial Port

Serial Port 1 can use either the J7 connector (10-pin) which was described on page 5-7, or the J8 connector (9-pin) described on this page, however the board supports only one at a time.

Like Serial Port 1 - J7, Serial Port 1 - J8 is configured as RS-232. But most importantly, the J8 serial port connector is a standard IBM serial port (DB9), needing no additional adapter cables to be 100% IBM-AT compatible.

The following table shows the Serial Port 1 - J8 connector's pinout:

TABLE 5-5: Serial Port 1 (J8) RS-232 - Standard IBM Serial Port

Pin Number			Pin Number		
Signal Flow			Signal Flow		
Signal			Signal		
DCD	I	1	2	I	RX
TX	O	3	4	O	DTR
GND	-	5	6	I	DSR
RTS	O	7	8	I	CTS
RI	I	9			

Serial Port 2 (J4) RS-232

The Serial Port 2 can be configured as RS-232 or RS-485/RS-422. As a RS-232 port, it is 100% compatible to the IBM-AT serial port, with the use of the IBM 9-pin DSUB Standard. The following tables show their pinouts:

TABLE 5-6a: Serial Port 2 (J4) RS-232

Pin Number			Pin Number		
Signal Flow			Signal Flow		
Signal			Signal		
DCD	I	1	2	I	DSR
RX	I	3	4	O	RTS
TX	O	5	6	I	CTS
DTR	O	7	8	I	RI
GND	-	9	10	-	Not Used

TABLE 5-6b: IBM 9-Pin DSUB Standard

Pin Number			Pin Number		
Signal Flow			Signal Flow		
Signal			Signal		
DCD	I	1	2	I	RX
TX	I	3	4	O	DTR
GND	-	5	6	I	DSR
RTS	O	7	8	I	CTS
RI	I	9			

TEKNOR offers a 10-pin header to 9-pin DSUB cable for IBM-AT compatibility. This can be purchased from TEKNOR or a cable can be made with a flat cable, a 10-pin flat cable crimp header and a 9-pin DSUB flat cable crimp connector. The use of Taiwanese adapter cables is not recommended, since the pinout is often incorrect. The direct crimp design offered by TEKNOR allows the simplest cable assembly. All these cables are available from TEKNOR by contacting the Sales department.

Serial Port 2 (J4) RS-485/RS-422

If Serial Port 2 is configured for RS-485/RS-422 operation, it can support either full-duplex or party line communication.

Full Duplex Operation (RS-422): Upon power-up or reset, the COM2 interface circuits are automatically configured for full duplex operation. Pins 3 and 4 of J4 act as the receiver lines and pins 5 and 6 act as the transmitter lines.

Party Line Operation (RS-485): In order to enable party line operation, the user must first write "1" to bit 3 at I/O Port 190H (or at 290H or 390H depending on W13 jumper). This allows the transceiver (pins 3 and 4 of J4) to be controlled by the RTS signal. Upon power-up or reset, the transceiver is by default in "receiver mode" in order to prevent unwanted perturbation on the line.

In party line operation, termination resistors R1 and R2 must be installed only on the boards at both ends of the network.

The following table shows this connector's pinout:

TABLE 5-6: Serial Port 2 (J4) RS-485/RS-422

Pin Number			Pin Number		
Signal Flow			Signal Flow		
Signal			Signal		
DCD	I	1	2	I	DSR
RXD(-)	I/O	3	4	I/O	RXD(+)
TXD(-)	I/O	5	6	I/O	TXD(+)
DTR	O	7	8	I	RI
GND	-	9	10	-	Not Used

5.02.2 JUMPERS

Serial ports jumpers and their settings appear below:

- W4, W7, W8, W9 & W10 Serial Port 2 Configuration:
 - W4 open and pins 1-2 of W7-W10 shorted: RS-232: This is the initial setting.
 - Or W4 shorted and pins 2-3 of W7-W10 shorted: RS-485/RS-422.

- W5 RTS2-CTS2 & W6 DSR2-DTR2:
 - W5 and W6 shorted: Loopback, or
 - W5 and W6 open: Normal: This is the initial setting.

For location and settings of jumpers, refer to Section 3 of this manual.

5.02.3 AMIBIOS SETUP

Follow these steps, from the AMIBIOS Setup program's main menu:

- From the Setup window, select the Peripheral icon. To modify settings, the PROGRAMMING MODE option must first be set to Manual.
- In the Peripheral Setup screen, the SERIAL PORT 1 option may be set to Disabled, 3F8h, 2F8h, 3E8h or 2E8h (if one of these is used by SERIAL PORT 2, it will not appear in the scroll list).
- Also in the Peripheral Setup screen, the SERIAL PORT 2 option may be set to Disabled, 3F8h, 2F8h, 3E8h or 2E8h (if one of these is used by SERIAL PORT 1, it will not appear in the scroll list).

For more detail, refer to section 9.02 - AMIBIOS SETUP PROGRAM.

SECTION 6 INSTALLING IDE & FLOPPY DEVICES

6.01 INSTALLING IDE DEVICES

6.01.1 TYPE OF HARD DISK SUPPORTED

The VIPer805 supports AT Integrated Disk Drives. The AT embedded drive architecture incorporates drive electronics and controller circuitry on a single printed circuit board which is mounted directly to the disk drive chassis.

The integration of drive and controller functions increases reliability and performance by eliminating redundant circuitry, thus providing increased performance at reduced cost.

6.01.2 IDE CONNECTOR PIN-OUT

TABLE 6-1: IDE Hard Disk Connector (J1) - Pinout

Pin Number	Signal Flow	Signal	Pin Number	Signal Flow	Signal
1	I	RESET*	2	-	GND
3	I/O	HD7	4	I/O	HD8
5	I/O	HD6	6	I/O	HD9
7	I/O	HD5	8	I/O	HD10
9	I/O	HD4	10	I/O	HD11
11	I/O	HD3	12	I/O	HD12
13	I/O	HD2	14	I/O	HD13
15	I/O	HD1	16	I/O	HD14
17	I/O	HD0	18	I/O	HD15
19	-	GND	20	-	Not Used
21	-	Not Used	22	-	GND
23	I	IOW*	24	-	GND
25	I	IOR*	26	-	GND
27	O	IOCHRDY	28	I	BALE
29	-	Not Used	30	-	GND
31	O	IRQ14	32	O	IOCS16*
33	I	SA1	34	-	Not Used
35	I	SA0	36	I	SA2
37	I	CS0*	38	I	CS1*
39	O	ACTIVE*	40	-	GND

* Active low signal

6.01.3 IDE HOOK-UP

For the hook-up, a 40-pin dual row header signal connector is required. This connector handles all command, data and status I/O lines. Its recommended maximum cable length is 18-24 inches. It connects directly with the onboard 40-pin male header connector at J1.

The drive itself can be mounted in any horizontal or vertical plane.

For a list of recommended devices and connectors, see Appendix E - RECOMMENDED DEVICES & MATING CONNECTORS.

6.01.4 IDE JUMPER

IDE Controller jumper and its setting appears below:

- W11 IOCHRDY signal to IDE interface:
 - Shorted: Enabled.
 - Or open: Disabled: This is the initial setting.

For location and setting of jumper, refer to Section 3 of this manual.

6.01.5 IDE SOFTWARE SETUPS

VIP-UP Setup

In the VIP-UP software utility, the drive letter position C, D and E can be changed, when the first parameter "Disks C: to E: Configuration (BIOS Int 13h)" is set to Enabled.

For more detail on the VIP-UP Setup, refer to section 9.01 of this manual.

AMIBIOS Setup

Follow these steps, from the AMIBIOS Setup program's main menu:

- From the Setup window, select the Standard icon.
- From the Standard Setup screen, select the Master Disk icon or the Slave Disk icon.
- An options list displays all valid disk drive types. Select the correct type and press ENTER. If the hard disk drive is an IDE drive, select Detect Master or Detect Slave from the Utility window of the main menu to have AMIBIOS automatically detect the IDE drive parameters and report them to this screen.
- You can also enter the hard disk drive parameters: Type, Cylinders, Heads, Write Precompensation, Landing Zone, Sectors, and Capacity.
- Return to the main menu, and select the Chipset icon from the Setup window.
- From the Chipset Setup screen, you can set the TURBO IDE COMMAND WIDTH and TURBO IDE BACK TO BACK DELAY options in the scroll list, based on timing parameters of your hard disk.
- Return to the main menu, and select the Peripheral icon from the Setup window.
- In the Peripheral Setup screen, the ONBOARD IDE option may be set to Enb-PRI (enable primary IDE controller), Enb-SEC (enable secondary IDE controller) or disabled. To modify settings, the PROGRAMMING MODE option must first be set to Manual.

For more detail, refer to section 9.02 - AMIBIOS SETUP PROGRAM.

6.02 INSTALLING FLOPPY DEVICES

6.02.1 TYPES OF FLOPPY DEVICES SUPPORTED

The floppy disk controller is IBM PC XT/AT compatible (single and double density) and supports Enhanced Floppy Mode (2.88MB). It handles 3.5 inch and 5.25 inch, low and high density drives. Up to two drives can be supported in any combination.

6.02.2 FLOPPY CONNECTOR

TABLE 6-2: Floppy Connector (J2) - Pinout

Pin Number	Signal Flow	Signal	Pin Number	Signal Flow	Signal
1	-	GND	2	O	DRV DENS.SEL.0*
3	-	GND	4	-	Not Used
5	-	GND	6	-	Not Used
7	-	GND	8	I	INDEX*
9	-	GND	10	O	MOTOR ON 0,1*
11	-	GND	12	O	DRIVE SELECT B
13	-	GND	14	O	DRIVE SELECT A
15	-	GND	16	O	MOTOR ON 2*
17	-	N. C. ¹	18	O	DIR CONTROL*
19	-	GND	20	O	STEP*
21	-	GND	22	O	WRITE DATA*
23	-	GND	24	O	WRITE ENABLE*
25	-	GND	26	I	TRACK0*
27	-	N. C. ¹	28	I	WRITE PROTECT*
29	-	N. C. ¹	30	I	READ DATA*
31	-	GND	32	O	HEAD SELECT*
33	-	N. C. ¹	34	I	DSKCHG

* Active low signal

¹ By default, these pins are not connected, however, by installing the W1 and W2 jumpers,

these configurations are possible (see also page 6-8 in the manual):

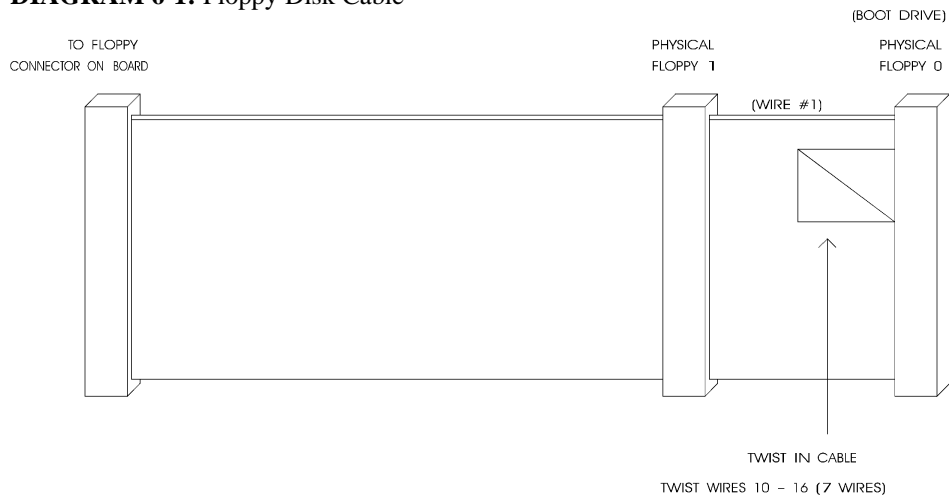
- | | | |
|-------------------|-----|----------------------|
| 1) 17 GND | Or: | 2) 17 EDOUT (2.88MB) |
| 27 GND | | 27 HDOUT (2.88MB) |
| 29 EDOUT (2.88MB) | | 29 GND |
| 33 HDOUT (2.88MB) | | 33 GND |

6.02.3 FLOPPY HOOK-UP

Mechanical Floppy Disk Installation:

The installation of the floppy drives is done via a standard IBM 34-pin flat ribbon cable that connects to J2.

DIAGRAM 6-1: Floppy Disk Cable



Enhanced Floppy Mode:

In order to connect your 2.88MB floppy drive, simply indicate the proper floppy disk drive in the AMIBIOS Setup program (Section 9); it is not necessary to set the HDOUT and EDOUT media detection signals jumpers.

6.02.4 FLOPPY JUMPERS

There are three possible jumper configurations for the 2.88MB High Density Floppy EDOUT and HDOUT signals:

- (1) W1: No jumper: HDOUT left to software, and
W2: No jumper: EDOUT left to software. This is the initial setting.

- (2) W1: Short Pins 1 and 3: HDOUT to Pin 33 (J2), and
Short Pins 2 and 4: Ground to Pin 27 (J2), and

W2: Short Pins 1 and 3: EDOUT to Pin 29 (J2), and
Short Pins 2 and 4: Ground to Pin 17 (J2).

- (3) W1: Short Pins 1 and 2: HDOUT to Pin 27 (J2), and
Short Pins 3 and 4: Ground to Pin 33 (J2), and

W2: Short Pins 1 and 2: HDOUT to Pin 17 (J2), and
Short Pins 3 and 4: Ground to Pin 29 (J2).

These jumpers are optional. Your 2.88MB Floppy Drive will operate correctly if 2.88MB is indicated in the AMIBIOS Standard Setup screen. Not installing these jumpers will work for all floppy disk drives, as long as the proper floppy type is indicated in AMIBIOS Setup. We recommend you not install these jumpers, for proper operation.

For location and settings of jumpers, refer to Section 3 of this manual.

6.02.5 FLOPPY AMIBIOS SETUP

Follow these steps, from the AMIBIOS Setup program's main menu:

- From the Setup window, select the Standard icon.
- From the Standard Setup screen, select the Floppy A icon (or the Floppy B icon).
- The settings are 360KB 5¼ inch, 1.2MB 5¼ inch, 720KB 3½ inch, 1.44MB 3½ inch, 2.88MB 3½ inch, or not installed.
- Return to the main menu, and select the Peripheral icon from the Setup window.
- In the Peripheral Setup screen, the ONBOARD FDC option may be set to Enabled (enable Floppy Drive Controller) or Disabled. To modify settings, the PROGRAMMING MODE option must first be set to Manual.

For more detail, refer to section 9.02 - AMIBIOS SETUP PROGRAM.

SECTION 7

INSTALLING SOLID STATE DISKS (FLASH)

Solid State Disks (SSDs) have no moving parts and are far less susceptible to dirt, moisture, vibration and temperature variations than mechanical Floppy disks. One type of SSDs is available: Flash EPROM.

7.01 FLASH EPROM DISK

The non-volatile characteristics of Flash memory eliminate the risk of losing valuable data updates (a concern with battery-backed SRAM). As a result, Flash memory offers major advantages in applications like automated factories, remote systems, portable equipment and similar environments. Also, Flash memory is obtainable at a much lower cost than EPROM or battery-backed SRAM.

The VIPer805 comes optionally with 2MB or 4MB of Flash EPROM for use as Flash disks. Two special software utilities are available for creating Flash disks: TEKNOR's VFLASH software and Microsoft's FLASH FILE SYSTEM II (FFSII files can be purchased from TEKNOR).

A Flash EPROM disk created with VFLASH is very much like a hard disk. A partition is created and data is stored in files, just like on a hard disk. The main difference between the two is that a Flash disk is a read-only drive. Therefore, in order to write software to Flash devices you must use VFLASH. VFLASH must also be used if you want to make the Flash EPROM disk bootable, after which you must configure the Flash Disk as C: in the VIP-UP Setup. For more information on using VFLASH, see Section 10.

With the FLASH FILE SYSTEM II software, Flash EPROM disks are read/write and may be accessed via DOS commands. For information on using this utility, see Section 11.

SECTION 8 POWER MANAGEMENT

8.01 POWER SUPPLY SOURCE

The VIPer805 board is powered from one of two sources:

- Power connector (J9): Stand-alone systems are powered from an outside power supply through the J9 connector.
- ISA (AT) bus: When the board is in a passive backplane system, it is powered through the ISA bus.

The pinout for the J9 power connector is shown in the table below:

TABLE 8-1: External Power Connector (J9) - Pinout

Pin Number	Signal
1	VCC (+5V)
2	GND
3	GND
4	+12V
5	-12V
6	PD (Power Fail Detection Input)

8.02 POWER MANAGEMENT MODES

The VIPer805 supports a very flexible and powerful power management scheme. The System Controller provides progressively higher levels of power conservation whenever the system is idle through the following special power saving modes: Doze Mode, Sleep Mode and Suspend Mode (power management test results are given in Table A-2 on page A-2). These modes are fully programmable through the AMIBIOS Setup Program.

The CPU power consumption is reduced through the STOPCLOCK protocol, which is used to shut down the CPU's internal clock during the various power management modes. In general, each progressive level of power management is entered when inactivity is detected by the System Controller which monitors activity from the Keyboard, Video, Serial and Parallel I/O, and the Hard and Floppy Drives.

The timeouts which are used to enter into Doze Mode, then Sleep Mode, and finally Suspend Mode, are programmable via the AMIBIOS Power Management Setup screen. Each mode is described below.

8.02.1 DOZE MODE

The Doze Mode is the System Controller's first level of power conservation. During Doze Mode, the display and hard drive will remain active. In fact, this mode is transparent to the user. Exit from Doze Mode is by a keypress or a serial port interrupt (e.g., mouse movement). Exit from Doze Mode is immediate.

8.02.2 SLEEP MODE

The Sleep Mode is the System Controller's second level of power conservation. During Sleep Mode, the display becomes inactive and the hard drive motor is stopped. Exit from Sleep Mode is by a keypress or a serial port interrupt (e.g., mouse movement). Exit from Sleep Mode takes approximately 5 seconds.

8.02.3 SUSPEND MODE

The Suspend Mode is the System Controller's third and deepest level of power conservation. During Suspend Mode, the display and the hard drive motor remain inactive. Exit from Suspend Mode is via a contact closure on the J16 Suspend / Resume Momentary Switch Connector (see Diagram 3-1) or via the RING signal from an external modem. Thus, if Suspend Mode is to be used, a Normally Open momentary switch should be connected to this connector. Exit from Suspend Mode takes approximately 7 seconds.

8.03 RESET CIRCUIT

8.03.1 EXTERNAL RESET CIRCUIT SWITCH

The VIPer can be reset by activating an external reset switch.

This switch should be connected between pin 13 (PBRES*) and pin 14 (GND) on the Keyboard / Speaker Connector (J3).

This provides an easy and effective way of resetting the system.

See Section 4.05 for more information.

8.03.2 ONBOARD POWER DETECTION

An onboard device, which is part of the reset circuit, constantly monitors the voltage which powers the board. Normally, the board is powered with 5V; if the supply voltage drops below 4.65V (a typical threshold), the onboard circuitry will reset the VIPer board and the system. This reset has the same effect on the system as the reset button.

8.04 POWER FAIL DETECTION CIRCUIT

The Power Failure Detector always monitors:

- The backup battery to warn of a low battery condition, and
- The +5V power supply to detect when it falls below 4.75V.

If either of the two above conditions occur, the PFO (Power Fail Output signal) goes low. In the case of the +5V power supply, a reset will result as explained in the previous section (8.03.2). In the case of the low battery, what happens will depend on the setting of the W18 jumper and user-defined algorithm.

The W18 jumper, when shorted, will generate a NMI (Non Maskable Interrupt), through the IOCHK* line, when the PFO goes low. In turn, this NMI may be serviced by an interrupt handler to locate the source and notify the user or the system.

If the W18 jumper is left open, no NMI is generated, however an algorithm could be used to detect a low battery condition and respond accordingly.

A low battery condition is detected, in any case, by polling bit 3 at TEKNOR's I/O base address register (190H, 290H or 390H, depending on W13 jumper setting): If this bit reads "1", then the battery voltage is good; if it reads "0", then it is in a low condition (below 2.9V, typical).

There are three ways to set the power fail circuit:

- **Using Internal Battery & Monitoring External Source:**

Internal Battery (set by W19 jumper with pins 1-2 shorted) and External Power Fail Input to Pin 6 of J9 connector (set by W20 jumper with pins 1-2 shorted).

The power detection input can only accept DC voltage. The line is monitored via a resistor network made up of a user-defined resistor (R93) and a fixed 1K Ω resistor connected to GND. The junction of these two resistors is connected to the input of the power fail circuit which has its threshold set to 1.25V. R93 can be calculated as follows:

$$R93 = \frac{1K\Omega (VI - 1.25)}{1.25} \quad \text{where VI is input voltage on pin 6 of the power connector.}$$

- **Using Internal Battery & Monitoring Internal Battery:**

Internal Battery (set by W19 jumper with pins 1-2 shorted) and Power fail detect when battery is less than 3V (set by W20 jumper with pins 2- 3 shorted).

When the internal battery is selected as being the source of the power fail circuit, it is set to trip when the battery goes lower that 3V.

- **Using External Battery & Monitoring External Battery:**

External Battery (set by W19 jumper with pins 2-3 shorted) and Power fail detect when battery is less than 3V (set by W20 jumper with pins 2-3 shorted).

When the external battery is selected as being the source of the power fail circuit, it is set to trip when the battery drops below 3V.

This means that when an external battery is used, the voltage needs to be monitored on the battery.

8.05 WATCHDOG TIMER

The Watchdog Timer is extremely useful in embedded systems where human supervision is not required.

Jumper W17 must be installed to permit activation of the Watchdog. If jumper W17 is removed, the Watchdog is disabled.

The Watchdog must also be enabled and refreshed by software. To enable the Watchdog by software, first write "1" in bit "0" at address 190H the first time (or at 290H or 390H depending on the W13 jumper setting).

When enabled, the microprocessor must refresh the Watchdog. This is done by writing alternatively "0" and "1" to bit 1 at address 190H (or at 290H or 390H), once every 1.6 seconds (or less) to verify proper software execution.

Following a reset, the Watchdog is always disabled.

If a hardware or software failure occurs such that the Watchdog is not refreshed, a reset pulse is generated by the Watchdog to restart the processor.

☞ **The user program must provide the first access to address 190H (or at 290H or 390H depending on the W13 jumper setting), and must also include the refresh routine. In addition, be certain to keep a mirror image of register 190H (or 290H or 390H) when programming it. This is necessary since the register is a write-only user register and, as a result, is not used by the system BIOS.**

TABLE 8-2: Watchdog Timer Register

ADDRESS	REGISTER
190H, 290H OR 390H: Bit 0 Read/Write	Watchdog enable
190H, 290H OR 390H: Bit 1 Read/Write	Watchdog refresh

The default timeout period is 1.6 seconds; however the timeout period can be changed. Shorting C63 and leaving R43 opened changes the timeout to 100 ms. Shorting R43 and installing a capacitor at C63 will change the timeout period according to the following formulae:

$$\text{Timeout (milliseconds)} = (400/47\text{pF}) * C$$

or

$$C63 = (\text{Timeout (milliseconds)} * 47\text{pF}) / 400\text{ms}$$

For instance, an external capacity of 100pF will lengthen the timeout to 851ms and a 1000pF will bring it to 8.5 seconds.

SECTION 9

VIPer SOFTWARE SETUPS

The VIPer805 is software configurable. The setup programs allow for minimal hardware configuration.

The VIP-UP program - TEKNOR's own Setup program for enabling / disabling / relocating various hardware features - is explained in section 9.01.

The AMIBIOS Setup program which is used to change operating parameters is explained in section 9.02.

9.01 VIP-UP PROGRAM

The VIP-UP program can be executed during boot-up. During boot-up, hit the CTRL and V keys simultaneously, before or when you see the message "Press CTRL-V to enter TEKNOR VIP-UP" at the top of the screen (CTRL-V will work, even if the message display is disabled in VIP-UP).

You may also execute the VIP-UP program at the DOS prompt; in such a case, type "VIP-UP" and press ENTER. This program is available on the utility disk (VIP-UP.COM).

There are one or two screens in the VIP-UP program. The values appearing on the right side of each screen can be modified: Follow the instructions found at the bottom of the screen to select another value.

Use the ↑ and ↓ keyboard keys to move up and down the screen, and on to subsequent or preceding screens. As you do, the value of the selected field is highlighted. If you press the ↓ key when the last field of the screen is highlighted, the next screen is displayed. Pressing the ↑ key when the first field is highlighted will display the first field of the preceding screen; in this way you can move quickly from screen to screen.

Once a field value is highlighted, you can change it by pressing PgDn or typing "+" on the keyboard (in VT100 mode, only "+" will work); this will usually display a higher value. You can also press the PgUp key or type "-" ("-" in VT100 mode), which will usually display a lower value.

Press F10 to save the current configuration and exit (type "U" in VT100 mode). The configuration is not saved until F10 is pressed or "U" is typed. Press ESC to exit without saving the setup.

9.01.1 VIP-UP SCREEN

TEKNOR MICROSYSTEMS INC --- VIPer SETUP	
TEKNOR BIOS Extension Address	C8000H-CBFFFH
TEKNOR BIOS Window Address	CC000H-CFFFFH
Disks C: to E: Configuration (BIOS Int 13h)	Disabled
Disk C: Configuration	Not Installed
Disk D: Configuration	Not Installed
Disk E: Configuration	Not Installed
Enter VIP-UP Message	Displayed 3 seconds
VT100 & Serial Download Speed	19200 BPS
VT100 & Serial Download Serial Port	COM1: 3F8H
Use Flash To Store CMOS RAM SETUP	No
↑↓ to select options	ESC - Quit without saving
PgDn(+), PgUp(-) to change an option	F10 - (U)pdate Flash BIOS

There are five parts to the screen:

1. Selection of TEKNOR BIOS addresses: The addresses of the Teknor BIOS extension and the Teknor BIOS window are set in the top part of the screen. The Teknor BIOS extension options are C8000h-CBFFFh and D4000h-D7FFFh. The Teknor BIOS window (Flash window) options are CC000h-CFFFFh and D0000h-D3FFFh.
2. Disks C: to E: Configuration (BIOS Int 13h): The Disk Configuration locations (C, D, E) can be user-defined by setting the first parameter "Disks C: to E: Configuration .." to "Enabled". You can then associate the disks present (e.g., Hard Disk 0, Hard Disk 1, Flash disk) to the drive letter desired. The disk you want to boot from must be configured as "Disk C:". Never assign a letter to a disk that is not present. Never skip a drive letter (e.g., the following is not valid: C: assigned to a disk, D: "Not Installed", E: to another disk).

Although the BIOS does not prevent it, you should not configure the same disk (Hard Disk 0, Hard Disk 1 or Flash Disk) at two or more locations (C, D or E), for example, Hard Disk 0 at D and E.
3. Enter VIP-UP message: This option allows the user to enable or disable the message "Press CTRL-V to enter TEKNOR VIP-UP" at the top of the screen upon boot-up.

4. VT100 & Serial Download: The VT100 & Serial Download Speed option is for selecting the desired speed for the VT100 and Download modes. The VT100 & Serial Download Serial Port option allows the use of either COM2 or COM1 for the VT100/Serial Download Mode hookup.
5. Use Flash To Store CMOS RAM SETUP: When this option is set to "Yes", the CMOS RAM Setup will be restored from Flash during each power up. Only the time and date could be lost (if the battery fails). Please note that modifying and saving the CMOS RAM Setup in AMIBIOS Setup does not change the Flash copy; to update Flash, you must return to the VIP-UP Setup and press F10 while "Use Flash To Store CMOS RAM SETUP" is set to "Yes".

9.02 AMIBIOS SETUP PROGRAM

9.02.1 ACCESSING AMIBIOS SETUP PROGRAM

The VIPer805 uses the AMIBIOS Setup program, a setup utility in ROM to configure data in CMOS RAM.

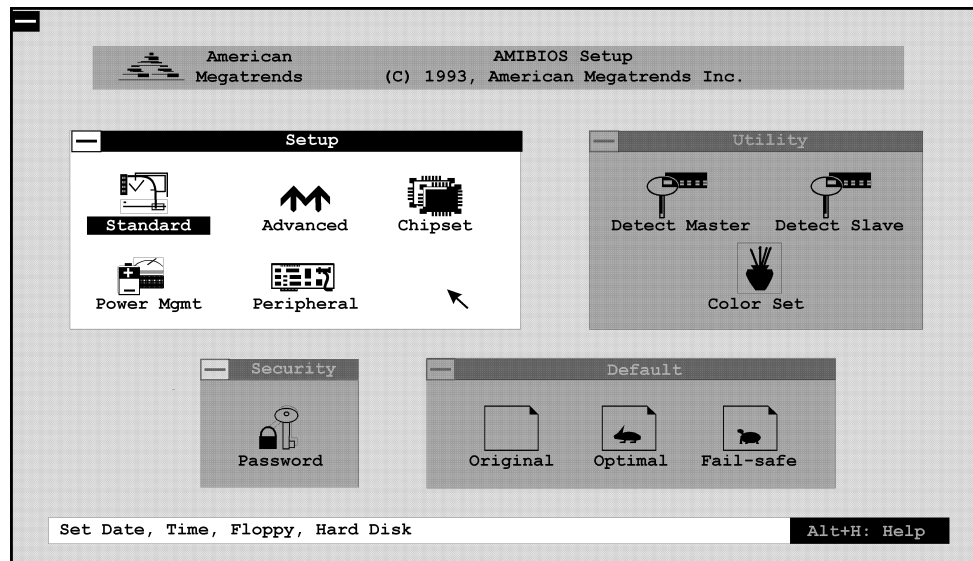
The system BIOS (Basic Input Output System) provides an interface between the operating system and the hardware of the VIPer805 single-board computer. This interface is 100% IBM AT compatible: All functions accept similar inputs as IBM and provide the same results, although the program code itself is different.

To run the AMIBIOS Setup program:

- Power on or reboot the system.
- Hit the DELETE key before or when the message - "Hit if you want to run SETUP" appears.

DELETE will work, even if the message display is disabled in AMIBIOS SETUP.

- The AMIBIOS main menu appears as follows:



10.02.2 DESCRIPTION

Four windows appear and are designated as follows:

- **Setup Window:** allows the user to access Standard, Advanced, Chipset, Power Management and Peripheral setups.
- **Utility Window:** offers tools to detect automatically hard drive setups (Master and Slave), and an utility to set screen background and foreground colors.
- **Security Window:** is used to control access to the system using a password.
- **Default window:** is used for restoring preset values to reconfigure the AMIBIOS Setup.

The active window is highlighted (for example, the Setup window on the previous page).

The following keyboard functions are available:

- Press TAB to move from one window to another.
- Press Arrow keys to move from one option to another.
- Press ENTER key to select an option or a value.
- The ESC key is used to close the current window and move to the previous one. In the main menu screen, pressing this key displays the EXIT SETUP window.
- Use the + or - keys to change date and time values in the Standard setup.

If a supported mouse¹ was detected during boot-up, an arrow cursor appears on the screen. Use the left mouse button to select icons, options and settings. Click the top left corner of a pop-up window to move to the previous window, or in the case of main menu windows, to display the EXIT SETUP window.

The EXIT SETUP window is for saving and exiting AMIBIOS Setup. Available options are:

- Save changes and Exit: This option is used to save the configuration in CMOS RAM. After the information is saved, the computer is automatically rebooted. This option will not change the values saved in Flash EPROM. To update the values in Flash, enter the VIP-UP program and perform a save (F10).
- Do not save changes and Exit: This option is used to exit AMIBIOS Setup without saving the configuration to CMOS RAM.
- Continue: This option returns to the main menu without saving or exiting.

¹All PS/2-type mice are supported, as well as bus mice that use IRQ 3, 4 or 5 (not 2), Microsoft-compatible mice (M, V, W Series), Logitech C-series-compatible mice and many serial mice.

9.02.3 SETUP WINDOW

This section describes the five options of the Setup Window. These are:

- **Standard Setup:** offers the options to set the time, date, hard disk parameters, and floppy drives.
- **Advanced Setup:** handles options and features such as key repetition settings, boot sequence, NUM LOCK and password checking, shadowing, ...
- **Chipset Setup:** sets chipset-specific options and features.
- **Power Management Setup:** sets power conservation options.
- **Peripheral Setup:** sets I/O controller-related options.

The Advanced Setup, Chipset Setup, Power Management Setup and Peripheral Setup are described in the following pages with both Fail-Safe Defaults and Optimal Defaults values.

Whenever you are not sure about a certain setting, you may refer to the list of default values. The list of defaults is provided in the event that a value has been changed and one wishes to set this option to its original value. Loading the Optimal or Fail-Safe defaults will affect all the options and will reset options previously altered.

The Fail-Safe default settings consist of the safest set of parameters. Use them if the system is behaving erratically. They should always work but do not provide optimal system performance.

The Optimal default values provide optimum performance settings for all devices and system features.

These default values have been provided to give control over the system. However, the values for these options should be changed only if the user has a full understanding of the timing relationships involved.

TABLE 9-1: Standard Setup

OPTION	DESCRIPTION
Date/Time	System date and time: to change the date or time, highlight the values you want to change, and press the + or - key (keyboard function) or click the + or - box (mouse function), until the desired values are displayed.
Master Disk Slave Disk	Displays all valid disk drive types that can be installed. IDE drives can be detected automatically with Detect Master / Detect Slave option from the Utility window of the main menu. Type, Cylinders, Heads, Write Precompensation, Landing Zone, Sectors, and Capacity can be set by the user manually.
Floppy A Floppy B	The settings are: 360KB 5¼ inch, 1.2MB 5¼ inch, 720KB 3½ inch, 1.44MB 3½ inch, 2.88MB 3½ inch and Not Installed.

TABLE 9-2: Advanced Setup

Option	Fail-safe Defaults	Optimal Defaults	Possible Settings	Description
Typematic Rate (Chars/Sec)	Disabled	30	Disabled, 15, 20, 30	The rate at which characters are displayed on the screen, when a key is pressed and held down.
System Keyboard	Present	Present	Absent, Present	Specifies whether a keyboard is attached to the system.
Primary Display	VGA/EGA	VGA/EGA	Absent, VGA/EGA, CGA40x25, CGA80x25, Mono	Specifies the type of display adapter card installed in the system.
Mouse Support	Disabled	Enabled	Enabled, Disabled	When Enabled, specifies PS/2 mouse support.
Above 1MB Memory Test	Disabled	Disabled	Enabled, Disabled	When Enabled, executes the POST memory routine on all system memory. When Disabled, AMIBIOS only tests the first 1MB of system memory.
Memory Test Tick Sound	Enabled	Disabled	Enabled, Disabled	Turns On or Off (Enabled/Disabled) the ticking sound during the memory test.
Parity Error Check	Disabled	Disabled	Enabled, Disabled	Parity error checking for memory system.
Hit Message Display	Enabled	Enabled	Enabled, Disabled	When Enabled, displays "Hit if you want to run Setup", when the system boots.
Extended BIOS RAM Area	0:300	0:300	0:300, DOS 1K	Specifies storage area for extended BIOS RAM information: address 0:300 in the system BIOS area in low memory, or the top 1KB of the system programming area beginning at 639K (DOS 1K).
Wait For "F1" If Any Error	Disabled	Disabled	Enabled, Disabled	When Enabled, the boot-up routine is suspended and the screen displays the message "RUN SETUP UTILITY Press F1 to RESUME". Press F1 to run the AMIBIOS Setup and update the setup.
System Boot Up Num Lock	On	On	On, Off	When set to Off, deactivates the Numeric Key Pad at power-on. Arrow keys are enabled.
Numeric Processor Test	Enabled	Enabled	Enabled, Disabled	When Enabled, performs the coprocessor test during the AMIBIOS POST.
Floppy Drive Seek At Boot	Enabled	Disabled	Enabled, Disabled	When Enabled, specifies that a SEEK will be performed on floppy drive A: at system boot time.
Floppy Drive Swapping	Disabled	Disabled	Enabled, Disabled	When Enabled, makes a swap between floppy A: and B: (if present). This allows to boot from drive B:.
System Boot Up Sequence	A:, C:	C:, A:	C:, A: or A:,C:	Specifies the boot sequence after AMIBIOS POST completes and attempts to boot DOS.
System Boot Up CPU Speed	High	High	High, Low	Sets the speed at which the system boots.
Internal Cache	Disabled	Enabled	Enabled, Disabled	Enables or Disables the CPU Internal Cache Memory.
Password Checking	Setup	Setup	Setup, Always	Specifies when a password check occurs: Setup option, when AMIBIOS is executed; Always option, when the computer is turned on.
Video Shadow C000, 16K	Disabled	Enabled	Enabled, Disabled	When Enabled, the video ROM BIOS area at the specified address is copied (shadowed) from ROM to RAM for faster execution.
Video Shadow C400, 16K	Disabled	Enabled	Enabled, Disabled	
Shadow C800, 16K	Disabled	Disabled	Enabled, Disabled	When Enabled, shadows the contents of the ROM area beginning at the address specified. Example: The SHADOW C800, 16K shadows the contents of ROM from C8000h-CBFFFh to RAM.
Shadow CC00, 16K	Disabled	Disabled	Enabled, Disabled	
Shadow D000, 16K	Disabled	Disabled	Enabled, Disabled	Not all BIOS can be shadowed. In some case, it can result in erratic operation. For example, if the expansion board has built-in "Scratchpad memory" which is used internally, shadowing may cause unpredictable results. In particular, the TEKNOR BIOS Extension and the Flash Window must not be shadowed.
Shadow D400, 16K	Disabled	Disabled	Enabled, Disabled	
Shadow D800, 16K	Disabled	Disabled	Enabled, Disabled	
Shadow DC00, 16K	Disabled	Disabled	Enabled, Disabled	
Shadow E000, 16K	Disabled	Disabled	Enabled, Disabled	
Shadow E400, 16K	Disabled	Disabled	Enabled, Disabled	
OS2 Compatible Mode	Disabled	Disabled	Enabled, Disabled	

TABLE 9-3: Chipset Setup

Option	Fail-safe Defaults	Optimal Defaults	Possible Settings	Description
DRAM Wait State	2 wait	1 wait	1 wait, 2 wait	Sets the Wait State value between the CPU and DRAM.
SYSCLK Divisor Select	Auto	Auto	Auto, CLOCK2IN/2, CLOCK2IN/3, CLOCK2IN/4, CLOCK2IN/5, CLOCK2IN/6, CLOCK2IN/8	Sets the speed of the ISA bus clock (SYSCLK) signal, which must be set to approximately 8MHz. The appropriate divisor depends on the CPU external bus speed.
AT Ready Delay Selects	2HS1XCLK	No Delay	No Delay, 1HS1XCLK, 2HS1XCLK	Sets the number of SYSCLK wait states to add, after a ready is received on the AT bus.
Back to Back I/O Delay	3 SYSCLK	0 SYSCLK	0 SYSCLK, 1 SYSCLK, 2 SYSCLK, 3 SYSCLK	Sets the delay, in terms of ISA bus clock, between consecutive ISA bus I/O cycles. This option is used for older ISA devices which require longer delays between consecutive I/O cycles. Due to the higher speed of new processors, it may be necessary to add the Back to Back I/O Delay for these older adaptor card.
ISA Refresh	Disabled	Disabled	Enabled, Disabled	Some ISA peripheral boards use the ISA Refresh signal (for example, bus mouse).
Turbo IDE Command Width	9HS1XCLK	9HS1XCLK	2HS1XCLK, 3HS1XCLK, 4HS1XCLK, 5HS1XCLK, 6HS1XCLK, 7HS1XCLK 8HS1XCLK, 9HS1XCLK	Sets the pulse width of read and write accesses from and to the hard disk. HS1XCLK is the same speed as the CPU bus clock. The minimum required pulse width varies from drive to drive. Consult your hard disk specifications for minimum pulse width.
Turbo IDE Back to Back Delay	16HS1XCL	16HS1XCL	2HS1XCLK, 4HS1XCLK, 6HS1XCLK, 8HS1XCLK, 10HS1XCLK, 12HS1XCLK 14HS1XCLK, 16HS1XCLK	Sets the delay between hard disk accesses. HS1XCLK is the same speed as the bus clock. The minimum required delay varies from drive to drive. Consult your hard disk specifications for minimum delay.
ISA Reserved Memory Size	Disabled	Disabled	Disabled, 16K, 32K, 64K	Both reserve a memory region which a Plug and Play ISA BIOS cannot use.
ISA Reserved Memory Base	N/A	N/A	N/A, C8000, CC000, D0000, D4000, D8000, DC000	Use Memory Size and Memory Base to define this region.
IRQ3 Reserved for ISA	No	No	Yes, No	When set to No, the specified IRQ<number> is free for a Plug and Play device. Set IRQ<number> to Yes if an ISA adapter card with a fixed IRQ is installed.
IRQ4 Reserved for ISA	No	No	Yes, No	
IRQ5 Reserved for ISA	No	No	Yes, No	
IRQ7 Reserved for ISA	No	No	Yes, No	
IRQ9 Reserved for ISA	No	No	Yes, No	
IRQ10 Reserved for ISA	No	No	Yes, No	
IRQ11 Reserved for ISA	No	No	Yes, No	
IRQ14 Reserved for ISA	No	No	Yes, No	
IRQ15 Reserved for ISA	No	No	Yes, No	
Boot to PNP OS	Disabled	Disabled	Enabled, Disabled	When Enabled, the operating system is Plug and Play compatible: During the boot-up, the BIOS will activate only the PNP devices required for booting.

TABLE 9-4: Power Management Setup

Option	Fail-safe Defaults	Optimal Defaults	Possible Settings	Description
Power Management Mode	Disabled	Disabled	Enabled, Disabled	When Enabled, activates power saving modes: DOZE, SLEEP and SUSPEND.
DOZE Mode Time Out	Disabled	4 Sec.*	Disabled, 1, 4, 8 and 16 sec.	First level of power conservation. The setting defines the timeout period to enter into Doze Mode when no activity is detected.
SLEEP Mode Time Out	Disabled	1 min.*	Disabled, 1, 2, 4, 6, 8, 12 and 16 min.	Second level of power conservation. The setting defines the timeout period to enter into Sleep Mode from Doze Mode.
SUSPEND Time Out	Disabled	5 min.*	Disabled, 5, 10, 15, 20, 30, 40 and 60 min.	Third level of power conservation. The setting defines the timeout period to enter into Suspend Mode from Sleep Mode.
Video access as an activity	Disabled	Disabled	Enabled, Disabled	When enabled, allows AMIBIOS to monitor every video access as an event.
Pri. ISA Master as an activity	Disabled	Disabled	Enabled, Disabled	When enabled, allows AMIBIOS to monitor every bus access from an ISA master device as an event.
HDD Standby Time Out	Disabled	Disabled	Disabled, 1, 2, 3, 4, 5, 6, and 7 min.	Sets a non-activity time-out, after which the hard disk is put into Standby mode. Note that once the hard disk has entered Standby mode, the next hard disk access will take a few extra seconds to occur.
LCD Standby Time Out	Disabled	Disabled	Disabled, 5, 10, 15, 30, 45, 60 and 90 sec.	Sets a non-activity timeout, after which an LCD display is put into Standby mode. Any subsequent detected activity will reenable the display.
Resume with Modem Ring	Disabled	Disabled	Disabled, 1, 2 and 4 Rings	Enables and specifies the number of modem rings required to re-activate the CPU when in Suspend Mode.
Suspend Warning Beeps	Disabled	Enabled*	Enabled, Disabled	When Enabled, warning beeps will be sounded before entering Suspend Mode.

* By default, the Power Management Mode option is set to Disabled, and all the other options read Disabled, hiding their actual default settings. Only when the Power Management Mode option is set to Enabled, can you see the default values shown here with an asterisk (*).

TABLE 9-5: Peripheral Setup

Option	Fail-safe Defaults	Optimal Defaults	Possible Settings	Description
OnBoard IDE*	Enabled	Set by BIOS during boot-up	Enabled, Disabled	Set to Enabled to use the onboard IDE Controller.
IDE LBA Mode	Disabled	Disabled	Enabled, Disabled	Set to Enabled to activate LBA (Logical Block Address) mode on the IDE Controller's drive. LBA Mode is available only on Enhanced IDE drives and allows the creation of partition greater than 500MB. IMPORTANT: To enable LBA mode, ensure that the drives are not partitioned; remove partition before enabling LBA mode (under DOS, use the FDISK command).
IDE Block Mode	Disabled	Disabled	Enabled, Disabled	Set to Enabled to allow multiple sector reads and writes with IDE drives (not supported by older IDE drives).
IDE 32 Bit Transfer	Disabled	Disabled	Enabled, Disabled	Set to Enabled to allow 32-bit transfers (when supported by the IDE Controller and drives).
Programming Mode	Manual	Auto	Manual, Auto	When set to Auto, AMIBIOS automatically detects all adapter cards installed in the system and automatically configures the onboard I/O (serial ports, parallel port, floppy controller, and IDE controller). All other Peripheral Setup option settings are ignored. Any serial port, parallel port, floppy controller, or IDE controller on an adapter card in an expansion slot is configured before onboard I/O. If Auto is selected, AMIBIOS also attempts to avoid IRQ conflicts. If the offboard serial ports are configured to specific starting I/O ports via jumper settings, AMIBIOS configures the onboard serial ports to avoid conflicts. When set to Manual, the settings of the other options in the Peripheral Setup apply. When Manual is chosen, AMIBIOS reports any I/O conflicts after displaying the BIOS Configuration Summary Screen.
OnBoard FDC	Enabled		Enabled, Disabled	Set to Enabled to use the onboard Floppy Drive Controller.
Serial Port1	3F8H	Set by BIOS during boot-up	Disabled, 3F8H, 2F8H, 3E8H, 2E8H	The setting defines the Serial Port 1 address. If one of these addresses are used by Serial Port 2, it will not be available.
Serial Port2	2F8H		Disabled, 3F8H, 2F8H, 3E8H, 2E8H	The setting defines the Serial Port 2 address. If one of these addresses are used by Serial Port 1, it will not be available.
Parallel Port	378H		Disabled, 278H, 3BCH, 378H	The setting defines the Parallel Port address.
Parallel Port Mode	Normal	Normal	Normal, SPP, EPP, ECP	Specifies the Parallel Port Mode. SPP = Standard Parallel Port, EPP = Enhanced Parallel Port, ECP = Extended Capabilities Port.
Parallel Port IRQ	IRQ5	Set by BIOS during boot-up	None, IRQ5, IRQ7	Specifies the IRQ line to be used for the Parallel Port.
ECP DMA Channel	None		None, CH0, CH1, CH2, CH3	Specifies the DMA channel used for the Parallel Port's ECP mode.

* In order for the hard disk autodetect feature to function, you must first set the Onboard IDE option to Enabled and then reboot the system.

9.02.4 UTILITY, SECURITY & DEFAULT WINDOWS

TABLE 9-6: Utility and Security Windows

UTILITY WINDOW	
Detect Master	This function automatically finds all IDE parameters for the Master hard drive.
Detect Slave	This function automatically finds all IDE parameters for the Slave hard drive.
<p>IDE drive parameters found with the Detect Master / Detect Slave function are stored in the user defined drive TYPE "USER".</p> <p>IMPORTANT: It is possible that the parameters provided do not match the ones founded in your drive's literature. This should not be considered an error. As matter of fact, different combinations of heads, cylinders and sectors that match the disk's capacity in MB will work when formatting an IDE hard drive. But if the disk is already formatted, it is not possible to use different parameters than the ones that were used when the drive was originally formatted.</p>	
Color Set	Sets the background and the foreground colors of the screen. Available colors are LCD, Army, Pastel and Sky.
SECURITY WINDOW	
Password	Enables / Disables the password feature. You can also change your password.
<p>By default, the user can boot the system and enter the AMIBIOS Setup without any restrictions. Choosing a password for the first time will automatically enable the password feature. At the next bootup, the user will be prompted to enter his password on bootup or when he attempts to enter AMIBIOS Setup, depending on the setting of the PASSWORD CHECKING option in the ADVANCED SETUP.</p> <p>To enable the password:</p> <ol style="list-style-type: none"> 1 - At the prompt "Enter New Password", enter your password and press ENTER. 2 - At the prompt "Confirm New Password", re-enter your password and press ENTER. 3 - The screen displays "Password is Enabled". <p>Make sure you select Save Changes and Exit from the EXIT SETUP window.</p> <p>To change or disable the password:</p> <ol style="list-style-type: none"> 1 - At the prompt "Enter Current Password", enter your current password and press ENTER. 2 - At the prompt "Enter New Password", press ENTER to disable password, or enter a new password and press ENTER to change password. 3 - At the prompt "Confirm New Password", press ENTER to disable password, or re-enter new password and press ENTER to change password. 4 - The screen displays "Password is Disabled" or "Password is Enabled" if password was changed. <p>Make sure you select Save Changes and Exit from the EXIT SETUP window.</p> <p>If you forget your current password, the password feature can be disabled by removing jumper W22 for several minutes; however this will also clear the CMOS Setup, which will then be configured at the BIOS default values.</p>	
Anti-Virus	Anti-virus protection for the hard disk boot sector available from AMIBIOS.

TABLE 9-7: Default Window

DEFAULT WINDOW	
Offers three options to reconfigure automatically the AMIBIOS Setup (the settings are loaded in the program and displayed in their respective fields, but they are not saved in CMOS).	
Original	Resets all options with the last saved CMOS Setup; it will be used to restore the values saved in CMOS, after a number of settings have been changed in the AMIBIOS Setup program.
Optimal	Loads the Optimal Default values. These are common recommended values to optimize system performance. This feature might be useful in instances where a quick reconfiguration is needed.
Fail-Safe	Loads the Fail-Safe Default settings. These are worst-case values that are the most stable values that can be chosen. Use this option as a diagnostic aid if the system is behaving erratically.

SECTION 10 VFLASH SOFTWARE

10.01 INTRODUCTION

VFLASH is TEKNOR's Flash EPROM transfer utility program for single board computers. Its main function is to download DOS files to the 2MB or 4MB Flash EPROM disk (U23), also referred to as data Flash.

A Flash EPROM disk created with VFLASH is very much like a hard disk. A partition is created and data is stored in files, just like on a hard disk. The main difference between the two is that this Flash disk is a read-only drive. Therefore, in order to write software to this Flash disk, you must use the VFLASH Transfer Utility.

However, with the FLASH FILE SYSTEM II software from Microsoft, Flash EPROM disks are read/write and may be accessed via DOS commands (this utility is covered in Section 11).

This Section will describe how to use the VFLASH software utility.

10.01.1 VFLASH SOFTWARE OVERVIEW

Depending on your particular configuration, VFLASH can transfer information to the Flash disk in one of two methods:

1. If your VIPer805 is equipped with hard or floppy drives, then VFLASH downloads data directly on the board's Flash EPROM disk.
2. If your VIPer805 does not have floppy or hard disks, then VFLASH must be run from a remote computer which downloads data to the VIPer805 board via a serial link on COM1 or COM2. This mode is recognized in the BIOS extension as Download Mode and is enabled by installing jumper W14 (1-2) on the VIPer805; in this mode, the VIPer805 board waits for signals from the remote computer's VFLASH software.

The first screen of the VFLASH software allows you to choose between direct and serial downloading (the screen is explained in section 10.02 - OUTPUT SELECTION/FIRST SCREEN).

The next screen is where the address and size of the Flash partition to create are determined (explained in section 10.03 - OUTPUT SELECTION/SECOND SCREEN).

The next step is to select the files in the FILE SELECTION screen, which are to be transferred to the Flash EPROM disk (explained in section 10.04 - FILE SELECTION SCREEN).

The next screen is the LIST OF SELECTED FILES; here the file listing can be verified and modified, duplicate files can be renamed or erased, and the Flash disk can be written (explained in section 10.05 - LIST OF SELECTED FILES).

Finally, the last screen to appear is the TRANSFER STATUS OF ONBOARD FLASH PROGRAMMING or the TRANSFER STATUS OF EXTERNAL FLASH PROGRAMMING; this screen displays each of the transfer operations in progress (explained in section 10.06 - TRANSFER STATUS SCREENS).

The above sections explain how to run the program in interactive mode via menus, but it is also possible to run the program without menus by a command which specifies the selected options and files with parameters; this mode is called batch mode (explained in section 10.07 - BATCH MODE).

10.01.2 TYPES OF FLASH EPROM DISKS

With VFLASH, you can create two types of Flash EPROM disks:

1 - Bootable Flash Disk:

This type of Flash EPROM disk must start from the first block and is recognized by the BIOS. Like a hard disk, an active Flash EPROM disk can boot your system. A typical system setup would contain a CONFIG.SYS file to start device drivers, an AUTOEXEC.BAT file to start your software, plus all driver files required (e.g., EMM386.EXE, a MOUSE driver, etc).

To boot from Flash EPROM three conditions must be met:

- You must have the optional 2MB or 4MB Flash EPROM installed at U23.
- The bootable Flash EPROM partition must start from the first block.
- The Flash disk must be configured in the VIP-UP Setup as the C: drive (section 9.01).

2 - Non-bootable Flash Disk:

Unlike bootable Flash disks which must begin at the first Flash block, non-bootable disks can begin anywhere.

10.01.3 VFLASH REQUIREMENTS

VFLASH is designed to operate in an IBM compatible environment.

The MS-DOS operating system has been successfully tested with VFLASH; MS-DOS compatible operating systems such as DR-DOS and PC-DOS should therefore support VFLASH. Operating systems such as QNX and OS-9000 are not supported by VFLASH (other utility programs are available for such operating systems; please contact our Technical Support department for more information).

If you intend to directly program Flash device on the VIPer805, VFLASH must be running on board.

If you need a remote computer to program Flash device on the VIPer805 (host), then the board must be in Download Mode and VFLASH must be running on the remote computer. A serial cable must be connected between the COM1 or COM2 ports, in the same way as in VT100 mode (the remote computer is cabled like a VT100 terminal, see Section 13 - VT100 MODE).

☞ **To properly run VFLASH, you need at least 1 floppy drive, 1MB of DRAM, MS-DOS® or PC-DOS (version 2 or greater) or DR-DOS (version 3. 41 or greater).**

10.02 OUTPUT SELECTION/FIRST SCREEN

To run VFLASH, simply type "VFLASH" at the DOS prompt and press ENTER.

The first OUTPUT SELECTION FOR THE TRANSFER screen appears with the following options:

On board Flash devices.

External Flash devices via serial link.

Quit VFLASH and return to DOS.

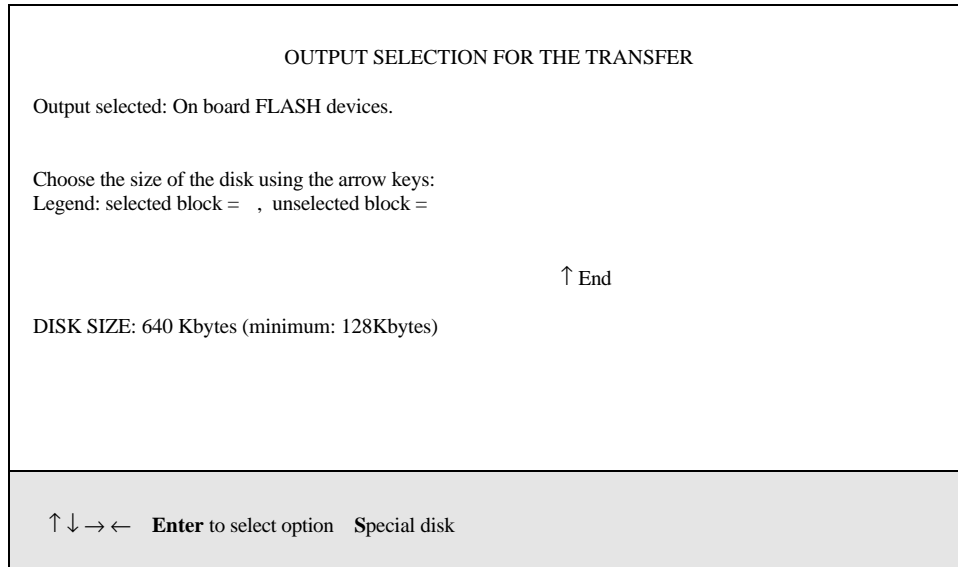
Use the ↑ and ↓ keys to highlight the option and then press ENTER to select.

On board Flash Devices: Use this option when VFLASH is run on a Board with Flash EPROM to be programmed directly on the board.

External Flash Devices via a Serial Link: Use this option when VFLASH is run from a remote computer, or when your VIPer805 has no floppy or hard disks, or simply because the data to transfer is on a different computer than the VIPer805 and Flash EPROM disk. The transfer takes place via a serial link on COM1 (3F8H) or COM2 (2F8H) from the remote computer to the VIPer805.

10.03 OUTPUT SELECTION/SECOND SCREEN

Once onboard or external Flash is selected, a second screen appears as follow.



On the first line, the output selected will be displayed ("On board FLASH devices" or "External FLASH devices via serial link").

The rest of the screen allows you to divide or partition the Flash disk according to your needs. The default disk always starts at the beginning of the Flash space and the size is all Flash selected. Therefore, a full bar will be displayed below the legend.

Directly below the bar is an END pointer. It shows where the Flash partition ends. The next line shows physical parameters such as the DISK SIZE of selected blocks. It also shows the minimal partition size you have available. The minimal disk size can be altered by the /G:x option (for details on this option, please refer to Section 10.07 - BATCH MODE).

To set the size of the disk, move the END pointer with the horizontal keys.

10.04 FILE SELECTION SCREEN

Once you have selected the output, the following information is displayed on screen:

Selected files (max 240):0;		Free Space to copy: 522240 bytes	
DRIVE A: COMPLETE COPY DRIVE B: COMPLETE COPY DRIVE C: DRIVE E: DOS <DIR> QAPLUS <DIR> TEMP <DIR> TP <DIR> VENTURA <DIR> ATTR2 PAS 569 1-04-91 9:32 AUTOEXEC BAT 74 2-14-91 16:12 BOOTDIR PAS 6508 3-03-91 13:31 COMMAND COM 25308 2-02-91 12:25 CONFIG SYS 128 1-01-91 14:42		DRIVE A: TO CHOOSE FILES DRIVE B: TO CHOOSE FILES DRIVE D: BIOS 700 <DIR> PCAD <DIR> SKEY <DIR> TEST <DIR> TYPESET <DIR> WIN <DIR> AUTOEXEC BAK 59 2-14-91 16:11 BOOT_DIR PAS 158 1-25-91 16:58 CHOIXMED PAS 19797 3-06-91 1:11 COMMANDE PAS 6110 2-21-91 15:57 CONFIG SYS 128 1-23-91 17:45	
21 Files, D:*.*			
(Tag Untag New dir) or Enter Block Make bootable Done Esc to quit ↑ ↓ → ← Home PgUp PgDn Volume label			

This menu allows the user to choose the files that will eventually make up the Flash disk. Files can be chosen from the various drives on the system.

The top line in this menu gives size information about the Flash partition. **SELECTED FILES** indicates how many files have been chosen up to this point. **FREE SPACE TO COPY** indicates the available Flash space found, minus the space used up by the selected files.

The largest block of information (center screen) is the **FILE AREA**. It lists the files in the current directory.

Highlighted files are marked for copying to Flash devices.

Entries marked with a "<DIR>" extension indicate a subdirectory. When you select a subdirectory, the first two entries are displayed as ". <DIR>" and ". . <DIR>". As with DOS, "." refers to the actual directory and ".." to the parent directory. Thus, if you do a "Newdir" command on the ". . <DIR>" you will return to the previous directory.

Entries marked as "Drive A:" or "Drive B:" allow you to change drives/directories or to select files. "DRIVE A/B: TO CHOOSE FILES" is used to select files. "DRIVE A/B: COMPLETE COPY" is used to make an exact copy of a floppy disk to Flash. This last function resembles a DOS DISKCOPY command. When this mode of transfer is chosen, no other files can be sent along with the diskette files. Note that you cannot use a write-protected floppy disk to create a bootable Flash disk.

The bottom of the screen is dedicated to the MESSAGE AREA and MENU COMMANDS.

The MESSAGE AREA gives indications and warnings with respect to file selection operations.

The MENU COMMANDS begin with a highlighted letter or identifier which indicates the key to press in order to execute the desired function. The following commands are available:

TAG: Use this function to select a file from the above file list. Simply move the cursor over the desired field and press T on your keyboard. The file will then be highlighted - indicating it was selected. If you press T again, you deselect the file.

UNTAG: This function is used to deselect a chosen file from the above list of files. To use this function, simply move the cursor over the desired file and press U.

BLOCK: This function is used to mark a group of files for selection or deselection. Move the cursor to the beginning of the first file you wish to select and press on the B key (a ">" symbol will be displayed after "Block" in the command area to remind you that a block has been entered). Then, move the cursor to the last file of the group and press B again (a "<" will appear next to the ">" indicating that a block definition is now complete). The block of outlined files are now ready to be "Tagged" or "Untagged".

MAKE BOOTABLE: Choose this function to move files you wish to make bootable into the FILE SELECTION area (to appear in the LIST OF SELECTED FILES screen). The system will then prompt you for the drive which contains the system files (Note that the source should not be a Flash disk, since these are read-only and write protected). Once the

selected files are found, the "Make Bootable" command will be changed to "BOOTABLE DISK". This confirms that the Flash disk will be bootable.

NEWDIR: This function lets you enter or exit a drive or directory. To change directories, place the cursor at the desired entry and press N. The listing will automatically change to the new directory's content.

ENTER: Press ENTER to either tag, untag, or change directory. When the cursor is on a directory, ENTER is equivalent to "Newdir". When the cursor is on a file, pressing ENTER will tag/untag it.

DONE: Use this function when the file selection is terminated. Press D and the next screen will appear (LIST OF SELECTED FILES).

ESC: Press the ESC key to abort VFLASH without modifying any information in the Flash devices. The system will prompt you before exiting to DOS.

VOLUME LABEL: Use this function to include a disk volume label for the Flash EPROM disk. Simply press V on your keyboard to bring the message into the following format:

```
Volume is xxxxxxxxxxxx
Volume label (11 characters, ENTER for none)?
```

The same operating system limitations on volume label names apply.

The cursor can be moved within the FILE SELECTION screen by using the ↑, ↓, →, ←, PAGE UP, PAGE DOWN and HOME keys.

10.05 LIST OF SELECTED FILES SCREEN

The LIST OF SELECTED FILES screen shows you the list of files that the Flash disk will contain.

LIST OF SELECTED FILES			
Disk volume label: xxxxxxxxxxxx			
AFIRST.ASM	AFIRST.BAK	AFIRST.OBJ	ASECOND.ASM
ASECOND.BAK	ASECOND.OBJ	ATTR2.PAS	BOOTDIR.BAK
BOOTDIR.BAK	BOOTDIR.PAS	COMM.ASM	COMM.BAK
COMM.OBJ	COMMANDE.PAS	COPYXB.BAK	COMMBAK.BAK
COPYXAC.BAK	COPYXAC.BAK	COMMBAK.ASM	ECRANSFX.DOC
Program Change Selection		Esc to quit	
↑ ↓ PgUp PgDn Home			

The list of previously selected files appears in the center of the screen.

You can browse through the list by using the ↑, ↓, PAGE UP, PAGE DOWN and HOME keys.

The following commands are also available:

CHANGE SELECTION: This option allows you to return to the FILE SELECTION screen by pressing C.

PROGRAM: Press P to enter the Programming (TRANSFER STATUS ...) screen. This will begin programming the Flash devices - according to the transfer mode selected (on board or external Flash).

ESC: This allows you to abort VFLASH and exit to DOS without modifying the contents of the Flash devices.

If duplicate files are found, the DUPLICATE FILES MENU section appears below the list of selected files. This section will appear only if two or more files with the same name are

found. When this occurs, a menu will automatically appear in the bottom section to solve the conflict:

LIST OF SELECTED FILES			
Disk volume label: xxxxxxxxxxxx			
AFIRST.ASM	AFIRST.BAK	AFIRST.OBJ	ASECOND.ASM
ASECOND.BAK	ASECOND.OBJ	ATTR2.PAS	BOOTDIR.BAK
BOOTDIR.BAK	BOOTDIR.PAS	COMM.ASM	COMM.BAK
COMM.OBJ	COMMANDE.PAS	COPYXB.BAK	COMMBAK.BAK
COPYXAC.BAK	COPYXAC.BAK	COMMBAK.ASM	ECRANSFX.DOC
DUPLICATE FILES MENU			
E:\BOOTDIR.BAK			
E:\TP\BOOTDIR.BAK			
1:Rename duplicate(s) (file.ext,file1.ext,etc)			
2:Rename or erase duplicate(s)			
3:Erase remaining duplicates			
Esc to quit			Select list

Make a selection by choosing the corresponding number. Choosing:

1. Will force a rename by appending a numeral at the end of the filename.
2. Will erase or rename files manually.
3. Will erase all duplicates.

When the final selection has been made and the final listing is displayed, the Flash disk can then be written.

10.06 TRANSFER STATUS SCREENS

10.06.1 TRANSFER STATUS OF ONBOARD FLASH PROGRAMMING SCREEN

TRANSFER STATUS OF ONBOARD FLASH PROGRAMMING
Erasing of all Flash devices installed, please wait. . . Erasing nth device. . . Erase completed
Creating a bootable Flash disk
Transferring the BOOT sector, FAT and root DIR . . . Completed
Copying selected files. . . Transfer completed: XX. X%
Transferring: FILENAME
Transfer complete

This screen displays each of the transfer operations in progress:

1. First, the Flash devices are erased. This operation can take some time to complete. Only the Flash devices of the actual disk to be programmed will be erased, however.
2. The base system information is then transferred. This is followed by the file data itself.
3. The transfer in progress is displayed by XX%, and the actual file being copied is also shown (unless a complete diskette copy is performed).

Restart the system if the disk is to be recognized by the TEKNOR BIOS extension. Although rebooting is not necessary if Flash disks were not created, it is a recommended procedure in all circumstances.

10.06.2 TRANSFER STATUS OF EXTERNAL FLASH PROGRAMMING SCREEN

When a serial link is used, the following screen will be displayed:

TRANSFER STATUS OF EXTERNAL FLASH PROGRAMMING
Erasing of all Flash devices installed, please wait. . . Erase completed
Creating a bootable Flash disk
Transferring the BOOT sector, FAT and root DIR. . . Completed
Copying selected files. . . Transfer completed: XX. X%
Transferring: FILENAME
Elapsed time: Xmin XXsec
Transfer complete

The above screen is used to display the transfer operation status. It shows each step in progress:

1. The devices are erased (this may take some time).
2. The base system information is transferred, followed by the file data itself.
3. The data progress is displayed by XX% up to 100%. The actual file being sent is also shown (unless a complete diskette copy is performed). In addition, the elapsed time of the transfer is displayed.

If an error occurs during transfer, the system beeps twice to warn the user.

To signal the end of a successful transfer, a single beep is heard.

☞ **The transfer operation can be time consuming in Serial Mode due to the serial transfer speed and protocol.**

4. When the transfer is 100% complete, the following message is displayed:

VFLASH Software 10-12

Do you want to Reset the receiving system?

This software command is made available to restart the receiving system by remote. In order for a new Flash disk to be recognized by the BIOS and DOS, the system must be rebooted.

The receiving system can be put in Download Mode by any of the following options:

1. Short Pins 1 and 2 on jumper W14. This forces Download Mode at boot up.
 2. Download Mode is automatically enabled when VT100 Mode is activated by shorting Pins 3 and 4 on jumper W14. In this case, the communications port will recognize the Download Mode commands and activate it.
- ☞ **Reset is the only way to exit from Download Mode which is forced on at setup by the W14(1-2) jumper. If Download Mode was entered by recognition of the code sequence, you can simply exit Download Mode and continue processing.**

10.07 BATCH MODE

While files can be manually selected using the Interactive Mode, automatic transfers of a predefined area (a sub-directory or preferably a diskette) can be achieved through Batch Mode.

In Batch Mode, a user or field technician with no previous knowledge of the system can easily effect a transfer to the Flash disk. This can be done either by calling a batch file (*.bat) or by simply issuing the proper command line parameters directly from DOS.

When the transfer is complete, reset the system. This allows the BIOS and DOS to recognize the new Flash disk.

Keep in mind that Batch Mode can be called directly from a floppy or hard disk, from a remote computer, or from a portable computer. In each case, the selected files can be downloaded to the Flash devices.

Batch Mode returns error codes (errorlevel) that can be read by a DOS batch file or by a high level language program.

10.07.1 BATCH MODE COMMAND LINE PARAMETERS

The command line format is as follows:

VFLASH [drive:] [\directory] [destination] [options]

where:

[drive:] is the source drive from which a complete copy will be made if no directory is specified (see section 10.04, for more information).

[\directory] is the path used to show from which directory the source files will be taken and transferred to the Flash or EPROM files. If you do not specify a directory (for example, VFLASH B:\), only the files in the root directory will be transferred to the Flash disk. Also, if the Flash disk is to be bootable, the /B option must be used.

Each option or switch starts with a '/' character followed by one or more letters. These letters are in uppercase and are used by VFLASH to identify a specific option.

A colon ':' or pound '#' character is also a necessary part of the switch. Lowercase letters represent a variable field that must be entered. Each switch may be separated by a space if you so choose.

The switches may be written in random order except for switches that are linked together. For example a /S must be followed by either /#order or /sizeK or both. Thus, a command line such as VFLASH B: /M /S/#2/128K is valid, however, VFLASH B: /S/M/#2/128K is not. The following list of options provides complete descriptions.

The first three options listed are not required to execute a disk. They can be used either in Interactive Mode or Batch Modes.

[options]

/G:group Specifies how many Flash blocks will be grouped together as a cluster. The Group Factor will set the smallest disk size available. Valid group values are defined as 1, 2, 4, 8, 16... and so on.

/M Instructs VFLASH to use a monochrome display pattern. This option is useful with LCDs since it may be difficult to distinguish colors with such displays.

/VT100 This option allows a visual monitoring of the transfer operation in progress while in VT100 mode. Use this switch when you make an onboard Flash disk.

The following options identify disk or file parameters to be executed in BATCH mode.

/B/bootdrive:

Makes the disk bootable by transferring the bootable files from the 'bootdrive' specified. Note that the source should not be a Flash disk, since these are read-only and write protected.

/E Performs an external transfer by serial link to the remote system. This switch must be present in order to use any of the next three options (/RATE, /COM2 and /R).

/rate The value entered corresponds to the desired baud rate for transfer. Any one of the following can be used: 300, 1200, 2400, 9600, 19200, 38400. It is set at 19200 by default.

/COM2 This option instructs COM2 to be used instead of the default value COM1.

- /R** Instructs VFLASH to reset the VIPer805 upon completion of download operation. This is valid only in VT100 Mode. In Download Mode, the remote system is always reset.
- /S** Used to create a special disk or partition. This option precedes the starting device number option (**/#order**) or the disk size option (**/sizeK**), or both.
- /#order** Specifies the Flash block to be used as the starting point for a disk partition (default setting is #1).
- /sizeK** Specifies a special disk size, in KB, for the Flash disk. The default setting is the largest disk size following the designated starting disk as selected in the **/#order** option).
- /V:volume label**
This switch specifies a volume label for the disk to be created. This option will report an invalid command line error if it is used while transferring a complete copy of a floppy disk. Since it is acceptable to have spaces in a volume label, do not place this switch before [drive:], [\directory] or [destination] since VFLASH would not be able to determine when the label ends and when these options begins.

To get a summary of the Batch Mode options from VFLASH, simply run VFLASH with the command line **/?** or **/HELP** (type **'VFLASH/?'** or **'VFLASH/HELP'**). Either command will display a Batch options summary and some examples of valid VFLASH command lines. The same help information will also be displayed each time VFLASH detects an error in the command line.

10.07.2 BATCH MODE ERROR CODES

The following error messages are returned by the VFLASH Batch Mode function. They can be detected with a DOS errorlevel condition.

ERROR (HEX)	NUMBER (DECIMAL)	DESCRIPTION
0	0	No error.
1	1	Bad command line.
2	2	Invalid drive choice for recovering boot information.
3	3	Unable to establish communication (serial download mode only).
4	4	No Flash memory found (verify jumper).
5	5	Mixed memory types detected in Flash bank.
6	6	Unable to find system files on specified disk.
7	7	Specified output file already exists.
8	8	Error reading transfer source drive.
9	9	Insufficient data space or directory space to copy all desired files.
A	10	Bad checksum (problem with serial link).
B	11	Non Hex code received (problem with serial link).
C	12	Error transferring data. Unusable Flash drive.
D	13	No files to transfer in selected directory.
E	14	Unable to open a file to be copied.
F	15	Media not yet supported.
10	16	Communications or device error while transferring files. Unusable Flash drive.
11	17	Unable to read transfer source drive.
12	18	Insufficient Flash space to store files.
13	19	Unrecognized Flash device type.
14	20	Programming failure on devices.
15	21	Cannot select any file from actual Flash disk.
16	22	Unable to find sourcefiles.
17	23	Cannot specify starting device on remote system.
18	24	Cannot find starting Flash bank address.
19	25	Communication error while reading Flash bank content.
1A	26	External device cannot be erased properly.
1B	27	Unsupported serial download function.

ERROR (HEX)	NUMBER (DECIMAL)	DESCRIPTION
1C	28	Flash content does not verify with source.
1D	29	No device found in specified starting socket.
1E	30	Cannot create a Flash disk of specified size.
1F	31	Communication error when reading Flash identification code.
20	32	Cannot use 8086 or 8088 CPU with Flash memory.
21	33	No serial port or card attached for transfer.
22	34	/S switch not supported with this BIOS.
23	35	/G:group value on command line is invalid.
24	36	Insufficient Flash or EPROM space to include the volume label entry.
25	37	Cannot make EPROM with same [source] and [destination] path.
26	38	EPROM filename already exist.
27	39	EPROM filename path not found.
28	40	Selected drive for EPROM files not ready.
29	41	Invalid EPROM filename or disk error.
2A	42	Not enough disk space to copy EPROM files.
2B	43	Not enough memory for data buffer.
2C	44	Command line option "/TEKXXX" is invalid.
2D	45	486SLC internal registers are different from BIOS setup.
2E	46	The 486SLC cache is not disabled over the Flash device(s).
2F	47	Unable to erase the nth device.
30	48	No VIPer BIOS found.
31	49	The source diskette must be DOS Version 4 and up.
32	50	Flash ID command to BIOS or data Flash must be issued first.

SECTION 11

FLASH FILE SYSTEM II

With FLASH FILE SYSTEM II, a read/write MS-Flash partition can be created in the 2MB or 4MB Flash EPROM device (located at U23 on component side). Such a partition can be accessed via the DOS commands.

Section 10 - VFLASH Software - explained how a read-only Flash partition is created with VFLASH and how data can be stored in files with the VFLASH Transfer Utility.

The 2MB or 4MB user or data Flash device can be configured in one of four ways:

- As one read-only partition, created by VFLASH. This partition can be created as a bootable or non-bootable disk. See Section 10 for more information.
- As one read/write MS-Flash partition created by FLASH FILE SYSTEM II.
- As a combination of the above two: one read-only VFLASH partition, followed by one MS-Flash read/write partition. The system will set up both as a different drive, with the MS-Flash disk always the last. For example, VIP-UP can set up the VFLASH disk as C:, other hard disks as D: and E:, while the MS-Flash disk, in this case, would automatically be set up as the next drive letter, that is F:. Another example could be only one hard disk, with the following setup: hard disk (C:), VFLASH disk (D:) and MS-Flash disk (E:).
- The fourth possible configuration is similar to the previous one except that space (one or more memory block) is left between the VFLASH disk and the MS-Flash disk. This non-partitioned space can be used by special applications to store data; this can only be done safely if one knows the exact address of these memory blocks.

FLASH FILE SYSTEM II can be purchased from TEKNOR and is not part of the standard VIPer805 package and utilities.

The following sections explain how to create and format an MS-Flash partition with MEMCARD.EXE, and how to set up your partition in CONFIG.SYS.

11.01 SETTING UP CONFIG.SYS FOR FLASH FILE SYSTEM II

Two lines must be included in your CONFIG.SYS file in order to set up the MS-Flash partition and to install the Microsoft FLASH FILE SYSTEM on your computer.

The first line differs depending on whether the Flash device has a VFLASH partition or not:

- If there is only the one MS-Flash partition on the device, these two lines must be included in CONFIG.SYS:

```
device=FFS_VIP.EXE
device=MS-FLASH.SYS
```

- If there is a VFLASH partition as well as an MS-Flash partition on the device, these two lines must be included in CONFIG.SYS:

```
device=FFS_VIP.EXE /start=X
device=MS-FLASH.SYS
```

where X can be replaced by the appropriate number of blocks which must be skipped from the beginning of the device. For example, a user created a bootable disk using VFLASH in the first four blocks of the Flash device; the size of each block is 64 KB. This leaves the remaining 64KB blocks for an MS-Flash partition which will begin at the fifth block. The two lines to add in CONFIG.SYS are therefore:

```
device=FFS_VIP.EXE /start=4
device=MS-FLASH.SYS
```

By default, the system uses start=0, meaning no blocks are skipped and the MS-Flash partition begins at the first block. That is why the /start switch is not needed if there is one MS-Flash partition on the Flash device.

11.02 CREATING & FORMATTING AN MS-FLASH PARTITION

FLASH FILE SYSTEM II on the VIPer805 allows only one MS-Flash read/write partition on the data Flash device.

The MEMCARD software is used to create and format an MS-Flash partition. The program can be used in one of two ways, by:

- û Running the program interactively and making selections in the menus, or
- û Executing the command from the DOS prompt with switches to specify the drive letter and volume label of the drive you want to format or to check the Flash device for errors.

Note: Prior to creating a new or expanded MS-Flash partition, you must erase any non MS-Flash section it will occupy. To do this, select option 5 - Erase entire memory card - in the MEMCARD program. This erases the whole partition that will be used by FLASH FILE SYSTEM, not the whole Flash disk.. For example, if one had specified FFS_VIP /START=10 in CONFIG.SYS, only the 384KB used by this partition will be erased.

11.02.1 USING MEMCARD MENU OPTIONS

To use the MEMCARD program with the menu options, follow these steps:

1. Type MEMCARD at the command prompt. The main menu appears as follow:

```
PC Memory Card Setup Program Version 2.00  
(C) 1991-1992 Microsoft Corporation
```

```
Memcard Options
```

```
Current memory card slot: 1 of 2 slots
```

```
Choose one of the following:
```

1. Create and format a new partition
2. Format an existing partition
3. Delete a partition
4. Display partition information
5. Erase entire memory card
6. Check memory card and fix errors
7. Select next memory card slot

```
Enter your choice. [4]
```

```
To quit Memcard, press ESC.
```

If your computer includes only one memory card slot, option 7 will not appear on the main menu.

To choose a menu option, type its number, and then press ENTER. When you choose menu options 1 through 6, another menu appears. To return to the main menu, press ESC. To quit MEMCARD, return to the main menu and press ESC.

2. To create and format an MS-Flash read/write partition, select 1 from the menu. A Create and Format a New Partition screen such as the following appears:

Current memory card slot: 1

Letter	Type	Status	Size
D	MS-Flash	Formatted	2048K

If the card already has one MS-Flash partition, the following message appears at the bottom of the screen:

This card has already been formatted.
Creating a partition will destroy all the data on the card.

Do you want to continue? (Y/N) [N]

Create a new partition only if you have backed up all the data that you want to save. To continue, type "Y", and then press ENTER.

3. If the card is unformatted or has one large partition, the following message appears:

Do you want to use the entire card for MS-Flash? (Y/N) [Y]

To create and format one large partition, type "Y", and then press ENTER; to create and format a partition that occupies only part of a memory card, type "N", and then press ENTER.

4. This step is only if you are creating a partition that will occupy only part of the Flash device: Specify the size of the partition you want to create, and then press ENTER. The minimum size depends on the amount of free space available on the memory card. The number that appears on your screen is the largest amount of available space.
5. Specify the number of spare blocks that MS-Flash should reserve for memory card cleanup, and then press ENTER. The default is 1. Although reserving extra blocks may speed up the memory card slightly, you will not be able to use the reserved blocks for files. The default is recommended.
6. Specify a volume label for the partition, and then press ENTER. If you do not want to specify a volume label, leave the field blank, and press ENTER.

11.02.2 USING MEMCARD DIRECTLY FROM THE COMMAND PROMPT

If you use switches with the MEMCARD command directly from the command prompt, you can format memory cards and check Flash memory cards for errors.

Syntax MEMCARD /FMT=*drive*: [/V=*label*]
MEMCARD /CHK=*drive*: [/F]

Parameters *drive*: Specifies the drive you want to format.

label Specifies the volume label.

Switches /FMT= Formats the memory card partition associated with the specified drive.

 /V= Specifies a volume name for the newly formatted memory card.

 /CHK= Checks the specified Flash memory card partition for errors and displays a status report. If no drive is specified, MEMCARD will check the current drive.

 /F Fixes errors found on a Flash memory card. If this switch is not specified, the errors are displayed, but not fixed.

For example, you can assign an entire memory card to drive D and specify the volume label CARD1, if you type the following at the command prompt:

```
MEMCARD /FMT=D:/V=CARD1
```

Here's another example: You can check partition E for errors, fix any errors that are found, and display the status of the partition, if you type the following at the command prompt:

```
MEMCARD /CHK=E: /F
```

SECTION 12

UPDATING BIOS WITH UBIOS

UBIOS is a utility that allows you to take BIOS files from a disk and update the Flash BIOS EPROM with them. It also allows the reverse operation - to copy the contents of the Flash BIOS to files on disk.

The program can be executed in one of two modes:

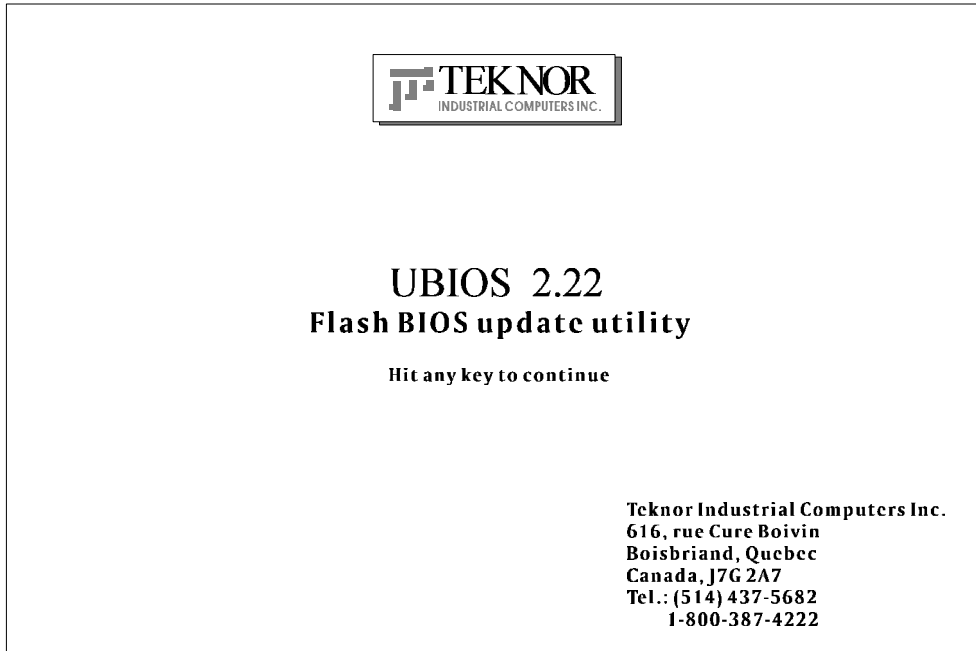
- **Interactive Mode:** In this mode the program is menu-driven. This mode is explained in section 12.01.
- **Batch Mode:** It is also possible to run the program without menus by a command which specifies the selected options and files with parameters. This mode is explained in section 12.02.

Both the Interactive Mode and the Batch Mode are available in VT100 mode (Section 13). The small differences will be explained in the sections noted above.

Note: Using UBIOS 2.15 and up to update the main BIOS (AMIBIOS), will clear the CMOS Setup in ROM. Therefore, it is recommended that you take note of your Setup parameters (especially Hard Disk parameters), so you can reset them afterwards.

12.01 UBIOS - INTERACTIVE MODE

To run the program in interactive mode, type "UBIOS" from the DOS prompt and the following screen will be displayed:



This is simply a presentation screen. To continue, hit any key on the keyboard. This brings you to the main menu.

In VT100 mode, type "UBIOS /VT", leaving a space between "UBIOS" and "/VT".

If you have a monochrome monitor or a CGA monitor, type "UBIOS/low", for low resolution.

The presentation screen in low resolution or VT100 mode is different from the one appearing above, but it works the same way: To continue, you must hit a key on the keyboard, which brings you to the main menu.

12.01.1 MAIN MENU

The main menu appears as follow:

UBIOS 2.22	
Write Flash BIOS device	Retrieve a BIOS to a file
1-Update all BIOS	6-Copy all BIOS
3-Update Teknor's BIOS extension	8-Copy Teknor's BIOS extension
5-Update main BIOS	0-Copy main BIOS

The main menu displays two groups of options: Write Flash BIOS device (options 1,3, 5) and Retrieve a BIOS to a file (options 6, 8, 0). The first group includes five options which allow you to update the Flash BIOS EPROM with a BIOS file stored on disk. The second group includes five options which allow you to copy the contents of the Flash BIOS EPROM to files on disk.

All four BIOS can be accessed individually using the appropriate files. Note that the different BIOS files have different extensions:

- All four can be combined in a single file with the .BIN extension.
- TEKNOR's BIOS extension file have the .EXT extension.
- MAIN BIOS files have the .ROM extension.

Selections are made in one of two ways:

- Enter the corresponding number (e.g. "1" for Update all BIOS).
- Use the ↓ or ↑ keys to highlight the desired option and press ENTER.

12.01.2 UPDATE MENU

If you select from the first group of options in the Main Menu (1, 3, 5), a screen similar to the following appears:

UPDATE	
You are currently using :VGA version AAB :Teknor's extension version 0.60 :main BIOS version 0.60 Directory:F:\LOGICIEL\UBIOS\UBIOS210.NOT	
FILES	DOCUMENTATION
.. <DIR> B800_060.BIN B800_987.BIN B801_612.BIN	No documentation available

The screen displays three windows:

- **UPDATE:** This window displays the current BIOS files being used; it shows all types of BIOS, not just the one selected from the main menu. On the bottom of this window, the current directory is also displayed.
- **FILES:** This window displays the first fourteen files of the type selected in the main menu (All, TEKNOR or Main) in the current directory.
- **DOCUMENTATION:** If there is no BIOS file for the type you wish to update, this message appears in the DOCUMENTATION window: "No corresponding file in that directory". However, when a filename is displayed in the top window, the DOCUMENTATION window will show the content of a .DOC file, if it is available. This file is a standard text file that can be created with a standard text editor; it must have the same filename as the BIOS file and the extension .DOC. If no .DOC file is available, then this message appears in the DOCUMENTATION window: "No documentation available".

The path and name of the current directory will be displayed next to "Directory:" in the top window.

The FILES window displays the files of the selected type (.BIN, .EXT or .ROM). Follow these instructions for selecting a file in the FILE window of the UPDATE screen:

- Letter for a drive: By typing the desired drive letter, you can change the current drive.
- ↑↓ to change files\directory: Use the ↑ or ↓ key to travel through the files of the current directory. When a directory is selected (see <ENTER> to select below), then the ↑ or ↓ key is used to scroll up or down the file list. To move quickly to a directory, press the F2 key and type the first letter of the desired directory next to "Scan:" (displayed in the FILES window).
- <ENTER> to select: Press ENTER to select the highlighted directory or file. When "..<Dir>" is displayed, pressing ENTER will bring you one level up to the parent directory. When a BIOS file is displayed, pressing ENTER will bring a pop-up message on the screen : "Do you really want to update: Flash BIOS, filename (Y/N)". If you type "Y", then the file will be used to update the Flash BIOS.

Aside from the ↑ or ↓ key, other keys can be used to travel through the FILES window of the current directory:

- HOME: This moves to the top of the current directory and displays the first fourteen files.
- END: This moves to the bottom of the current directory and displays the last fourteen files.
- PAGE UP: This moves up by fourteen in the current directory.
- PAGE DOWN: This moves down by fourteen in the current directory.

The above keys are displayed in a Help screen by pressing the F1 key.

After an update was made with a file of version 0.61 and up, the following message appears on the screen: "Do you want to reboot now (Y/N)". If you type "Y", the system reboots and the new configuration comes into effect; otherwise, if you type "N", a message appears to inform the user that he will have to reboot if he wants the new configuration to become operational and the program exits to the operating system prompt.

12.01.3 FLASH BIOS COPY MENU

If you select from the second group of options in the Main Menu (6, 8, 0), a screen similar to the following appears:

```
FLASH BIOS COPY
You are currently using version 0.60

File name for extension BIOS file (.EXT):
```

The top part of the screen displays the current BIOS files being used; it shows all types of BIOS, not just the one selected from the main menu.

Then the following is displayed below: "File name for Flash BIOS file ():".

To copy the selected BIOS to a file, follow these instructions:

- File name for Flash BIOS file (): The file extension of the selected type will appear in the parentheses: .BIN, .EXT or .ROM.
- Type in the name of the BIOS file to create and press ENTER to proceed.

Once done, the program will exit to the operating system prompt.

12.02 UBIOS - BATCH MODE

While files can be manually selected using the Interactive Mode, Flash BIOS Update or Copy can be achieved through Batch Mode.

12.02.1 BATCH MODE COMMAND LINE PARAMETERS

The command line format is as follows:

UBIOS -B [operation] [filetype] [filename] [options]

where:

[operation] is the Flash BIOS operation you wish to perform, and can be replaced with one of two letters: U for Update, or C for Copy.

[filetype] is the filetype of the BIOS file to program (with an update operation) or to create (with a copy operation), and can be replaced with one of the following:

ALL for All BIOS files in a single file with the .BIN extension,
TEKNOR for TEKNOR's BIOS extension with the .EXT extension,
MAIN for Main BIOS with the .ROM extension.

[filename] is the name of the BIOS file to program (with an update operation) or to create (with a copy operation), and can be replaced with the filename which corresponds to the filetype. For example, if "TEKNOR" was listed as filetype, then the filename could be "TEK3.EXT".

[options] these are optional parameters that may be added:

/C This option will no clear the CMOS Setup when updating main BIOS (AMIBIOS), however this is not recommended since the CMOS Setup should be updated when the main BIOS is changed.

/R Instructs UBIOS to reset the board upon completion of an operation.

/VT This option allows a visual monitoring of the Flash BIOS update/copy operation in VT100 mode.

To get a summary of the Batch Mode options from UBIOS, simply call UBIOS with the command line '?'. The command will display a Batch options summary of valid UBIOS command lines. The same help information will also be displayed each time UBIOS detects an error in the command line.

SECTION 13

VT100 MODE

The VIPer utilizes a feature known as VT100 Mode. This mode enables your single board computer to run without a local keyboard or screen. That is, operation can be controlled via a remote terminal supporting VT100 Mode or a computer with a terminal emulation program (for example, Telix, Procomm).

13.01 REQUIREMENTS

To use VT100 Mode, the board must be supplied with ± 12 volts. This is the voltage required by the RS-232 drivers.

The terminal you are using should emulate a VT100 or ANSI terminal. Although this is not an absolute requirement, strange characters may appear on screen if it does not. This occurs because the VT100 recognizes these control characters, and causes them to perform a specific function, for example, screen erase, cursor position, and so on.

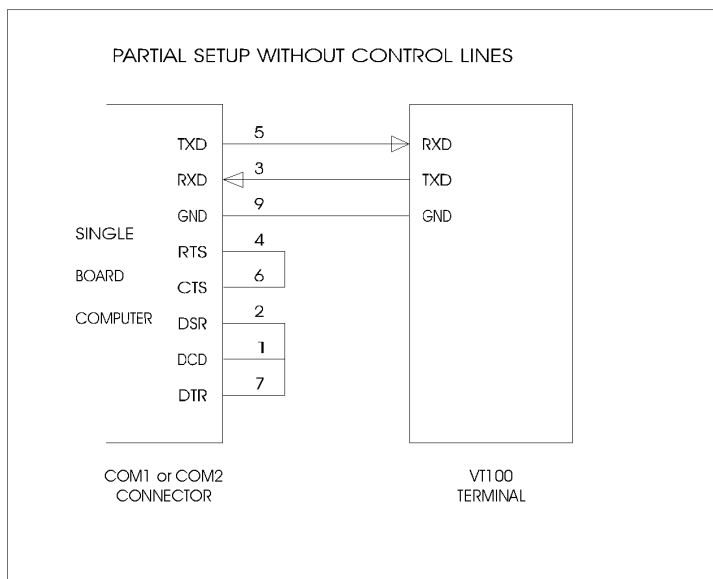
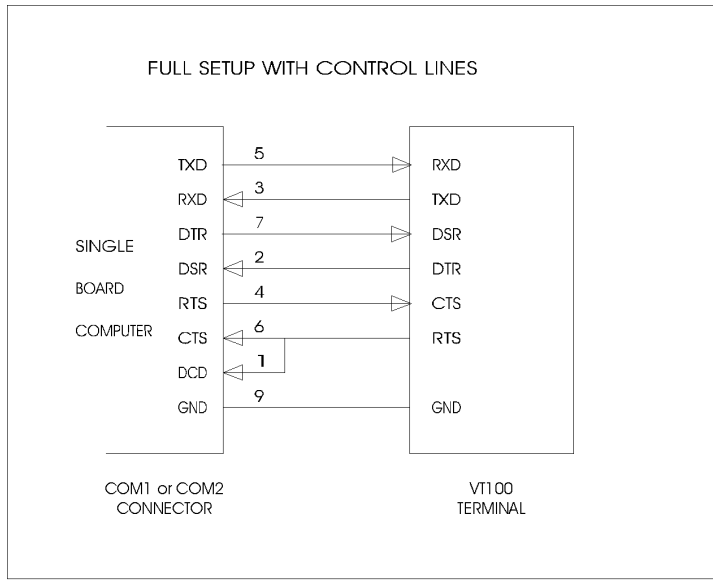
13.02 SETUP & CONFIGURATION

Follow these steps for setting up VT100 Mode:

- Power off your VIPer and install jumper W14(3-4) to enable VT100 Mode. Note: VT100 Mode runs on UART1 and UART2.
- Connect the communications cable as shown in Diagram 13-1. Note: If you do not require a full cable for your terminal, you can set up a partial cable by using only the TXD and RXD lines. The control lines can be ignored by looping them back as shown in Diagram 13-2.
- Power on your VIPer and run VIPer Setup by hitting the CTRL and V keys simultaneously, before or when you see the message "Press CTRL-V to enter TEKNOR VIP-UP" at the top of the screen. On the second screen, set the "VT100 & Serial Download Speed" at 19200 BPS or 9600 BPS.
- You must respect this protocol: 8 Bits
No Parity
Echo Off.

If you are running a terminal emulation program, these parameters must be set in it.

DIAGRAM 13-1: VT100 Full Setup
DIAGRAM 13-2: VT100 Partial Setup



13.03 RUNNING WITHOUT A TERMINAL

The VIPer can boot up without a screen or terminal attached. However, if VT100 Mode is desired, but the terminal is to be disconnected, you must ensure the control lines are in an active state. Failing this, the system may "hang" while waiting for the control lines to become active. Wiring the system according to Diagram 13-2 allows the lines to remain active. This does not apply if the VT100 jumper is not set.

Furthermore, you can run without any console at all simply by not enabling VT100 Mode and by not installing a video card.

SECTION 14

DOWNLOAD MODE

Information can be downloaded to the Flash EPROM disk on the VIPer by running VFLASH on a remote computer and using a serial link. This is referred to as Download Mode and is enabled by installing jumper W14(1-2).

Refer to Section 10 for more information on running VFLASH in Download Mode.

APPENDICES

APPENDIX A: VIPer805 SPECIFICATIONS

APPENDIX B: MEMORY & I/O MAPS

APPENDIX C: MECHANICAL LAYOUT & BLOCK DIAGRAM

APPENDIX D: CONNECTOR PINOUTS

APPENDIX E: RECOMMENDED DEVICES & MATING CONNECTORS

APPENDIX F: ERROR CODES

APPENDIX A
VIPer805 SPECIFICATIONS

A.01 SPECIFICATIONS

Operating Temperature: The maximum operating ambient temperature of the board is limited by the temperature of the CPU itself, as shown on Table A-1.

TABLE A-1: Maximum Operating Temperature (°C)

Processor	Heatsink	Frequency (MHz)	Airflow - feet / minute			
			0	200	400	600
Intel						
486DX	Yes	33	50	65	71	74
486DX	No	33	38	46	52	59
486DX2	Yes	66	19	48	59	65
486DX2	No	66	-4	11	22	36
486DX4	Yes	100	35.5	57	65.5	70
486DX4	No	100	18.5	29	37.5	44
AMD						
5X86	Yes	133	54.3	69.6	75.8	78.9
5X86	No	133	37.4	46.6	52.7	57.3

Noncondensing Relative Humidity: 5% to 95%

Electrical: Conforms to the IEEE P996 PC/AT bus electrical specifications

Supply Voltage: + 5V ±5%
±12V ±5%

Supply Current:

TABLE A-2: Supply Current

SUPPLY CURRENT *	INTEL DX4-100	INTEL DX2-66	AMD DX2-66	AMD DX4-100	AMD 5x86-133
ICC Typical (+5V)	1.69A	1.60A	0.94A	1.31A	1.40A
DOZE Mode	0.50A	0.50A	0.43A	0.50A	0.45A
SLEEP Mode	0.50A	0.50A	0.43A	0.50A	0.45A
SUSPEND Mode	0.36A	0.33A	0.30A	0.31A	0.31A
IPP (+12V)	4.3mA **	4.3mA **	4.3mA **	4.3mA **	4.3mA **
IPP (-12V)	13.9mA	13.9mA	13.9mA	13.9mA	13.9mA

* Measured with 4MB System Memory and 2MB Flash Memory.

** 70mA when CPU Fan connected to onboard Fan Connector.

Mechanical:

- Conforms to the IEEE P996 PC/AT bus mechanical specifications.
- 7.125 in. x 4.8 in. / 181mm x 122mm.

A.02 BATTERY

The VIPer805 comes with a 360mAh TL5186 TADIRAN battery. It powers the System Controller's Real Time Clock and CMOS Setup, whenever the board is powered down.

The TADIRAN TL5186 has a shelf life of approximately 10 years (under "no-load" conditions). The actual life of the battery depends on environmental (temperature) conditions. The TADIRAN TL5186 has an operating range of -55° to 75°C and discharge characteristics vary with temperature.

The voltage supplied by the battery is 3.6 volts. This can be verified with a standard voltmeter at the battery socket's two extreme pins (if you use the pin on the soldered side, you do not have to remove the battery).

The TADIRAN TL5186 is UL recognized. Its UL component recognition is MH12193.

Jumper W19 enables the Internal Battery's power. Removing the W19 jumper has the same effect as putting the battery in storage; TEKNOR always ships its board with battery jumper removed in order to increase the life of the battery.

An External Battery may be used. In such a case, pins 2 and 3 of jumper W19 should be shorted.

Please refer to Section 3 for jumper location and setting.

The VIPer805 board has a special feature that allows the CMOS RAM Setup to be saved in Flash EPROM memory. This feature eliminates battery dependence by saving and recovering the CMOS RAM Setup from Flash (only the time and date could be lost).

☞ **In order to save your current CMOS RAM Setup in Flash, you must update the VIP-UP Setup (with F10), while the "Use Flash To Store CMOS RAM SETUP" (first screen) is set to "Yes". See section 9.01 for more information.**

A.03 MTBF (MEAN TIME BETWEEN FAILURES)

The reliability analysis performed on the VIPer805 reflects all available options and has resulted in the following predicted reliability:

TABLE A-3: Reliability Prediction

Standard Configuration	CPU	MTBF (Hours)	Failure Rate (x10 ⁻⁶)
Option 1: Basic board	Intel 486DX2-33 5V	161980	6.1736
	Intel 486DX2-66 5V	142125	7.0360
	Intel 486DX4-100 3.3V	157956	6.3309
	AMD 486DX2-66 3.45V	188820	5.2961
	AMD 486DX4-100 3.45V	175401	5.7012
	AMD 5x86-133 3.45V	154235	6.4836
Option 2: Basic board plus 2MB Flash memory	Intel 486DX2-33 5V	157652	6.3431
	Intel 486DX2-66 5V	138782	7.2055
	Intel 486DX4-100 3.3V	153838	6.5004
	AMD 486DX2-66 3.45V	182964	5.4656
	AMD 486DX4-100 3.45V	170338	5.8707
	AMD 5x86-133 3.45V	150306	6.6531
Option 3: Basic board plus 4MB Flash memory	Intel 486DX2-33 5V	156226	6.4010
	Intel 486DX2-66 5V	137676	7.2634
	Intel 486DX4-100 3.3V	152480	6.5582
	AMD 486DX2-66 3.45V	181047	5.5234
	AMD 486DX4-100 3.45V	168675	5.9286
	AMD 5x86-133 3.45V	149010	6.7110

The MTBF is estimated using the prediction data from MIL-HDBK-217F, Reliability Prediction of Electronic Equipment (Dec. 1991).

The VIPer805 board is considered functioning in a Ground Fixed environment as defined in MIL-HDBK-217F. The calculations are performed at 20°C with a temperature rise of 10°C which is due to heat dissipated by active components.

It is assumed that only one failure at a time can occur and that the failure of any component will result in the system becoming inoperative or, as a minimum, resulting in a degraded mode of operation requiring repair action. All components are considered as having an exponential distribution of time to failure, with a constant failure rate. A failure

rate is attributed to each component called in the parts list, according to the stress levels it is submitted during normal operation.

The components with the highest calculated failure rate in the VIPer805 reliability prediction are: the 486 CPU, the Sequoia chipset (PT86C718) and the chip set (PT86C768).

The quality factors for commercial components on the VIPer805 has been adjusted in order to represent the impact of burn-in. TEKNOR submits each processor board produced to a 12 hour burn-in at 40°C. The boards are powered during this phase to precipitate latent failures. It is well known that a burn-in performed under these conditions improves board and component quality. Since there is a correlation between quality and reliability, it is generally accepted in the industry to reflect this in the reliability prediction.

A.04 MEETING INDUSTRY STANDARDS

TEKNOR Quality Standards insist that our products meet or exceed industry standards set by such respected agencies, organizations and associations as UL and CSA.

As a result, the VIPer805 has the following built-in features to help ensure that the conditions required for approval are met:

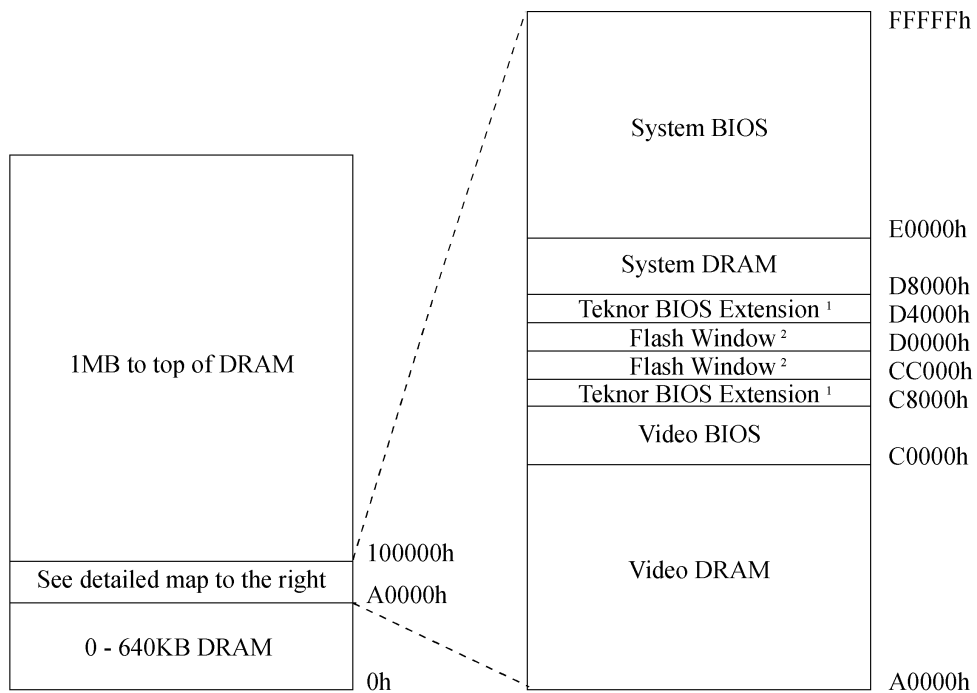
- A current block diode on the battery circuit,
- A current limiter resistor on the battery,
- A protection fuse on the keyboard controller.

TEKNOR computer cards are designed to meet industry standards for customers requiring approval for their equipment.

**APPENDIX B
MEMORY & I/O MAPS**

In this appendix, the Memory Map Diagram, as well as the Memory Map and I/O Map tables, are included.

DIAGRAM B-1: Memory Map Diagram



¹ For Teknor BIOS Extension, choose one of two options: C8000h-CBFFFh or D4000h-D7FFFh.

² For Flash Window, choose one of two options: CC000h-CFFFFh or D0000h-D3FFFh.

TABLE B-1: Memory Map

Address	Optional Address	Function
00000-9FFFF		0-640KB DRAM
A0000-BFFFF		Reserved for Video DRAM
C0000-C7FFF		Reserved for Video BIOS
C8000-CBFFF	D4000-D7FFF	Teknor BIOS Extension
CC000-CFFFF	D0000-D3FFF	Flash Window
D8000-DFFFF		System DRAM
E0000-FFFFF		System BIOS
100000 - Top of DRAM		1MB - Top of DRAM

TABLE B-2: I/O Map

Address	Optional Address	Optional Address	Optional Address	Function
000-00F				DMA Controller 1
020-03F				Interrupt Controller 1
040-043				Counter/Timers
060-064				Keyboard (8742)
070-071				Real-time clock, NMI mask
080-09F				DMA Page Register
0A0-0BF				Interrupt Controller 2
0C0-0DF				DMA Controller 2
0EC-0EF				Configuration Registers
0F0-0FF				Math Coprocessor/ Configuration Registers
190-197	290-297	390-397		Teknor Control Port
1F0-1F7, 3F6-3F7				IDE Hard Disk
3F0-3F7				Floppy Disk
378-37A	3BC-3BE	278-27A		Parallel Port (LPT1 by default)
3F8-3FF (COM1)	2F8-2FF (COM2)	3E8-3EF (COM3)	2E8-2EF (COM4)	UART1 (COM1 by default)
2F8-2FF (COM2)	3F8-3FF (COM1)	3E8-3EF (COM3)	2E8-2EF (COM4)	UART2 (COM2 by default)
3C0-3CF, 3D0-3DF, 3B0-3BB				Reserved for Graphics Controller

APPENDIX C
MECHANICAL LAYOUT & BLOCK DIAGRAM

In this appendix, two diagrams are included in the following pages.

DIAGRAM C-1: Mechanical Specifications

DIAGRAM C-2: Block Diagram VIPer805

DIAGRAM C-1: Mechanical Specifications

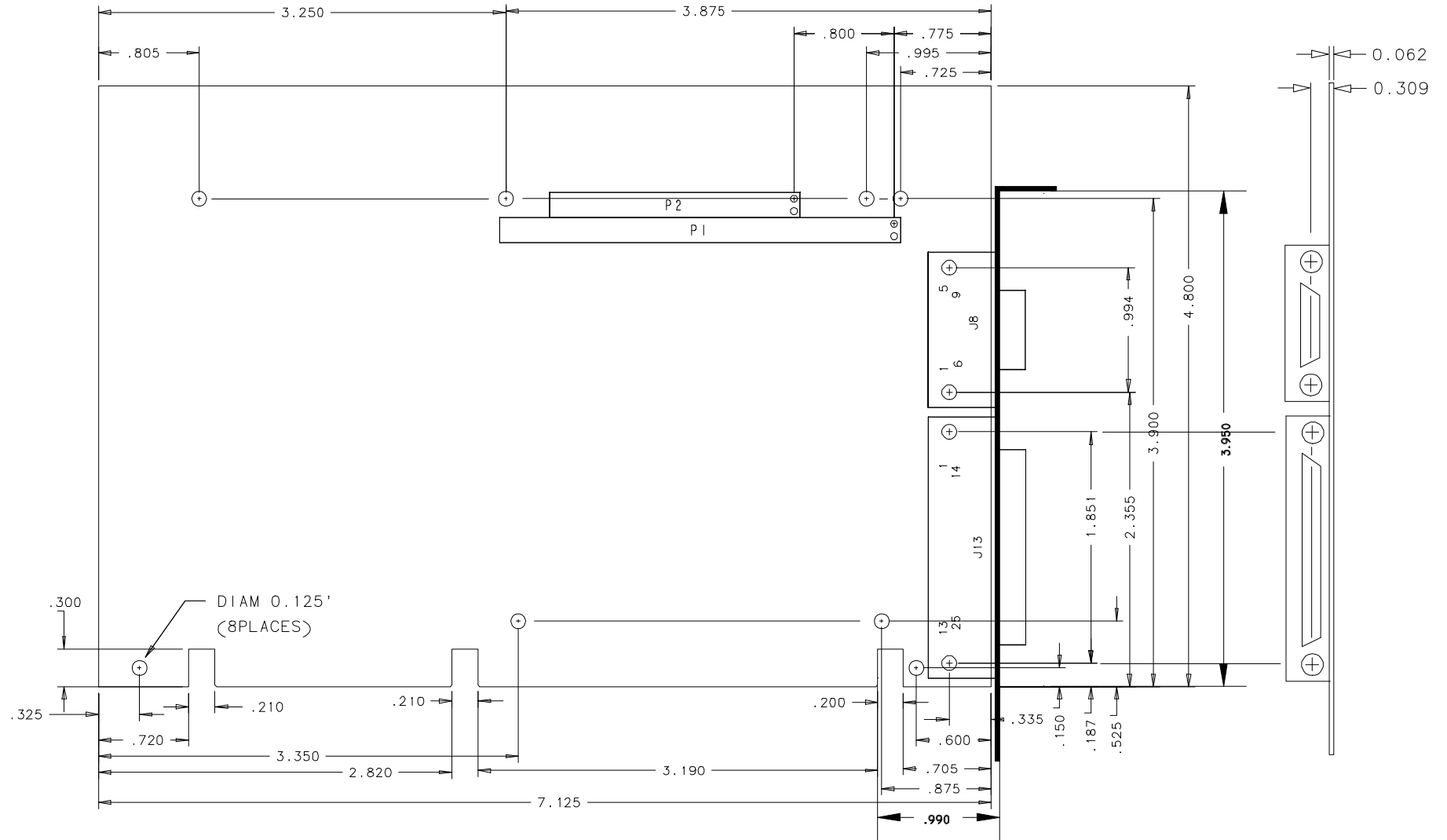
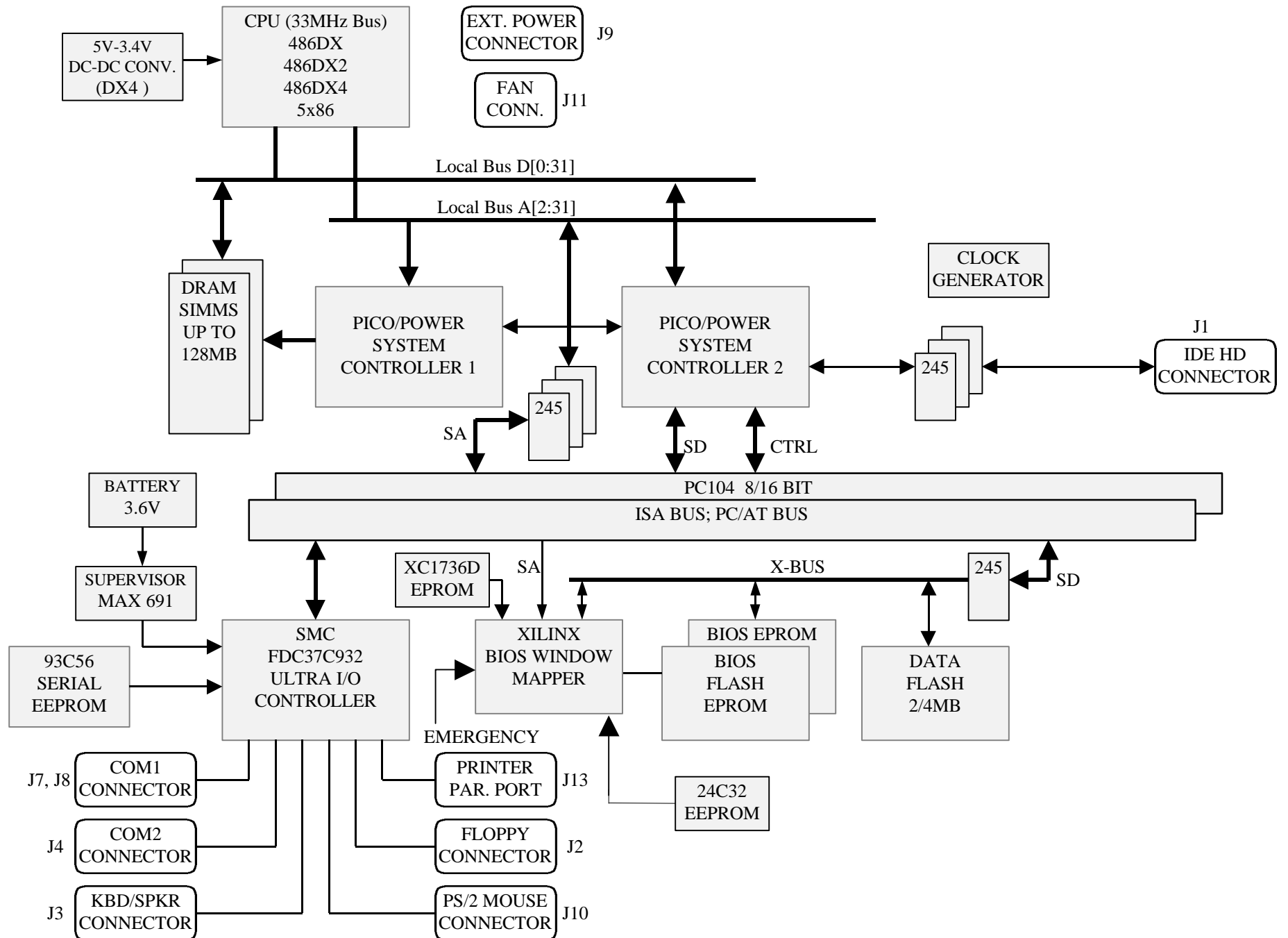


DIAGRAM C-2: Block Diagram VIPer805



**APPENDIX D
CONNECTOR PINOUTS**

IDE Hard Disk Connector (J1) - Pinout

Pin Number	Signal Flow	Signal	Pin Number	Signal Flow	Signal
1	I	RESET*	2	-	GND
3	I/O	HD7	4	I/O	HD8
5	I/O	HD6	6	I/O	HD9
7	I/O	HD5	8	I/O	HD10
9	I/O	HD4	10	I/O	HD11
11	I/O	HD3	12	I/O	HD12
13	I/O	HD2	14	I/O	HD13
15	I/O	HD1	16	I/O	HD14
17	I/O	HD0	18	I/O	HD15
19	-	GND	20	-	Not Used
21	-	Not Used	22	-	GND
23	I	IOW*	24	-	GND
25	I	IOR*	26	-	GND
27	O	IOCHRDY	28	I	BALE
29	-	Not Used	30	-	GND
31	O	IRQ14	32	O	IOCS16*
33	I	SA1	34	-	Not Used
35	I	SA0	36	I	SA2
37	I	CS0*	38	I	CS1*
39	O	ACTIVE*	40	-	GND

* Active low signal

Floppy Connector (J2) - Pinout

Pin Number	Signal Flow	Signal	Pin Number	Signal Flow	Signal
1	-	GND	2	O	DRV DENS.SEL.0*
3	-	GND	4	-	Not Used
5	-	GND	6	-	Not Used
7	-	GND	8	I	INDEX*
9	-	GND	10	O	MOTOR ON 0,1*
11	-	GND	12	O	DRIVE SELECT B
13	-	GND	14	O	DRIVE SELECT A
15	-	GND	16	O	MOTOR ON 2*
17	-	N. C. ¹	18	O	DIR CONTROL*
19	-	GND	20	O	STEP*
21	-	GND	22	O	WRITE DATA*
23	-	GND	24	O	WRITE ENABLE*
25	-	GND	26	I	TRACK0*
27	-	N. C. ¹	28	I	WRITE PROTECT*
29	-	N. C. ¹	30	I	READ DATA*
31	-	GND	32	O	HEAD SELECT*
33	-	N. C. ¹	34	I	DSKCHG

* Active low signal

¹ By default, these pins are not connected, however, by installing the W1 and W2 jumpers, these configurations are possible (see also page 6-8 in the manual):

- | | | |
|-------------------|-----|----------------------|
| 1) 17 GND | Or: | 2) 17 EDOUT (2.88MB) |
| 27 GND | | 27 HDOUT (2.88MB) |
| 29 EDOUT (2.88MB) | | 29 GND |
| 33 HDOUT (2.88MB) | | 33 GND |

Keyboard / Speaker Connector (J3) - Pinout

Pin Number			Pin Number		
Signal Flow			Signal Flow		
Signal			Signal		
KBCLK	I/O	1	2	-	GND
KBDATA	I/O	3	4	-	GND
VCC (+5V)	-	5	6	-	VCC (+5V)
SPKR	O	7	8	-	VCC (+5V)
Not Used	-	9	10	-	GND
DOWNLD*	I	11	12	-	GND
PBRES*	I	13	14	-	GND
HDD ACTIVE*	O	15	16	-	VCC (+5V)

* Active low signal

Serial Port 2 (J4) RS-232 - Pinout

Pin Number			Pin Number		
Signal Flow			Signal Flow		
Signal			Signal		
DCD	I	1	2	I	DSR
RX	I	3	4	O	RTS
TX	O	5	6	I	CTS
DTR	O	7	8	I	RI
GND	-	9	10	-	Not Used

Serial Port 2 (J4) RS-485/RS-422 - Pinout

Pin Number			Pin Number		
Signal Flow			Signal Flow		
Signal			Signal		
DCD	I	1	2	I	DSR
RXD(-)	I/O	3	4	I/O	RXD(+)
TXD(-)	I/O	5	6	I/O	TXD(+)
DTR	O	7	8	I	RI
GND	-	9	10	-	Not Used

Serial Port 1 - (J7) RS-232 - Pinout

Pin Number			Pin Number		
Signal Flow			Signal Flow		
Signal			Signal		
DCD	I	1	2	I	DSR
RX	I	3	4	O	RTS
TX	O	5	6	I	CTS
DTR	O	7	8	I	RI
GND	-	9	10	-	Not Used

**Serial Port 1 (J8) RS-232
Standard IBM Serial Port**

Pin Number			Pin Number		
Signal Flow			Signal Flow		
Signal			Signal		
DCD	I	1	2	I	RX
TX	O	3	4	O	DTR
GND	-	5	6	I	DSR
RTS	O	7	8	I	CTS
RI	I	9			

External Power Connector (J9) - Pinout

Pin Number	Signal
1	VCC (+5V)
2	GND
3	GND
4	+12V
5	-12V
6	PD (Power Fail Detection Input)

PS/2 Mouse Connector (J10) - Pinout

Pin Number	Signal
1	MCLK
2	GND
3	MDATA
4	VCC (+5V)

Fan Connector (J11) - Pinout

Pin Number	Signal
1	+12V
2	GND

Printer Parallel Port (J13) - Standard Mode - Pinout

Pin Number			Pin Number		
Signal Flow			Signal Flow		
Signal				Signal	
STROBE*	O	1	2	I/O	D0
D1	I/O	3	4	I/O	D2
D3	I/O	5	6	I/O	D4
D5	I/O	7	8	I/O	D6
D7	I/O	9	10	I	ACK*
BUSY	I	11	12	I	PE
SELECT	I	13	14	O	AUTOFD*
ERROR*	I	15	16	O	INIT*
SELECTIN*	O	17	18	-	GND
GND	-	19	20	-	GND
GND	-	21	22	-	GND
GND	-	23	24	-	GND
GND	-	25			

* Active low signal

Printer Parallel Port (J13) - EPP Mode - Pinout

Pin Number			Pin Number		
Signal Flow			Signal Flow		
Signal			Signal		
WRITE*	O	1	2	I/O	D0
D1	I/O	3	4	I/O	D2
D3	I/O	5	6	I/O	D4
D5	I/O	7	8	I/O	D6
D7	I/O	9	10	I	INTR
WAIT*	I	11	12	I	Not Used
Not Used	I	13	14	O	DATASTB*
Not Used	I	15	16	O	Not Used
ADDRSTRB*	O	17	18	-	GND
GND	-	19	20	-	GND
GND	-	21	22	-	GND
GND	-	23	24	-	GND
GND	-	25			

* Active low signal

Printer Parallel Port (J13) - ECP Mode - Pinout

Pin Number			Pin Number		
Signal Flow			Signal Flow		
Signal			Signal		
STROBE*	O	1	2	I/O	D0
D1	I/O	3	4	I/O	D2
D3	I/O	5	6	I/O	D4
D5	I/O	7	8	I/O	D6
D7	I/O	9	10	-	ACK*
BUSY, PERIPHACK ³	I	11	12	-	PERROR, ACKREVERSE ³
SELECT	I	13	14	O	AUTOFD*, HOSTACK ³
FAULT* ^{1,2} PERIPHRQST* ³	I	15	16	O	INIT* ¹ , REVERSERQST* ³
SELECTIN* ^{1,3}	O	17	18	-	GND
GND	-	19	20	-	GND
GND	-	21	22	-	GND
GND	-	23	24	-	GND
GND	-	25			

- * Active low signal
- ¹ Compatible Mode
- ² High Speed Mode

Suspend / Resume Momentary Switch (J16) - Pinout

Pin Number	Signal
1	VCC (+5V)
2	SWITCH

PC/104 Card Connector (P1)

A Side

P1 Pin	I/O PIN	Signal Name	I/O
2	A1	IOCHK*	I
4	A2	SD7	I/O
6	A3	SD6	I/O
8	A4	SD5	I/O
10	A5	SD4	I/O
12	A6	SD3	I/O
14	A7	SD2	I/O
16	A8	SD1	I/O
18	A9	SD0	I/O
20	A10	IOCHRDY	I
22	A11	AEN	O
24	A12	SA19	I/O
26	A13	SA18	I/O
28	A14	SA17	I/O
30	A15	SA16	I/O
32	A16	SA15	I/O
34	A17	SA14	I/O
36	A18	SA13	I/O
38	A19	SA12	I/O
40	A20	SA11	I/O
42	A21	SA10	I/O
44	A22	SA9	I/O
46	A23	SA8	I/O
48	A24	SA7	I/O
50	A25	SA6	I/O
52	A26	SA5	I/O
54	A27	SA4	I/O
56	A28	SA3	I/O
58	A29	SA2	I/O
60	A30	SA1	I/O
62	A31	SA0	I/O
64	A32	GND	-

B Side

P1 Pin	I/O PIN	Signal Name	I/O
1	B1	GND	-
3	B2	RESET DRV	O
5	B3	VCC (+5V)	-
7	B4	IRQ9	I
9	B5	-5V	-
11	B6	DRQ2	I
13	B7	-12V	-
15	B8	OWS*	I
17	B9	+12V	-
19	B10	Not Used	-
21	B11	SMEMW*	O
23	B12	SMEMR*	O
25	B13	IOW*	I/O
27	B14	IOR*	I/O
29	B15	DACK3*	O
31	B16	DRQ3	I
33	B17	DACK1*	O
35	B18	DRQ1	I
37	B19	REFRESH*	I/O
39	B20	SYSCLK	O
41	B21	IRQ7	I
43	B22	IRQ6	I
45	B23	IRQ5	I
47	B24	IRQ4	I
49	B25	IRQ3	I
51	B26	DACK2*	O
53	B27	T/C	O
55	B28	BALE	O
57	B29	VCC (+5V)	-
59	B30	OSC	O
62	B31	GND	-
64	B32	GND	-

* Active low signal

PC/104 Card Connector (P2)

C Side

P2 Pin	I/O PIN	Signal Name	I/O
1	C0	GND	-
3	C1	SBHE*	I/O
5	C2	SA23	I/O
7	C3	SA22	I/O
9	C4	SA21	I/O
11	C5	SA20	I/O
13	C6	SA19	I/O
15	C7	SA18	I/O
17	C8	SA17	I/O
19	C9	MEMR*	I/O
21	C10	MEMW*	I/O
23	C11	SD8	I/O
25	C12	SD9	I/O
27	C13	SD10	I/O
29	C14	SD11	I/O
31	C15	SD12	I/O
33	C16	SD13	I/O
35	C17	SD14	I/O
37	C18	SD15	I/O
39	C19	Not Used	-

D Side

P2 Pin	I/O PIN	Signal Name	I/O
2	D0	GND	-
4	D1	MEMCS16*	I
6	D2	IOCS16*	I
8	D3	IRQ10	I
10	D4	IRQ11	I
12	D5	IRQ12	I
14	D6	IRQ15	I
16	D7	IRQ14	I
18	D8	DACK0*	O
20	D9	DRQ0	I
22	D10	DACK5*	O
24	D11	DRQ5	I
26	D12	DACK6*	O
28	D13	DRQ6	I
30	D14	DACK7*	O
32	D15	DRQ7	I
34	D16	VCC (+5V)	-
36	D17	MASTER*	I
38	D18	GND	-
40	D19	GND	-

* Active low signal

PC Bus Connector

A Side

I/O PIN	Signal Name	I/O
A1	IOCHK*	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	IOCHRDY	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

B Side

I/O PIN	Signal Name	I/O
B1	GND	-
B2	RESET DRV	O
B3	VCC (+5V)	-
B4	IRQ9	I
B5	-5V	-
B6	DRQ2	I
B7	-12V	-
B8	OVS*	I
B9	+12V	-
B10	GND	-
B11	SMEMW*	O
B12	SMEMR*	O
B13	IOW*	I/O
B14	IOR*	I/O
B15	DACK3*	O
B16	DRQ3	I
B17	DACK1*	O
B18	DRQ1	I
B19	REFRESH*	I/O
B20	SYSCLK	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	VCC (+5V)	-
B30	OSC	O
B31	GND	-

* Active low signal

PC Bus Connector

C Side

I/O PIN	Signal Name	I/O
C1	SBHE*	I/O
C2	SA23	I/O
C3	SA22	I/O
C4	SA21	I/O
C5	SA20	I/O
C6	SA19	I/O
C7	SA18	I/O
C8	SA17	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

D Side

I/O PIN	Signal Name	I/O
D1	MEMCS16*	I
D2	IOCS16*	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	VCC (+5V)	-
D17	MASTER*	I
D18	GND	-

* Active low signal

APPENDIX E
RECOMMENDED DEVICES & MATING CONNECTORS

The following is a list of recommended devices and connectors for use on the VIPer805. Many other models are available and function equally well. Users are encouraged to check with their local distributors for comparable substitutes.

DRAM (U13 and U14)

DRAM devices with parity bit and page mode at 70ns maximum access time are recommended. For example:

MICRON	MT10D25636M-7	(256K*36)
NEC	MC-42255A36B-70	(256K*36)
SAMSUNG	KMM536256C-7	(256K*36)
TOSHIBA	THM362500AS-70	(256K*36)
MICRON	MT18D51236M-7	(512K*36)
MICRON	MT9D136M-7	(1M*36)
NEC	MC-421000A36B-70	(1M*36)
SAMSUNG	KMM5361000B-7	(1M*36)
TI	TM124MBK36R-70	(1M*36)
TOSHIBA	THM361020AS-70	(1M*36)
HITACHI	HB56D236B2-7C	(2M*36)
HITACHI	HB56D236BS-7BC	(2M*36)
HITACHI	HB56D236BW-7B	(2M*36)
HITACHI	HB56D236BW-7C	(2M*36)
HYUNDAI	HYM536220W-70	(2M*36)
MICRON	MT18D236M-7	(2M*36)
NEC	MC422000A36B-70	(2M*36)
SAMSUNG	KMM5362000B-7	(2M*36)
TOSHIBA	THM362040AS-60	(2M*36)
TOSHIBA	THM362040AS-70	(2M*36)
HYUNDAI	HYM536410AM-70	(4M*36)
MITSUBISHI	MH4M36ANXJ-7	(4M*36)
NEC	MC-424000A36BH-70	(4M*36)

NEC	MC-424000A36BJ-70	(4M*36)
SAMSUNG	KMM5364100-7	(4M*36)
TOSHIBA	THM364020S-70	(4M*36)
HITACHI	HB56D836BR-70A	(8M*36)
TOSHIBA	THM368020S-70	(8M*36)
TOSHIBA	THM368020SG-70	(8M*36)

INTERFACE CONNECTORS

The following connectors are recommended for interfacing with the I/O devices. The parts shown here do not have a strain relief but one may be added.

<u>Connector</u>	<u>Recommended Mating Part</u>
Hard Disk (J1)	Robinson Nugent IDS-C40PK-TG Amp 746285-9 [499252-1*] Thomas & Betts 622-4030 [622-4041*] (40-pin flat cable connector)
Floppy Disk (J2)	Robinson Nugent IDS-C34PK-TG Amp 746285-8 [499252-6*] Thomas & Betts 622-3430 [622-3441*] (34-pin flat cable connector)
Keyboard /Speaker (J3)	Robinson Nugent IDS-C16PK-TG Amp 746285-3 [499252-8*] Thomas & Betts 622-1630 [622-1641*] (16-pin flat cable connector)
Serial Ports (J4 & J7)	Robinson Nugent IDS-C10PK-TG Amp 746285-1 [499252-5*] Thomas & Betts 622-1030 [622-1041*] (10-pin flat cable connector)
Standard IBM Serial Port (J8)	Robinson Nugent IDD-C9SM-440-TG30 Amp 747318-4 <747275-4**> Thomas & Betts 609-09S Amphenol 841-17-DEFR-B9P (9-pin flat cable connector)
Power Connector (J9)	Leoco 2530 S060013 (housing) Leoco 2533 TCB00A0 (crimp) Molex 22-01-3067 (housing) Molex 08-50-0114 (crimp)

* optional strain relief part number shown in square brackets

** optional cable stabilizer part number shown in angle brackets

<u>Connector</u>	<u>Recommended Mating Part</u>
PS/2 Connector (J10)	Molex 22-01-3047 (connector) Molex 08-50-0114 (crimp)
Fan Connector (J11)	Leoco 2530 S020013 (housing) Leoco 2533 TCB00A0 (crimp) Molex 22-01-3027 (housing) Molex 08-50-0114 (crimp)
Parallel Port (J13)	Amp 747321-2 [747275-2*] Amphenol 841-17-DBFR-B25P Robinson Nugent IDD-C25PM-440-TG30 [SR-25M-IDD*] Thomas & Betts 609-25P (25-pin flat cable connector)

* optional strain relief part number shown in square brackets

POST DESCRIPTION
CODE

CF	Initialization after KB controller BAT to be done. Keyboard command byte to be written next.
D1	Keyboard controller command byte is written. Going to check pressing of <INS> key during power-on.
D2	Checking for pressing of <INS> key during power-on done. Going to disable DMA and Interrupt controllers.
D3	DMA controllers 1 and 2 and interrupt controllers 1 and 2 disabled. Chipset initialization and auto memory detection about to begin.
D4	Chipset initialization and auto memory detection over. To uncompress the RUNTIME code.
D5	RUNTIME code is uncompressed.
DD	Transfer control to uncompressed code in shadow RAM at F000:FFF0. ***** * Runtime code is uncompressed in F000 shadow RAM * *****
03	NMI is disabled. To check soft reset and power-on.
05	Soft reset and power-on determined. Going to disable Cache if any.
06	POST code to be uncompressed.
07	POST code is uncompressed. CPU initialization and CPU data area initialization to be done next.
08	CPU and CPU data area initialization done. CMOS checksum calculation to be done next.
09	The CMOS checksum calculation is done and the CMOS RAM Diagnostic byte written. CMOS RAM initialization is next if the <i>Initialize CMOS RAM At Every Boot</i> option is set.
0A	CMOS RAM initialization done (if any). The CMOS RAM status register will be initialized for Date and Time next.
0B	The CMOS RAM status register initialization done. Any initialization before keyboard BAT test to be done next.
0C	The keyboard controller I/B is free. Issuing the BAT command to the keyboard controller next.
0D	BAT command to keyboard controller is issued. Going to verify the BAT command.
0E	The keyboard controller BAT result has been verified. Any initialization after the keyboard controller BAT command to be done next.
0F	Initialization after the keyboard controller BAT command is done. The keyboard command byte will be written next.

POST CODE	DESCRIPTION
10	The keyboard controller command byte has been written. Going to issue Pin-23,24 blocking/unblocking command.
11	Keyboard controller pins 23 and 24 have been blocked and unblocked. See if the <Ins> key was pressed during power-on next.
12	Checking for pressing of <Ins> key during power-on done. Going to disable DMA and Interrupt controllers.
13	DMA controllers 1 and 2 and interrupt controllers 1 and 2 have been disabled. The video display is disabled and port-B is initialized. Initializing the chipset next.
15	Chipset initialization over. 8254 timer test about to start.
19	8254 timer test over. About to start the memory refresh test.
1A	The memory refresh line is toggling. Going to check the 15 <i>ms</i> second ON/OFF time next.
20	Memory refresh period 30 <i>ms</i> second test complete. Base 64 KB memory to be initialized.
23	Base 64 KB memory initialized. Going to set BIOS stack and to do any setup before the interrupt vector initialization.
24	Setup required before vector initialization complete. Interrupt vector initialization about to begin.
25	Interrupt vector initialization is done. Going to read the input port of the 8042 for turbo switch (if any) and to clear the password if the POST Diagnostic switch is on.
26	The input port of the 8042 is read. Going to initialize global data for the turbo switch.
27	The global data initialization for the turbo switch is over. Any required initialization before setting video mode to be done next.
28	Initialization before setting the video mode is complete. Going for monochrome mode and color mode setting.
2A	Different BUSES initialization (system, static, output devices) to start if present. See section E.02 for details of different BUSES.
2B	About to give control for any setup required before optional video ROM check.
2C	Processing before video ROM control is done. About to look for optional video ROM and pass control to this ROM, if present.
2D	Optional video ROM control is done. About to give control to do any processing after video ROM returns control to POST.
2E	Return from processing after the video ROM control. If EGA or VGA is not found, will do the display memory Read/Write test next.
2F	EGA/VGA not found. About to display the memory Read/Write test.

POST CODE	DESCRIPTION
30	The display memory Read/Write test passed. About to look for the retrace checking.
31	Display memory R/W test or retrace checking failed. Performing the alternate display memory Read/Write test next.
32	The alternate display memory Read/Write test passed. About to look for the alternate display retrace checking.
34	Video display checking over. The display mode will be set next.
37	Display mode set. Going to display the power on message.
38	Different BUSES initialization (input, IPL, general devices) to begin, if present. See section E.02 for details of different BUSES.
39	Display different BUSES initialization error messages. See section E.02 for details of different BUSES.
3A	New cursor position read and saved. Going to display the <i>Hit </i> message.
3B	The <i>Hit </i> message has been displayed. The virtual mode memory test is about to begin.
40	Going to prepare the descriptor tables.
42	The descriptor tables have been prepared. Entering virtual mode for the memory test next.
43	Entered virtual mode. Enabling interrupts for diagnostics mode next.
44	Interrupts enabled (if the diagnostics switch is on). Going to initialize data to check memory wrap around at 0:0h.
45	Data initialized. Checking for memory wraparound at 0:0h and finding the total system memory size.
46	Memory wrap around test done. Memory size calculation over. Writing patterns in memory to test memory next.
47	Pattern to be tested written in extended memory. Going to write patterns in base 640 KB memory.
48	Patterns written in base memory. Determining the amount of memory below 1MB memory.
49	Amount of memory below 1MB found and verified. Determining the amount of memory above 1MB memory.
4B	Amount of memory above 1MB found and verified. Checking for soft reset and clearing the memory below 1MB for a soft reset. (If at power on, go to check-point 4Eh).
4C	Memory below 1MB cleared. Next, doing a soft reset to clear memory above 1 MB.
4D	Memory above 1MB cleared via a soft reset. Saved the memory size. Going to check-point 52h next.

POST CODE	DESCRIPTION
4E	Memory test started. A soft reset was not done. Displaying the first 64KB memory size next.
4F	The memory size display has started and will be updated during memory test. The sequential and random memory tests will be performed next.
50	Memory testing and initialization for the memory below 1MB is complete. Adjust the displayed memory size for memory relocation and shadowing next.
51	The memory size display was adjusted because of memory relocation and shadowing. The test of the memory above 1MB will be done next.
52	The testing and initialization of the memory above 1MB complete. Going to save the memory size information.
53	The memory size information is saved. The CPU registers are saved. Entering real mode next.
54	The shutdown was successful and the CPU is in real mode. Disabling the Gate A20 line and parity/NMI next.
57	The Gate A20 address line and parity/NMI disable was successful. Going to adjust the memory size depending on the memory relocation and/or shadowing parameters.
58	The memory size has been adjusted for memory relocation and/or shadowing. Clearing the <i>Hit </i> message next.
59	The <i>Hit </i> message has been cleared. The <i>WAIT...</i> message is being displayed. About to start the DMA and interrupt controller tests.
60	DMA page register test passed. The DMA controller 1 base register test is next.
62	The DMA controller 1 base register test passed. Starting the DMA controller 2 base register test next.
65	The DMA controller 2 base register test passed. Programming DMA controllers 1 and 2 next.
66	DMA controllers 1 and 2 have been programmed. Initializing the 8259 interrupt controllers next.
67	8259 initialization over.
7F	Extended NMI sources enabling is in progress.
80	The keyboard test has started. Clearing the output buffer and checking for stuck keys. The keyboard reset command will be issued next.
81	A keyboard reset error or stuck key was found. Issuing the keyboard controller interface test command next.
82	The keyboard controller interface test completed. About to write the command byte and initialize the circular buffer.
83	The keyboard command byte is written and global data initialization complete. Checking for a locked keyboard next.

POST CODE	DESCRIPTION
84	Keyboard locked key checking has completed. Checking for a memory size mismatch with the data in CMOS RAM next.
85	The memory size check is done. Displaying soft errors, checking for a password, or bypassing WINBIOS Setup next.
86	The password has been checked. Doing programming before WINBIOS Setup runs next.
87	Programming before WINBIOS Setup has completed. Uncompressing WINBIOS Setup code and executing WINBIOS Setup next.
88	Returned from WINBIOS Setup program and screen is cleared. Doing programming after WINBIOS Setup next.
89	Programming after WINBIOS Setup has completed. Display the power-on screen message next.
8B	First power-on screen message displayed. The <i>WAIT...</i> message is also displayed. Shadowing of the Video BIOS will be done next.
8C	The Video BIOS has been shadowed successfully. About to begin programming setup options after WINBIOS Setup.
8D	The WINBIOS Setup options are programmed. The mouse check and initialization will be done next.
8E	The mouse check and initialization have completed. Resetting the hard disk controller next.
8F	The hard disk controller has been reset. The floppy setup to be done next.
91	Floppy setup is complete. Hard disk setup to be done next.
94	Hard disk setup complete. Setting the base and extended memory sizes next.
95	Memory size adjusted due to mouse support. Initialization of different BUSES optional ROM's from C8000h to start. See section E.02 for details of different BUSES.
96	Going to perform any initialization required before passing control to optional ROM at C8000h.
97	Initialization before C8000h optional ROM control has completed. About to check the C8000h optional ROM, then pass control to it.
98	Optional ROM control is done. About to give control to do any required processing after optional ROM returns control.
99	Any initialization required after the optional ROM test is over. Going to setup the timer data area and printer base address.
9A	The timer and printer base address have been configured. Configuring the RS-232 base I/O port address next.
9B	The RS-232 base I/O port address has been configured. Performing any initialization required before testing the coprocessor.

POST CODE	DESCRIPTION
9C	The required initialization before the coprocessor test has completed. Initializing the coprocessor next.
9D	The coprocessor has been initialized. Doing any required initialization after the coprocessor test next.
9E	The required initialization after the coprocessor test has completed. Checking the extended keyboard, keyboard ID and Num Lock key next.
9F	The extended keyboard check is done and the keyboard ID flag is set. The Num Lock key has been turned On or Off as specified in WINBIOS Setup. The keyboard ID command will be issued next.
A0	The keyboard ID command was issued. The keyboard ID flag will be reset next.
A1	The keyboard ID flag has been reset. The Cache memory test will be done next.
A2	The Cache memory test has completed. Displaying any soft errors next.
A3	The soft errors have been displayed. Setting the keyboard typematic rate next.
A4	The keyboard typematic rate has been set. Programming the memory wait states next.
A5	The memory wait states have been programmed. Clearing the screen and enabling parity and the NMI next.
A7	The NMI and parity have been enabled. Performing any required initialization before passing control to the optional ROM at E0000h next.
A8	Any required initialization before the E0000h optional ROM gains control has been completed. The E0000h optional ROM gets control next.
A9	Control returned to WINBIOS POST from the E0000h optional ROM. Performing any required initialization after E0000h optional ROM control next.
AA	Any required initialization after the E0000h optional ROM had control has completed. Displaying the WINBIOS system configuration screen next.
B0	The WINBIOS system configuration is displayed.
B1	Going to copy any required code to a specific area.
00	The code has been copied to a specific area. Going to give control to the INT 19H boot loader.

F.02 WORD CHECK-POINTS

Additional WORD check-points are output to port 80h while control is inside the different BUS routines. The LOW BYTE of check-point is the POST code (section E.01) representing the system BIOS check-point from where the control is passed to different BUS routines.

The HIGH BYTE of check-point is the indication of which routine is being executed in different BUSes. The details of HIGH BYTE ('XY') are explained below.

The upper nibble 'X' indicates the function number being executed:

- 0 Disable all devices on the BUS concerned.
- 1 Static devices initialization on the BUS concerned.
- 2 Output device initialization on the BUS concerned.
- 3 Input device initialization on the BUS concerned.
- 4 IPL device initialization on the BUS concerned.
- 5 General device initialization on the BUS concerned.
- 6 Error reporting for the BUS concerned.
- 7 Add-on ROM initialization for all BUSes.

The lower nibble 'Y' indicates the BUS on which the different routines are being executed:

- 0 Generic DIM (Device Initialization Manager).
- 1 On-board system devices.
- 2 ISA devices.
- 3 EISA devices.
- 4 ISA PnP devices.
- 5 PCI devices.

F.03 BEEP ERROR CODES

All beep codes, except number 8, are fatal errors.

If your system starts beeping during POST, count the number of beeps and check the table below to identify the error. Note that it is not guaranteed that these errors will always generate beeps.

TABLE F-1: Beep Error Codes

BEEPS	ERROR MESSAGE	DESCRIPTION
1	Refresh Failure	The memory refresh circuitry is faulty.
2	Parity Error	Parity error in the base memory (the first 64KB block of memory)
3	Base 64KB Memory Failure	Memory failure in the first 64KB.
4	Time Not Operational	A memory failure in the first 64KB of memory, or Timer 1 is not functioning.
5	Processor error	The CPU generated an error.
6	8042 - Gate A20 Failure	Cannot switch to protected mode.
7	Processor Exception Interrupt Error	The microprocessor on the CPU Card generated an exception interrupt.
8	Display Memory Read/Write Error	The system video adapter is missing or its memory is faulty. This is not a fatal error.
9	ROM Cheksum Error	The ROM checksum value does not match the value encoded in AMIBIOS.
10	CMOS Shutdown Register Read/Write Error	The shutdown register for CMOS RAM has failed.
11	Cache memory bad - do not enable Cache	The Cache memory test failed. Cache memory is disabled. Do not press the CTRL, ALT, SHIFT and + keys (simultaneously) to enable Cache memory.

GETTING HELP

At TEKNOR we take great pride in our customer's successes. We strongly believe in providing full support at all stages of your product development.

If at any time you encounter difficulties with your application or with any of our products, or if you simply need guidance on system setups and capabilities, you may contact our Technical Support department at:

CANADIAN HEADQUARTERS

Tel.: (450) 437-5682

Fax: (450) 437-8053

EUROPEAN REGIONAL OFFICE

Tel.: +49 811 / 600 15-0

Fax: +49 811 / 600 15-33

If you have any questions about TEKNOR, our products or services, you may reach us at the above numbers or by writing to:

TEKNOR INDUSTRIAL COMPUTERS INC.

**616 Cure Boivin
Boisbriand, Quebec
J7G 2A7 CANADA**

TEKNOR INDUSTRIAL COMPUTERS INC.

**Zeppelin Str. 4
D-85399 Hallbergmoos
GERMANY**

LIMITED WARRANTY

TEKNOR INDUSTRIAL COMPUTERS INC. ("the seller") warrants its products to be free from defects in material and workmanship for a period of two (2) years commencing on the date of shipment. The liability of the seller shall be limited to replacing or repairing, at the seller's option, any defective units. Equipment or parts which have been subject to abuse, misuse, accident, alteration, neglect, or unauthorized repair are not covered by this warranty. This warranty is in lieu of all other warranties expressed or implied.

Returning Defective Merchandise

If your TEKNOR product malfunctions, please do the following before returning any merchandise:

- 1) Call our Technical Support department in Canada at (450) 437-5682 or in Germany at +49 811 / 600 15-0. Make certain you have the following at hand: the TEKNOR Invoice #, your Purchase Order #, and the Serial Number of the defective unit.
- 2) Give the serial number found on the back of the card and explain the nature of your problem to a service technician.
- 3) If the problem cannot be solved over the telephone, the technician will further instruct you on the return procedure.
- 4) Prior to returning any merchandise, make certain you receive an RMA # from TEKNOR's Technical Support and clearly mark this number on the outside of the package you are returning. To request a number, follow these steps: make a copy of the request form on the following page, fill it out and fax it to us.
- 5) When returning goods, please include the name and telephone number of a person whom we can contact for further explanations if necessary. **Where applicable, always include all duty papers and invoice(s) associated with the item(s) in question.**
- 6) When returning a TEKNOR card:
 - i) Make certain that the card is properly packed: Place it in an antistatic plastic bag and pack it in a rigid cardboard box.
 - ii) Ship prepaid to (but not insured, since incoming units are insured by TEKNOR):

**TEKNOR INDUSTRIAL
COMPUTERS INC.
616 Cure Boivin
Boisbriand, Quebec
J7G 2A7 CANADA**

**TEKNOR INDUSTRIAL
COMPUTERS INC.
Zeppelin Str. 4
D-85399 Hallbergmoos
GERMANY**



**RETURN TO MANUFACTURER
AUTHORISATION REQUEST**

Contact Name : _____
Company Name : _____
Street Address _____
City : _____ Province / State : _____
Country : _____ Postal / Zip Code _____
Phone Number : _____ Fax Number: _____

Serial Number	Failure or Problem Description	P.O. # (if not under warranty)

**Fax this form to TEKNOR's Technical Support department
in Canada at (450) 437-8053 or in Germany at +49 811 / 600 15-33**