TEKNOR
INDUSTRIAL COMPUTERS INC.

VIPer820

INDUSTRIAL SBC - PENTIUM BASED

TECHNICAL REFERENCE MANUAL	VERSION 2.1 August 1998

FOREWORD

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PART 3 - SOFTWARE & ONBOARD UTILITIES

READ ME FIRST

EXERCISE CAUTION WHILE REPLACING LITHIUM BATTERY

⚠️ **WARNING**

There is a danger of explosion if the battery is incorrectly replaced.

Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

⚠️ **ATTENTION**

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.

Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabriquant.

⚠️ **ACHTUNG**

Explosionsgefahr bei falschem Batteriewechsel.

Verwenden Sie nur die empfohlenen Batterietypen des Herstellers. Entsorgen Sie die verbrauchten Batterien laut Gebrauchsanweisung des Herstellers.

⚠️ **ATENCION**

Puede explotar si la pila no este bien reemplazada.

Solo reemplazca la pila con tipas equivalentes segun las instrucciones del manifacturo. Vote las pilas usadas segun las instrucciones del manifacturo.

OTHER WARNINGS

Please heed the following warnings concering the VIPer820 board:

⚠️ CPU Voltage

Faulty jumper settings on the TEK-067 daughterboard will damage the CPU. Please read pages 6-9 and 6-10 in the VIPer820 Technical Reference Manual carefully, if you need to install or replace the processor.

⚠️ Flat Panel Power

The VIPer820 only supplies the Flat Panel with 5V power. In order to supply 3.3V power to your Flat Panel, an external 5V to 3.3V DC-DC voltage converter is required.

Incorrect power voltage can damage your Flat Panel.

⚠ SCSI & Flat Panel 50-Pin Connectors

Connect the SCSI or Flat Panel cables to the VIPer820 board carefully, since both the J5 SCSI connector and the J9 Flat Panel connector are 50-pin headers.

Faulty cable connections will damage the board!

J5 SCSI CONNECTOR

J9 FLAT PANEL
CONNECTOR

WARNING!

BOTH THE SCSI CONNECTOR AND THE FLAT PANEL
CONNECTOR ARE IDENTICAL 50-PIN HEADERS!

FAULTY CABLE CONNECTIONS WILL DAMAGE
YOUR VIPᴇʀ820 BOARD!

IMPORTANT INFORMATION

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

50-pin High Density Connector

The J9 Flat Panel connector found on the VIPer820 is a 50-pin high density connector, which has a different pinout than most dual row headers. The pin numbers are shown below.

ONBOARD FLAT PANEL CONNECTOR

FLAT PANEL CABLE: MATING CONNECTOR

In the same way, the mating connector on the Flat Panel Cable (TEKNOR # 150-105), has the same linear pinout, as shown above. Two 25-pin flat cables are crimped to this connector: one cable has pins 1 to 25, while the other cable has pins 26 to 50.

Adapter Cables

When connecting Serial Ports, the use of Taïwanese 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.

Read Me First 4

⚠ 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.

⚠ Connecting Flat Panel Video Display

The VIPer820 board supports many different types of Flat Panel displays. TEKNOR has fully tested a number of these panels and provides all the BIOS software support and the technical information needed.

If you have access to the Internet, many video BIOS files in a binary format and related interconnection charts in a PDF format are available on our web site. You can download these files, if you are a customer of TEKNOR and have a password from TEKNOR. If you do not have your password, contact TEKNOR's Technical Support to obtain it.

To download a video BIOS file or its interconnection chart file, follow this procedure:

1. Access the TEKNOR web site. Our address is http://www.teknor.com .
2. Go to the Support & Services section.
3. Scroll down the list of products until you find the name of your board and click on it. This selection is a link to the board's support area.
4. Click on the Video BIOS link.
5. The list of tested Flat Panel displays appears. If you find your particular display, you can then ask to download the associated BIOS or interconnection chart files by clicking the appropriate link.
6. A pop-up window appears. You must enter your password (case sensitive) and click the SUBMIT button. Entering your e-mail address is optional. Follow the instructions in subsequent pop-ups to download the file.

If you do not have access to our web site, or if you do not see the name of your Flat Panel, then you need to contact TEKNOR's Technical Support department. Since we are always testing new flat panels, it is possible that we have tested your particular type of panel display. Even if we have not tested it, TEKNOR's Technical Support can do it for you and supply the video BIOS and the technical information you need.

⚠ Flat Panel Cable Length

The Flat Panel Cable length for the SBC should be cut on the unconnected end to a recommanded maximum length of 18 inches from the high density connector. Though some Flat Panels may support longer flat cables, and TEKNOR has made allowance for this by providing more than 18 inches of cable, it is the customer's responsability to ensure that the additional length is fully supported by the Flat Panel's specifications.

⚠ Flat Panel Control Signals and the Feature/V-PORT Connector

When the voltage level for the Flat Panel Control signal is set at 3.3V via the W11 jumper, only 3.3V logic levels can be used for the Feature/V-PORT Connector.

⚠ Powering up the system

If you should encounter a problem, verify the following items:

· Make sure that all connectors are properly connected. On the standard flat ribbon cable used for the floppy connector, pin 1 is indicated by small red stripe. Verify that this red stripe is located on the appropriate side of the connector.

· Verify your boot diskette. It must be a system disk and it must be in proper working order.

· If the system still does not start up properly, you should try booting your system with only the power cord and video monitor connected to the board (this is the minimum required to see if the board is working).

· If you still are not able to start up your system, please refer to the Emergency Procedure in Appendix G.

· If you still are not able to get your board up and running, contact our Technical Support department for assistance.

⚠ 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 (450) 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 2 and Revision 1

Revision 2 boards support Pentium MMX 166/200/233 and K6 166/200/233 processors. The changes include the use of a new TEK-067 power supply daughterboard which replaces the TEK-059, a new socket-7 processor socket and higher bulk capacitance to support the increased current demands and tighter voltage tolerances of the new processors.

PART 1
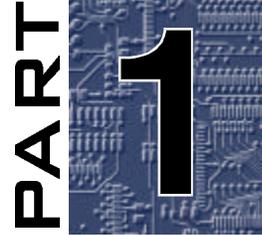
PRODUCT DESCRIPTION

1. **PRODUCT OVERVIEW**

2. **FEATURES**

3. **COMPATIBILITY WITH TEKNOR SBC PRODUCTS**

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1. PRODUCT OVERVIEW

The VIPer820 is a PC/AT industrial Single Board Computer (SBC) based on the Intel Pentium (Socket 7) processor and the Intel Triton II chipset.

The VIPer820 is based on the half size PC/AT card format and can be installed into a standard passive ISA backplane. The SBC and backplane assembly is used as a substitute for the standard PC motherboard, and in general includes all of the standard interfaces and peripherals that are normally included in a top of the line PC. This compact solution allows an industrial user the possibililty of designing a system that uses standard x86 software and peripherals, but in an industrial environment where reliability, integration and service are of major concern.

The VIPer820 can also be used without a backplane, as a stand-alone computer: in such a case, it is powered through the external power connector and expansion is possible through the PC/104 connector.

2. FEATURES

The VIPer820 includes the following features:

- **Microprocessor Support:** The following processors are supported (maximum internal CPU clock speed indicated):
    - Intel Pentium: 75, 90, 100, 120, 133, 150, 166 and 200 MHz.
    - Intel Pentium MMX: 150, 166, 200 and 233 MHz.
    - AMD K6: 166, 200 and 233 MHz.

- **External Cache:** Pipelined burst cache: 512 KB standard, 256 KB option.

- Video**:** The video system includes a PCI Flat Panel / CRT Super VGA controller (the CL-GD7548), 1MB of video memory (DRAM) and a video feature / V-PORT connector (jumper selectable). The V-PORT connector supports TEKNOR's TEK-380 Video Camera Interface Module (VIPer Vision).

- **System Memory:**
    - Two vertical 72-pin SIMM sockets support DRAM memory configurations from 8 to 256 MB.
    - Uses standard 5V, 70ns/60ns single-sided or double-sided 72-pin FPM or EDO SIMMs.
    - Supports 4MB, 8MB, 16MB, 32MB, 64MB and 128MB SIMM modules (32-bit and 36-bit).

- **Flash Disk:** This option includes a bootable Flash Disk device with capacities of 2 or 4 MB.

- **Bus Support:**
    - ISA Bus (IEEE P966 Specification).
    - PCI Local Bus Specification, Revision 2.1. Onboard only.

- **Enhanced IDE Interface:** Enhanced IDE controller can drive up to four enhanced IDE devices with transfer rates up to 22MB/s.

- **SCSI Interface:** This interface is implemented with a PCI to Fast SCSI II controller. Symbios 53C810 controller is used to perform this function.

- **PC/104 Connector:** Allows peripheral expansion with a compact format. In conjunction with the V-PORT connector supports the TEK-380 Video Camera Interface Module (VIPer Vision).

- **Operating Systems:** Supports all operating systems developed for x86 and Pentium processors: DOS, Windows 3.1, OS/2, Windows 95, Windows NT, UNIX, QNX, Novell 4.10, etc.

- **BIOS Licenses:** AWARD CPU BIOS, Cirrus Logic Video BIOS, and Symbios SCSI BIOS.

- **Boot Block Flash BIOS:** 256KB device contains all the board's BIOSes, and is used for nonvolatile configuration storage required for the Plug and Play BIOS. Protected boot block section allows for reprogramming of BIOS, even in the case of an inadvertent corruption of the Flash contents.

3. COMPATIBILITY WITH TEKNOR SBC PRODUCTS

The VIPer820 board is an upgraded version of the 486 processor based VIPer803 and VIPer807.

PART **2**

CONNECTING & INSTALLING

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4. STATIC ELECTRICITY PRECAUTIONS

Since static electricity can damage a board, the following precautions should be taken whenever you handle the VIPer820:

- 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 on your body.
- Handle the board by the edges.

5. UNPACKING

Follow these recommendations while unpacking:

- Observe the Static Electricity Precautions (Section 4).
- 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.

6. QUICK INSTALLATION

6.1 INSTALLING SYSTEM MEMORY

6.1.1 72-PIN SOCKETS LOCATION

The location of the two 72-pin vertical SIMM (Single In-line Memory Module) sockets appears on Diagram 6-1 and they are labeled U2 and U3.

DIAGRAM 6-1: SIMM Sockets Location
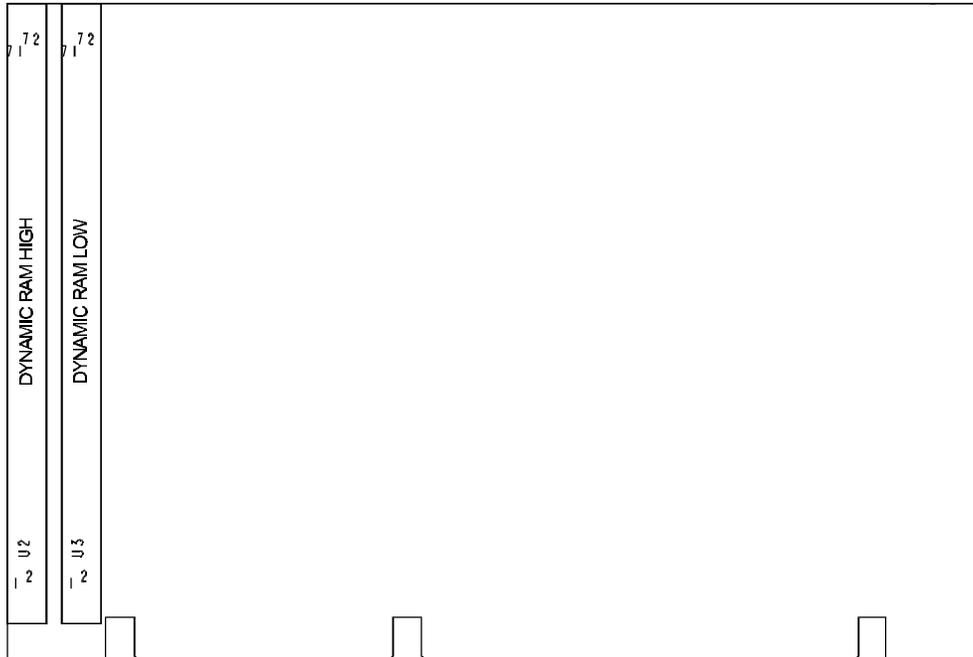
6.1.2 SUPPORTED SYSTEM MEMORY CONFIGURATIONS

At least 8MB of system memory must be installed on the VIPer820 for proper operation. System Memory can be configured from 8 to 256 MB. SIMM modules must be installed in both sockets (U2 and U3) and must be of the same capacity. The following SIMM modules are supported: 4MB (1Mx32/36), 8MB (2Mx32/36), 16MB (4Mx32/36), 32MB (8Mx32/36), 64MB (16Mx32/36) and 128MB (32Mx32/36).

The VIPer820 supports the following:

- Standard 5V, 70ns/60ns single-sided or double-sided SIMMs.
- 32-bit and 36-bit SIMMs.
- Fast Page Mode (FPM) and Extended Data Out (EDO) SIMMs.
- Error Checking and Correction (ECC) or parity bit with 36-bit SIMMs.

TABLE 6-1: VIPer820 System Memory Configuration: 8MB - 256MB

SYSTEM MEMORY	U2	U3
8MB	4MB (1Mx32/36)	4MB (1Mx32/36)
16MB	8MB (2Mx32/36)	8MB (2Mx32/36)
32MB	16MB (4Mx32/36)	16MB (4Mx32/36)
64MB	32MB (8Mx32/36)	32MB (8Mx32/36)
128MB	64MB (16Mx32/36)	64MB (16Mx32/36)
256MB	128MB (32Mx32/36)	128MB (32Mx32/36)

Consult Table 6-2 to see examples of recommended SIMM devices on the VIPer820. Many other models are available and function equally well. Users are encouraged to check with their local distributors for comparable substitutes.

TABLE 6-2: Recommended SIMM Devices

SIMM	VENDOR	PART NUMBER
1M*36 (FPM) 4MB modules	MICRON	MT9D136M-7
	NEC	MC-421000A36B-70
	SAMSUNG	KMM5361000B-7
	TEXAS INSTRUMENTS	TM124MBK36R-70
	TOSHIBA	THM361020AS-70
2M*32 (EDO) 8MB modules	MICRON	MT4D232DM-6X
2M*36 (FPM) 8MB modules	HITACHI	HB56D236BW-7B
	HITACHI	HB56D236B2-7C
	HITACHI	HB56D236BS-7BC
	HITACHI	HB56D236BW-7C
	HYUNDAI	HYM536220W-70
	MICRON	MT18D236M-7
	NEC	MC422000A36B-70
	SAMSUNG	KMM5362000B-7
	TOSHIBA	THM362040AS-60
	TOSHIBA	THM362040AS-70
4M*36 (FPM) 16MB modules	HYUNDAI	HYM536410AM-70
	MITSUBISHI	MH4M36ANXJ-7
	NEC	MC-424000A36BJ-70
	NEC	MC-424000A36BH-70
	SAMSUNG	KMM5364100-7
	TOSHIBA	THM364020S-70
8M*32 (EDO) 32MB modules	MICRON	MT16D832DM-6X
8M*36 (FPM) 32MB modules	HITACHI	HB56D836BR-70A
	HITACHI	HB56D836BR-60A
	TOSHIBA	THM368020SG-60
	TOSHIBA	THM368020S-70

6.1.3 SIMM INSTALLATION

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 sockets are at the end of the board farthest from you.

- Hold the module with the notch on the bottom left facing you, and insert the connector into the socket at a 70° angle from the board. Always start inserting the module in the socket nearest the center of the board. Then work your way by inserting the other modules, one by one, towards the exterior edge of the board.

- Snap the module 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.

To remove the SIMMs from the sockets, pull on the retaining pegs situated on each side of the SIMM socket. Once the module has snapped out of the socket, pull gently on it.

6.2 SETTING JUMPERS

6.2.1 CONNECTING THE BATTERY

To enable the internal battery, you must short pins 1 and 2 on jumper W10. An external battery may be used. In such a case, pins 2 and 3 of jumper W10 should be shorted.

W10   Battery
          Selection

Internal
Battery

External
Battery
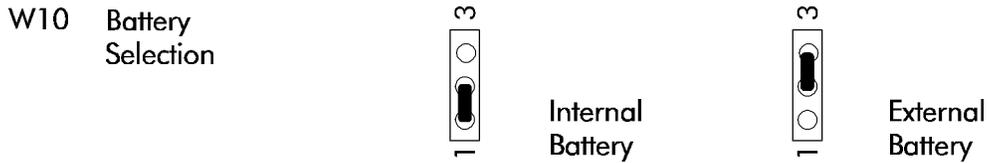
✎ **NOTE**

> Removing the W10 jumper has the same effect as putting the battery in storage; TEKNOR always ships its board with the battery jumper removed in order to increase the life of the battery.

6.2.2 JUMPER SETTINGS ON THE VIPer820 SBC

Diagram 6-2 shows the jumper locations on the VIPer820 board. The jumpers appear as rectangular boxes containing small circles which represent the pins. Pins on the ends or corners are numbered on the diagram.

The jumpers are shown with default settings (the black strips over the pins indicate that those pins are shorted by jumper caps).

DIAGRAM 6-2: Jumper Locations With Default Settings
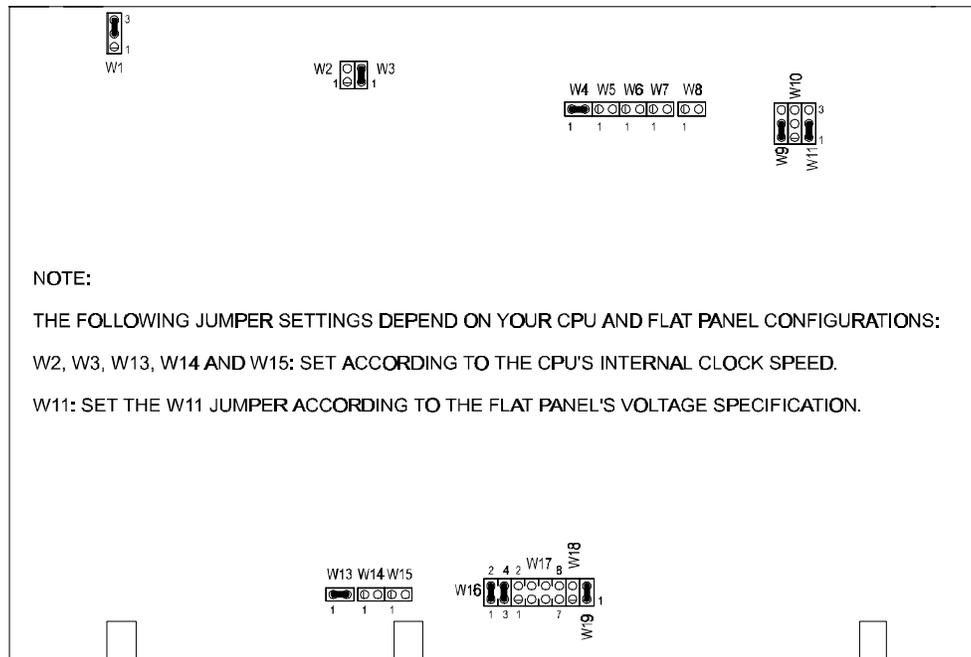
Table 6-3 to 6-5 on the following pages show all jumper settings (default settings are indicated with an *).

Note that the jumpers on the TEK-067 power supply daughterboard are shown in section 6.2.3.

TABLE 6-3: Jumper Settings: W1-W3, W13-W15

NAME	FUNCTION	CONFIGURATION (INITIAL SETTING: *)
W1	SCSI Termination	Controlled by software Disabled by hardware Enabled by hardware *
W2 W3 W13 W14 W15	Internal CPU Clock Speed	75MHz 90MHz 100MHz 120MHz 133MHz 150MHz 166MHz 200MHz 233MHz **WARNING: Incorrect settings can cause damage to the CPU!**

TABLE 6-4: Jumper Settings: W4-W11

NAME	FUNCTION	CONFIGURATION (INITIAL SETTING: *)
W4 W5	Feature Connector, V-PORT	W4 W5 [○ ○ | ⬤] Enabled W4 W5 [⬤ | ○ ○] Disabled * W4 W5 [○ ○ | ○ ○] V-PORT (for TEK-380)
W6 W7	Serial Port 2 Termination Resistors	W6 W7 RS-232 or RS-422/RS-485 [○ ○ | ○ ○] Without Termination Resistors * W6 W7 RS-422/RS-485 [⬤ | ⬤] With Termination Resistors
W8	Non Maskable Interrupt on Power Fail Output	[⬤] Enabled [○ ○] Disabled *
W9	Power Fail Detection Source	External Power Fail Input to Pin 6 of J12 * Internal/External Battery When Less Than 3 V
W10	Battery Selection	Internal Battery External Battery Battery Disconnected * **WARNING: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended. Dispose of used batteries according to the manufacturer's instruction.**
W11	Voltage Level for Flat Panel Control Signals (This jumper does not select the voltage for the Flat Panel Power)	5V * 3.3V NOTE: To know which interface level to select, refer to the Flat Panel voltage specification. **WARNING: Incorrect settings can cause damage to the Flat Panel.**
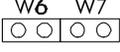
TABLE 6-5: Jumper Settings: W16-W19

NAME	FUNCTION	CONFIGURATION (INITIAL SETTING: *)
W13 W14 W15	See W2	
W16	Supervisor I/O: Base Address	190H * 390H 290H 390H
W17	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 5-6: Enable TEKNOR Extension Extension * 7-8: Disable Onboard 7-8: Enable Onboard VGA Controller VGA Controller *
W18	BIOS Boot Selection	Emergency Boot Normal Boot *
W19	Watchdog Timer	Enabled * Disabled
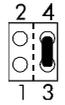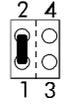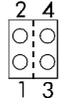
6.2.3 JUMPER SETTINGS ON THE TEK-067 DAUGHTERBOARD

The TEK-067 daughterboard which is installed on the VIPer820's P1 connector has three jumpers (W1,W2 and W3) for setting the CPU voltage.

DIAGRAM 6-3: TEK-067 CPU Voltage Jumpers
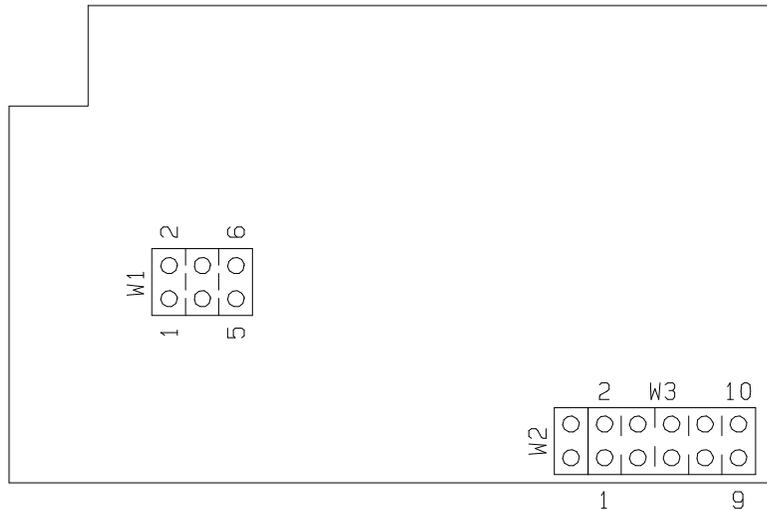
These jumpers are very important and must be carefully configured. If you ordered your VIPer820 with a CPU on board, then the TEK-067 jumpers will already be set. Do not modify these settings!

⚠️ **WARNING!**

> CPU voltage must be configured as specified by CPU manufacturer, otherwise damage to the processor can result.

See Table 6-6 for jumper settings.

Single-voltage Pentium processors must be set for 3.3 V only. In the case of split-core technology (Pentium MMX or K6), you must select the right core voltage for your particular processor. For example, Pentium MMX processors running at 166MHz, 200MHz and 233MHz require 2.8 V core voltage. Be sure you know the specified core voltage for your processor when it is a split-core technology!

TABLE 6-6: TEK-067 Jumper Settings: W1 - W3

Processor	W1	W2	W3					Comments
			1-2	3-4	5-6	7-8	9-10	
Pentium-100	1-3, 2-4	IN	IN	OUT	IN	IN	OUT	
Pentium-120	1-3, 2-4	IN	IN	OUT	IN	IN	OUT	
Pentium-133	1-3, 2-4	IN	IN	OUT	IN	IN	OUT	Single plane Vcore=Vio=3.3V
Pentium-150	1-3, 2-4	IN	IN	OUT	IN	IN	OUT	
Pentium-166	1-3, 2-4	IN	IN	OUT	IN	IN	OUT	
Pentium-200	1-3, 2-4	IN	IN	OUT	IN	IN	OUT	
MMX-166	3-5, 4-6	OUT	OUT	OUT	OUT	IN	OUT	Split plane Vcore=2.8V, Vio=3.3V
MMX-200	3-5, 4-6	OUT	OUT	OUT	OUT	IN	OUT	
MMX-233	3-5, 4-6	OUT	OUT	OUT	OUT	IN	OUT	
K6-166	3-5, 4-6	OUT	IN	OUT	OUT	IN	OUT	Split plane Vcore=2.9V, Vio=3.3V
K6-200	3-5, 4-6	OUT	IN	OUT	OUT	IN	OUT	
K6-233	3-5, 4-6	OUT	OUT	OUT	IN	IN	OUT	Split plane Vcore=3.2V, Vio=3.3V

6-11

6.3 *CONNECTING & POWERING UP THE BOARD*

6.3.1 INSTALLING VIPer820 BOARD IN A SYSTEM

The VIPer820 is fully IBM AT compatible and, as such, can be installed on any standard ISA passive backplane. The available slots on the backplane will then provide the possibility of expansion through add-on cards.

Since the VIPer820 also has power connectors for an external power supply, it can also be used as part of a stand-alone system. The board's PC/104 connector will then provide any needed expansion through stackable PC/104 mezzanine cards.

Mounting holes on the VIPer820 are plated and connected to the VIPer board's chassis ground. If you need to isolate the board, insert plastic washers (or washers made with some other electrically isolating material) between the screws and the mounting holes.

The VIPer820 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.

6.3.2 CONNECTING A FLOPPY DISK

The Floppy connector appears on Diagram 6-4 at J2.

DIAGRAM 6-4: Floppy Connector Location
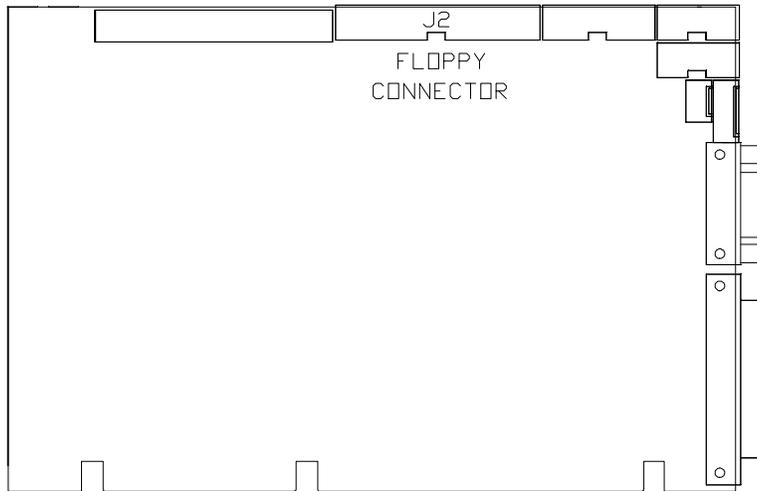
The installation of the floppy drives is done via a standard IBM 34-pin flat ribbon cable that connects to J2.

The following list includes approved vendors for the J2 connector's mating parts:
Amp 746285-8 [optional strain relief: 499252-6],
Robinson Nugent IDS-C34PK-TG,
Thomas & Betts 622-3430 [optional strain relief: 622-3441].
(34-pin flat cable connector).

DIAGRAM 6-5: Floppy Disk Cable
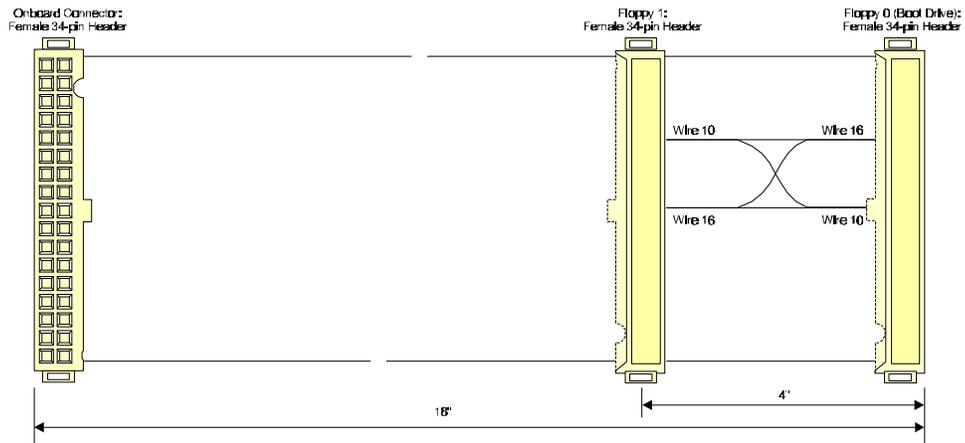
6.3.3 CONNECTING INTERFACE DEVICES (KEYBOARD, SPEAKER, RESET, LED)

Connector J3 provides all the necessary signals for connecting the keyboard, speaker, reset, and keylock interface devices. The Keyboard/Speaker connector appears on Diagram 6-6 at J3.

DIAGRAM 6-6: Keyboard/Speaker Connector Location
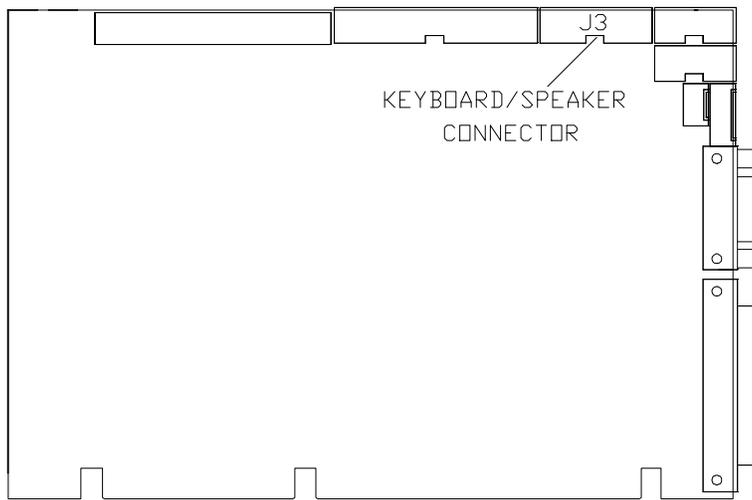
The following list includes approved vendors for the J3 connector's mating parts:
Amp 746285-3 [optional strain relief: 499252-8],
Robinson Nugent IDS-C16PK-TG,
Thomas & Betts 622-1630 [optional strain relief: 622-1641].
(16-pin flat cable connector).

The following functions are available on the J3 connector:

- <u>Speaker</u>: An 8 ohm speaker can be directly connected to pins 7 and 8 of J3. All necessary drivers are on the board.

- <u>Keyboard Disable</u>: The keyboard can be disabled or locked up by shorting pins 9 and 10 of J3.

- <u>Hard Disk LED</u>: 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 board.

- <u>Reset</u>: Manually reset the system by driving pin 13 (J3) to low state (< 0.8 V).

The following table gives the J3 Connector pinout:

TABLE 6-7: J3 Connector Pinout

Pin Number						Pin Number
Signal Flow						Signal Flow
Signal						Signal
KBCLK	I/O	1		2	-	GND
KDATA	I/O	3		4	-	GND
VCC (+5V)	-	5		6	-	VCC (+5V)
SPEAKER	O	7		8	-	VCC (+5V)
KBDINH*	I	9		10	-	GND
DOWNLD*	I	11		12	-	GND
PBRES*	I	13		14	-	GND
ACTIVE*	O	15		16	-	VCC(+5V)

*   Active low signal

6.3.4 CONNECTING A MOUSE

The board supports a mouse, through the PS/2 connector at J11. 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.

The Mouse connector appears on Diagram 6-7 at J11.

DIAGRAM 6-7: Mouse Connector Location
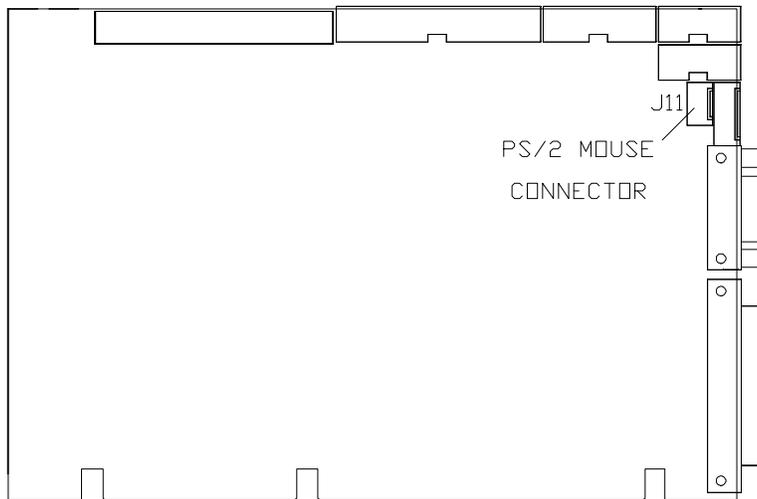
The following list includes approved vendors for the J11 connector's mating parts:

Molex 22-01-3047 (connector),
Molex 08-50-0114 (crimp).

6.3.5 CONNECTING A MONITOR

Connecting CRT video to the VIPer820 is simple. Merely connect the standard VGA DB15 male connector to the board's J13 high density, right angle, female connector. See Diagram 6-8 for the location of J13.

DIAGRAM 6-8: Video CRT Connector Location
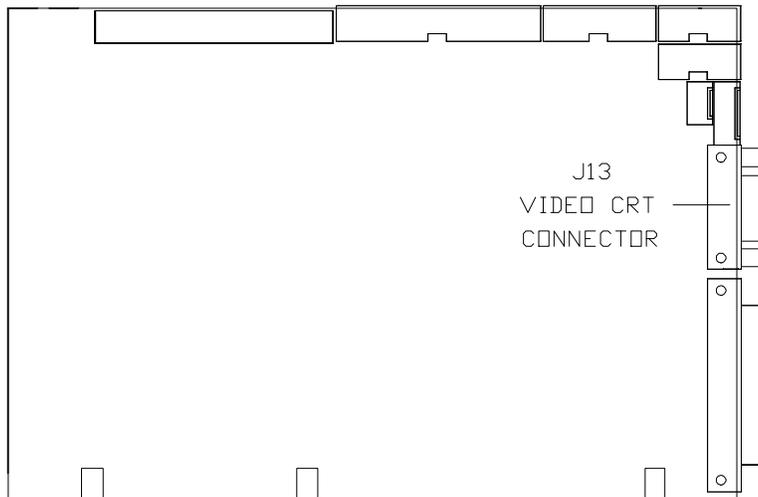
6.3.6 POWERING UP THE SYSTEM

6.3.6.1 Power Sources for the VIPer820

The VIPer820 Single Board Computer is powered via the ISA bus when it is installed on a passive backplane or via the VIPer820's external power connector(s).

The external power connectors are:

J12 - Power A Connector: for +5V, +12V, -12V and Ground.
Pin 6 is used as Power Fail Detection Input (PD)

J14 - Power B Connector: for +5V and Ground.

Power B is a +5V supply input to be used when Power A supply is not enough (for example, when using PC/104 modules or processors with higher current requirements, such as the Pentium MMX or K6).

Power A and Power B Connector pinouts are given in Appendix C.

✎ **NOTE**

When connecting external power to boards with a Pentium MMX or an AMD K6 processor, both the J12 Power A connector and the extra J14 Power B connector need to be used because of higher current requirements.

6.3.6.2 Power Up Procedure

You are now ready to power up your system.

1. Insert a bootable diskette in drive A to start your system with DOS.
2. Hit the DELETE key before or when this message appears near the bottom of the screen: ″Press **DEL** to enter SETUP″. This will bring you to the Main Menu of the AWARD BIOS CMOS Setup Utility. Use the arrow keys to select among the items and press ENTER to accept.
    - Select ″STANDARD CMOS SETUP″ to set the date and time.
      More detail on the AWARD Setup is given in Section 11.1 of this manual.
    - Select ″LOAD SETUP DEFAULTS″ to reset the setup.
    - Select ″SAVE & EXIT SETUP″ to continue the boot procedure.
3. Once the boot procedure is completed, reboot the system to make sure everything works properly.

6.3.7 TROUBLESHOOTING

If you should encounter a problem, verify the following items:

- Make sure that all connectors are connected properly. On the standard flat ribbon cable used for the floppy connector, pin 1 is indicated by small red stripe. Verify that this red stripe is located on the appropriate side of the connector.
- Verify your boot diskette. It must be a system disk and it must be in proper working order.
- If the system still does not start up properly, you should try booting your system with only the power cord and video monitor connected to the board (this is the minimum required to see if the board is working).
- If you still are not able to start up your system, please refer to the Emergency Procedure in Appendix G.
- If you still are not able to get your board up and running, contact our Technical Support department for assistance.

7. INSTALLING & WORKING WITH SYSTEM COMPONENTS

7.1 INSTALLING MICROPROCESSOR &FAN

Normally, your VIPer820 will be ordered with one of the available processors and a cooling system. However, it may be necessary to reinstall or reconfigure these components.

7.1.1 INSTALLING MICROPROCESSOR

The following jumpers on the VIPer820 are related to the microprocessor (CPU): W2, W3, W13,W14 and W15. They are configured together depending on the internal CPU clock speed, as shown on Diagram 7-1.

DIAGRAM 7-1: VIPer820 CPU Related Jumpers
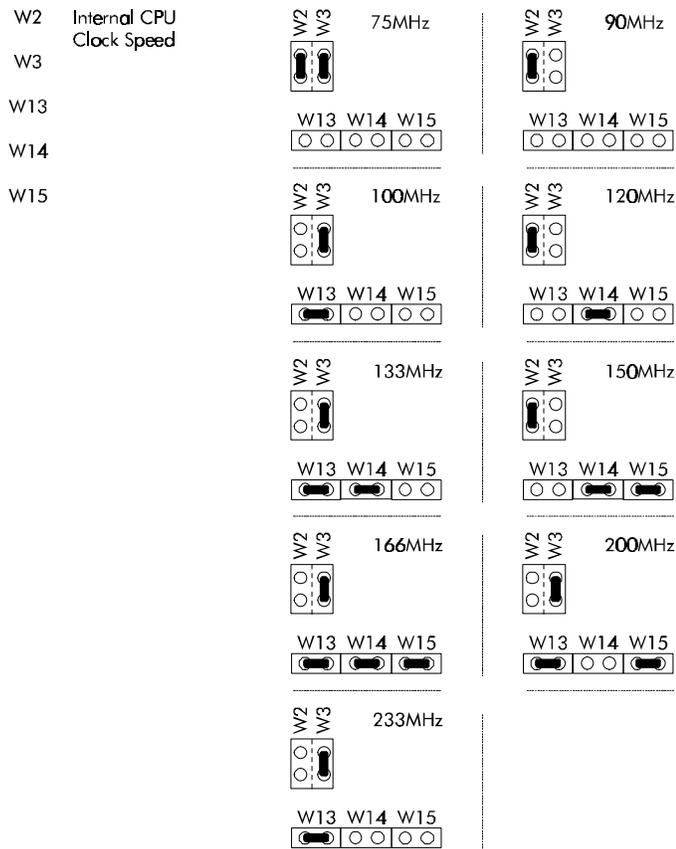
WARNING: Incorrect settings can cause damage to the CPU!

The TEK-067 daughterboard which is installed on the VIPer820's P1 connector has three jumpers (W1,W2 and W3) for setting the CPU voltage.

These jumpers are very important and must be carefully configured. If you ordered your VIPer820 with a CPU on board, then the TEK-067 jumpers will already be set. Do not modify these settings!

See Table 7-1 for jumper settings.

TABLE 7-1: TEK-067 Jumper Settings: W1 - W3

Processor	W1	W2	W3					Comments
			1-2	3-4	5-6	7-8	9-10	
Pentium-100	1-3, 2-4	IN	IN	OUT	IN	IN	OUT	Single plane Vcore=Vio=3.3V
Pentium-120	1-3, 2-4	IN	IN	OUT	IN	IN	OUT	
Pentium-133	1-3, 2-4	IN	IN	OUT	IN	IN	OUT	
Pentium-150	1-3, 2-4	IN	IN	OUT	IN	IN	OUT	
Pentium-166	1-3, 2-4	IN	IN	OUT	IN	IN	OUT	
Pentium-200	1-3, 2-4	IN	IN	OUT	IN	IN	OUT	
MMX-166	3-5, 4-6	OUT	OUT	OUT	OUT	IN	OUT	Split plane Vcore=2.8V, Vio=3.3V
MMX-200	3-5, 4-6	OUT	OUT	OUT	OUT	IN	OUT	
MMX-233	3-5, 4-6	OUT	OUT	OUT	OUT	IN	OUT	
K6-166	3-5, 4-6	OUT	IN	OUT	OUT	IN	OUT	Split plane Vcore=2.9V, Vio=3.3V
K6-200	3-5, 4-6	OUT	IN	OUT	OUT	IN	OUT	
K6-233	3-5, 4-6	OUT	OUT	OUT	IN	IN	OUT	Split plane Vcore=3.2V, Vio=3.3V

7.1.2 FAN CONNECTOR

The fan connector for connecting a CPU fan appears on Diagram 7-2.

DIAGRAM 7-2: J7 Fan Connector
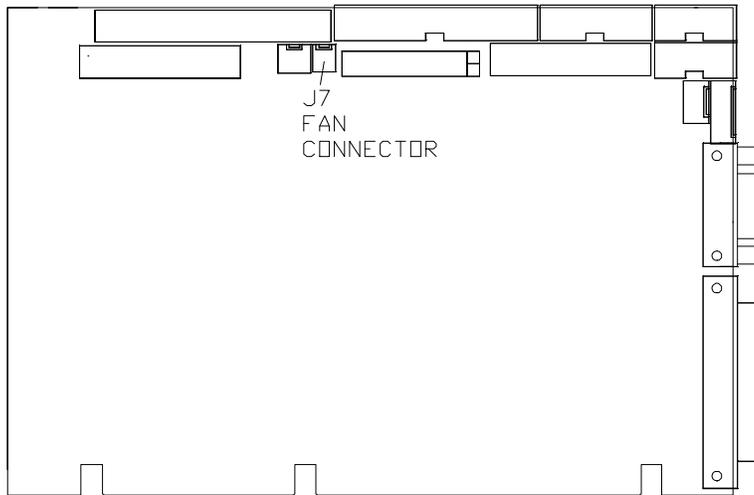
The following list includes approved vendors for the J7 connector's mating parts:

Leoco 2530 S020013 (housing),
Leoco 2533 TCB00A0 (crimp);

Molex 22-01-3027 (housing),
Molex 08-50-0114 (crimp).

The fan connector's pinout is as follows:

TABLE 7-2: Fan Connector (J7) - Pinout

Pin Number	Signal
1	+12V
2	GND

7.2 ENABLING CACHE MEMORY

There are two separate caches in the host subsystem: internal cache and external cache. The cache inside the processor (internal cache) is referred to as the first level cache (also primary cache). The external cache (called system cache in this manual) comprises the System Controller's cache control circuitry and associated external memory array; it is referred to as the second level cache (also secondary cache). The second level cache is unified, which means that both CPU data and instructions are stored in the cache.

System cache is enabled and configured in the AWARD Setup program.

7.3 ALLOCATING DMA CHANNELS

The VIPer820 integrates the functionality of two 8237 DMA controllers. Eight DMA channels are available.

According to Plug and Play standards, the system BIOS automatically allocates DMA Channel 1 or 3 for the parallel port's ECP mode. Channel 2 is reserved for the floppy controller and Channel 4 is used to cascade Channels 0 through 7 to the microprocessor.

TABLE 7-3: DMA Channels

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

7.4 ALLOCATING IRQ LINES

TABLE 7-4: IRQ Lines

Controller # 1		Controller # 2	
IRQ 0	Timer 0	IRQ 8	Real-time clock
IRQ 1	Keyboard	IRQ 9	Available [1]
IRQ 2	Cascade controller # 2	IRQ 10	Available [1]
IRQ 3	COM 2 *	IRQ 11	Available [1]
IRQ 4	COM 1 *	IRQ 12	PS/2 Mouse Interface
IRQ 5	LPT2 * or available [1]	IRQ 13	Coprocessor Error
IRQ 6	Floppy controller *	IRQ 14	Primary IDE * or available [1]
IRQ 7	LPT1 * or available [1]	IRQ 15	Secondary IDE * or available [1]

*   All functions marked with an asterisk (*) can be disabled or reconfigured.
[1]   Available lines service on board and external PCI/ISA PnP devices or a Legacy ISA device.

7.5 SELECTING BIOS BOOT OPTIONS

A section or block of the Flash BIOS is reserved for emergency boot, when it is needed. The W18 jumper selects between Emergency BIOS boot and Normal boot (* = initial setting):

W18   BIOS Boot
       Selection

Emergency Boot   Normal Boot *

7.6 INSTALLING SUPERVISOR UTILITIES

7.6.1 SUPERVISOR I/O REGISTER

TEKNOR computers utilize address space 190H, 290H or 390H (depending on the setting of W16 jumper for I/O base address) to enable special features (see Table 7-5 below).

TABLE 7-5: 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	Enable direction control RS-485 1=enable RS-485 only, write only	Power Detection Output or Battery Low output
4	0	Reserved	W17 (7-8) Status
5	0	Reserved	W17 (5-6) Status
6	1	Reserved	W17 (3-4) Status
7	0	Reserved	W17 (1-2) Status

✎ **NOTE**

> Not all bits are R/W. Therefore, be certain to keep a mirror image of the register when programming it.

✎ **NOTE**

> All bits are 0 after a hardware RESET or power up condition.

✎ **NOTE**

> Write the values shown in the "Bit Value (Default)" column if you are unsure.

7.6.2 POWER FAIL DETECTION

The power fail circuit can be used to determine if a voltage crosses a pre-determined threshold. The output of the power fail circuit can be connected to the IOCHK* line to generate a non-maskable interrupt (NMI) when the monitored voltage crosses this threshold.

Power fail monitoring is enabled by shorting the W8 jumper.

The power failure detector, which generates a NMI when a failure occurs, provides a 1.25V threshold for DC power fail warning when the system monitors:

- Low battery detection, or
- A power supply other than +5V DC.

There are three ways to set the Power Fail and Battery circuit:

Using Internal Battery & Monitoring External Source:
Internal Battery (set by W10 jumper with pins 1-2 shorted) and External Power Fail Input to Pin 6 of J12 connector (set by W9 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 (R17) and a fixed 1KΩ 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. R17 can be calculated as follows:

$$R17 = 1K\Omega \; \frac{(VI-1.25)}{1.25}$$

where VI is input voltage on pin 6 of the power connector.

- **Using Internal Battery & Monitoring Internal Battery:**
  Internal Battery (set by W10 jumper with pins 1-2 shorted) and Power fail detect when battery is less than 3V (set by W9 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 W10 jumper with pins 2-3 shorted) and Power fail detect when battery is less than 3V (set by W9 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.

Related jumpers appear below (* = initial setting).

W8   Non Maskable
      Interrupt on Power
      Fail Output   [▬●▬]   Enabled   [○ ○]   Disabled *

W9   Power Fail
      Detection Source
                                             External Power   Internal/External
                                             Fail Input to   Battery When
                                             Pin 6 of J12 *   Less Than 3 V

W10   Battery
      Selection

                                             Internal   External
                                             Battery   Battery

7.6.3 WATCHDOG TIMER

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

Jumper W19 must be installed to permit activation of the Watchdog. If jumper W19 is removed, the Watchdog is disabled. The W19 settings are shown below (* = initial setting):

W19   Watchdog Timer   Enabled *   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 (or at 290H or 390H depending on the W16 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 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.

⚠ CAUTION

> The user program must provide the first access to address 190H (or at 290H or 390H depending on the W16 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 7-6: 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 C111 and leaving R125 opened changes the timeout to 100 ms. Shorting R125 and installing a capacitor at C111 will change the timeout period according to the following formulae:

$$\text{Timeout (milliseconds)} = \frac{400}{47\text{pF}} \times C \qquad \text{or} \qquad C111 = \frac{\text{Timeout (milliseconds) x 47pF}}{400\text{ms}}$$

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

7.7 SYSTEM POWER MANAGEMENT

System Power Management is software configurable through the AWARD Setup program or hardware configurable through the SMI Connector (J6).

For a description of power management modes and setup options available through the AWARD Power Management Setup, see section 11.1.7 - Power Management Setup.

To turn your system into Power Management state through the J6 connector, maintain an electrical short between pin 1 and pin 3 of the SMI connector.

Please refer to Table 7-7 for SMI Connector pinout.

TABLE 7-7: SMI Connector (J6) - Pinout

Pin Number	Signal Flow	Signal
1	I	SMI
2	-	Not Connected
3	-	GND

7.8 USING THE 2KB USER SERIAL EEPROM

The 4KB serial EEPROM device located at U20 is non-volatile memory. This storage area is completely user-defined.

For instructions on accessing this device, contact TEKNOR's Technical Support department.

7.9 READING THE UNIQUE SERIAL NUMBER

The 48-bit serial number device contains the board's unique serial number. The number can be read by software.

For instructions on accessing this device, contact TEKNOR's Technical Support department.

8. INSTALLING STORAGE DEVICES

8.1 FLOPPY DEVICES

8.1.1 FLOPPY CONNECTOR

The J2 Floppy connector's pinout appears in Table 8-1.

TABLE 8-1: 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 Connected
5	-	GND	6	-	Not Connected
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	-	Not Connected	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	TRACK 0*
27	-	Not Connected	28	I	WRITE PROTECT*
29	-	Not Connected	30	I	READ DATA*
31	-	GND	32	O	HEAD SELECT*
33	-	Not Connected	34	I	DSKCHG*

*   Active low signal

8.2 ENHANCED IDE DEVICES

8.2.1 EIDE CONNECTOR

The Enhanced IDE connector appears on Diagram 8-1 at J1.

DIAGRAM 8-1: Enhanced IDE Connector (J1)
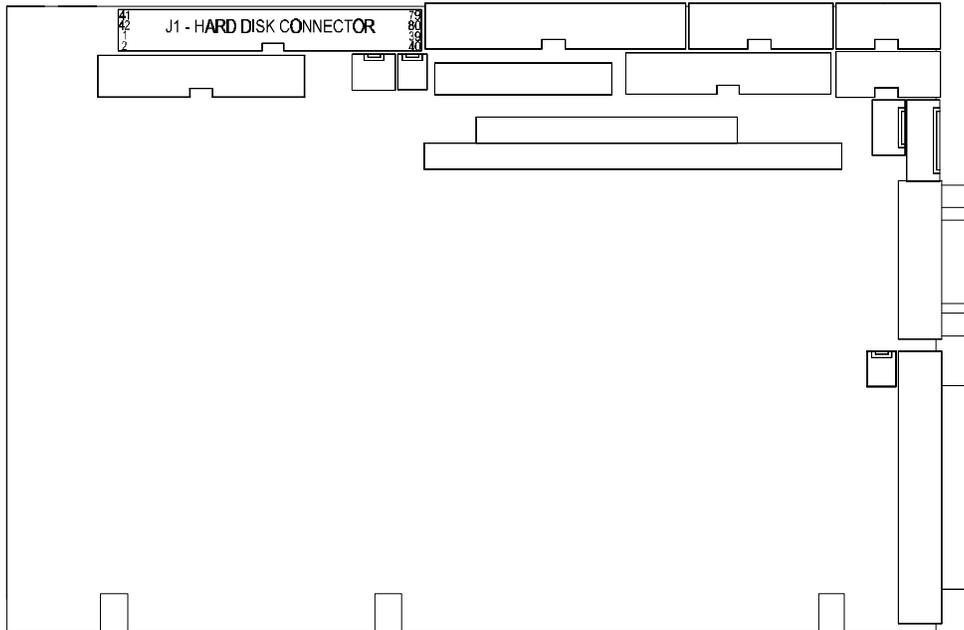
This connector is a dual-IDE 80-pin connector (2 x 40-pin). Its pinout appears in Table 8-2.

TABLE 8-2: Enhanced IDE Connector (J1) - Pinout

	Pin Number	Signal Flow	Signal	Pin Number	Signal Flow	Signal
P	1	O	RESET*	2	-	GND
	3	I/O	HD7	4	I/O	HD8
R	5	I/O	HD6	6	I/O	HD9
I	7	I/O	HD5	8	I/O	HD10
M	9	I/O	HD4	10	I/O	HD11
A	11	I/O	HD3	12	I/O	HD12
R	13	I/O	HD2	14	I/O	HD13
Y	15	I/O	HD1	16	I/O	HD14
	17	I/O	HD0	18	I/O	HD15
I	19	-	GND	20	-	Not Connected
D	21	I	DMA REQ 0	22	-	GND
E	23	O	IOW*	24	-	GND
	25	O	IOR*	26	-	GND
	27	I	IOCHRDY	28	O	BALE
	29	O	DMA ACK 0*	30	-	GND
	31	I	IRQ14	32	-	IOCS16*
	33	O	SA1	34	-	GND
	35	O	SA0	36	O	SA2
	37	O	CS0*	38	O	CS1*
	39	I	ACTIVE*	40	-	GND
S	41	O	RESET*	42	-	GND
E	43	I/O	HD7	44	I/O	HD8
C	45	I/O	HD6	46	I/O	HD9
O	47	I/O	HD5	48	I/O	HD10
N	49	I/O	HD4	50	I/O	HD11
D	51	I/O	HD3	52	I/O	HD12
A	53	I/O	HD2	54	I/O	HD13
R	55	I/O	HD1	56	I/O	HD14
Y	57	I/O	HD0	58	I/O	HD15
	59	-	GND	60	-	Not Connected
I	61	I	DMA REQ 1	62	-	GND
D	63	O	IOW*	64	-	GND
E	65	O	IOR*	66	-	GND
	67	I	IOCHRDY	68	O	BALE
	69	O	DMA ACK 1*	70	-	GND
	71	I	IRQx	72	-	IOCS16*
	73	O	SA1	74	-	GND
	75	O	SA0	76	O	SA2
	77	O	CS2*	78	O	CS3*
	79	I	ACTIVE*	80	-	GND

*   Active low signal

Two types of cables are needed to hook up the IDE connector:

▪ The first type is a 80-pin to two 40-pin IDE adaptor cable. The 80-pin connector side fits directly on the J1 connector. The short end of the adaptor cable is for the Primary IDE, the longer end is for the Secondary IDE, as shown on Diagram 8-2. This cable is furnished with the board.

▪ The second type of cable is a 40-pin cable, which connects directly to one of the 40-pin connectors of the adaptor cable and allows two IDE devices to be connected. Two such cables may be connected to the adapter cable, thus allowing the J1 connector to support up to four IDE devices (see Diagram 8-2). This 40-pin cable handles all command, data and status I/O lines. Its recommended maximum length is 18 inches from the IDE device to the adaptor cable's 40-pin connector.

DIAGRAM 8-2: Enhanced IDE Flat Cables
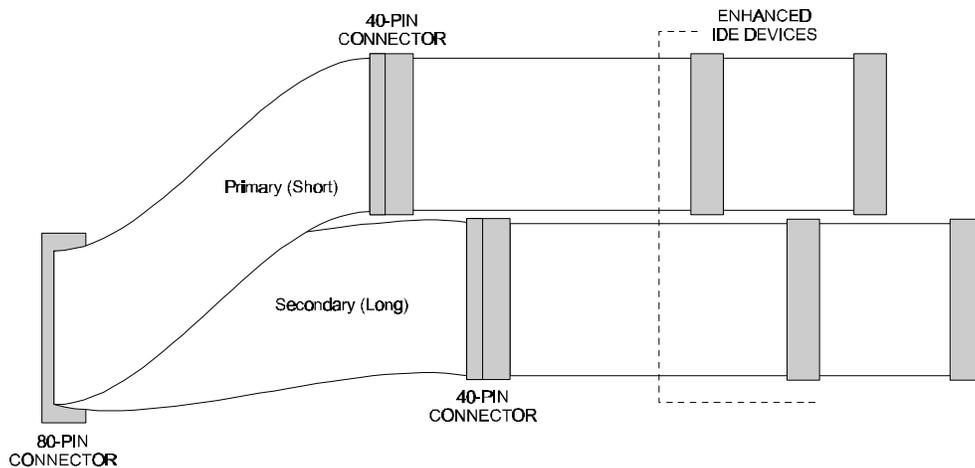
The following is a list of approved vendors for the mating 40-pin flat cable connector:

AMP 746285-9 [optional strain relief: 499252-1],
Robinson Nugent IDS-C40PK-TG,
Thomas & Betts622-4030 [optional strain relief: 622-4041].

8.3 SCSI DEVICES

8.3.1 SCSI CONNECTOR

The SCSI connector appears on Diagram 8-3 at J5. Its pinout is given in Table 8-3.

DIAGRAM 8-3: SCSI (J5) Connector
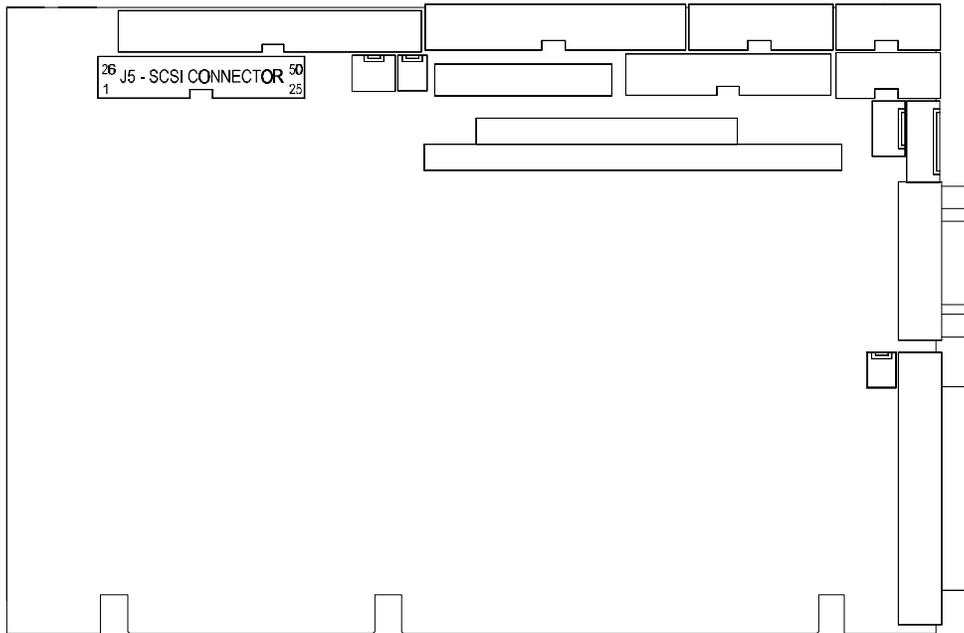
TABLE 8-3: Fast SCSI Interface Connector (J5) - Pinout

Pin Number	Signal	Pin Number	Signal
1	GND	2	SD0
3	GND	4	SD1
5	GND	6	SD2
7	GND	8	SD3
9	GND	10	SD4
11	GND	12	SD5
13	GND	14	SD6
15	GND	16	SD7
17	GND	18	SDP
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	Not Connected	26	Term Power
27	GND	28	GND
29	GND	30	GND
31	GND	32	SATN
33	GND	34	GND
35	GND	36	SBSY
37	GND	38	SACK
39	GND	40	SRST
41	GND	42	SMSG
43	GND	44	SSEL
45	GND	46	SCD
47	GND	48	SREQ
49	GND	50	SIO

.

8.3.2 INSTALLING A FIXED SCSI HARD DISK

This section explains how to go about installing a fixed SCSI Hard Disk on your system. No additional hardware or drivers are necessary if no more than two IDE/SCSI hard disks are present in your system.

To install your fixed SCSI hard disk, the steps described in sections 8.3.2.1 to 8.3.2.4 below must be followed.

8.3.2.1 VIP-UP Setup

It is important to configure your VIPer820 properly with the VIP-UP software utility prior to physically installing the SCSI hard disk:

- Set the Onboard SCSI controller/BIOS option of the VIP-UP screen at "Enabled".

- Update the VIP-UP Setup by pressing the F10 key.

⚠ WARNING

> You should not "install" your SCSI hard disk type in AWARD Setup (only your IDE hard disk).

8.3.2.2 Jumpers (Power Off)

Power off your computer. The W1 jumper determines whether the VIPer820 board is terminated by hardware or by software. The settings are:

W1   SCSI Termination

Controlled
by
software

Disabled
by
hardware

Enabled
by
hardware *

* Default setting

⚠ CAUTION

> Make sure that both ends of the SCSI cable are terminated and that all devices in between the ends are not terminated. If the VIPer820 board is located at the end of the SCSI cable, it should be terminated.

8.3.2.3 Connect SCSI Cable (Power Off)

The VIPer820 comes with a high density 50-pin connector. To connect to the SCSI cable, two cables are needed:

1. First, a SCSI Adaptor Cable Assembly. The SCSI Adaptor 50HDD to 50 HD Assembly (available from Teknor - Part number: Teknor 150-176) that connects directly to the board's J5 connector. Make sure line 1 of the cable matches with pin 1 of connector J5.

2. The second cable needed is a mating 50-pin flat cable connector. Approved vendors are listed below:

> AMP 1-746285-0 [499252-4*],
> Robinson Nugent IDS-C50PK-TG,
> Thomas & Betts 622-5030 [622-55041*].

> Attach this cable to your SCSI device. Make sure line 1 matches with pin 1 on your device.

A cable from your power supply and the SCSI Device must also be installed.

8.3.2.4 Follow Specific Device Installation Instructions (Power On)

Follow the installation instructions provided with your SCSI peripheral device to install it in the host.

✎ NOTE

> Each device being installed must be assigned a unique identifier called a SCSI Target ID. The lower the ID, the lower the priority level to the device in the SCSI subsystem. The host adaptor is usually assigned the highest priority level (i.e. 7). Table 8-4 lists common SCSI Target IDs.

TABLE 8-4: Common SCSI Target IDs

SCSI Devices	Common Used IDs
Host Adaptor	7
Hard Disks	0,1,2,3
CD-ROM	4,5
Tape Drive	5,6

8.3.3 INSTALLING OTHER SCSI DEVICES

To install any of the following: CD-ROM, Magneto-Optical/Removable Disk Drive, Tape Drive, Write Once Read Many (WORM) and scanners, please use the SCSI diskette that you received with your VIPer820. A special utility will install all the necessary drivers.

9. INSTALLING VIDEO

9.1 VIDEO CONTROLLER

9.1.1 INSTALLING VIDEO DRIVERS

The Video Controller has specific video drivers for various operating systems and software. To install these drivers, you must use the Utility Disk containing the video drivers, which came with your VIPer820. If you are looking for a driver which is not on the Utility Disk, please contact the Technical Support department.

9.1.2 DISABLING VIDEO CONTROLLER

The video controller can be disabled by shorting pins 7 and 8 on the W17 jumper.

This feature is useful when an external video card is required for testing or other purposes.

9.2 INSTALLING CRT VIDEO DISPLAY

9.2.1 VGA CONNECTOR

The VGA connector's pinout appears in Table 9-1.

TABLE 9-1: VGA Connector (J13) - Pinout

Pin Number	Signal Flow	Signal	Pin Number	Signal Flow	Signal	Pin Number	Signal Flow	Signal
1	O	RED	6	-	ANALOG GND	11	-	Not Connected
2	O	GREEN	7	-	ANALOG GND	12	-	Not Connected
3	O	BLUE	8	-	ANALOG GND	13	O	HSYNC
4	-	Not Connected	9	-	Not Connected	14	O	VSYNC
5	-	GND	10	-	GND	15	-	Not Connected

Connecting CRT video to the VIPer820 is simple. Merely connect the standard VGA DB15 male connector to the board's J13 high density, right angle, female connector.

9.3 INSTALLING FLAT PANEL VIDEO DISPLAY

9.3.1 FLAT PANEL CONNECTOR

TABLE 9-2: Flat Panel Connector Location
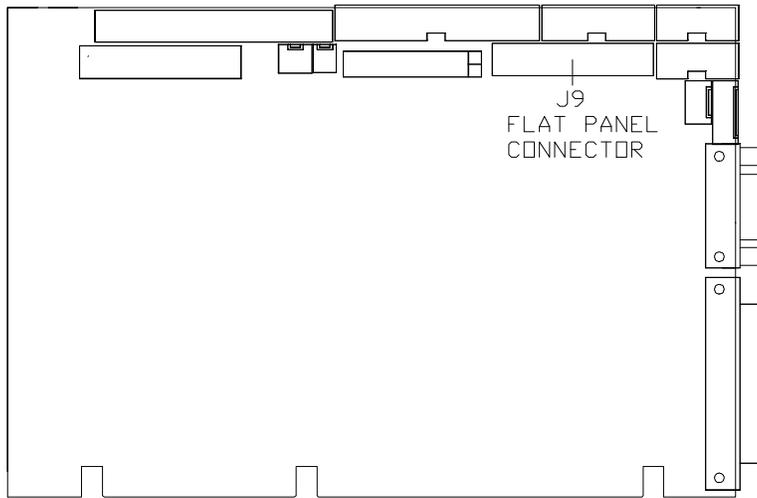
The Flat Panel connector's pinout appears in Table 9-3.

TABLE 9-3: Flat Panel Connector (J9) - Pinout

Pin Number	Signal Flow	Signal	Pin Number	Signal Flow	Signal
1	O	FP4	26	O	FPDE (Data Enable)
2	O	FP5	27	-	GND
3	O	FP6	28	-	GND
4	O	FP7	29	O	FP8
5	O	FP12	30	O	GP0 (Control 0)
6	O	FP13	31	O	GP1 (Control 1)
7	O	FP14	32	-	GND
8	O	FP15	33	O	ENB (Backlight)
9	O	FP19	34	-	GND
10	O	FP18	35	O	LLCLK (Line clock)
11	O	FP11	36	-	GND
12	O	FP10	37	O	FPVEE (Enable VEE)
13	O	FP23	38	O	FPVCC (Enable VCC)
14	O	FP22	39	O	FP2
15	O	FP21	40	O	GP2 (Control 2)
16	O	FP20	41	I	STANDBY*
17	-	GND	42	O	FP16
18	O	FPVDCLK (Shift Clock)	43	O	FP1
19	-	GND	44	O	FP17
20	O	FP9	45	-	Not Connected
21	-	GND	46	-	Not Connected
22	O	LFS (Frame start)	47	-	VCC (+5V)
23	O	FP3/MOD (Modulation)	48	-	VCC (+5V)
24	O	FP0	49	-	+12V
25	-	GND	50	-	+12V

* Active low signal

9.3.2 FLAT PANEL POWER SUPPLY CONNECTION

The VIPer820 only supplies the Flat Panel with 5V power. In order to supply 3.3V power to your Flat Panel, an external 5V to 3.3V DC-DC voltage converter is required.

9.3.3 FLAT PANEL INSTALLATION

9.3.3.1 *Connecting Flat Panel Video Display*

The VIPer820 board supports many different types of Flat Panel displays. TEKNOR has fully tested a number of these panels and provides all the BIOS software support and the technical information needed to properly interface your VIPer820 board with your selected Flat Panel display.

9.3.3.2 *Downloading Files From the TEKNOR Web Site*

If you have access to the Internet, many video BIOS files in a binary format and related interconnection charts in a PDF format are available on our web site. You can download these files, if you are a customer of TEKNOR and have a password from TEKNOR. If you do not have your password, contact TEKNOR's Technical Support to obtain it.

To download a video BIOS file or its interconnection chart file, follow this procedure:

1. Access the TEKNOR web site. Our address is http://www.teknor.com .

2. Go to the Support & Services section.

3. Scroll down the list of products until you find the name of your board and click on it. This selection is a link to the board's support area.

4. Click on the Video BIOS link.

5. The list of tested Flat Panel displays appears. If you find your particular display, you can then ask to download the associated BIOS or interconnection chart files by clicking the appropriate link.

6. A pop-up window appears. You must enter your password (case sensitive) and click the SUBMIT button. Entering your e-mail address is optional. Follow the instructions in subsequent pop-ups to download the file.

9.3.3.3 *More Available From TEKNOR*

If you do not have access to our web site, or if you do not see the name of your Flat Panel display on our site for your specific TEKNOR board, then you need to contact TEKNOR's Technical Support department. Since we are always testing new flat panels, it is possible that we have tested your particular type of panel display. Even if we have not tested it, TEKNOR's Technical Support can do it for you and supply the video BIOS and the technical information you need.

9.3.3.4 BIOS File

The BIOS files are self-extracting files (VXX_XXX.EXE), each including two files: the flat panel BIOS file (VXX_XXX.BFP) and a DOS text file (VXX_XXX.DOC) for the BIOS update utility program.

The letters which form the BIOS name are made up of the following parts:

V	XX	_	XX	X
Video	Video		Version	Revision
BIOS	Controller			

Once you have the correct video BIOS file, you need to copy the video BIOS file to your board's Flash BIOS device. This is done with the BIOS update utility program; see Section 14 to learn how to perform a video BIOS file update with this TEKNOR utility.

9.3.3.5 Technical Information File

The related technical information file, which includes the interconnection chart, is a PDF (Portable Document Format) file. The name of this file identifies the Flat Panel and the TEKNOR board with its video controller.

Note:
The column labeled EXTERNAL in the Display Interconnection table of the PDF file refers to the external circuitry or supplies which are needed in certain cases. This is usually an external power supply or an inverter frequently used in the clock circuit "SHFCLK" (in the case of V_{LCD} and V_{ADJ}, consult the manufacturer's flat panel data sheet for the actual voltage). An inverter is shown as $\longrightarrow\!\!\triangleright\!\!\circ\!\longrightarrow$. When no special circuits are shown in this column, connections are direct.

9.4 VIDEO FEATURE / V-PORT CONNECTOR

TABLE 9-4: Video Feature / V-PORT Connector Location
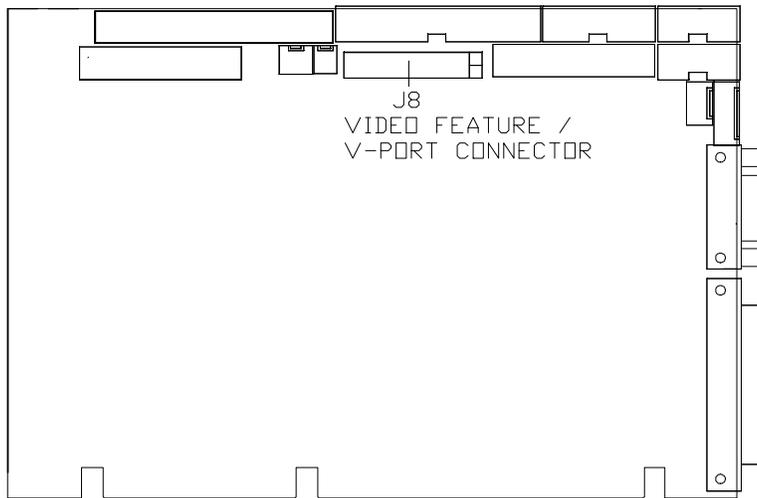
The J8 connector is a VESA/VGA pass-through connector. It supports the 8-bit mode directly and the 16-bit mode when using an external data multiplexer.

Through the J8 connector, the VIPer820 makes possible dynamic overlay. In dynamic overlay configurations, the video signal can be overlayed on a pixel by pixel basis. This makes it possible to overlay a portion of the frame and mix the signal with externally generated video signal. Both the video source and the choice of pixels to overlay can be changed dynamically.

The J8 connector also supports the 8-bit V-PORT, with options such as live video capture (TV in a window) or hardware MPEG decode. V-PORT eliminates the need for an external video frame buffer and additional hardware. It also enables video multimedia add-in card solutions. If you want to use the V-PORT capabilities, contact Technical Support for other important information (including changes in the connector's signals).

Jumpers W4 and W5 are used for enabling or disabling the J8 connector:
- Enable Feature Connector: Open W4 and short W5;
- Disable Feature Connector: Short W4 and open W5 (This is the initial setting);
- Enable V-PORT: Open W4 and W5.

✎ **NOTE**

> When the feature connector or the V-PORT connector is enabled, the Flat Panel connector will support 18-bit Flat Panels or less (maximum 256K colors). When the feature connector is disabled, Flat Panel types above 18-bit are supported (for example, 24-bit).

TABLE 9-5: Video Feature / V-PORT Connector (J8) - Pinout

I/O Pin	Signal Flow	Signal Name	I/O Pin	Signal Flow	Signal Name
Y1	I	FCP0	Z1	-	GND
Y2	I	FCP1	Z2	-	GND
Y3	I	FCP2	Z3	-	GND
Y4	I	FCP3	Z4	I/O	FCEVIDEO*
Y5	I	FCP4	Z5	I	FCESYNC*
Y6	I	FCP5	Z6	-	Not Connected
Y7	I	FCP6	Z7	-	Not Connected
Y8	I	FC P7	Z8	-	GND
Y9	O	FCDCLK	Z9	-	GND
Y10	I/O	FCBLANK*	Z10	-	GND
Y11	I	FCHSYNC	Z11	-	GND
Y12	I	FCVSYNC	Z12	O	FCVCLK
Y13	-	GND	Z13	O	OVRW*

*Active low signal

✎ **NOTE**

> If you want to use the J8 connector as a V-PORT, contact Technical Support for changes in the connector's signals and other important information.

10. INSTALLING PERIPHERALS

10.1 SERIAL PORTS

There are two 16C550 compatible serial ports. These have internal 16-byte FIFO buffers for more efficient data transfers.

For information on the programming of serial ports with the use of FIFO buffers, you can ask for Application Note # AN93007 from TEKNOR's Technical Support department.

10.1.1 SERIAL PORT CONNECTORS

Serial Port 1 and Serial Port 2 appear on Diagram 10-1 at J4 and J10 respectively.

DIAGRAM 10-1: Serial Ports Location
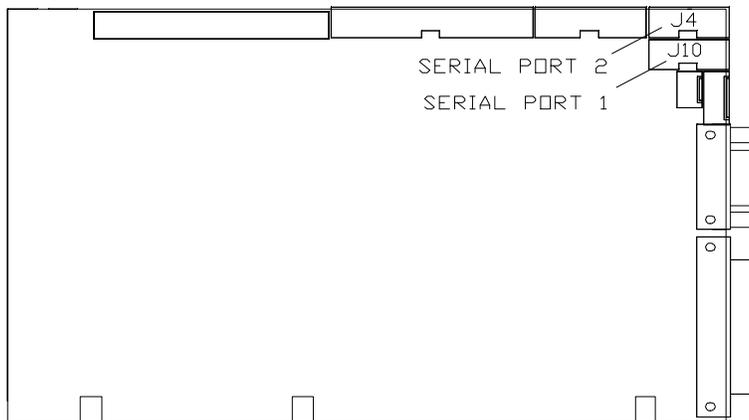
The following list includes approved vendors for the J4 and J10 connectors' mating parts:
Amp 746285-1 [optional strain relief: 499252-5],
Robinson Nugent IDS-C10PK-TG,
Thomas & Betts 622-1030 [optional strain relief: 622-1041].
(10-pin flat cable connector).

10.1.1.1 Serial Port 1 (J10) RS-232

The Serial Port 1 is configured as RS-232. With the IBM 9-pin DSUB Standard, Serial Port 1 is 100% compatible with the IBM-AT serial port. The cable and connector pinouts appear in Diagram 10-2.

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.

DIAGRAM 10-2: RS-232 Cable and Connectors (J10, Mating and DSUB)
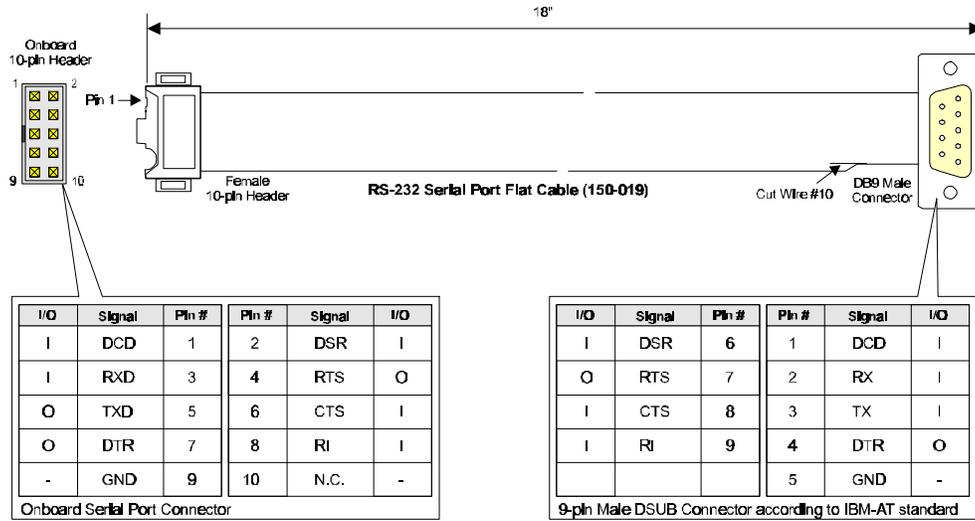
I/O	Signal	Pin #	Pin #	Signal	I/O
I	DCD	1	2	DSR	I
I	RXD	3	4	RTS	O
O	TXD	5	6	CTS	I
O	DTR	7	8	RI	I
-	GND	9	10	N.C.	-

Onboard Serial Port Connector

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

9-pin Male DSUB Connector according to IBM-AT standard

⚠ CAUTION

The use of Taïwanese 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.

10.1.1.2 *Serial Port 2 (J4) RS-232*

The Serial Port 2 can be configured as RS-232 in the VIP-UP Setup program (COM2 Operation Mode option, RS232 selection).

As a RS-232 port, and with the IBM 9-pin DSUB Standard, Serial Port 2 is 100% compatible with the IBM-AT serial port.

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.

DIAGRAM 10-3: RS-232 Cable and Connectors (J4, Mating and DSUB)
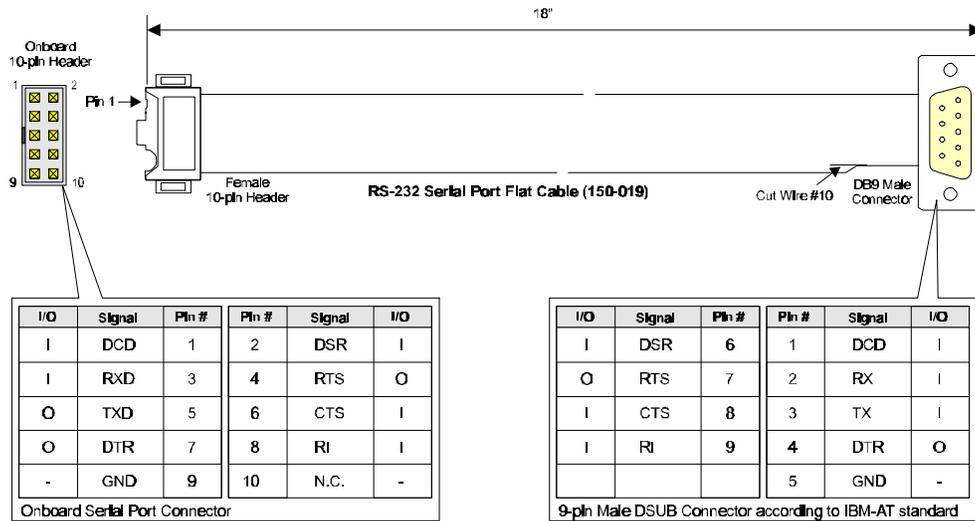
I/O	Signal	Pin #	Pin #	Signal	I/O
I	DCD	1	2	DSR	I
I	RXD	3	4	RTS	O
O	TXD	5	6	CTS	I
O	DTR	7	8	RI	I
-	GND	9	10	N.C.	-

Onboard Serial Port Connector

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

9-pin Male DSUB Connector according to IBM-AT standard

CAUTION

The use of Taïwanese 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.

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

The Serial Port 2 can be configured as RS-422/RS-485 in the VIP-UP Setup program (COM2 Operation Mode option, RS485 selection). In RS-422/RS-485 operation, Serial Port 2 can transmit and receive differential signals, in either full-duplex (RS-422) or party line (RS-485) communication.

Communicating with differential signals requires one pair of wires for RS-485 and two pairs for RS-422 (one for transmission, one for reception).

For a better noise rejection, the use of twisted pair cable is highly recommended. This will enable faster serial transmissions over greater distances than with the common RS-232 protocol.

The RS-485 protocol offers some advantages such as increased speed over long distances, improved reliability over similar RS-232 setups, ability to share transmission line, and less cabling requirements than the RS-422 protocol.

Diagram 10-4 shows the connector's pinout for Serial Port 2 (J4) when in RS-422/RS-485 mode.

DIAGRAM 10-4: RS-422 / RS-485 Pinout

Onboard
10-pin Header

I/O	Signal	Pin #	Pin #	Signal	I/O
I	DCD	1	2	DSR	I
I/O	RX(-)	3	4	RX(+)	O
O	TX(-)	5	6	TX(+)	I
O	DTR	7	8	RI	I
-	GND	9	10	N.C.	-

Onboard Serial Port Connector set as RS-485
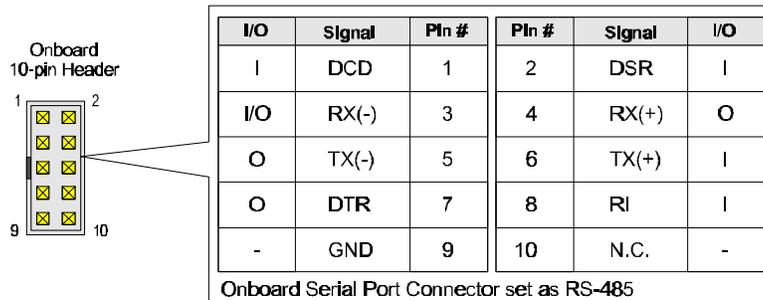
RS-422 - Full Duplex Operation:

Upon power-up or reset, the Serial Port 2 interface circuits are automatically configured for full duplex operation.

The RS-422 protocol uses both RX and TX lines during a communication session. Pins 3 and 4 of J4 act as the receiver lines and pins 5 and 6 act as the transmitter lines, as shown below.

DIAGRAM 10-5: RS-422 Signals
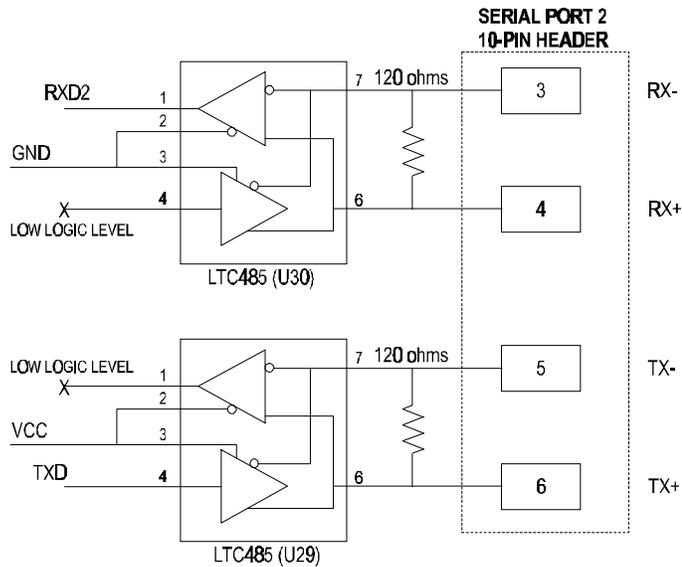
In RS-422 mode, software should not use the handshake signals (e.g., DSR, DTR), since they are not connected. However, software handshaking can be used (e.g., XON-XOFF).

RS-485 - Party Line Operation:

In order to enable party line operation, the user must first write "1" to bit 3 at I/O address 190H (or at 290H or 390H depending on W16 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.

The RS-485 offers the ability to transmit and receive over the same pair of wires (RX outputs: pins 3 and 4 as shown below), and share the same communication line with multiple stations.

DIAGRAM 10-6: RS-485 Signals
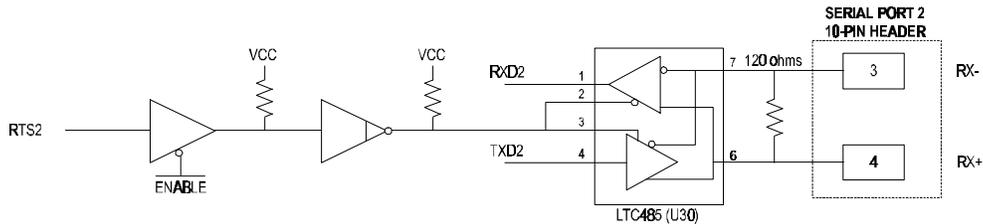
To ensure this configuration, only one system takes control of the communication at a time.

In party line operation, termination resistors must be installed on boards located at both ends of the network. Termination resistors (R242 and R243) are available on the VIPer820. If the board is installed at the end of the network, use the W6 and W7 jumpers to connect the RS-485 termination resistors as shown below.

* = initial setting

10.2 PARALLEL PORT

10.2.1 PARALLEL PORT CONNECTOR

The Parallel Port is a DB25 female connector located on the edge of the board at J19.

DIAGRAM 10-7: Parallel Port Location

J19
PARALLEL
PORT
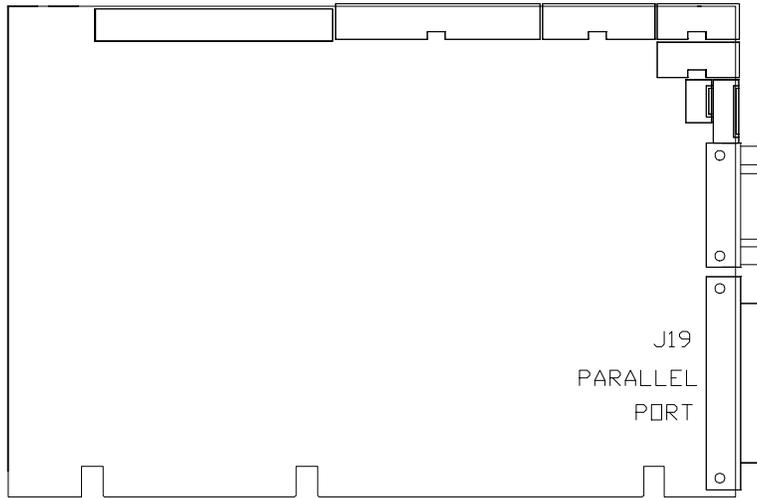
10.2.1.1 Standard Mode

The Standard Mode is an unidirectional parallel port. It is used for compatibility with the IBM PC standard.

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

TABLE 10-1: Parallel Port Connector (J19) - Standard Mode - Pinout

Pin Number	Signal Flow	Signal	Pin Number	Signal Flow	Signal
1	O	STROBE*	14	O	AUTOFD*
2	I/O	PD0	15	I	ERROR*
3	I/O	PD1	16	O	INIT*
4	I/O	PD2	17	O	SELECTIN*
5	I/O	PD3	18	-	GND
6	I/O	PD4	19	-	GND
7	I/O	PD5	20	-	GND
8	I/O	PD6	21	-	GND
9	I/O	PD7	22	-	GND
10	I	ACK*	23	-	GND
11	I	BUSY	24	-	GND
12	I	PE	25	-	GND
13	I	SELECT			

*   Active low signal

10.2.1.2 EPP (Enhanced Parallel Port) Mode

To operate in EPP mode, the peripheral must be designed to operate in this mode and the BIOS setup must be configured to support it.

The EPP mode consists of a hardware independent method of accessing a parallel port. It provides support for single I/O cycle as well as high performance block I/O transfers.

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

TABLE 10-2: Parallel Port Connector (J19) - EPP Mode - Pinout

Pin Number	Signal Flow	Signal	Pin Number	Signal Flow	Signal
1	O	WRITE*	14	O	DATASTB*
2	I/O	PD0	15	-	Not Connected
3	I/O	PD1	16	-	Not Connected
4	I/O	PD2	17	O	ADDRSTRB*
5	I/O	PD3	18	-	GND
6	I/O	PD4	19	-	GND
7	I/O	PD5	20	-	GND
8	I/O	PD6	21	-	GND
9	I/O	PD7	22	-	GND
10	I	INTR	23	-	GND
11	I	WAIT*	24	-	GND
12	-	Not Connected	25	-	GND
13	-	Not Connected			

*   Active low signal

10.2.1.3 ECP (Extended Capabilities Port) Mode

To operate in ECP mode, the peripheral must be designed to operate in this mode and the BIOS setup must be configured to support it.

While the EPP mode may intermix read and write operations without any overhead or protocol handshaking, the ECP mode negotiates data transfers using a request from the host and an acknowledgement from the peripheral.

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

TABLE 10-3: Parallel Port Connector (J19) - ECP Mode - Pinout

Pin Number	Signal Flow	Signal	Pin Number	Signal Flow	Signal
1	O	STROBE*	14	O	AUTOFD*, HOSTACK[2]
2	I/O	PD0	15	I	FAULT*[1], PERIPHRQST*[2]
3	I/O	PD1	16	O	INIT*[1], REVERSERQST*[2]
4	I/O	PD2	17	O	SELECTIN*[1,2]
5	I/O	PD3	18	-	GND
6	I/O	PD4	19	-	GND
7	I/O	PD5	20	-	GND
8	I/O	PD6	21	-	GND
9	I/O	PD7	22	-	GND
10	I	ACK*	23	-	GND
11	I	BUSY, PERIPHACK[2]	24	-	GND
12	I	PERROR, ACKREVERSE[2]	25	-	GND
13	I	SELECT			

*   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.

PART 3

SOFTWARE & ONBOARD UTILITIES

TEKNOR
INDUSTRIAL COMPUTERS INC.

11. SOFTWARE SETUP

11.1 THE AWARD SETUP PROGRAM

11.1.1 ACCESSING THE AWARD SETUP PROGRAM

The system BIOS (Basic Input Output System) provides an interface between the operating system and the hardware of the VIPer820 single board computer. The interface provided by AWARD is 100% IBM AT compatible. All functions accept similar inputs as IBM and provide the same results, although the program code itself is different.

The VIPer820 uses the AWARD Setup program, a setup utility in ROM that is accessed by pressing the DELETE key at the appropriate time during system boot. This utility is used to set configuration data in CMOS RAM.

⚠ CAUTION

> Before modifying CMOS setup parameters, insure that the W10 battery selection jumper is installed to enable the CMOS battery back-up (settings in section 6.2).

To run the AWARD Setup program incorporated in the ROM BIOS:

1. Turn on or reboot the system.

2. Hit the DELETE key before or when the message - "Press **DEL** To Enter SETUP" appears near the bottom of the screen.

3. The main menu of the AWARD BIOS CMOS Setup Utility appears on the screen.

<div align="center">

ROM PCI/ISA BIOS (2A59FI3C)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

</div>

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
Esc : Quit F10 : Save & Exit Setup	↑↓→← : Select Item (Shift)F2 : Change Color
Time, Date, Hard Disk Type . . .	

11.1.2 USING AWARD SETUP

The arrow keys ($\uparrow \downarrow \rightarrow \leftarrow$) are used to highlight items on the menu and the PAGEUP and PAGEDOWN keys are used to change the entry values for the highlighted item. To select an entry, press the ENTER key. Also, you can press the F1 key to obtain help information or the ESC key to leave an option, close a menu or to quit the program.

Table 11-1 provides more details on how to navigate in the Setup program:

TABLE 11-1: Using AWARD Setup Program

Key	Function
$\uparrow$	Moves to previous item.
$\downarrow$	Moves to next item.
$\leftarrow$	Moves to the item in the left hand.
$\rightarrow$	Moves to the item in the right hand.
ESC	When in the Main Menu: Quits program (Answer 'Y' to save changes into CMOS). When in other screens: Exits and returns to the Main Menu.
PAGEUP or +	Increases the numeric value or changes value.
PAGEDOWN or -	Decreases the numeric value or changes value.
F5	When in the Main Menu: Restores the previous setup values from the BIOS Default Table for all the BIOS parameters. When in BIOS Features Setup, Chipset Features Setup, Power Management Setup, PNP/PCI Setup or Integrated Peripherals Setup: Restores the previous setup values from the BIOS Default Table for that setup screen only.
F6	When in the Main Menu: Loads the default setup values from BIOS Default Table for all the BIOS parameters. When in BIOS Features Setup, Chipset Features Setup, Power Management Setup, PNP/PCI Setup or Integrated Peripherals Setup: Loads the default setup values from BIOS Default Table for all the BIOS parameters for that setup screen only.
F7	When in the Main Menu: Loads the default setup values from Setup Default Table for all the BIOS parameters. When in BIOS Features Setup, Chipset Features Setup, Power Management Setup, PNP/PCI Setup or Integrated Peripherals Setup: Loads the default setup values from Setup Default Table for all the BIOS parameters for that setup screen only.
F10	When in the Main Menu: Saves all the CMOS changes.

The Main Menu includes the following categories:

Standard CMOS Setup	This Setup page includes all the items in a standard, AT-compatible BIOS (date, time, hard disk type, floppy disk type, video adapter type, memory...).
BIOS Features Setup	This Setup page includes all the items of AWARD's special enhanced features.
Chipset Features Setup	This Setup page includes all the items of the chipset's special features.
Power Management Setup	This Setup page sets power conservation options.
PnP/PCI Configuration	This Setup page sets Plug and Play and PCI Local Bus configuration options.
Integrated Peripherals	I/O susbsystems that depend on the integrated peripherals controller in your system.
Supervisor/User Password Setting	Change, set, or disable password. It allows you to limit access to the system and the Setup, or just to the Setup.
IDE HDD Auto Detection	Automatically detect and configure hard disk parameters. This ability is included in the event you are uncertain of your hard disk's parameters.
HDD Low Level Format	This option does not appear in many BIOS versions. Most manufacturers of IDE hard drives strongly recommend that you do not run a low-level format on their drives, because of the danger that the bad-track table may be over-written. Award supplies this utility for service personnel only. ***If you need to run a low-level format on your hard drive, contact your drive manufacturer for instructions!***
Load Bios Defaults	The BIOS defaults represent settings which provide the minimum requirements for your system to operate.
Load Setup Defaults	The chipset defaults are settings which provide for maximum system performance.

11.1.3 SAVING CONFIGURATIONS & EXITING AWARD SETUP

Use one of the following options available from the Main Menu:

Save & Exit After having modified the AWARD Setup, you can save the configuration in CMOS RAM, by selecting this option. This option will not change the values saved in Flash EPROM. To update the values in Flash, enter the VIP-UP program, set the "Save CMOS in Flash" option to "Yes" and perform a save (F10).

Exit Without Saving This option is used to exit AWARD Setup without saving the configuration to CMOS RAM.

11.1.4 STANDARD CMOS SETUP

This part of the setup allows you to set the time, date, hard disk type, types of floppy drives and video type.

Date/Time The current values for each category are displayed. Enter new values through the keyboard.

Hard Disks Two IDE controllers are defined on the VIPer820 board (Primary and Secondary), each can have two disks: Master Disk or Slave Disk. The disks are bootable in this order: 1) IDE-1 Master, 2) IDE-1 Slave, 3) IDE-2 Master, 4) IDE-2 Slave.

Drive A / Drive B Select the type of floppy disk installed for drive A and drive B.

Video This option specifies the basic type of display adapter card installed in the system.

Halt on This option specifies the type of errors that will stop the system during the BIOS booting procedure. A message asks that you press F1 to continue or press the DELETE key to enter Setup. The settings are: All errors, No errors, All but keyboard (default setting), All but diskette, and All but disk/key.

Memory This display-only option indicates the amount of Base, Extended and other types of memory installed in the system.

11.1.5 BIOS FEATURES SETUP

This part of the setup handles options and features such as boot sequence, NUM LOCK, security options, shadowing, ...

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 BIOS or SETUP defaults will affect all the options in this screen (or all parameters if defaults are loaded from the Main Menu) and will reset options previously altered.

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

TABLE 11-2: BIOS Features Setup

Option	BIOS Defaults	Setup Defaults	Possible Settings	Description
Virus Warning	Disabled	Disabled	Enabled, Disabled	When Enabled, you receive a warning message if a program (specifically, a virus) attempts to write to the boot sector or the partition table of the hard disk drive. You should then run an anti-virus program. Keep in mind that this feature protects only the boot sector, not the entire hard drive. **Note: Many disk diagnostic programs that access the boot sector table can trigger the virus warning message. If you plan to run such a program, we recommend that you first disable the virus warning.**
CPU Internal Cache	Disabled	Enabled	Enabled, Disabled	Enables or Disables the CPU Internal Cache (L1 cache).
External Cache	Disabled	Enabled	Enabled, Disabled	Enables or Disables the External Cache (L2 cache).
Quick Power On Self Test	Disabled	Enabled	Enabled, Disabled	Select Enabled to reduce the amount of time required to run the power-on self test (POST). A quick POST skips certain steps. We recommend that you normally disable quick POST. It is better to find a problem during POST than lose data during your work.
Boot Sequence	A, C	C, A	A, C; C, A; C, CDROM, A; CDROM, C, A; C only	The original IBM PCs load the DOS operating system from drive A (floppy disks), so IBM PC-compatible systems are designed to search for an operating system first on drive A, then on drive C (hard disk). However, modern computers usually load the operating system from the hard drive, and may even load it from a CD-ROM drive.
Swap Floppy Drive	Disabled	Disabled	Enabled, Disabled	Selecting Enabled assigns physical drive B to logical drive A, and physical drive A to logical drive B. If there is only one flopy on the system, it could be assigned to B with this option.
Boot Up Floppy Seek	Disabled	Disabled	Enabled, Disabled	When Enabled, the BIOS tests (seeks) floppy drives to determine whether they have 40 or 80 tracks. Only 360KB floppy drives have 40 tracks; drives with 720KB, 1.2MB, and 1.44MB capacity all have 80 tracks. Because very few modern PCs have 40 track floppy drives, we recommend that you set this field to "Disabled" to save time.
Boot Up NumLock Status	Off	Off	On, Off	Toggle between On or Off to control the state of the NumLock key when the system boots. When toggled On, the numeric keypad generates numbers instead of controlling cursor operations.
Boot Up System Speed	High	High	Low, High	Select High to boot at the default CPU speed; select Low to boot at the speed of the AT bus. Some add-in peripherals or old software (such as old games) may require a slow CPU speed. The default setting is High.
Typematic Rate Setting	Disabled	Disabled	Enabled, Disabled	When Disabled, the following two items (Typematic Rate and Typematic Delay) are irrelevant. Keystrokes repeat at a rate determined by the keyboard controller in your system. When Enabled, you can select a typematic rate and a typematic delay.
Typematic Rate (Chars/Sec)	30	30	6, 8, 10, 12, 15, 20, 24, 30 characters per second	When the typematic rate setting is Enabled, you can select a typematic rate (the rate at which characters repeat when you hold down a key) of 6, 8, 10, 12, 15, 20, 24 or 30 characters per second.
Typematic Delay (Msec)	250	250	250, 500, 750, 1000 milliseconds	When the typematic rate setting is Enabled, you can select a typematic delay (the delay before key strokes begin to repeat) of 250, 500, 750 or 1000 milliseconds.
Security Option	Setup	Setup	Setup, System	If you have set a password, select whether the password is required every time the system boots ("System" option), or only when you enter Setup ("Setup" option).
OS Select For DRAM > 64MB	Non-OS2	Non-OS2	Non-OS/2, OS/2	Select OS2 only if you are running an OS/2 operating system with greater than 64MB of RAM.
Video BIOS Shadow	Disabled	Enabled	Enabled, Disabled	Software that resides in a read-only memory (ROM) chip on a device is called *firmware*. The Award BIOS allows shadowing of
CC000-CFFFF Shadow	Disabled	Disabled	Enabled, Disabled	firmware such as the system BIOS, the video BIOS, and similar operating instructions that come with some expansion peripherals
D0000-D3FFF Shadow	Disabled	Disabled	Enabled, Disabled	(for example, a SCSI adaptor). Shadowing copies firmware from ROM into system RAM, where the CPU can read it through the
D4000-D7FFF Shadow	Disabled	Disabled	Enabled, Disabled	16-bit or 32-bit DRAM bus. Firmware not shadowed must be read by the system through the 8-bit X-bus. Shadowing improves
D8000-DBFFF Shadow	Disabled	Disabled	Enabled, Disabled	the performance of the system BIOS and similar firmware for expansion peripherals.
DC000-DFFFF Shadow	Disabled	Disabled	Enabled, Disabled	Enable shadowing into each section of memory separately. Many system designers hardwire shadowing of the system BIOS and eliminate a System BIOS Shadow option. Video BIOS shadows into memory area C0000-CBFFF. The remaining areas shown on the BIOS Features Setup screen may be occupied by other expansion card firmware. If an expansion peripheral in your system contains ROM-based firmware, you need to know the address range the ROM occupies to shadow it into the correct area of RAM.

11.1.6 CHIPSET FEATURES SETUP

This part of the setup allows you to define chipset-specific options and features.

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 BIOS or SETUP defaults will affect all the options in this screen (or all parameters if defaults are loaded from the Main Menu) and will reset options previously altered.

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

⚠️ **CAUTION**

> These parameters 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 11-3: Chipset Features Setup

Option	BIOS Defaults	Setup Defaults	Possible Settings	Description
Auto Configuration	Enabled	Enabled	Enabled, Disabled	Auto Configuration selects predetermined optimal values of chipset parameters. When Disabled, chipset parameters revert to setup information stored in CMOS. Many fields in this screen are not available when Auto Configuration is Enabled.
DRAM Timing	70 ns	70 ns	70 ns, 60 ns	The value in this field depends on performance parameters of the installed memory chips (DRAM). Do not change the value from the factory setting unless you install new memory that has a different performance rating than the original DRAMs.
DRAM RAS# Precharge Time	3	3	4, 3	Select the number of CPU clocks allocated for the Row Address Strobe (RAS#) signal to accumulate its charge before the DRAM is refreshed. If insufficient time is allowed, refresh may be incomplete and data lost.
DRAM R/W Leadoff Timing	7/6	7/6	7/6, 6/5	Select the combination of CPU clocks the DRAM on your board requires before each read from or write to the memory. Changing the value from the setting determined by the board designer for the installed DRAM may cause memory errors.
RAS# to CAS# Delay	3	3	3, 2	When DRAM is refreshed, both rows and columns are addressed separately. This setup item allows you to determine the timing of the transition from RAS to Column Address Strobe (CAS).
DRAM Read Burst (EDO/FPM)	x333/ x444	x333/ x444	x444/ x444, x333/ x444, x222/ x333	Sets the timing for reads from EDO (Extended Data Output) or FPM (Fast Page Mode) memory. The lower the timing numbers, the faster the system addresses memory. Selecting timing numbers lower than the installed DRAM is able to support can result in memory errors.
DRAM Write Burst Timing	x333	x333	x444, x333, x222	Sets the timing for writes to memory. The lower the timing numbers, the faster the system addresses memory. Selecting timing numbers lower than the installed DRAM is able to support can result in memory errors.
Turbo Read Leadoff	Disabled	Disabled	Enabled, Disabled	Select Enabled to shorten the leadoff cycles and optimize performance in cacheless, 50-60 MHz, or one-bank EDO DRAM systems.
DRAM Speculative Leadoff	Enabled	Enabled	Enabled, Disabled	A read request from the CPU to the DRAM controller includes the memory address of the desired data. When Enabled, Speculative Leadoff lets the DRAM controller pass the read command to memory sightly before it has fully decoded the address, thus speeding up the read process.
Turn-Around Insertion	Disabled	Disabled	Enabled, Disabled	When Enabled, the chipset inserts one extra clock to the turn-around of back-to-back DRAM cycles.
ISA Clock	PCI CLK/ 3	PCI CLK/ 3	PCI CLK/ 4, PCI CLK/ 3	You can set the speed of the AT bus at one-third or one-fourth of the PCI clock speed (60 or 66 MHz).
System BIOS Cacheable	Disabled	Enabled	Enabled, Disabled	Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may occur.
Video BIOS Cacheable	Disabled	Enabled	Enabled, Disabled	Selecting Enabled allows caching of the video BIOS ROM at C0000h to C7FFFh, resulting in better video performance. However, in any program writes to this memory area, a system error may occur.
8 Bit I/O Recovery Time	3	1	1, 2, 3, 4, 5, 6, 7, 8, NA	The I/O recovery mechanism adds bus clock cycles between PCI-originated I/O cycles to the ISA bus. This delay takes place because the PCI bus is so much faster than the ISA bus.
16 Bit I/O Receiving Time	2	1	1, 2, 3, 4, NA	These two fields let you add recovery time (in bus clock cycles) for 16-bit and 8-bit I/O.
Peer Concurrency	Enabled	Enabled	Enabled, Disabled	Peer concurrency means that more than one PCI device can be active at a time.
Chipset Special Features	Enabled	Enabled	Enabled, Disabled	When Disabled, the chipset behaves as if it were the earlier Intel 82430FX chipset.
DRAM ECC/PARITY Select	Parity	Parity	ECC, Parity	Set this option according to the type of DRAM installed in your system: error-correcting code (ECC) or parity (default).
Memory Parity/ECC Check	Auto	Auto	Enabled, Disabled, Auto	In Auto mode, the BIOS enables memory checking automatically when it detects the presence of ECC or parity DRAM.
Single Bit Error Report	Enabled	Enabled	Enabled, Disabled	If ECC is enabled, selecting Enabled here tells the system to report an error when a correctable single-bit error occurs.
L2 Cache Cacheable Size	64MB	64MB	64MB, 512MB	Select 512MB only if your system RAM is greater than 64MB.
Passive Release	Enabled	Enabled	Enabled, Disabled	When Enabled, CPU to PCI bus accesses are allowed during passive release otherwise the arbiter only accepts another PCI master access to local DRAM.
Delayed Transaction	Disabled	Enabled	Enabled, Disabled	The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select Enabled to support compliance with PCI specifications version 2.1.
Memory Hole Location	None	None	512K-640K, 15M-16M, None	You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements.

11.1.7 POWER MANAGEMENT SETUP

This part of the setup sets power conservation options.

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 BIOS or SETUP defaults will affect all the options in this screen (or all parameters if defaults are loaded from the Main Menu) and will reset options previously altered.

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

TABLE 11-4: Power Management Setup

Option	BIOS Defaults	Setup Defaults	Possible Settings	Description
Power Management	Disable	Disable	Min Saving, Max Saving, User Define, Disable	This option allows you to select the type (or degree) of power saving for Doze, Standby, and Suspend modes. Max Saving: Maximum power savings. Inactivity period is 1 minute in each mode. Min Saving: Minimum power savings. Inactivity period is the maximum setting in each mode (1 hour for Doze, Standby and Suspend). User Define: Set each mode individually. Select time-out periods in the PM Timers section (see below).
PM Control by APM	Yes	Yes	Yes, No	If Advanced Power Management (APM) is installed on your system, selecting Yes gives better power savings. This enables power management control by an external program (generally the operating system).
Video Off Method	V/H SYNC+Blank	V/H SYNC+Blank	V/H SYNC+Blank, DPMS, Blank Screen	Determines the manner in which the monitor is blanked. V/H SYNC + Blank: System turns off vertical and horizontal synchronization ports and writes blanks to the video buffer. DPMS Support: Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards Association (VESA). Use the software supplied for your video subsytem to select video power management values. Blank Screen: System only writes blanks to the video buffer.
Modem Use IRQ	3	3	N/A, 3, 4, 5, 7, 9, 10, 11	Name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system.
PM Timers				The following modes are Green PC power saving functions. They are user-configurable only during User Defined Power Management mode.
Doze Mode	Disable	Disable	1, 2, 4, 6, 8, 10, 20, 30, 40 mins, 1 hour, Disable	When the selected period of system inactivity prior to Doze mode (1 minute to 1 hour) has elapsed, the CPU clock runs at lower speed while all other devices still operate at full speed.
Standby Mode	Disable	Disable	1, 2, 4, 6, 8, 10, 20, 30, 40 mins, 1 hour, Disable	After entering Doze mode, when the selected period of system inactivity prior to Standby mode (1 minute to 1 hour) has elapsed, the fixed disk drive and the video shut off while all other devices still operate at full speed.
Suspend Mode	Disable	Disable	1, 2, 4, 6, 8, 10, 20, 30, 40 mins, 1 hour, Disable	After entering Standby mode, when the selected period of system inactivity prior to Suspend mode (1 minute to 1 hour) has elapsed, all devices except the CPU shut off.
HDD Power Down	Disable	Disable	1, 2, 3, (...), 15 mins, Disable	When the selected period of drive inactivity prior to HDD power down (1 to 15 minutes) has elapsed, the hard disk drive powers down while all other devices remain active. The HDD power down mode is only available if the hard drive has this capability.
Wake Up Events In Doze & Standby			On, Off	When the system is in Doze or Standby mode, you may disable activity monitoring of some common interrupt requests so they do not wake
IRQ3 (Wake-Up Events)	Off	On		up the system.
IRQ4 (Wake-Up Events)	Off	On		The default wake-up event is keyboard activity. In these wake-up event fields, you can turn On or Off four commonly used interrupts. For
IRQ8 (Wake-Up Events)	Off	On		example, if you have a modem on IRQ3, you can turn on IRQ3 as a wake-up event, so an interrupt from the modem can wake up the system.
IRQ12 (Wake-Up Events)	Off	On		Or you may wish to turn Off IRQ12 (the PS/2 mouse) as a wake-up event, so accidentally brushing the mouse does not awaken the system.
Power Down and Resume Events			On, Off	You may disable monitoring of common interrupt requests so they do not reset activity timers.
IRQ3 (COM 2)	Off	On		
IRQ 4 (COM 1)	Off	On		
IRQ 5 (LPT 2)	Off	On		
IRQ 6 (Floppy Disk)	Off	Off		
IRQ 7 (LPT 1)	Off	On		
IRQ 8 (RTC Alarm)	Off	Off		
IRQ 9 (IRQ2 Redir)	Off	On		
IRQ 10 (Reserved)	Off	On		
IRQ 11 (Reserved)	Off	On		
IRQ12 (PS/2 Mouse)	Off	On		
IRQ 13 (Coprocessor)	Off	On		
IRQ 14 (Hard Disk)	Off	On		
IRQ 15 (Reserved)	Off	On		

11.1.8 PNP/PCI SETUP

This part of the setup sets PnP/PCI options.

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 BIOS or SETUP defaults will affect all the options in this screen (or all parameters if defaults are loaded from the Main Menu) and will reset options previously altered.

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

TABLE 11-5: PnP/PCI Setup

Option	BIOS Defaults	Setup Defaults	Possible Settings	Description
Resources Controlled By	Auto	Manual	Auto, Manual	The Award Plug and Play BIOS can automatically configure all the boot and Plug and Play-compatible devices. If you select Auto, all the interrupt requests (IRQs) and DMA assignment fields disappear, as the BIOS automatically assigns them.
Reset Configuration Data	Disabled	Disabled	Enabled, Disabled	Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot.
IRQ *n* Assigned To		IRQ-3, IRQ-4: Legacy ISA All other: PCI/ISA PnP	PCI/ISA PnP, Legacy ISA	When resources are controlled manually, assign each system interrupt as one of the following types, depending on the type of device using the interrupt: Legacy ISA: Devices compliant with the original PC AT bus specification, requiring a specific interrupt, such as IRQ4 for serial port 1. PCI/ISA PnP: Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture. When Legacy ISA is selected for an IRQ line, this resource will not be available for PCI/ISA PnP.
DMA *n* Assigned To		PCI/ISA PnP	PCI/ISA PnP, Legacy ISA	When resources are controlled manually, assign each system DMA channel as one of the following types, depending on the type of device using the interrupt: Legacy ISA: Devices compliant with the original PC AT bus specification, requiring a specific DMA channel. PCI/ISA PnP: Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture. When Legacy ISA is selected for a DMA channel, this resource will not be available for PCI/ISA PnP.
PCI IRQ Activated By	Level	Level	Level, Edge	Leave the IRQ trigger set at *Level* unless the PCI device assigned to the interrupt specifies Edge-triggered interrupts.
PCI IDE IRQ Map To	PCI-Auto	PCI-Auto	PCI-Auto, ISA, PCI-SLOT1, PCI-SLOT2, PCI-SLOT3, PCI-SLOT4	This field lets you select PCI IDE IRQ mapping or PC AT (ISA) interrupts. If your system does not have one or two PCI IDE connectors on the system board, select values according to the type of IDE interface(s) installed in your system (PCI or ISA). Standard ISA interrupts for IDE channels are IRQ14 for primary and IRQ15 for secondary.
Primary IDE INT#	A	A	A, B, C, D	Each PCI peripheral connection is capable of activating up to four interrupts: INT# A, INT# B, INT# C and INT# D. By default, a PCI connection is assigned INT# A. Assigning INT# B has no meaning unless the peripheral device requires two interrupt services rather than just one. Because the PCI IDE interface in the chipset has two channels, it requires two interrupt services. The primary and secondary IDE INT# fields default to values appropriate for two PCI IDE channels, with the primary PCI IDE channel having a lower interrupt than the secondary.
Secondary IDE INT#	B	B	A, B, C, D	
Used Mem Base Address		N/A	N/A, C800, CC00, D000, D400, D800, DC00	Select a base address for the memory area used by any peripheral that requires high memory.
Used Mem Length			8K, 16K, 32K, 64K	Select a length for the memory area specified in the previous field. This field does not appear if no base address is specified.

11.1.9 INTEGRATED PERIPHERALS SETUP

This part of the setup sets Integrated Peripherals options.

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 BIOS or SETUP defaults will affect all the options in this screen (or all parameters if defaults are loaded from the Main Menu) and will reset options previously altered.

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

TABLE 11-6: Integrated Peripherals Setup

Option	BIOS Defaults	Setup Defaults	Possible Settings	Description
IDE HDD Block Mode	Disabled	Enabled	Enabled, Disabled	Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.
PCI Slot IDE 2nd Channel	Enabled	Enabled	Enabled, Disabled	You may separately disable the second channel on an IDE interface installed in a PCI expansion slot.
On-Chip Primary/Secondary PCI IDE	Enabled	Enabled	Enabled, Disabled	The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select Enabled to activate each channel separately.
IDE Primary/Secondary Master/Slave PIO	Auto	Auto	Mode 0, Mode 1, Mode 2, Mode 3, Mode 4, Auto	The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance and speed. In Auto mode, the system automatically determines the best mode for each device. If you select a mode that the drive does not support, it may not work, so choose a lesser value or Auto to see the best mode for the drive.
Onboard FDC Controller	Enabled	Enabled	Enabled, Disabled	Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field.
Onboard Serial Port 1/2	Auto	Auto	Disabled, 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, Auto	Select a logical COM port name and matching address for the first and second serial ports.
UART2 Mode	Standard	Standard	Standard, IrDA, ASK-IR	Select a communition protocol for COM2 port: Standard for normal operation, IrDA or ASK-IR for infrared operation.
Duplex Select			Half, Full	This option only appears when IrDA or ASK-IR are selected in the UART2 Mode option. Half Duplex allows one communication at a time, while full duplex allows simultaneous communication.
TxD, RxD Active			Hi, Hi, Hi, Lo Lo, Hi Lo, Lo	This option only appears when IrDA or ASK-IR are selected in the UART2 Mode option. Determines whether the transmit signal (TxD) and the receive signal (RxD) are active high (Hi) or active low (Lo).
Onboard Parallel Port	378/IRQ7	378/IRQ7	378/IRQ7, 278/IRQ5, 3BC/IRQ7, Disabled	Select a logical LPT port name and matching address for the physical parallel (printer) port.
Parallel Port Mode	Normal	ECP+EPP1.9	ECP+EPP1.9, Normal, EPP1.7+SPP, ECP+EPP1.7, SPP, EPP1.9+SPP, ECP	Select an operating mode for the onboard parallel port. Select ECP or EPP unless you are certain both your hardware and software does not support ECP or EPP mode.
ECP Mode Use DMA		3	1, 3	Select a DMA channel for the port.

11.2 THE VIP-UP PROGRAM

11.2.1 ACCESSING THE VIP-UP PROGRAM

The VIP-UP program is TEKNOR's own Setup program for enabling / disabling / relocating various hardware features on the VIPer820.

To access the VIP-UP Setup menu, you have two options:

1. 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).

2. At the DOS prompt, type "VIP-UP" and press ENTER. This program is available on the utility disk.

There is one screen in the VIP-UP program. The values appearing on the right side of the 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.

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

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

11.2.2 VIP-UP SCREEN

```
┌──────────────────────────────────────────────────────────────┐
│            TEKNOR MICROSYSTEMS INC  ---  VIPer SETUP           │
├──────────────────────────────────────────────────────────────┤
│  TEKNOR BIOS Extension Address        CC000H-CFFFFH            │
│  TEKNOR BIOS Window Address           D0000H-D3FFFH           │
│                                                                │
│  BIOS Interrupt 13h Configuration     Disabled                 │
│  Flash Disk Support                   Not Installed            │
│                                                                │
│  On Board SCSI Controller/BIOS        Enabled                  │
│  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                       │
│  Flat Panel VGA Controller Display Mode  CRT Only              │
│                                                                │
│  COM2 Operation Mode                  RS-232                   │
│                                                                │
├──────────────────────────────────────────────────────────────┤
│  ↑↓ to select options              ESC - Quit without saving   │
│  PgDn(+), PgUp(-) to change an option  F10 - (U)pdate Flash BIOS │
└──────────────────────────────────────────────────────────────┘
```

The VIP-UP options are:

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.

2. **BIOS Interrupt 13h Configuration:** When enabled, this option allows the following Flash Disk Support configurations: Not Installed (default setting), Installed Bootable or Installed.

   Installed Bootable: The Flash disk is assigned to C:\,
   Other disks are assigned to subsequent drive letters: D:\, E:\, ...

   Installed: The hard disks are assigned first, then the Flash disk;
   For example, two hard disks C:\ and D:\ and one Flash disk E:\.

3. **On Board SCSI Controller/BIOS:** This option allows the user to enable or disable the on board SCSI controller.

4. **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. When the message is displayed, the user has around 3 seconds more to press CTRL-V.

5. **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.

6. **Use Flash To Store CMOS RAM SETUP:** When this option is set to "Yes", the CMOS RAM Setup will be restored from Flash at each power up. If the battery fails, only the time and date could be lost.

✎ **NOTE**

> Please note that modifying and saving the CMOS RAM Setup in AWARD Setup does not change the Flash copy; to update Flash, you must return to the VIP-UP Setup and update it while "Use Flash To Store CMOS RAM SETUP" is set to "Yes".

7. **Flat Panel VGA Controller Display Mode:** This option allows the user to set the display mode for the video controller. The following settings are available: CRT Only (default), Flat Panel Only or Simultaneous (CRT and Flat Panel are allowed).

8. **COM2 Operation Mode:** This option allows the user to select whether Serial Port 2 will be configured as an RS-232 type (RS232 selection) or an RS-422/RS-485 type (RS485 selection).

12. VFLASH SOFTWARE

12.1 INTRODUCTION

VFLASH is TEKNOR's Flash EPROM transfer utility program for single board computers. Its main function is to download DOS files to the 2 or 4 MB Flash EPROM disk U28, 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 13).

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

12.1.1 VFLASH SOFTWARE OVERVIEW

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

1. If your VIPer820 is equipped with hard or floppy drives, then VFLASH downloads data directly on the board's Flash EPROM disk.

2. If your VIPer820 does not have floppy or hard drives, then VFLASH must be run from a remote computer which downloads data to the VIPer820 board via a serial link on Serial Port 1 or Serial Port 2. This mode is recognized in the BIOS extension as Download Mode and is enabled by installing jumper W17 (1-2) on the VIPer820; in this mode, the VIPer820 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 next screen is where the address and size of the Flash partition to create are determined (the screens are explained in section 12.3 - OUTPUT SELECTION).

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 12.4 - FILE SELECTION).

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 (also explained in section 12.4 - FILE SELECTION).

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 12.5 - FILE TRANSFER).

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 14.06 - BATCH MODE).

12.1.2 TYPES OF FLASH EPROM DISKS

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

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 four conditions <u>must</u> be met:

- You must have the optional 2 MB or 4 MB Flash EPROM installed at U28.
- The bootable Flash EPROM partition must start from the first block.
- The VIP-UP option "BIOS Interrupt 13h Configuration" must be set to Enabled.
- The Flash disk must be configured in the VIP-UP Setup as "Installed Bootable". To do so, you must change the value of the Flash Disk Support option on VIP-UP's second screen from Disabled to Installed Bootable.

NON-BOOTABLE
FLASH DISK:

Unlike bootable Flash disks which must begin at the first Flash block, non-bootable disks can begin anywhere. When installed as a non-bootable Flash disk, the disk will be assigned a drive letter after your last physical hard drive installed.

To use Flash EPROM as a non-bootable Flash disk, three conditions must be met:

- The bootable Flash EPROM partition must start from the first block.
- The VIP-UP option "BIOS Interrupt 13h Configuration" must be set to Enabled.
- The Flash disk must be configured in the VIP-UP Setup as "Installed". To do so, set the value of the Flash Disk Support option on VIP-UP's second screen to Installed.

12.1.3 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 VIPer820, VFLASH must be running on board.

If you need a remote computer to program Flash device on the VIPer820 (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 remote computer and either the Serial Port 1 or Serial Port 2, as it would be in VT100 mode (the remote computer is cabled like a VT100 terminal, see Section 15 - VT100 MODE).

✎ **NOTE**

> To run VFLASH properly, you need at least one floppy drive or hard disk, 1 MB of DRAM, MS-DOS® or PC-DOS (version 2 or higher) or DR-DOS (version 3. 41 or higher).

12.2 RUNNING VFLASH

To run VFLASH, simply type "VFLASH" at the DOS prompt, press ENTER and press any key. The first OUTPUT SELECTION FOR THE TRANSFER screen appears.

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

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

External FLASH device via a serial link   Use this option when VFLASH is run from a remote computer, or when your VIPer820 has no floppy or hard disks, or simply because the data to transfer is on a different computer than the VIPer820 and Flash EPROM disk. The transfer takes place via a serial link on Serial Port 1 (3F8H) or Serial Port 2 (2F8H) from the remote computer to the VIPer820.

12.3 OUTPUT SELECTION

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

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

In the case of "External FLASH device via serial link", the rest of the screen shows the SERIAL COMMUNICATION PARAMETERS. By using the arrows, you can select the BAUD RATE and the COMMUNICATION PORT.

In the case of "On board FLASH device", the rest of the screen shows the FLASH device size. You can proceed by selecting ENTER or "S" to select a special size. A new screen appears (see figure next page). You use the left and right arrow keys to select the desired disk size, and ENTER to accept. Press any key to continue.

OUTPUT SELECTION FOR THE TRANSFER

Output selected: On board FLASH device.

Choose the size of the disk using the arrow keys.
Legend: selected block = ■, unselected block = ☐

↑ End

DISK SIZE: 3072 Kbytes (minimum: 128Kbytes).

↑ ↓ → ← **Enter** to select option   **S**pecial disk

12.4 FILE SELECTION

Once you have selected the output, a file selection screen appears.

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 (max240)" 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 current directory and ". ." to the parent directory. Thus, if you enter 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.

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:

Selected files (max 240):0;   Free Space to copy: 522240 bytes

```
    DRIVE A: COMPLETE COPY              DRIVE A: TO CHOOSE FILES
    DRIVE B: COMPLETE COPY              DRIVE B: TO CHOOSE FILES
    DRIVE C:                            DRIVE D:
    DRIVE E:                      BIOS 700    <DIR>
DOS        <DIR>                  PCAD        <DIR>
QAPLUS     <DIR>                  SKEY        <DIR>
TEMP       <DIR>                  TEST        <DIR>
TP         <DIR>                  TYPESET     <DIR>
VENTURA  <DIR>                    WIN         <DIR>
ATTR2      PAS     569  1-04-91   9:32   AUTOEXEC  BAK     59  2-14-91   16:11
AUTOEXEC BAT      74  2-14-91  16:12     BOOT_DIR   PAS    158  1-25-91   16:58
BOOTDIR    PAS   6508  3-03-91  13:31    CHOIXMED   PAS  19797  3-06-91    1:11
COMMAND  COM  25308  2-02-91  12:25      COMMANDE PAS   6110  2-21-91   15:57
CONFIG     SYS    128  1-01-91  14:42    CONFIG     SYS    128  1-23-91   17:45
```

21 Files, D:*.*

(Tag **U**ntag **N**ew dir) or **Enter B**lock **M**ake bootable **D**one **Esc** to quit
↑ ↓ → ← Home PgUp PgDn **V**olume label

12.4.1 MENU COMMANDS

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.

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.

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.

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). You then accept or change the DOS version with "OS version detected, based on MS-DOS: >4.x. Is it right (y/n)?" 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.

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 xxxxxxxxxx
    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 $\uparrow$, $\downarrow$, $\rightarrow$, $\leftarrow$, PAGE UP, PAGE DOWN and HOME keys.

12.4.2 LIST OF SELECTED FILES

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: xxxxxxxxxx                                            │
│                                                                          │
│ 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.

When the list exceeds the screen area, you can browse through it 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. The system will prompt you before exiting to DOS.

12.4.3 DUPLICATE FILES MENU

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: xxxxxxxxxxx                                       │
│                                                                      │
│  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                              **S**elect 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.

12.5 FILE TRANSFER

12.5.1 TRANSFER STATUS OF ONBOARD FLASH PROGRAMMING SCREEN

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.X%, 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.

TRANSFER STATUS OF VIPer MAPPED FLASH PROGRAMMING

Erasing the Flash space required for the disk to create, please wait...
Erasing nth device. . . Erase completed

Creating a bootable flash disk

Transferring the master BOOT & BOOT sectors, FAT and root DIR...Completed

Copying selected files. . .

Transfer completed: XX. X%

Transferring: FILENAME

Transfer completed

12.5.2 TRANSFER STATUS OF EXTERNAL FLASH PROGRAMMING SCREEN

When a serial link is used, this screen is displayed. It displays 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.X% 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.

✎ **NOTE**

> 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:

   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:

4. Short Pins 1 and 2 on jumper W17. This forces Download Mode at boot up.

5. Download Mode is automatically enabled when VT100 Mode is activated by shorting Pins 3 and 4 on jumper W17. In this case, the communications port will recognize the Download Mode commands and activate it.

✎ **NOTE**

> Reset is the only way to exit from Download Mode which is forced on at setup by the W17 (1-2) jumper. If Download Mode was entered by recognition of the code sequence, you can simply exit Download Mode and continue processing.

TRANSFER STATUS OF EXTERNAL FLASH PROGRAMMING

Erasing the Flash space required for the disk to create, please wait...
 Erasing nth device. . . Erase completed

 Creating a bootable flash disk

Transferring the master BOOT & BOOT sectors, FAT and root DIR...Completed

 Copying selected files. . .

 Transfer completed: XX. X%

 Transferring: FILENAME

 Elapsed time: Xmin XXsec

 Transfer completed

12.6 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.

12.6.1 BATCH MODE COMMAND LINE PARAMETERS

The command line format is as follows:

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

where:

[drive:]   is the source drive from which a complete copy will be made if no directory is specified (see section 12.4 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.

[options]   options are described in the next pages

12.6.2 BATCH MODE COMMAND LINE OPTIONS

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 Mode.

[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.

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.

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.

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/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 VIPer820 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.

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12.6.3 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 source files
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
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

ERROR (HEX)	NUMBER (DECIMAL)	DESCRIPTION
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

13. FLASH FILE SYSTEM II

13.1 INTRODUCTION

With FLASH FILE SYSTEM II, a read/write MS-Flash partition can be created in the 2MB or 4MB Flash EPROM device (located at U28). Such a partition can be accessed via the DOS commands.

Section 12 - 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 12 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 "Installed Bootable" (C:), other physical 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 "Installed" (D:) and MS-Flash disk (E:).

- The fourth possible configuration is similar to the previous one except that space (one or more memory blocks) 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 VIPer820 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.

13.2 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, the user may have already 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 twelve 64-KB 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.

13.3 CREATING & FORMATTING AN MS-FLASH PARTITION

FLASH FILE SYSTEM II on the VIPer820 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; either:

▪ Run the program interactively and make selections in the menus, or

▪ Execute 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.

⚠ **CAUTION:**

> 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.

13.3.1 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 follows:

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

13-4

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 required 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.

13.3.2 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.

Example 1:
To assign an entire memory card to drive D and specify the volume label CARD1, type the following at the command prompt:

MEMCARD /FMT=D:/V=CARD1

Example 2:
To check partition E for errors, fix any errors that are found, and display the status of the partition, type the following at the command prompt:

MEMCARD /CHK=E: /F

14. UPDATING BIOS WITH UBIOS

14.1 INTRODUCTION

UBIOS is a utility that allows you to take BIOS files from a disk and update the Boot Block Flash BIOS with them. It also allows the reverse operation - to copy the contents of the Boot Block 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 14.2.
- 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 14.3.

Both the Interactive Mode and the Batch Mode are available in VT100 mode (Section 15). The small differences will be explained in the sections noted above.

✎ **NOTE**

> Using UBIOS 2.15 and up, 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.

14.2 UBIOS - INTERACTIVE MODE

To run the program in interactive mode, type "UBIOS" from the DOS prompt and the following screen will be displayed:
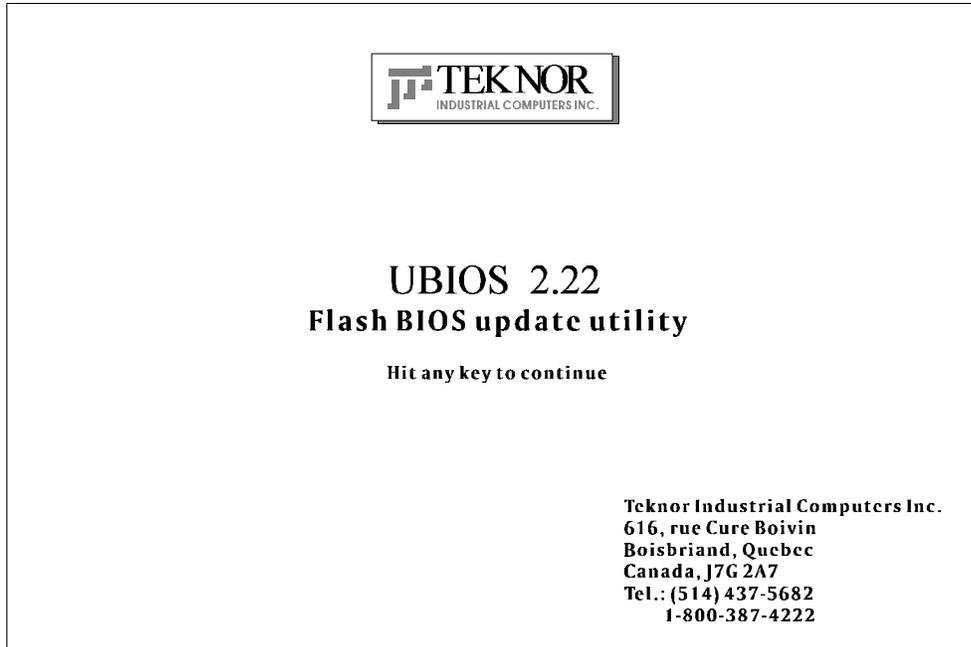
This is simply a presentation screen. To continue, hit any key on the keyboard. This brings you to the main menu.

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.

14.2.1 MAIN MENU

An example of the main menu appears below:

```
                        UBIOS 2.22


Write Flash BIOS device             Retrieve a BIOS to a file

  1-Update all BIOS                   6-Copy all BIOS

  2-Update VGA BIOS                   7-Copy VGA 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 to 3 and 5) and Retrieve a BIOS to a file (options 6 to 8 and 0). The first group includes five options which allow you to update the Boot Block Flash BIOS with a BIOS file stored on disk. The second group includes five options which allow you to copy the contents of the Boot Block Flash BIOS to files on disk.

All four BIOSes 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.
- VGA BIOS files come in two types: with the .VGA extension (supports CRT displays only) or the .BFP extension (supports CRT and Flat Panel displays).
- 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), or
- Use the ↓ or ↑ keys to highlight the desired option and press ENTER.

14.2.2 UPDATE MENU

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

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

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. At 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, VGA, 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, .BFP, .EXT or .ROM). Follow these instructions for selecting a file in the FILE window of the UPDATE screen:

- <u>Letter for a drive</u>: By typing the desired drive letter, you can change the current drive.

- <u>↑↓ to change files/directory</u>: Use the ↑ or ↓ key to browse through the files of the current directory. When a directory is selected (see <u><ENTER> to select</u> 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).

- <u><ENTER> to select</u>: 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 navigate 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 you that you will have to reboot if you want the new configuration to become operational. The program then exits to the operating system prompt.

14.2.3 FLASH BIOS COPY MENU

If you select from the second group of options in the Main Menu (6 to 8 and 0), a screen similar to the one below 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, .VGA, .EXT or .ROM.

▪ Type in the name of the BIOS file to create and press ENTER to proceed.

Once you complete this step, the program will exit to the operating system prompt.

14.3 UBIOS - BATCH MODE

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

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,
VGA   for VGA BIOS file with the .VGA 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 "VGA" was listed as filetype, then the filename could be "FLAT.BFP".

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

/C   This option will not 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.

14-7

15. VT100 MODE

15.1 VT100 REQUIREMENTS

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.

15.2 VT100 SETUP & CONFIGURATION

Follow these steps for setting up VT100 Mode:

- Power off your VIPer820 and install jumper W17 (3-4) to enable VT100 Mode. Note: VT100 Mode runs on UART1 and UART2.
- Connect the communications cable as shown in Diagram 15-1. 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 15-2.
- Power on your VIPer820 and run VIP-UP 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 VIP-UP 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.

15.3 RUNNING WITHOUT A TERMINAL

The VIPer820 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 15-2 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 by simply not enabling VT100 Mode and by not installing a video card.

DIAGRAM 15-1: VT100 Full Setup

DIAGRAM 15-2: VT100 Partial Setup
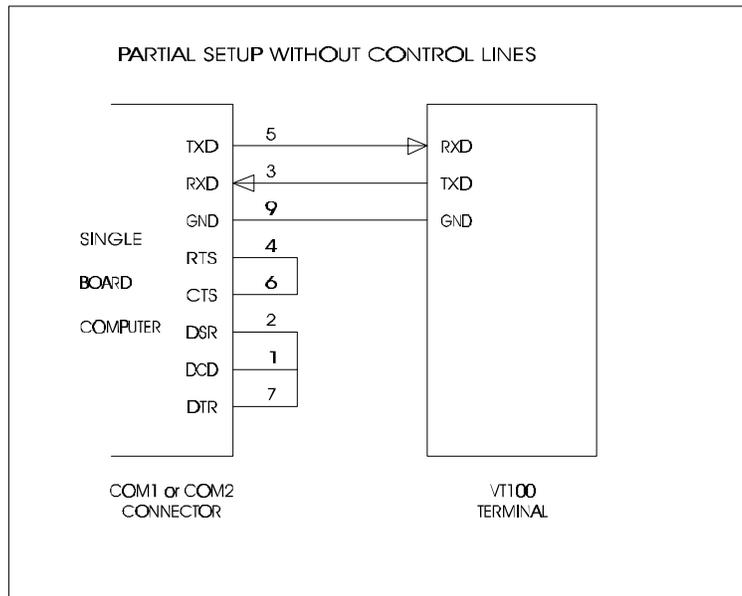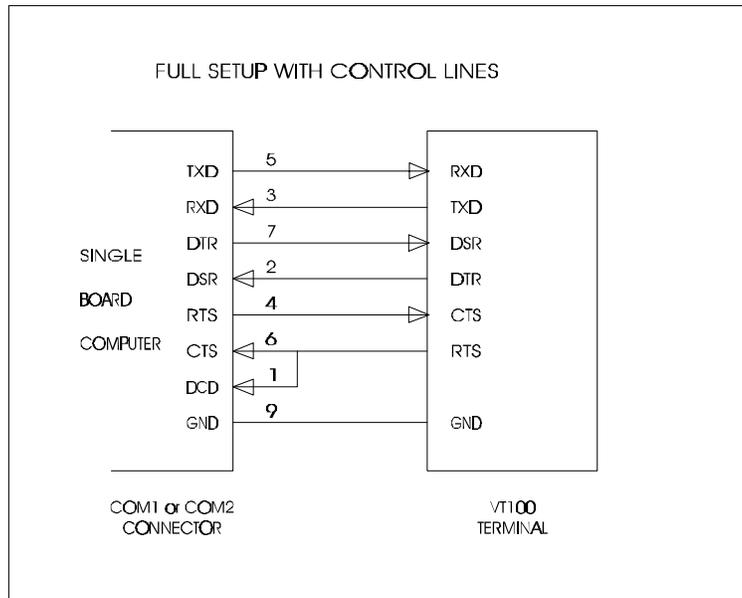
16. DOWNLOAD MODE

Information can be downloaded to the Flash EPROM disk on the VIPer820 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 W17 (1-2).

Refer to Section 12 for more information on running VFLASH in Download Mode.

PART 4

APPENDIXES

- A.   BOARD SPECIFICATIONS

- B.   BOARD DIAGRAMS

- C.   CONNECTOR LOCATION & PINOUTS

- D.   LIST OF APPROVED VENDORS

- E.   MEMORY & I/O MAPS

- F.   BIOS SETUP ERROR CODES

- G.   EMERGENCY PROCEDURE

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A. BOARD SPECIFICATIONS

A.1 ELECTRICAL

- Conforms to the electrical specifications in the IEEE P996 Bus Specification (PC/AT) and the PCI Local Bus Specification Revision 2.1.
- Supply Current:

TABLE A-1: Supply Current

Supply Current *	Pentium 100MHz	Pentium 120MHz	Pentium 133MHz	Pentium 150MHz	Pentium 166MHz	Pentium 200MHz	Pentium MMX 166MHz	Pentium MMX 200MHz	Pentium MMX 233MHz
+5V Typical	2.5 A	2.8 A	2.7 A	2.8 A	3.0 A	3.2 A	3.3 A	3.4 A	3.5 A
+5V Suspend	1.0 A	1.0 A	1.0 A	1.1 A	1.1 A	1.1 A	1.3 A	1.3 A	1.3 A
+12V	10 mA	10 mA	10 mA	10 mA	10 mA	10 mA	10 mA	10 mA	10 mA

*   Measured with 8MB DRAM, 4MB Flash EPROM and SCSI installed.

A.2 MECHANICAL

- Please refer to Mechanical Specifications in Appendix C Board Diagrams
- Dimensions: 7.125 in. x 4.80 in. / 181 mm x 121.9 mm.

A.3 ENVIRONMENTAL

- Operating Temperature: 0 to 62°C (heatsink and fan), calculated with typical power consumption.
- Storage Temperature: Ambient temperature range of -30°C to +85°C.
- Noncondensing Relative Humidity: 5% - 95%.

A.4 RELIABILITY

- MTBF (Mean Time Between Failure) with Pentium 133 MHz, is estimated at 115 921 hours for an operating temperature of 20°C.

B. BOARD DIAGRAMS

B.1 VIPer820 BLOCK DIAGRAM

DIAGRAM B-1: VIPer820 Block Diagram

P3 — 5V - 2.8V / 2.9V / 3.2V / 3.3V DC-DC CONV.

PENTIUM / MMX / K6 PROCESSOR — U11

VIDEO DRAM 256x16

LOCAL BUS

L2 CACHE & TAG

INTEL TXC PCI CONTROLLER

DRAM SIMMs UP TO 128MB — U2 U3

CIRRUS CL-GD7548 CRT SVGA CONTROLLER

SVGA CONNECTOR — J13

FLAT PANEL CONNECTOR — J9

V. FEATURE CONN./V-PORT — J8

PCI BUS

INTEL PIIX3 PCI TO ISA BRIDGE

IDE HD CONNECTOR — J1

SYMBIOS FAST SCSI II CONTROLLER 53C810

SCSI CONNECTOR — J5

245

SA   SD

PC104 8/16 BIT — P1, P2

ISA BUS; PC/AT BUS

BATTERY 3.6V

SUPERVISOR MAX 691

93C56 SERIAL EEPROM

SMC FDC37C932 ULTRA I/O CONTROLLER

X-BUS

245 — SD

FPGA BIOS WINDOW MAPPER

BOOT BLOCK FLASH EPROM

DATA FLASH DISK 2/4MB

POWER MANAGEMENT — J6

EXT. POWER CONNECTOR — J12, J14

FAN CONNECTOR — J7

DALLAS DS2401 48-BIT SERIAL NUMBER

COM1 CONNECTOR — J10

COM2 CONNECTOR — J4

KBD/SPKR CONNECTOR — J3

PRINTER PARALLEL PORT — J19

FLOPPY CONNECTOR — J2

PS/2 MOUSE CONNECTOR — J11

CLOCK GENERATOR

B.2 VIPer820 ASSEMBLY DIAGRAM (TOP)

DIAGRAM B-2: VIPer820 Assembly Top
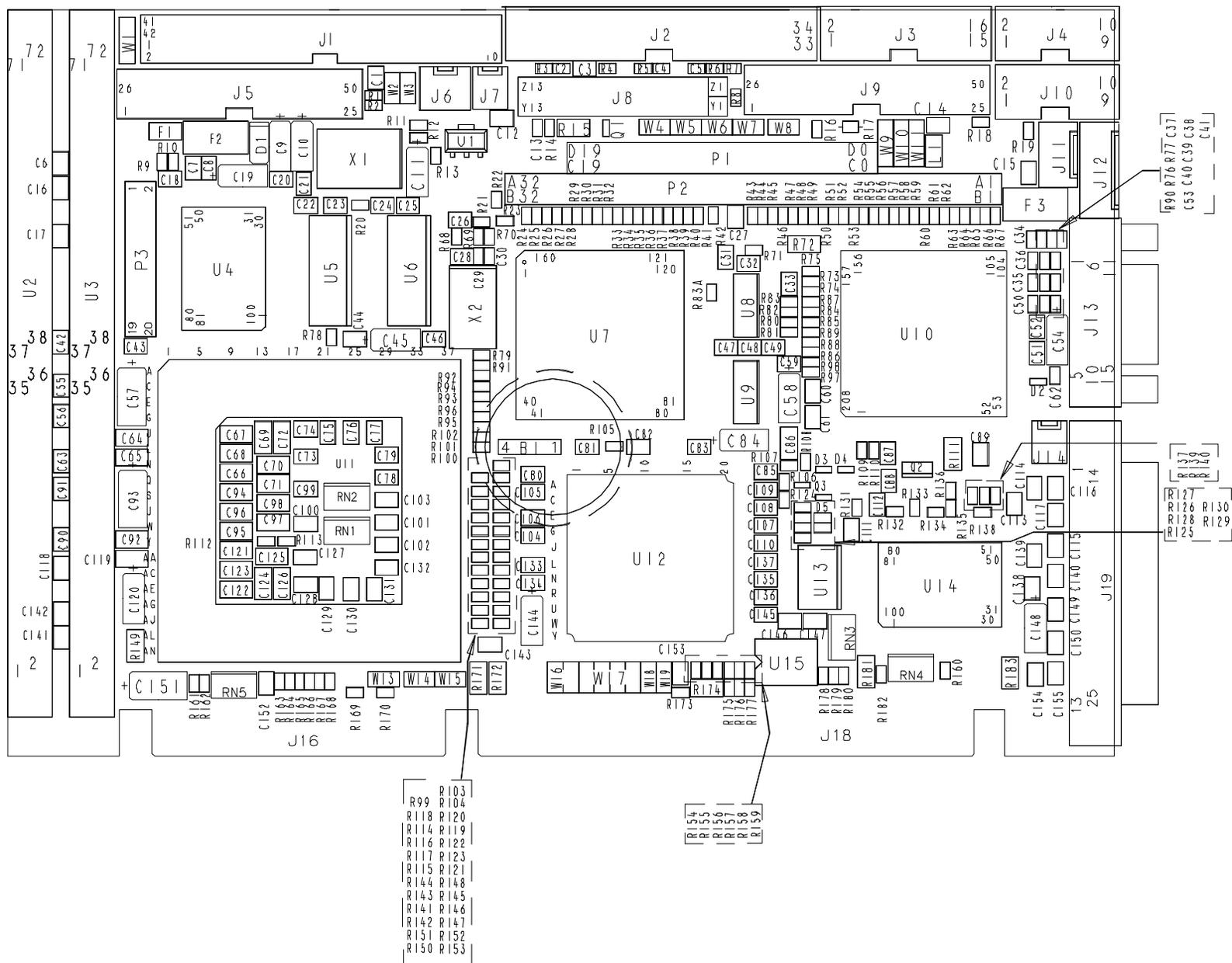
B.3 VIPer820 ASSEMBLY DIAGRAM (BOTTOM)

DIAGRAM B-3: VIPer820 Assembly Bottom
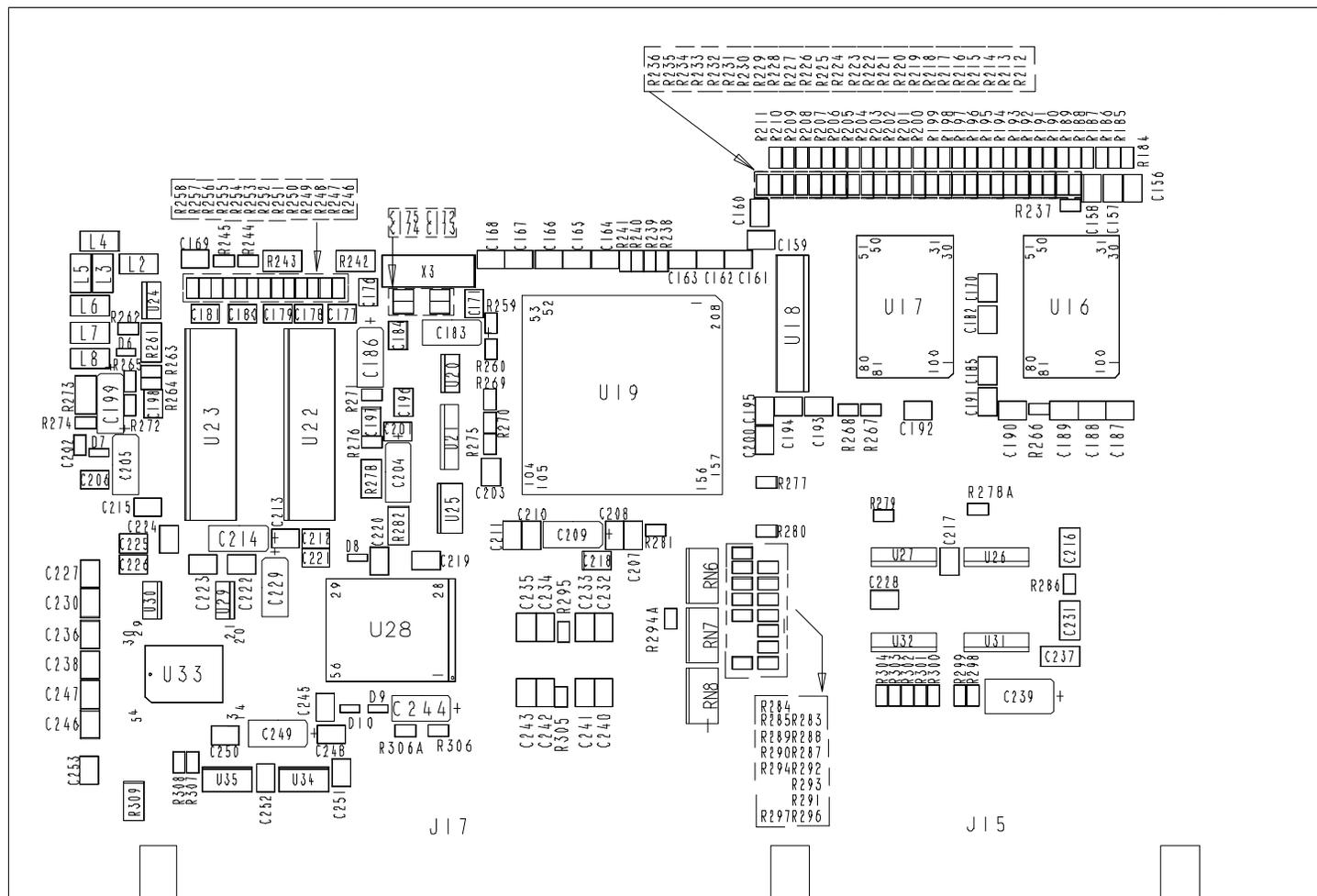
B.4 VIPer820 CONFIGURATION DIAGRAM

DIAGRAM B-4: VIPer820 Configuration Diagram

B.5   VIPer820 MECHANICAL SPECIFICATIONS DIAGRAM

DIAGRAM B-5: VIPer820 Mechanical Specifications
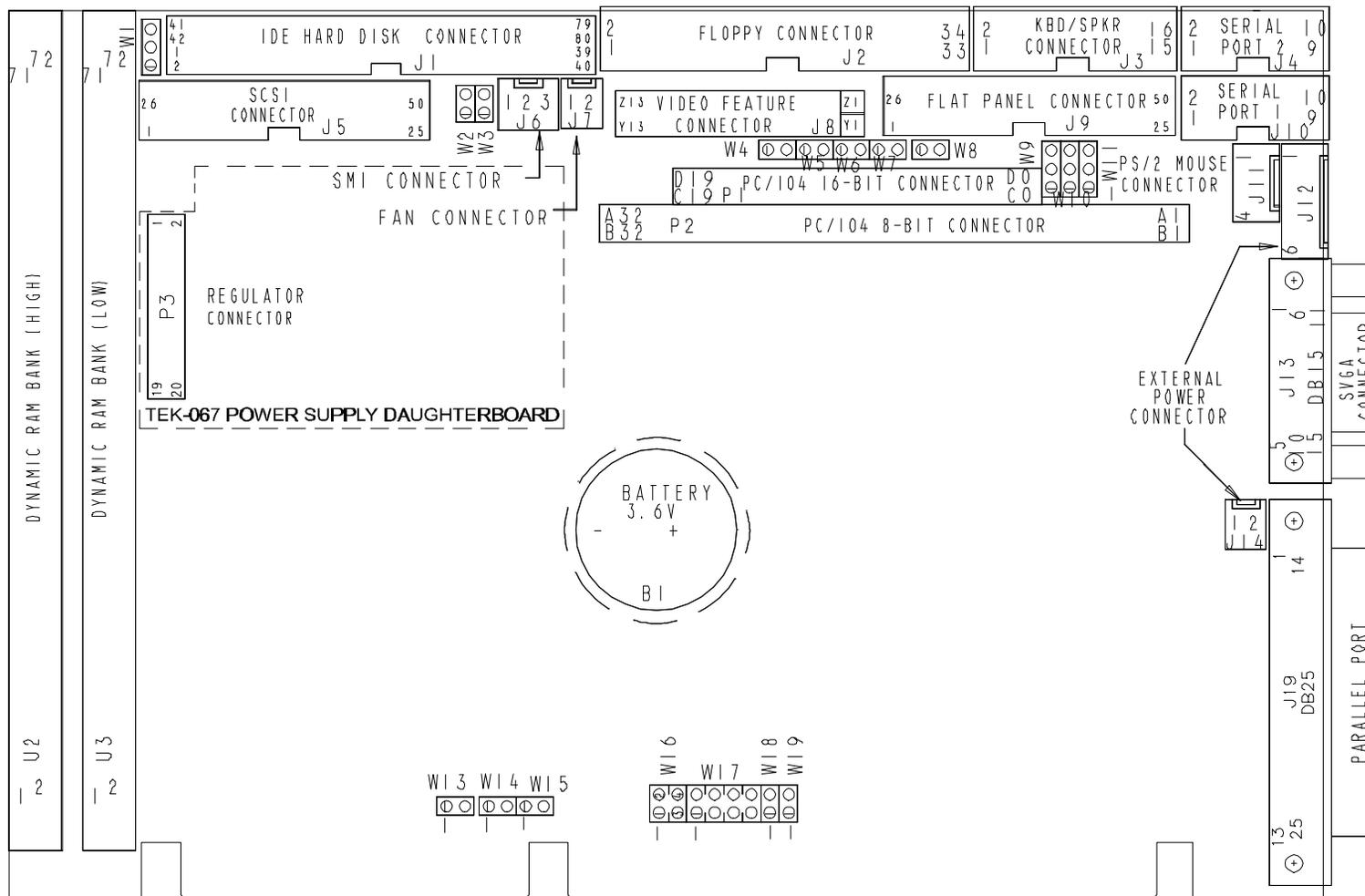
B.6 TEK-067 DAUGHTERBOARD ASSEMBLY DIAGRAMS

DIAGRAM B-6: TEK-067 Assembly Top Diagram
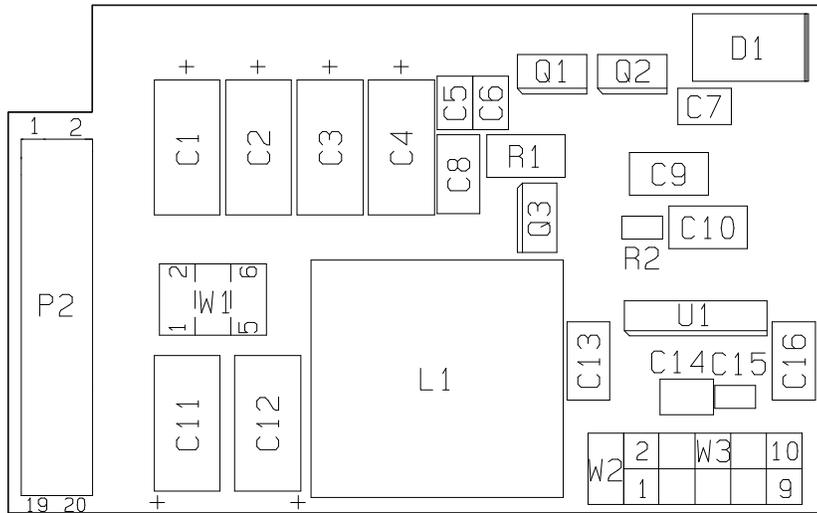
DIAGRAM B-7: TEK-067 Assembly Bottom Diagram
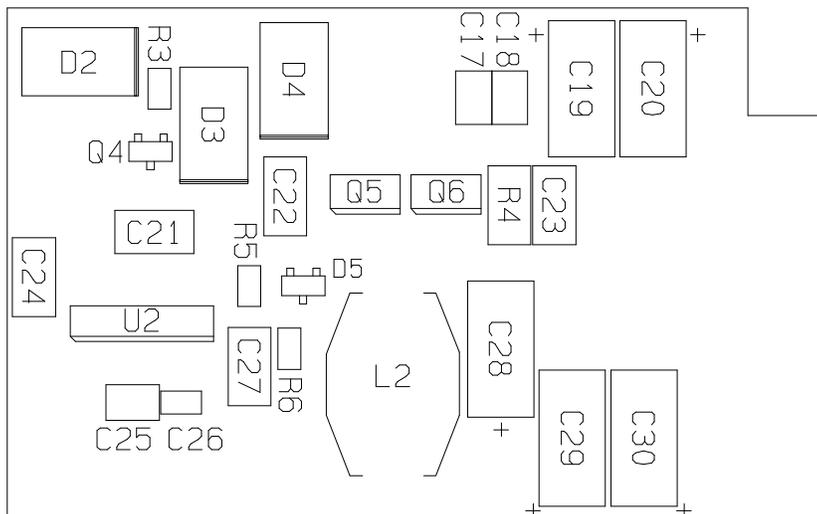
B.7 TEK-067 MECHANICAL SPECIFICATIONS DIAGRAM

DIAGRAM B-8: TEK-067 Mechanical Specifications Diagram
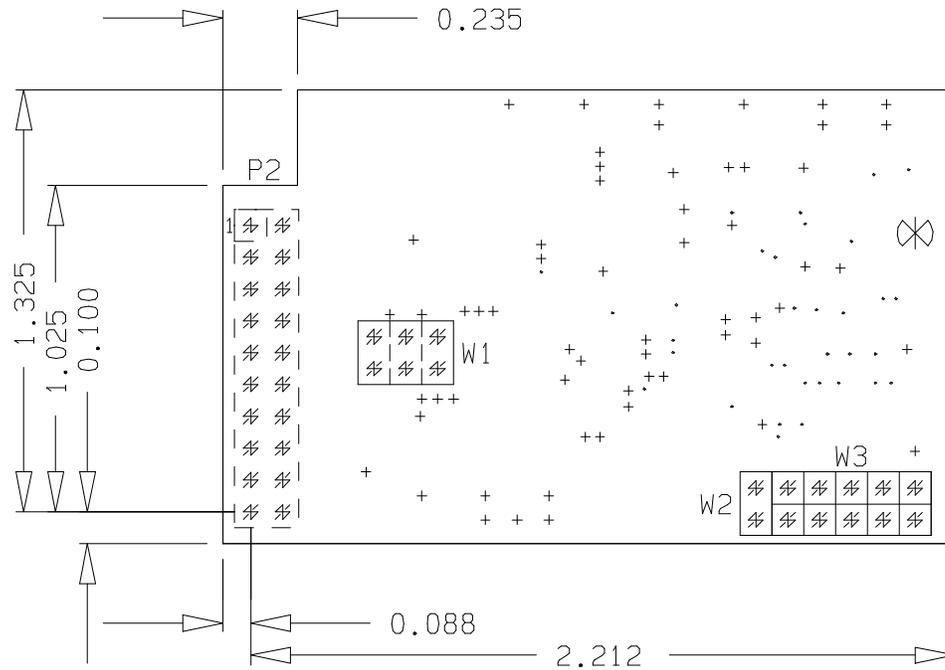
C. CONNECTOR LOCATION & PINOUTS

C.1 LOCATION OF CONNECTORS ON THE VIPer820 & THE TEK-067

Diagram C-1 shows the connector locations on the VIPer820 and Diagram C-2 shows the TEK-067 connector.

DIAGRAM C-1: VIPer820 Connector Locations
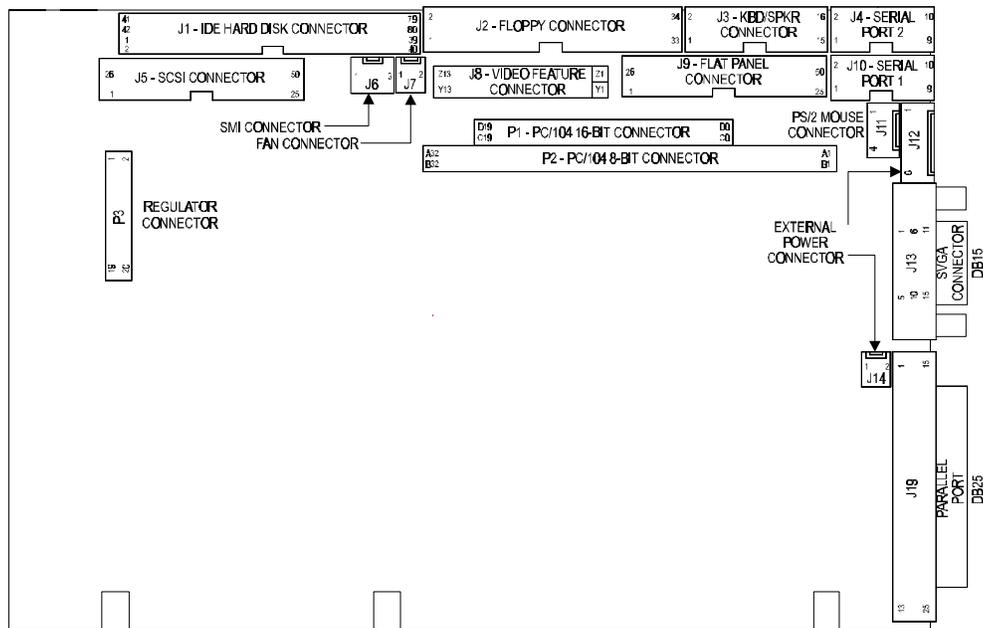
DIAGRAM C-2: TEK-067 Connector Location
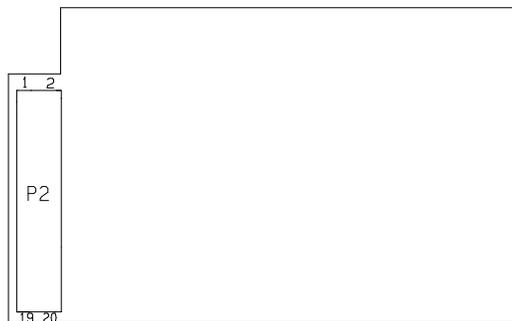
C.2 CONNECTOR PINOUTS

TABLE C-1: Enhanced IDE Connector (J1) - Pinout

	Pin Number	Signal Flow	Signal	Pin Number	Signal Flow	Signal
P R I M A R Y **I D E**	1	O	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 Connected
	21	I	DMA REQ 0	22	-	GND
	23	O	IOW*	24	-	GND
	25	O	IOR*	26	-	GND
	27	I	IOCHRDY	28	O	BALE
	29	O	DMA ACK 0*	30	-	GND
	31	I	IRQ14	32	-	IOCS16*
	33	O	SA1	34	-	GND
	35	O	SA0	36	O	SA2
	37	O	CS0*	38	O	CS1*
	39	I	ACTIVE*	40	-	GND
S E C O N D A R Y **I D E**	41	O	RESET*	42	-	GND
	43	I/O	HD7	44	I/O	HD8
	45	I/O	HD6	46	I/O	HD9
	47	I/O	HD5	48	I/O	HD10
	49	I/O	HD4	50	I/O	HD11
	51	I/O	HD3	52	I/O	HD12
	53	I/O	HD2	54	I/O	HD13
	55	I/O	HD1	56	I/O	HD14
	57	I/O	HD0	58	I/O	HD15
	59	-	GND	60	-	Not Connected
	61	I	DMA REQ 1	62	-	GND
	63	O	IOW*	64	-	GND
	65	O	IOR*	66	-	GND
	67	I	IOCHRDY	68	O	BALE
	69	O	DMA ACK 1*	70	-	GND
	71	I	IRQx	72	-	IOCS16*
	73	O	SA1	74	-	GND
	75	O	SA0	76	O	SA2
	77	O	CS2*	78	O	CS3*
	79	I	ACTIVE*	80	-	GND

*   Active low signal

TABLE C-2: Floppy Disk 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 Connected
5	-	GND	6	-	Not Connected
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	-	Not Connected	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	TRACK 0*
27	-	Not Connected	28	I	WRITE PROTECT*
29	-	Not Connected	30	I	READ DATA*
31	-	GND	32	O	HEAD SELECT*
33	-	Not Connected	34	I	DSKCHG*

* Active low signal

TABLE C-3: Keyboard / Speaker Connector (J3) - Pinout

Pin Number				Pin Number		
Signal Flow				Signal Flow		
Signal				Signal		
KBCLK	I/O	1		2	-	GND
KDATA	I/O	3		4	-	GND
VCC (+5V)	-	5		6	-	VCC (+5V)
SPEAKER	O	7		8	-	VCC (+5V)
KBDINH*	I	9		10	-	GND
DOWNLD*	I	11		12	-	GND
PBRES*	I	13		14	-	GND
ACTIVE*	O	15		16	-	VCC(+5V)

* Active low signal

TABLE C-4: Serial Port 2 - (J4) RS-232 - Pinout

Pin Number						Pin Number
Signal Flow						Signal Flow
Signal						Signal
DCD 2*	I	1		2	I	DSR 2*
RXD 2*	I	3		4	O	RTS 2*
TXD 2	O	5		6	I	CTS 2*
DTR 2*	O	7		8	I	RI 2*
GND	-	9		10	-	Not Connected

* Active low signal

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

Pin Number						Pin Number
Signal Flow						Signal Flow
Signal						Signal
DCD 2*	I	1		2	I	DSR 2*
RX(-)	I/O	3		4	I/O	RX(+)
TX(-)	O	5		6	I	TX(+)
DTR 2*	O	7		8	I	RI 2*
GND	-	9		10	-	Not Connected

* Active low signal

TABLE C-6: Fast SCSI Interface Connector (J5) - Pinout

Pin Number	Signal	Pin Number	Signal
1	GND	2	SD0
3	GND	4	SD1
5	GND	6	SD2
7	GND	8	SD3
9	GND	10	SD4
11	GND	12	SD5
13	GND	14	SD6
15	GND	16	SD7
17	GND	18	SDP
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	Not Connected	26	Term Power
27	GND	28	GND
29	GND	30	GND
31	GND	32	SATN
33	GND	34	GND
35	GND	36	SBSY
37	GND	38	SACK
39	GND	40	SRST
41	GND	42	SMSG
43	GND	44	SSEL
45	GND	46	SCD
47	GND	48	SREQ
49	GND	50	SIO

TABLE C-7: SMI Connector (J6) - Pinout

Pin Number	Signal Flow	Signal
1	I	SMI
2	-	Not Connected
3	-	GND

✎ **NOTE**

> To turn your system into Power Management state, maintain an electrical short between pin 1 and pin 3 of the SMI connector.

C-5

TABLE C-8: Fan Connector (J7) - Pinout

Pin Number	Signal
1	+12V
2	GND

TABLE C-9: Video Feature / V-PORT Connector (J8) - Pinout

I/O Pin	Signal Flow	Signal Name	I/O Pin	Signal Flow	Signal Name
Y1	I	FCP0	Z1	-	GND
Y2	I	FCP1	Z2	-	GND
Y3	I	FCP2	Z3	-	GND
Y4	I	FCP3	Z4	I/O	FCEVIDEO*
Y5	I	FCP4	Z5	I	FCESYNC*
Y6	I	FCP5	Z6	-	Not Connected
Y7	I	FCP6	Z7	-	Not Connected
Y8	I	FC P7	Z8	-	GND
Y9	O	FCDCLK	Z9	-	GND
Y10	I/O	FCBLANK*	Z10	-	GND
Y11	I	FCHSYNC	Z11	-	GND
Y12	I	FCVSYNC	Z12	O	FCVCLK
Y13	-	GND	Z13	O	OVRW*

*Active low signal

✎ **NOTE**

> If you want to use the J8 connector as a V-PORT, contact Technical Support for changes in the connector's signals and other important information.

TABLE C-10: Flat Panel Connector (J9) - Pinout

Pin Number	Signal Flow	Signal	Pin Number	Signal Flow	Signal
1	O	FP4	26	O	FPDE (Data Enable)
2	O	FP5	27	-	GND
3	O	FP6	28	-	GND
4	O	FP7	29	O	FP8
5	O	FP12	30	O	GP0 (Control 0)
6	O	FP13	31	O	GP1 (Control 1)
7	O	FP14	32	-	GND
8	O	FP15	33	O	ENB (Backlight)
9	O	FP19	34	-	GND
10	O	FP18	35	O	LLCLK (Line clock)
11	O	FP11	36	-	GND
12	O	FP10	37	O	FPVEE (Enable VEE)
13	O	FP23	38	O	FPVCC (Enable VCC)
14	O	FP22	39	O	FP2
15	O	FP21	40	O	GP2 (Control 2)
16	O	FP20	41	I	STANDBY*
17	-	GND	42	O	FP16
18	O	FPVDCLK (Shift Clock)	43	O	FP1
19	-	GND	44	O	FP17
20	O	FP9	45	-	Not Connected
21	-	GND	46	-	Not Connected
22	O	LFS (Frame start)	47	-	VCC (+5V)
23	O	FP3/MOD (Modulation)	48	-	VCC (+5V)
24	O	FP0	49	-	+12V
25	-	GND	50	-	+12V

*   Active low signal

TABLE C-11: Serial Port 1 - (J10) RS-232 - Pinout

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

TABLE C-12: PS/2 Mouse Connector (J11) - Pinout

Pin Number	Signal Flow	Signal
1	I/O	MCLK
2	-	GND
3	I/O	MDATA
4	-	VCC (+5V)

TABLE C-13: External Power A Connector (J12) - Pinout

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

TABLE C-14: External Power B Connector (J14) - Pinout

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

TABLE C-15: SVGA Connector (J13) - Pinout

Pin Number	Signal Flow	Signal	Pin Number	Signal Flow	Signal	Pin Number	Signal Flow	Signal
1	O	RED	6	-	ANALOG GND	11	-	Not Connected
2	O	GREEN	7	-	ANALOG GND	12	-	Not Connected
3	O	BLUE	8	-	ANALOG GND	13	O	HSYNC
4	-	Not Connected	9	-	Not Connected	14	O	VSYNC
5	-	GND	10	-	GND	15	-	Not Connected

TABLE C-16: Parallel Port Connector (J19) - Standard Mode

Pin Number	Signal Flow	Signal	Pin Number	Signal Flow	Signal
1	O	STROBE*	14	O	AUTOFD*
2	I/O	PD0	15	I	ERROR*
3	I/O	PD1	16	O	INIT*
4	I/O	PD2	17	O	SELECTIN*
5	I/O	PD3	18	-	GND
6	I/O	PD4	19	-	GND
7	I/O	PD5	20	-	GND
8	I/O	PD6	21	-	GND
9	I/O	PD7	22	-	GND
10	I	ACK*	23	-	GND
11	I	BUSY	24	-	GND
12	I	PE	25	-	GND
13	I	SELECT			

*   Active low signal

TABLE C-17: Parallel Port Connector (J19) - EPP Mode

Pin Number	Signal Flow	Signal	Pin Number	Signal Flow	Signal
1	O	WRITE*	14	O	DATASTB*
2	I/O	PD0	15	-	Not Connected
3	I/O	PD1	16	-	Not Connected
4	I/O	PD2	17	O	ADDRSTRB*
5	I/O	PD3	18	-	GND
6	I/O	PD4	19	-	GND
7	I/O	PD5	20	-	GND
8	I/O	PD6	21	-	GND
9	I/O	PD7	22	-	GND
10	I	INTR	23	-	GND
11	I	WAIT*	24	-	GND
12	-	Not Connected	25	-	GND
13	-	Not Connected			

*   Active low signal

TABLE C-18: Parallel Port Connector (J19) - ECP Mode

Pin Number	Signal Flow	Signal	Pin Number	Signal Flow	Signal
1	O	STROBE*	14	O	AUTOFD*, HOSTACK[2]
2	I/O	PD0	15	I	FAULT*[1], PERIPHRQST*[2]
3	I/O	PD1	16	O	INIT*[1], REVERSERQST*[2]
4	I/O	PD2	17	O	SELECTIN*[1,2]
5	I/O	PD3	18	-	GND
6	I/O	PD4	19	-	GND
7	I/O	PD5	20	-	GND
8	I/O	PD6	21	-	GND
9	I/O	PD7	22	-	GND
10	I	ACK*	23	-	GND
11	I	BUSY, PERIPHACK[2]	24	-	GND
12	I	PERROR, ACKREVERSE[2]	25	-	GND
13	I	SELECT			

*   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.

TABLE C-19: Regulator Connector (P3 on VIPer820; P2 on TEK-067) - Pinout

Pin Number	Signal	Pin Number	Signal
1	VCC (+5V)	2	VCC (+5V)
3	VCC (+5V)	4	VCC (+5V)
5	VCC (+5V)	6	VCC (+5V)
7	GND	8	GND
9	GND	10	GND
11	VCC3[1]	12	VCC3[1]
13	GND	14	GND
15	+12V	16	VCORE[2]
17	VCORE[2]	18	VCORE[2]
19	VCORE[2]	20	VCORE[2]

[1]   +3.34V
[2]   Voltage varies between 1.34V and 3.54V depending on the TEK-067 W3 jumper setting (section 6.2.3)

TABLE C-20: PC/104 Card Connector (P2)

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
A32	GND	-

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	OWS*	I
B9	+12V	-
B10	Not Connected	-
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	-
B32	GND	-

*Active low signal

TABLE C-21: PC/104 Card Connector (P1)

C Side

I/O Pin	Signal Name	I/O
C0	GND	-
C1	SBHE*	I/O
C2	LA23	I/O
C3	LA22	I/O
C4	LA21	I/O
C5	LA20	I/O
C6	LA19	I/O
C7	LA18	I/O
C8	LA17	I/O
C9	MEMR*	I/O
C10	MEMW*	I/O
C11	SD8	I/O
C12	SD9	I/O
C13	SD10	I/O
C14	SD11	I/O
C15	SD12	I/O
C16	SD13	I/O
C17	SD14	I/O
C18	SD15	I/O
C19	Not Connected	-

D Side

I/O Pin	Signal Name	I/O
D0	GND	-
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	-
D19	GND	-

*   Active low signal

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TABLE C-22: 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	OWS*	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

TABLE C-23: PC Bus Connector

C Side

I/O Pin	Signal Name	I/O
C1	SBHE*	I/O
C2	LA23	I/O
C3	LA22	I/O
C4	LA21	I/O
C5	LA20	I/O
C6	LA19	I/O
C7	LA18	I/O
C8	LA17	I/O
C9	MEMR*	I/O
C10	MEMW*	I/O
C11	SD8	I/0
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

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D. LIST OF APPROVED VENDORS

The following is list of recommended devices and connectors for use on the VIPer820. Many other modes are available and function equally well. Users are encouraged to check with their local distributors for comparable substitutes.

D.1 RECOMMENDED DRAM DEVICES

Recommended DRAM devices for the U2 and U3 72-pin sockets come with page mode at 70ns maximum access time. Consult the following list to see examples of recommended DRAM devices on the VIPer820.

TABLE D-1: Recommended DRAM devices on the VIPer820

SIMM	VENDOR	PART NUMBER
1M*36 (FPM) 4MB modules	MICRON	MT9D136M-7
	NEC	MC-421000A36B-70
	SAMSUNG	KMM5361000B-7
	TEXAS INSTRUMENTS	TM124MBK36R-70
	TOSHIBA	THM361020AS-70
2M*32 (EDO) 8MB modules	MICRON	MT4D232DM-6X
2M*36 (FPM) 8MB modules	HITACHI	HB56D236BW-7B
	HITACHI	HB56D236B2-7C
	HITACHI	HB56D236BS-7BC
	HITACHI	HB56D236BW-7C
	HYUNDAI	HYM536220W-70
	MICRON	MT18D236M-7
	NEC	MC422000A36B-70
	SAMSUNG	KMM5362000B-7
	TOSHIBA	THM362040AS-60
	TOSHIBA	THM362040AS-70
4M*36 (FPM) 16MB modules	HYUNDAI	HYM536410AM-70
	MITSUBISHI	MH4M36ANXJ-7
	NEC	MC-424000A36BJ-70
	NEC	MC-424000A36BH-70
	SAMSUNG	KMM5364100-7
	TOSHIBA	THM364020S-70
8M*32 (EDO) 32MB modules	MICRON	MT16D832DM-6X
8M*36 (FPM) 32MB modules	HITACHI	HB56D836BR-70A
	HITACHI	HB56D836BR-60A
	TOSHIBA	THM368020SG-60
	TOSHIBA	THM368020S-70

D.2 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.

Connector	Recommended Mating Part
IDE (J1)	Teknor 150-179 (IDE Adaptor 80 HDD to 2 x 40HD)
	Amp 746285-9 [499252-1*], Robinson Nugent IDS-C40PK-TG, Thomas & Betts 622-4030 [622-4041*]. (40-pin flat cable connector).
Floppy Disk (J2)	Amp 746285-8 [499252-6*], Robinson Nugent IDS-C34PK-TG, Thomas & Betts 622-3430 [622-3441*]. (34-pin flat cable connector).
Keyboard/Speaker (J3)	Amp 746285-3 [499252-8*], Robinson Nugent IDS-C16PK-TG, Thomas & Betts 622-1630 [622-1641*]. (16-pin flat cable connector).
Serial Ports 1 & 2 (J4 & J10)	Amp 746285-1 [499252-5*], Robinson Nugent IDS-C10PK-TG, Thomas & Betts 622-1030 [622-1041*]. (10-pin flat cable connector).
SCSI Connector (J5)	Teknor 150-176 (SCSI Adaptor 50 HDD to 50 HD Assembly) Hirose HIF6-50D-1.27R (Connector only) Adam Tech HFCS-50SG (Connector only)
Fan Connector (J7)	Leoco 2530 S020013 (housing), Leoco 2533 TCB00A0 (crimp); Molex 22-01-3027 (housing), Molex 08-50-0114 (crimp).

*   optional strain relief part number shown in square brackets

<u>Connector</u>	<u>Recommended Mating Part</u>
Feature Connector (J8)	Robinson Nugent IDS-C26PK-TG Amp 746285-6 [499252-3*] Thomas & Betts 622-2630 [622-2641*] (Polarized IDC female socket connector)
Flat Panel (J9)	Teknor 150-105 (High Density Flat Panel Connector Assembly) Hirose HIF6-50D-1.27R (Connector only) Adam Tech HFCS-50SG (Connector only)
PS/2 Mouse Connector (J11)	Molex 22-01-3047 (connector), Molex 08-50-0114 (crimp).
Power Connector (J12)	Leoco 2530 S060013 (housing) Leoco 2533 TCB00A0 (crimp) Molex 22-01-3067 (housing) Molex 08-50-0114 (crimp)
Power Connector (J14)	Leoco 2530 S020013 (housing), Leoco 2533 TCB00A0 (crimp); Molex 22-01-3027 (housing), Molex 08-50-0114 (crimp).

*   optional strain relief part number shown in square brackets

E. MEMORY & I/O MAPS

E.1 MEMORY MAP

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

DIAGRAM E-1: Memory Map Diagram
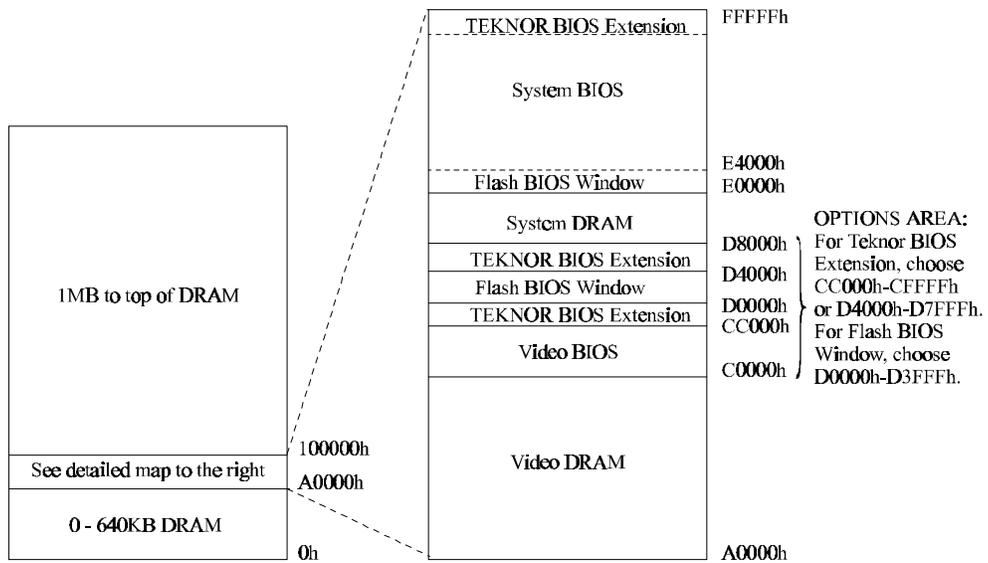
The System BIOS includes a temporary 16 KB for TEKNOR BIOS Extension, and a temporary 16 KB for Flash Window.

On the following page, the memory map is displayed in a table format. See Table E-1.

TABLE E-1: Memory Map

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

✎ **NOTE**

> The System BIOS includes a temporary 16 KB for TEKNOR BIOS Extension, and a temporary 16 KB for Flash Window.

E.2 I/O MAP

TABLE E-2: I/O Map

Address	Optional Address	Optional Address	Optional Address	Function
000-01F				DMA Controller 1
020-03F				Interrupt Controller 1
040-05F				Timer
060-06F				Keyboard (8742)
070-07F				Real-time clock
080-09F				DMA Page Register
0A0-0BF				Interrupt Controller 2
0C0-0DF				DMA Controller 2
0F0-0F1, 0F8-0FF				Math Coprocessor
190-197	290-297	390-397		TEKNOR Control Port
1F0-1F7, 3F6				Primary IDE
170-177, 376				Secondary IDE
3F0-3F7	370-377			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				Graphics Controller

✎ **NOTE**

> The I/O adresses for the On Board SCSI device are automatically allocated by the System BIOS.

F. BIOS SETUP ERROR CODES

F.1 POST MESSAGES

During the Power On Self Test (POST), if the BIOS detects an error requiring you to do something to fix, it will either sound a beep code or display a message.

If a message is displayed, it will be accompanied by:
"PRESS F1 TO CONTINUE, DEL TO ENTER SETUP".

F.2 POST BEEP

Currently there is only one beep code in BIOS. This code indicates that a video error has occurred and BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by two short beeps.

F.3 ERROR MESSAGES

One or more of the following messages may be displayed if the BIOS detects an error during the POST. This list includes messages for both the ISA and EISA BIOS.

CMOS BATTERY HAS FAILED

CMOS battery is no longer functional. It should be replaced.

CMOS CHECKSUM ERROR

Checksum of CMOS is incorrect. This can indicates that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

DISK BOOT FAILURE, INSERT SYSTEM DISK AND PRESS ENTER

No boot device was found. This could mean either a boot drive was not detected or the drive does not contain proper system boot files. Insert a system disk into Drive A and press Enter. If you assumed the system would boot from the hard drive, make sure the controller is inserted correctly and all cables are properly attached. Also be sure the disk is formatted as a boot device. Then reboot the system.

DISKETTE DRIVES OR TYPES MISMATCH ERROR - RUN SETUP

Type of diskette drive installed in the system is different from CMOS definition. Run Setup to reconfigure the drive type correctly.

DISPLAY SWITCH IS SET INCORRECTLY

Display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, and then either turn off the system and change the jumper, or enter Setup and change the VIDEO selection.

DISPLAY TYPE HAS CHANGED SINCE LAST BOOT

Since last powering off the system, the display adapter has been changed. You must configure the system for the new display type.

ERROR ENCOUNTERED INITIALIZING HARD DRIVE

Hard drive cannot be initialized. Be sure the adapter is installed correctly and all cables are correctly and firmly attached. Also be sure the correct hard drive type is selected in Setup.

ERROR INITIALIZING HARD DRIVE DISK CONTROLLER

Cannot initialize controller. Make sure the cord is correctly and firmly installed in the bus. Be sure the correct hard drive type is selected in Setup. Also check to see if any jumper needs to be set correctly on the hard drive.

FLOPPY DISK CNTRLR ERROR OR NO CNTRLR PRESENT

Cannot find or initialize the floppy drive controller. Make sure the controller is installed correctly and firmly. If there are no floppy drives installed, be sure the Diskette Drive selection in Setup is set to NONE.

KEYBOARD ERROR OR NO KEYBOARD PRESENT

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

If you are purposely configuring the system without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. This will cause BIOS to ignore the missing keyboard and continue the boot.

MEMORY ADDRESS ERROR AT ...

Indicates a memory address error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

MEMORY PARITY ERROR AT ...

Indicates a memory parity error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

MEMORY SIZE HAS CHANGED SINCE LAST BOOT

Memory has been added or removed since the last boot. In EISA mode use Configuration Utility to reconfigure the memory configuration. In ISA mode enter Setup and enter the new memory size in the memory fields.

MEMORY VERIFY ERROR AT ...

Indicates an error verifying a value already written to memory. Use the location along with your system's memory size in the memory map to locate the bad chip.

OFFENDING SEGMENT

This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem cannot be isolated.
PRESS A KEY TO REBOOT

This will be displayed at the bottom screen when an error occurs that requires you to reboot. Press any key and the system will reboot.

PRESS F1 TO DISABLE NMI, F2 TO REBOOT

When BIOS detects a Non-maskable Interrupt condition during boot, this will allow you to disable the NMI and continue to boot, or you can reboot the system with the NMI enabled.

RAM PARITY ERROR - CHECKING FOR SEGMENT ...

Indicates a parity error in Random Access Memory.

F.4 POST CODES

✎ **NOTE**

EISA POST codes are typically output to port address 300h.
ISA POST codes are output to port address 80h.

TABLE F-1: POST Codes

POST (hex)	Name	Description
CO	Turn Off Chipset Cache	OEM Specific-Cache control
1	Processor Test 1	Processor Status (1FLAGS) Verification. Tests the following processor status flags: Carry, zero, sign, overflow. The BIOS will set each of these flags, verify they are set, then turn each flag off and verify it is off.
2	Processor Test 2	Read/Write/Verify all CPU registers except SS, SP, and BP with data pattern FF and 00.
3	Initialize Chips	Disable NMI, PIE, AIE, UEI, SQWV. Disable video, parity checking, DMA. Reset math coprocessor. Clear all page registers, CMOS shutdown byte. Initialize timer 0, 1, and 2, including set EISA timer to a known state. Initialize DMA controllers 0 and 1. Initialize interrupt controllers 0 and 1. Initialize EISA extended registers.
4	Test Memory Refresh Toggle	RAM must be periodically refreshed in order to keep the memory from decaying. This function assures that the memory refresh function is working properly.
5	Blank video, Initialize keyboard	Keyboard controller initialization.
6	Reserved	
7	Test CMOS Interface and Battery Status	Verifies CMOS is working correctly, detects bad battery.
BE	Chipset Default Initialization	Program chipset registers with power on BIOS defaults.
C1	Memory presence test	OEM Specific-Test to size on-board memory.
C5	Early Shadow	OEM Specific-Early Shadow enable for fast boot.
C6	Cache presence test	External cache size detection.
8	Setup low memory	Early chip set initialization. Memory presence test. OEM chip set routines. Clear low 64K of memory. Test first 64K memory.

9	Early Cache Initialization	Cyrix CPU initialization. Cache initialization.
A	Setup Interrupt Vector Table	Initialize first 120 interrupt vectors with SPURIOUS_INT_HDLR and initialize INT 00h-1Fh according to INT_TBL.
B	Test CMOS RAM Checksum	Test CMOS RAM Checksum, if bad, or insert key pressed, load defaults.
C	Initialize keyboard	Detect type of keyboard controller (optional). Set NUM LOCK status.
D	Initialize Video Interface	Detect CPU clock. Read CMOS location 14h to find out type of video in use. Detect and Initialize Video Adapter.
E	Test Video Memory	Test video memory, write sign-on message to screen. Setup shadow RAM - Enable shadow according to Setup.
F	Test DMA Controller 0	BIOS checksum test. Keyboard detect and initialization.
10	Test DMA Controller 1	
11	Test DMA Page Registers	Test DMA Page Registers.
12-13	Reserved	
14	Test Timer Counter 2	Test 8254 Timer 0 Counter 2.
15	Test 8259-1 Mask Bits	Verify 8259 Channel 1 masked interrupts by alternately turning off and on the interrupt lines.
16	Test 8259-2 Mask Bits	Verify 8259 Channel 2 masked interrupts by alternately turning off and on the interrupt lines.
17	Test Stuck 8259's Interrupts Bits	Turn off interrupts then verify no interrupt mask register is on.
18	Test 8259 Interrupt Functionality	Force an interrupt and verify the interrupt occurred.
19	Test Stuck NMI Bits (Parity/IO Check)	Verify NMI can be cleared.
1A		Display CPU clock
1B-1E	Reserved	
1F	Set EISA Mode	If EISA non-volatile memory checksum is good, execute EISA initialization. If not, execute ISA tests and clear EISA mode flag. Test EISA Configuration Memory Integrity (checksum & communication interface).
20	Enable Slot 0	Initialize slot 0 (System Board).
21-2F	Enable Slots 1-15	Initialize slots 1 through 15.
30	Size Base and Extended Memory	Size base memory from 256KB to 640KB and extended memory above 1 MB.
31	Test Base and Extended Memory	Test base memory from 256KB to 640KB and extended memory above 1 MB using various patterns. NOTE: This will be skipped in ISA mode and can be « skipped » with ESC key in EISA mode.

32	Test EISA Extended Memory	If EISA Mode flag is set then test EISA memory found in slots initialization. NOTE: This will be skipped in ISA mode and can be « skipped » with ESC key in EISA mode.
33-3B	Reserved	
3C	Setup Enabled	
3D	Initialize & Install Mouse	Detect if mouse is present, initialize mouse, install interrupt vectors.
3E	Setup Cache Controller	Initialize Cache controller.
3F	Reserved	
BF	Chipset Initialization	Program chipset registers with Setup values.
40		Display virus protect disable or enable
41	Initialize Floppy Drive & Controller	Initialize floppy disk drive controller and any drives.
42	Initialize Hard Drive & Controller	Initialize hard drive controller and any drives.
43	Detect & Initialize Serial/Parallel Ports	Initialize any serial and parallel ports (also game port).
44	Reserved	
45	Detect & Initialize Math Coprocessor	Initialize math coprocessor
46	Reserved	
47	Reserved	
48-4D	Reserved	
4E	Manufacturing POST Loop or Display Messages	Reboot if Manufacturing POST Loop pin is set. Otherwise display any messages (i.e., any non-fatal errors that were detected during POST) and enter Setup.
4F	Security Check	Ask password security (optional).
50	Write CMOS	Write all CMOS values back to RAM and clear screen.
51	Pre-boot Enable	Enable parity checker. Enable NMI, Enable Cache before boot.
52	Initialize Option ROMs	Initialize any option ROMs present from C8000h to EFFFFh. NOTE: When FSCAN option is enabled, will initialze from C8000h to F7FFFh.
53	Initialze Time Value	Initialize time value in 40h: BIOS area.
60	Setup Virus Protect	Setup virus protect according to Setup.
61	Set Boot Speed	Set system speed for boot.
62	Setup NumLock	Setup NumLock status according to Setup.
63	Boot Attempt	Set low stack. Boot via INT 19h.
B0	Spurious	If interrupt occurs in protected mode.
B1	Unclaimed NMI	If unmasked NMI occurs, display: Press F1 to disable NMI, F2 reboot.
E1-EF	Setup Pages	E1 - Page 1, E2 - Page 2, etc.
FF	Boot	

TABLE F-2: Boot Block Recovery Check Points

Post code	Description
Boot block recovery check points	
41	Enterring the boot block recovery code (i.e. Main BIOS checksum error)
xx	Post code counter displaying emergency file block number loaded from floppy
11	Begin the flash reprogramming process
22	Error when getting the boot block flash ID code
33	Error when erasing the boot block flash
44	Error when programming the boot block flash
55	Success of the boot block recovery code

TABLE F-3: Beep Code

Post code	BeepCode	Description
41	**-*	Enterring the boot block recovery code (i.e. Main BIOS checksum error)
22	*-*-*	Error when getting the boot block flash ID code
33	*-*-*-*	Error when erasing the boot block flash
44	*-*-*-*-*	Error when programming the boot block flash
55	*-*	Success of the boot block recovery code. The board is ready to be manually reseted.

LEGEND

Symbol	Description
*	1 Beep code
-	Silence

G. EMERGENCY PROCEDURE

Follow this procedure only in case of emergency such as a critical error during the boot block flash BIOS update (when using UBIOS utility program or saving VIP-UP parameters flash) or if you meet one of the following symptoms at anytime:

G.1 SYMPTOMS

- No POST code on a power up (when using a POST code card).
- No TEKNOR BIOS extension sign on at boot even if jumper W17 (5-6) and W18 are not installed.
- System stops at post 41(when using a POST code card) and associated beep code is generated (indicated in Table F-3).
- Board does not boot, even after following all the steps indicated in the Read Me First section.

G.2 EMERGENCY PROCEDURE

Running an EMERGENCY PROCEDURE.

1. Remove battery jumper W10 even if it is set to internal or external.
2. Be sure that your Supervisor I/O base address is set to 190h (jumper W16).
3. Install the EMERGENCY jumper (W18).
4. Install the EMERGENCY diskette in the floppy drive A (1.44 MB) connected to the VIPer820 board.
5. Power on the board. (Note that no VGA is present during this procedure.)
6. Boot block flash update will be completed when you will see the POST code 55 (when using a POST code card) or hear the associated beep code (indicated in Table F-3).
7. After the procedure is successfully completed, power down the board, remove the EMERGENCY jumper (W18), set your battery jumper and Supervisor I/O base address as it was previously and power up the board. Your VIPer820 boot block flash BIOS should be correctly programmed and the system should run properly.

✎ **NOTE**

> If the emergency disk has been lost, see section G.3: Generate a Emergency Floppy Diskette.

G.3 GENERATE AN EMERGENCY FLOPPY DISKETTE

Use a system that has a 1.44 MB floppy drive A.

1. Insert the TEKNOR EMERGENCY diskette in drive A:

2. Copy the two files WDISK.COM and EMERDISK.TEK from drive A: to your hard drive (those files are available in your TEKNOR diskette package).

3. Remove the TEKNOR EMERGENCY diskette and insert a **DOS formatted** floppy diskette in drive A:.

4. At the DOS prompt of your hard drive (same path of the two files WDISK.COM and EMERDISK.TEK), type WDISK then press Enter.

INDEX

GLOSSARY

ANSI (AMERICAN NATIONAL STANDARD INSTITUTE)

A group of committees formed to establish voluntary commercial and government standard. ANSI is a member of ISO.

AT BUS

The AT bus is the ISA bus. It is a 16-bit electronic path containing active signals and power lines to interface with compatible interfaces or adapter cards for the transfer of data. Data is exchanged 8 or 16-bit at a time (per access) in parallel.

BIOS (BASIC INPUT/OUTPUT SYSTEM)

BIOS is permanent built-in firmware that controls accesses to devices that are connected to the computer, such as the memory, the monitor, the disk drives, the serial communications port, etc. In TEKNOR single board computer, this may include video BIOS, TEKNOR's BIOS extension, main BIOS and Flat Panel BIOS.

BOOT BLOCK FLASH

A sectored Flash device which allows one or more sectors/blocks to be protected from further updates or erasures. The overall benefits of Boot Block Flash are as follow:

Reduces required space on board, compared to Emergency/Flash implementation.

Increases reliability, fail safe.

Single voltage device. (no 12V VPP required)

Easier to maintain (no more tracking of Emergency BIOS version)

Becoming industry standard.

CACHE MEMORY

Cache memory is an intelligent memory buffer used for speeding access to frequently used data and instructions. There are two main types of cache memory : internal cache which is found inside the microprocessor and external cache located outside the microprocessor on the system board. See also Internal Cache and External Cache or L2 Cache.

CHIPSET

A chipset is a collection of ICs (*Integrated Circuits*) used to interface a micro-processor to a standard PC platform. For instance, in the case of the 80486 processor, a chipset is used to adapt the processor to a standard PC platform. The chipset converts the signals generated by the processor to standard signals used in such interfaces as the PCI and ISA bus. Other functions such as the keyboard and disk drive interfaces are implemented within the chipset.

CMOS (COMPLEMENTARY METAL-OXIDE SEMICONDUCTOR)

A computer chip that allows many components to be packed together in a very small area. CMOS uses a very small electric current, thereby generating very little heat, making it suitable for very-large-scale integration (VLSI). CMOS are nonvolatile, meaning they retain their information even after the power is switched off. In other words, CMOS is a digital logic family that is characterized by high density, low-to-medium power, and medium-to-high speeds.

CRT (CATHODE-RAY TUBE)

Cathode-Ray Tube, an output device consisting of a screen on which the letters, numbers, or graphics output of a computer can be displayed.

DEVICE DRIVER

Software that tells the computer how to connect to a peripheral device, for instance a printer. It acts as an interface between the operating system and the hardware attached to a computer, to allow applications to communicate in an orderly fashion.

DMA (DIRECT MEMORY ACCESS)

A method of transferring blocks of data directly between a masse-storage device and memory, with no intervention from the CPU. To transfer data from a non-storage devices (terminals) to a destination (memory), the CPU must intervene in the transfer of each byte. The DMA interface is typically incorporated into the device controller.

DOWNLOAD MODE

This is a mode for transferring a file from a remote information service (or computer) to the local computer. For instance, information can be downloaded to the Flash EPROM disk on a single board computer by running VFlash on a remote computer and using a serial link.

DRAM (DYNAMIC RANDOM ACCESS MEMORY)

A memory technology that is characterized by extremely high density, low power and low cost. It must be refreshed often (every one thousandth of a second) to avoid loss of data. This type of memory is used as the system memory in many personal computers. DRAM can be configured using 36-bit or 9-bit SIMMs (Single In-line Modules), and is the only type of memory that can be installed by the user.

DSUB CONNECTOR

A standard connector found on the back of most PC products. The connector has a backshell which resembles the letter D. The number of pins per devices vary (from 9 pins and up). All DSUB connectors have a pin pitch of 100 mils and alternate rows are offset from each other by 50 mils.

ECP (EXTENDED CAPABILITIES PORT)

A parallel port mode which provides the following features: high performance half-duplex forward and reverse channel, interlocked handshake, optional single byte RLE compression (64:1), permits the use of active output drivers, permits the use of adaptive signal timing and peer-to-peer capability.

EDO (EXTENDED DATA OUT) **DRAM**

DRAM technology that allows for faster operation. This is done by performing DRAM pre-charge and data accesses in parallel, rather than in series.

EIDE (ENHANCED INTEGRATED DRIVE ELECTRONICS)

An enhanced IDE system offers improved performance, higher capacity and increased options while allowing the user to double the number of devices to four. These devices may include CD-ROM, Tape Back-up and Hard Disk Drives. See also IDE.

EMI (ELECTROMAGNETIC INTERFERENCE)

EMI is a reference to the standard regarding maximum electromagnetic radiation emitted by electronic components.

EPP (ENHANCED PARALLEL PORT)

A parallel port mode in which the read and write operations can be performed as you would normally read or write the content of a memory location. Four registers are used for data input and output to the port.

EPROM (ERASABLE PROGRAMMABLE READ-ONLY MEMORY)

EPROM is a chip with a glass window that is useful for storing firmware. It can be erased by removing the protective cover from the chip package and exposing the semiconductor material to ultraviolet light. It can then be re-programmed.

FAST-PAGE MODE (FPM) **DRAM**

A standard DRAM access mode which allows faster access to data. It is used with very fast processors to ensure that each processor does not have to wait for information when it is needed, thereby reducing or eliminating the wait state. To use Fast-Page Mode, it must be supported by the DRAM controller and enabled in the main BIOS Setup.

FLASH MEMORY

A type of EEPROM, only at a much lower cost, that can be re-programmed by the computer or peripheral device to which it is connected. Flash memory is nonvolatile and as a result, it eliminates the risk of losing valuable data updates. Flash memory offers major advantages in applications like automated factories, remote systems, portable equipment and similar environments.

IDE (INTEGRATED DRIVE ELECTRONICS)

A hard disk drive standard/protocol characterized by the integration of the controller circuitry onto the drive itself; this reduces interface costs and allows easy implementation of a drive within a computer system.

INTERRUPT

Interrupt is a signal that stops what the computer system is currently doing, caused by a deliberate instruction to the microprocessor. This allows the system to perform a higher priority task. After the interrupt is serviced, the suspended microprocessor task can be resumed at the point where it stopped.

The interrupt channel is designated for receiving and transmitting interrupts, so that input/output or other operations can take place. See IRQ.

I/O MAP

An I/O (*Input/Output ports*) map is a list of all special hardware circuits used by the computer to communicate with external devices. They are simply a special type of memory location that can be accessed only by means of the IN and OUT instructions. It is possible to have up to 65 536 different I/O devices attached to the system since the I/O port addresses are 16-bit numbers. Actually, most I/O devices (disk drive controller, video display controllers, etc.) require more than one I/O port to control them.

IRQ (INTERRUPT REQUEST)

Hardware channels over which devices such as I/O ports, disk drives, and the keyboard can send interrupts to the processor. They are built into the computer's internal hardware and are assigned different priority levels so the processor can determine the relative importance of incoming requests for service. There are 16 IRQs in ISA systems. See Interrupt.

ISA (INDUSTRY STANDARD ARCHITECTURE)

In reference to IBM PC AT compatible computers, it is the definition of the standard bus. In other words ISA is the Industrial Standard Architecture expansion bus built into the IBM PC AT computer.

LOCAL BUS

A bus system that has a higher data transfer rate than the standard eight MHz of the ISA bus.

MEMORY MAP

A technical reference that shows the entry point and marks the blocks of memory that are reserved for specific functions.

PASSIVE BACKPLANE

A Printed Circuit Board (PCB) populated mostly with passive electronic components (connectors, resistors...) equipped with connectors that accept different types of Plug-in Electronic boards (SBC, Video Board, I/O Board...). The main purpose of the Passive Backplane is to serve as an interconnection medium for the different Plug-in boards installed in a computer system. The backplane is also generally used to supply power to the different Plug-in boards.

PC/104 (P996.1 STANDARD FOR COMPACT EMBEDDED PC MODULES)

PC/104 was designed in response to the need for a more compact implementation of the PC bus (12.4" x 4.8"), satisfying the reduced space and power constraints of embedded control application without sacrificing full hardware and software compatibility with the popular PC bus standard..

PC/104 is an extension to IEEE-P996. The key differences between PC/104 and the regular PC bus (IEEE P996) are:

Compact form factor: Size reduces to 3.6" by 3.8".

Unique self-stacking bus: Eliminates the cost and bulk of backplanes and card cages.

Pin-and-Socket connectors: Rugged and reliable 64- and 40- contact male/female headers replace the standard PC's edgecard connectors.

Relaxed bus drive: (4mA): Lowers power consumption (to 1-2 Watts per module) and minimizes component count.

PCI (PERIPHERAL COMPONENT INTERCONNECT)

PCI is a local bus architecture designed to put peripherals on an electrical pathway closer to the central processing unit in order to improve the performance of graphics and allow up to ten peripherals.

PCI DEVICE

A device, or electrical component, compliant with the PCI specification, operating in a PCI local bus environment.

PICMG (PCI INDUSTRIAL COMPUTERS MANUFACTURER GROUP)

PICMG is a consortium of industrial computer product vendors who are designing a specification for PCI-based systems and boards to be used in industrial computing applications. TEKNOR is a member of this consortium.

POST CODE (POWER ON SELF TEST CODE)

POST Code is part of the system or main BIOS and is a set of routines that test parts of the computer (including the keyboard, memory, and the disk drives) every time the computer is turned on or reset. It also sets initial values and, if successful, passes control to the bootstrap loader, which boots the operating system. If hardware errors are found, POST either beeps or displays error messages.

REAL-TIME CLOCK (RTC)

It is needed for software compatibility and it has no direct relationship with the ISA bus. It provides time and date information.

RS-232 OR RS-232C

A standard which defines the physical and electrical serial interface used to connect data communications equipment. This is the most commonly used interface, especially between modems and computers.

There are two interfaces: DTE (Data Terminal Equipment), used by computers, and DCE (Data Communications Equipment), used by modems.

SIMM (SINGLE IN-LINE MEMORY MODULES)

A method of organizing surface mount RAM chips on a small circuit board so that the SIMMs can be mounted vertically or at an angle to save space.

SBC (SINGLE BOARD COMPUTER)

A term generally used for a computer in which all of the functions (processor, memory, I/O, peripherals, etc.) are contained on a single board. All of TEKNOR's processor boards are examples of SBC's.

SCSI (SMALL COMPUTER SYSTEM INTERFACE)

An interface standard for connecting peripheral devices (such as hard disk drives and printers) to a computer system.

A SCSI device is attached to a SCSI bus cable and can be an initiator, target, or both. It can be a peripheral device, a host device, or a device that combines both roles. (Pronounced "skuzzy").

SRAM (STATIC RANDOM ACCESS MEMORY)

As opposed to DRAM, SRAM is memory that does not need to be refreshed by a controller and holds its information as long as the power is on.

UASRT (UNIVERSAL ASYNCHRONOUS SYNCHRONOUS RECEIVER/TRANSMITTER)

A single IC (*Integrated Circuits*) that contains both the receiving and transmitting circuitry for synchronous and asynchronous serial communications. It can also convert from serial to parallel or parallel to serial. It inserts and checks for synchronizing control bits in serial data. Computers equipped with a UASRT can communicate over a simple wire connection.

VGA (VIDEO GRAPHICS ARRAY)

VGA offers improved graphics and text resolution and an expanded number of available colors for both text and graphics while maintaining software compatibility with most CGA and EGA applications. It has a maximum screen resolution of 640x480 or 720x400 pixels, where each character is formed in a 9x16 pixel matrix. A maximum of 256 colors can be displayed at once, from an overall selection of 256 000 colors.

VT100 MODE

A mode which allows a single board computer to run without a local keyboard or screen. The operation can be controlled via a remote terminal supporting VT100 Mode or a computer with a terminal emulation program (for example, Telix, Procomm).

WATCHDOG TIMER

A device that watches for CPU inactivity and then resets the CPU after a specified duration of inactivity. It is extremely useful in embedded systems where human supervision is not required.

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	EUROPEAN REGIONAL OFFICE
Tel.: (450) 437-5682	Tel.: +49 811 / 600 15-0
Fax: (450) 437-8053	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.	TEKNOR INDUSTRIAL COMPUTERS INC.
616 Cure Boivin	Zeppellin Str. 4
Boisbriand, Quebec	D-85399 Hallbergmoos
J7G 2A7 CANADA	GERMANY

LIMITED WARRANTY

TEKNOR INDUSTRIAL COMPUTERS INC. ("the seller") warrants its boards 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: <u>the TEKNOR Invoice #, your Purchase Order #, and the Serial Number of the defective board</u>.

2) Give the serial number found on the back of the board 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 board:

   i) Make certain that the board 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.	**TEKNOR INDUSTRIAL COMPUTERS INC.**
616 Cure Boivin	**Zeppellin Str. 4**
Boisbriand, Quebec	**D-85399 Hallbergmoos**
J7G 2A7 CANADA	**GERMANY**

Getting Help 2

TEKNOR
INDUSTRIAL COMPUTERS INC.

RETURN TO MANUFACTURER
AUTORIZATION REQUEST

Contact Name: _____

Company Name: _____

Street Address: _____

City: _____ **Province / State:** _____

Country: _____ **Postal / Zip Code:** _____

Phone Number: _____ **Fax Number:** _____

Extension: _____

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

ref.: RMA-02

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