ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

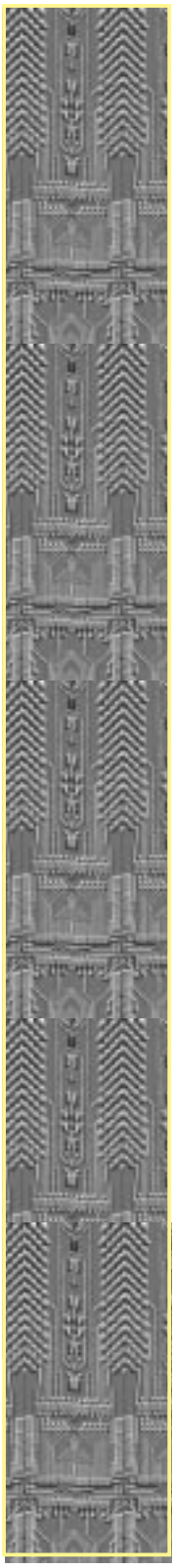
Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *Kontron / Teknor Applicom cPCI-1000* at our website: *Click HERE*



TEKNOR
INDUSTRIAL COMPUTERS INC.

TEK-CPCI-1000

CompactPCI Single Board Computer

TECHNICAL REFERENCE MANUAL **VERSION 2.1**
May 1998

ref.: M1000_2.1

NOTE:
This manual is for reference purpose only.
Reproduction in whole or in part is authorized provided TEKNOR INDUSTRIAL COMPUTERS INC. is cited as the original source.

EXERCISE CAUTION WHILE REPLACING LITHIUM BATTERY

WARNING

Danger of explosion if battery is incorrectly replaced.

Replace 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.

TABLE OF CONTENTS

PART 1

1. PRODUCT OVERVIEW.....1-1

2. ONBOARD SUBSYSTEMS.....2-2

2.1 CONNECTOR LOCATION.....2-2
2.2 ONBOARD CONNECTORS.....2-2
2.3 REAR-PANEL CONNECTORS.....2-2
2.4 FRONT PLATE CONNECTORS.....2-2

3. COMPATIBILITY WITH TEKNOR PRODUCTS.....3-2

4. UNPACKING.....4-2

5. SAFETY PRECAUTIONS.....5-2

5.1 STATIC ELECTRICITY.....5-2
5.2 STORAGE ENVIRONMENT.....5-2
5.3 POWER SUPPLY.....5-2

PART 2

6. CUSTOMIZING THE BOARD 6-2

6.1 PROCESSOR AND FAN 6-2
6.2 INSTALLING MEMORY 6-2
6.3 ENABLING MEMORY CACHE 6-2
6.4 CONFIGURING THE BOARD 6-2
6.5 BIOS BOOT OPTIONS 6-2
6.6 INSTALLING SUPERVISOR UTILITIES 6-2
6.7 INSTALLING THE BOARD INTO A BAY 6-2

7. CONNECTING DEVICES 7-2

7.1 SUPPLYING POWER ON THE TEK-CPCI-1000 7-2
7.2 CONNECTOR LOCATION 7-2
7.3 SERIAL PORTS CONNECTORS (J4) 7-2
7.4 PS/2 MOUSE CONNECTOR (J8) 7-2
7.5 KEYBOARD CONNECTOR (J9) 7-2
7.6 USB CONNECTOR (J7) 7-2
7.7 PARALLEL PORT CONNECTOR (J3) 7-2
7.8 10BASE-T CONNECTOR (J12) 7-2
7.9 MULTI-FUNCTION CONNECTOR (J2) 7-2
7.10 MISCELLANEOUS DEVICES 7-2
7.11 CONNECTING STORAGE DEVICES 7-2
7.12 BATTERY BACKUP CIRCUIT 7-2

8. INSTALLING VIDEO 8-2

9. CONFIGURING DMA & IRQ 9-2

9.1 ALLOCATING DMA CHANNELS 9-2
9.2 ALLOCATING IRQ LINES 9-2

10. SETTING JUMPERS 10-2

10.1 JUMPER LOCATION 10-2
10.2 CPU MODEL SELECTION; W1 AND W2 10-2
10.3 JUMPERS W3-W7 10-2
10.4 JUMPERS W8-W13 10-2
10.5 JUMPERS W14-W19 10-2

PART 3

11. POWERING UP THE SYSTEM 11-2

11.1 POWER UP 11-2
11.2 TROUBLESHOOTING 11-2

12. SOFTWARE SETUP 12-2

12.1 AWARD SETUP PROGRAM 12-2
12.2 VIP-UP PROGRAM 12-2

13. VFLASH SOFTWARE 13-2

13.1 INTRODUCTION 13-2
13.2 RUNNING VFLASH 13-2
13.3 OUTPUT SELECTION 13-2
13.4 FILE SELECTION 13-2
13.5 FILE TRANSFER 13-2
13.6 BATCH MODE 13-2

14. FLASH FILE SYSTEM II 14-2

14.1 INTRODUCTION 14-2
14.2 SETTING UP CONFIG.SYS FOR FLASH FILE SYSTEM 14-2
14.3 CREATING & FORMATTING A MS-FLASH PARTITION 14-2

15. UPDATING THE BIOS WITH UBIOS 15-2

15.1 INTRODUCTION 15-2
15.2 UBIOS - INTERACTIVE MODE 15-2
15.3 UBIOS - BATCH MODE 15-2

16. VT100 MODE 16-2

16.1 VT100 REQUIREMENTS 16-2
16.2 VT100 SETUP & CONFIGURATION 16-2
16.3 RUNNING WITHOUT A TERMINAL 16-2

PART 4

A. BOARD SPECIFICATIONS A-1

B. MEMORY & I/O MAPS B-1

B.1 MEMORY MAP DIAGRAM B-1
B.2 I/O MAPPING B-1

BOARD DIAGRAMS C-1

C.1 MECHANICAL SPECIFICATIONS C-1
C.2 ASSEMBLY - TOP DIAGRAM C-1
C.3 ASSEMBLY - BOTTOM DIAGRAM C-1

D. CONNECTOR PINOUTS D-1

D.1 MULTI-FUNCTION CONNECTOR - (J2) D-1
D.2 PARALLEL PORT CONNECTOR (J3) - STANDARD MODE D-1
D.3 PARALLEL PORT CONNECTOR (J3) - EPP MODE D-1
D.4 PARALLEL PORT CONNECTOR - ECP MODE (J3) D-1
D.5 COM1 - RS-232 (J4A) D-1
D.6 COM2 - RS-232 (J4B) D-1
D.7 COM2 - RS-422/RS-485 MODE (J4B) D-1
D.8 PS/2 MOUSE CONNECTOR (J6) D-1
D.9 USB CONNECTOR (J7) D-1
D.10 KEYBOARD CONNECTOR (J9) D-1
D.11 FAN CONNECTOR (J10) D-1
D.12 ETHERNET 10/100 BASE-TX RJ-45 CONNECTOR (J12) D-1
D.13 CPCI-BUS CONNECTOR D-1
D.14 CPCI-I/O CONNECTOR D-1

E. BIOS SETUP ERROR CODES E-1

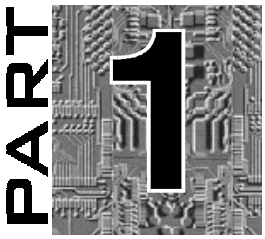
E.1 POST BEEP E-1
E.2 POST MESSAGES E-1
E.3 ERROR MESSAGES E-1
E.4 POST CODES E-1

F. EMERGENCY PROCEDURE F-1

F.1 EMERGENCY PROCEDURE F-1
F.2 GENERATE AN EMERGENCY FLOPPY DISKETTE: F-1

G. LIST OF APPROVED VENDORS G-1

G.1 DRAM (U18,19,20,22) G-1
G.2 INTERFACE CONNECTORS G-1



PRODUCT DESCRIPTION

1. PRODUCT OVERVIEW
2. ONBOARD SUBSYSTEMS
3. COMPATIBILITY WITH TEKNOR PRODUCTS
4. UNPACKING
5. SAFETY PRECAUTIONS

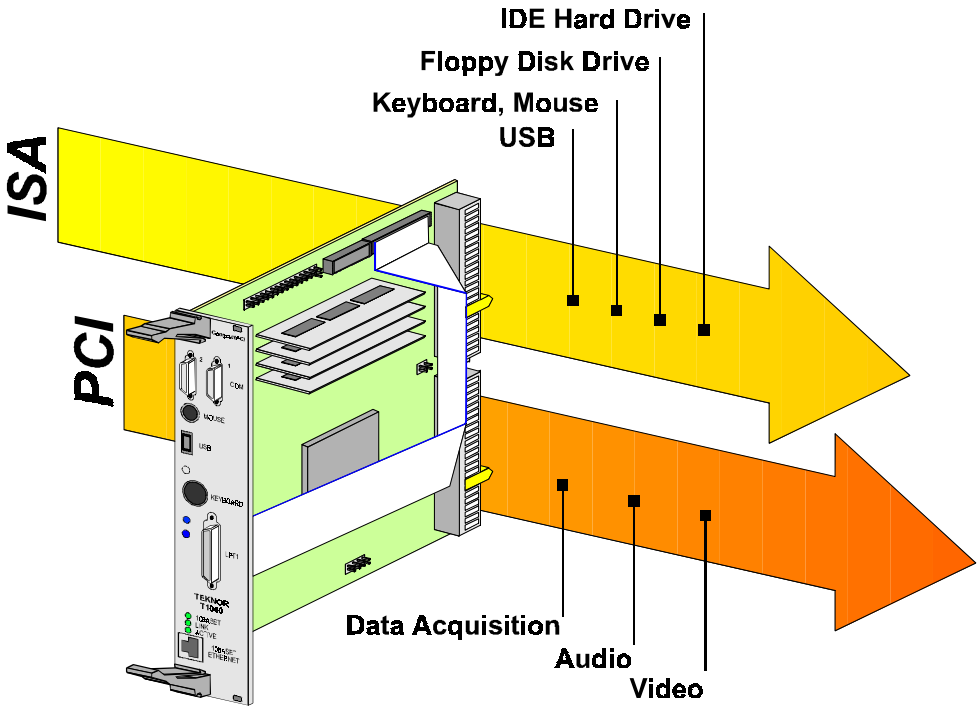
1. PRODUCT OVERVIEW

The TEK-CPCI-1000 *CompactPCI* board represents the most advanced computer architecture in the Single Board Computer world. The TEK-CPCI-1000 is based on INTEL Pentium and AMD K6 processors, and is 100% electrically compatible with INTEL's PCI bus specifications.

The board is a 6U mechanical form factor (Eurocard format). It complies with the CompactPCI design specification and takes advantages of the existent enclosures, card-cages, and fixtures widely used in applications such as: communications, military, or medical.

CompactPCI is a practical extension to the common PCI local bus. It is dedicated to a robust industrial grade computer architecture and provides up to 132MB/sec of transfer rate.

The TEK-CPCI-1000 board is fully compatible with existing application software and operating systems available for desktop PCI: PC and MS-DOS®, Windows® 3.1, Windows® 95, Windows® NT, OS/2® Warp, QNX™, NOVELL™, UnixWare™.



CompactPCI Connectors

According to the PICMG 2.0 R2.1 CompactPCI™ specification, CompactPCI connectors are located at the rear of the board. They are defined as a 2mm pitch, shielded connectors with a 5x47 array of pin for signals and 2 rows of 47 pins for shielding.

If required, a coding key may be installed to ensure a correct mating when connecting the board to a CompactPCI backplane.

CompactPCI™ connector is also known as 2mm Hard Metric connector.

Supported Processors

The TEK-CPCI-1000 supports: INTEL Pentium® 100, 120, 133, 150, 166 and 200MHz

INTEL VRT Pentium® 100, 120, 133, and 150MHz
INTEL MMX™ Pentium® 166, 200, and 233Mhz
AMD K6 166, 200, and 233MHz

MMX™ is for Multi Media eXtension, and VRT is for Voltage Reduced Technology.

▪ Environment

The TEK-CPCI-1000 SBC is provided for rack-mounted systems which offer the highest modularity for applications. The TEK-CPCI-1000 supports four CompactPCI connectors:

PCI P1, P2 - System connectors: output the 32-bit PCI signals and provides arbitration, clock distribution, and reset functions for the peripheral slots of the PCI segment. This segment will support up to seven CompactPCI sub-systems (four bus master devices – with Ethernet disabled - and three slaves) such as: Audio, Video, acquisition boards...

ISA P4, P5 - I/O connectors: provide both ISA and IDE signals to support connections of hard drives, floppy disk drives, mouse and keyboard through the backplane. USB communication signals are also provided through this I/O segment. The signal assignation on these connectors is defined by TEKNOR. When connecting the board to a backplane, ensure the backplane is capable of supporting these signals and of making them available on separate local headers.

Such a backplane is provided by TEKNOR and is referred as TEK1101 CompactPCI Backplane.

A complete *CompactPCI* system (TEK-CPCI-1201) is also available from TEKNOR.

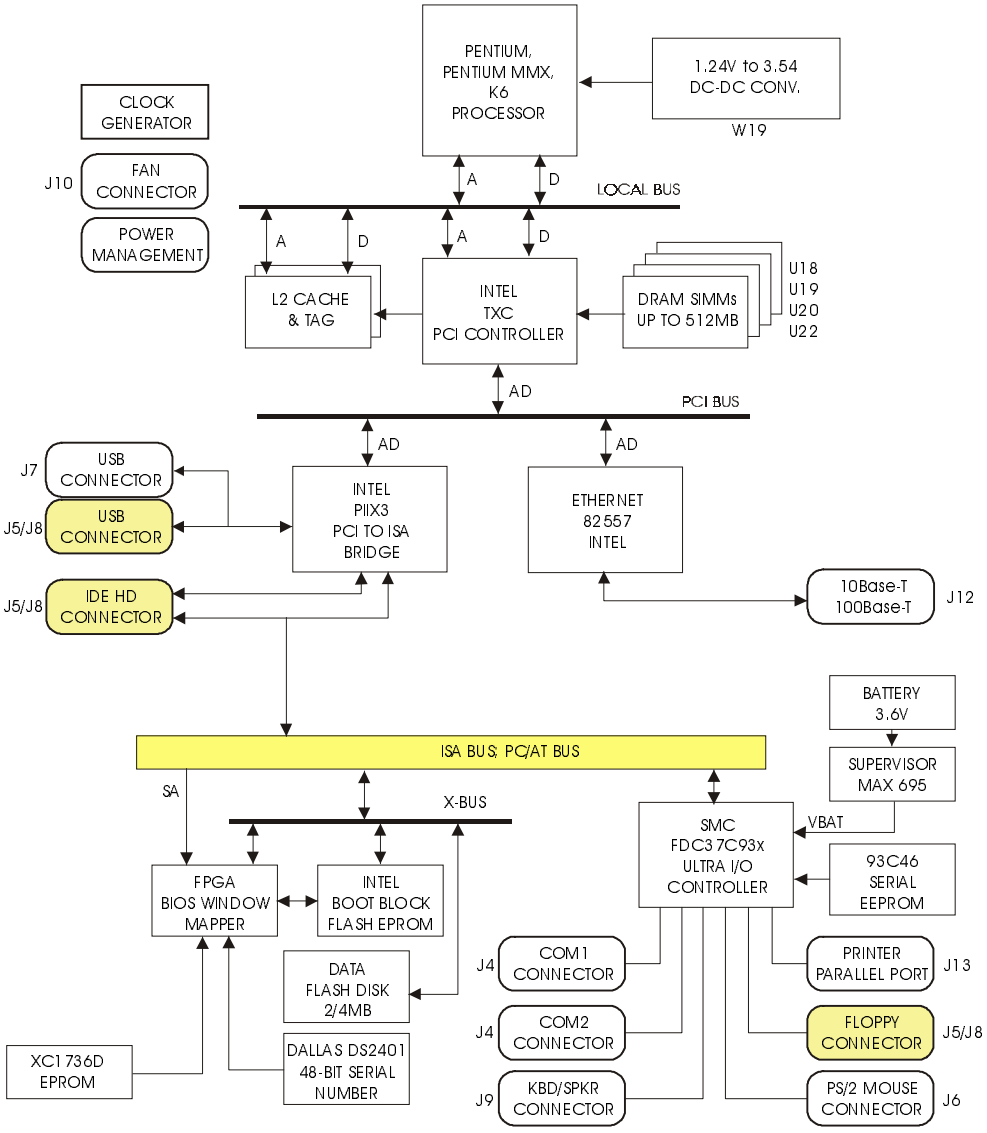
▪ Memory

System memory: the TEK-CPCI-1000 supports from 8MB to 512MB vertical DRAM on four 72-pin SIMM sockets (FPM or EDO). Parity and ECC are supported.

Internal cache: 8KB CPU-internal L1 cache with Pentium processors.
16KB with MMX processors.
32KB with K6 processors.

External cache: 256 or 512KB (L2) pipelined burst cache is implemented to enhance the processor operations by eliminating wait states on cache accesses.

TEK-CPCI-1000 *CompactPCI* - Block Diagram



2. ONBOARD SUBSYSTEMS

The TEK-CPCI-1000 system board is built around a single chip host-to-PCI bridge (430HX from INTEL) which makes the PCI bus accessible through 2mm Hard Metric connectors for up to 7 loads: 4 masters, including the onboard Ethernet, and 3 slaves.

The 430HX interfaces with the onboard processor host bus and a dedicated memory data bus, and provides second level cache (L2) and DRAM control functions.

The DRAM controller supports up to 512MB of main memory. Both Fast Page Mode (FPM) and Extended Data Output (EDO) memory technology are supported. The PCI-to-DRAM interface transfer rate can go up to 112MB/sec for read and 121MB/sec for write.

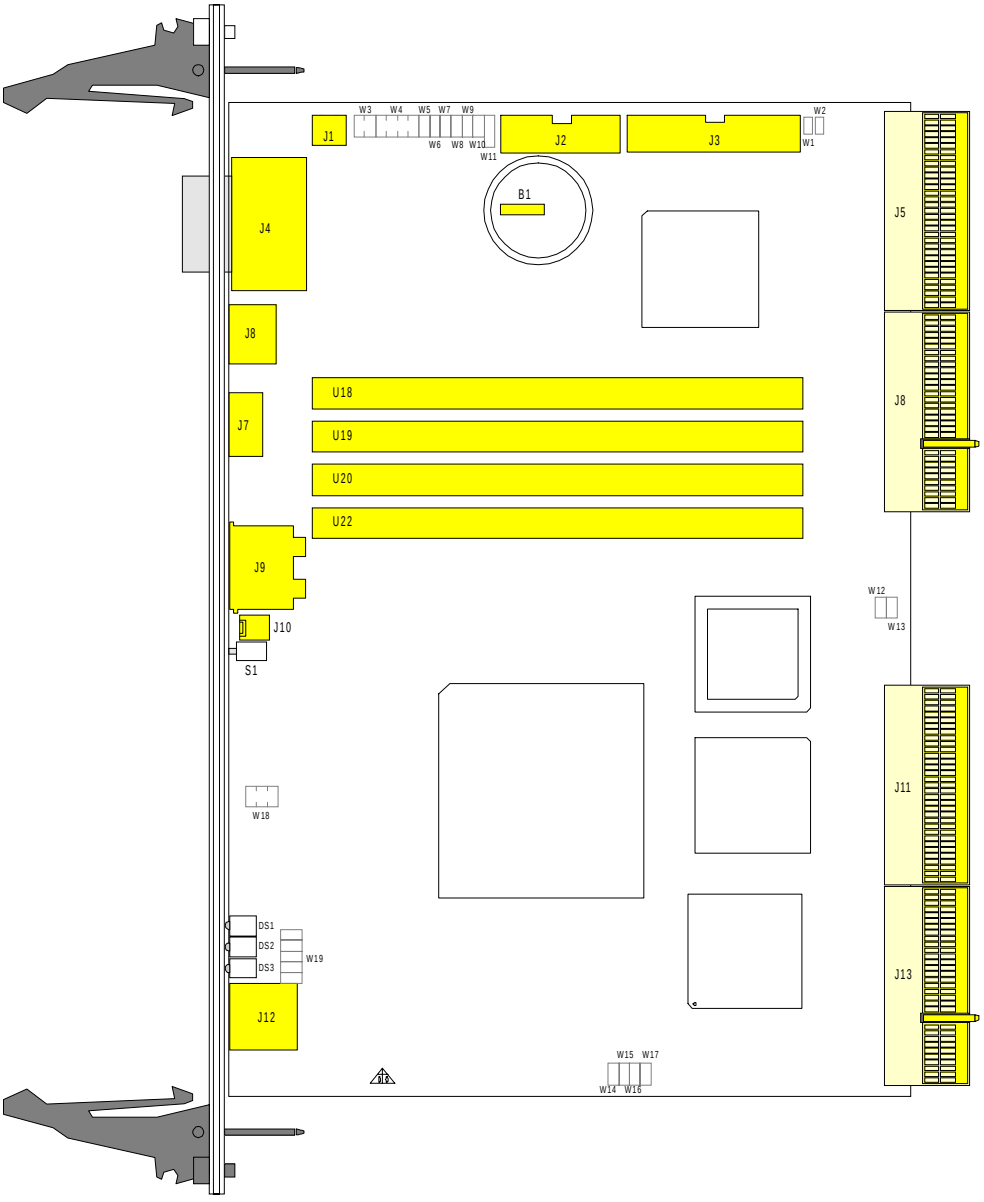
The 430HX allows the processor to sustain the highest possible bandwidth to the graphics frame buffer at all frequencies. To conform with "modular" oriented environment, the board does not provide video function. Video will be supported using a CompactPCI™ video module connected directly on the PCI bus (Order TEK-1002 from TEKNOR).

Ethernet subsystem is directly connected to the PCI bus. As PCI target, this configuration allows all accesses to the internal registers to be automatically mapped into free memory and I/O space upon initialization of the system. The Ethernet controller chip operates as a master and a slave on the PCI bus. As a master, it interacts with the system memory to access data for transmission or deposit received data. As a slave, some internal control structures are accessed by the CPU for read and write operations.

The Ethernet chip provides 3Kbyte FIFO for receive and 3Kbyte FIFO for transmit which prevent data overruns or underruns while waiting for access to the PCI bus. While the chip provides independent Receive and Command units, the TEK-CPCI-1000 can process communication commands and receive incoming frame simultaneously without real-time CPU intervention.

The TEK-CPCI-1000 also provides a PCI-to-ISA bridge (PIIX3) along with other features such as fast IDE interface, and USB.

2.1 CONNECTOR LOCATION



2.2 ONBOARD CONNECTORS

Two connectors are used to drive various signals to the front plate:

- **Parallel Port (J3)** - A flat cable is required to output the parallel signals from the onboard connector to a standard 25-pin DSUB connector mounted on the front plate. The Parallel Port is compliant with Standard, EPP and ECP modes.

- **Multi-function connector (J2)** - Speaker, keyboard inhibit, download, reset, and hard disk activity functions are available through the J2 connector.

  Features are described as follows:

Speaker	An 8ohm speaker can be directly connected. The power stage is integrated onboard.
Keyboard inhibit	Keyboard inhibit function is used to enable or disable the keyboard.
Download	Download function is used to transfer information from a remote computer to the Flash disk through a serial link.
Reset	A normally open push button can be used to reset the board. Reset interface is open drain, thus external logic is not required.
Hard disk activity	LED can be used to indicate read and write operations on the hard disk.

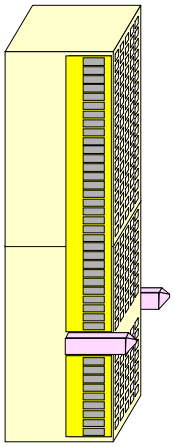
- **System Memory** - The TEK-CPCI-1000 provides four 72-pin vertical SIMM sockets to support from 8MB to 512MB of DRAM system memory. The memory is divided into two banks referred as Bank 0 and Bank 1.

  Each bank can be populated separately, but must be populated with the same memory capacity.

2.3 REAR-PANEL CONNECTORS

Rear panel connectors consist of two 2mm Hard Metric connectors. The lower one is dedicated to the PCI signals while the upper one is reserved to I/O signals.

2.3.1 I/O connector (J5/J8): CPCI P4/P5



Speaker signal - The speaker signal is also available on the onboard multi-function connector (J2).

Enhanced IDE interface - Accelerates PIO data transfers and provides an interface for both Primary/Secondary and Master/Slave IDE devices (HD, CD-ROM).

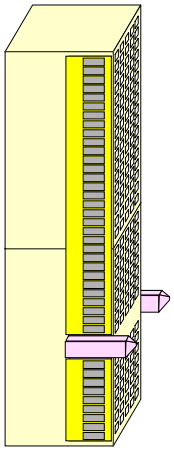
ISA I/O - Fully ISA bus compatible interface.

USB - The onboard USB controller supports up to two USB ports. One USB port is available through this connector, a second one is available on the front plate.

Floppy Disk and Keyboard Signals.

PS/2 Mouse. When the mouse interrupt function is enabled, the mouse interrupt is provided through IRQ12 to the CPU. A PS/2 mouse connector is also available on the front plate.

2.3.2 PCI connector (J11/J13):



Hard Metric Connector - 2mm pitch

PCI Bus – compliant with PICMG 2.0 specification

Bus Performance - up to 132MB/sec

Hot swap - capabilities for peripheral connections

Up to seven loads on the PCI segment

2.3.3 CompactPCI Connectors – Logical Identification

According to the PICMG 2.0 R2.1 specification, CompactPCI connectors are also logically referred as:

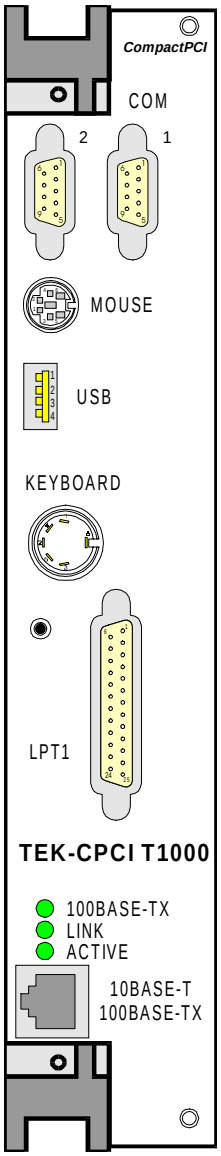
P1	32-bit PCI signals:	physically J13 on the board
P2	64-bit PCI signal extension:	physically J11 on the board

I/O application signals are defined by TEKNOR through:

P4	IDE and I/O signals	physically J8 on the board
P5	ISA signals	physically J5 on the board

2.4 FRONT PLATE CONNECTORS

The front plate supports various connectors, functions and LEDs:



COM1/2 J4 - RS-232 standard support on COM1 and COM2.

COM2 may also be set as RS-422 or RS-485.

Both are standard 9-pin DSUB male connectors.

Mouse J8 - PS/2 mouse connector.

USB J7 - Universal Serial Bus port with differential data signals available on data pair. A second USB port is available on the rear-panel I/O connector.

Keyboard J9 - Standard 5-pin DIN connector.

Reset S1 - Recessed reset button.

LPT1 Parallel port. Supports Standard mode, EPP and ECP modes depending on the BIOS setup. Connector is DSUB 25-pin standard.

Ethernet J12 - Operates directly on the PCI bus.

10Base-T and 100Base-T compatible on RJ-45 connector.

Auto detection and switching for 10Mbps or 100Mbps depending on the network speed.

Full and half-duplex capabilities at 10Mbps and 100Mbps.

Active, Link and 100Base-T LEDs.

3. COMPATIBILITY WITH TEKNOR PRODUCTS

The TEK-CPCI-1000 CPU Single Board Computer is a member of the TEKNOR CompactPCI product family. The board is fully compliant with the PICMG 2.0 R2.1 CompactPCI specification for the PCI bus segment.

When building a basic environment around the TEK-CPCI-1000, the system may comprise the following devices:

- TEK-CPCI-1000 6U system board
- TEK-CPCI-1002 3U VGA module
- TEK-CPCI-1101 (or 1100) CompactPCI backplane
- 3U and 6U CompactPCI devices
- 6U form factor enclosure

A CompactPCI Development Platform is available from TEKNOR and is referred to as TEK-CPCI-1002.

4. UNPACKING

Follow these recommendations while unpacking:

1. After opening the box, save it and the packing material for possible future shipment.
2. Remove the board from its antistatic wrapping and place it on a grounded surface.
3. Inspect the board for damage. If there is any damage, or items are missing, notify TEKNOR immediately.

Contents

When unpacking you will find:

1. One TEK-CPCI-1000, Pentium/K6 Single Board Computer
2. One Technical Reference Manual.
3. A set of cables

5. SAFETY PRECAUTIONS

5.1 STATIC ELECTRICITY

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

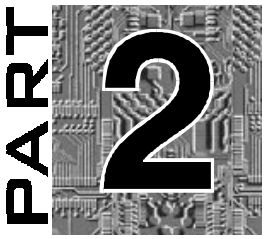
1. Keep the board in its antistatic package, until you are ready to install it.
2. Touch a grounded surface or wear a grounding wrist strap before removing the board from its package; this will discharge any static electricity that may have built up in your body.
3. Handle the board by the edges.

5.2 STORAGE ENVIRONMENT

Electronic boards are sensitive devices. Do not handle or store devices near strong electrostatic, electromagnetic, magnetic or radioactive fields.

5.3 POWER SUPPLY

Before any installation or setup, ensure that the board is unplugged from power sources or subsystems.



PRODUCT DESCRIPTION

6. CUSTOMIZING THE BOARD

7. CONNECTING DEVICES

8. INSTALLING VIDEO

9. CONFIGURING DMA & IRQ

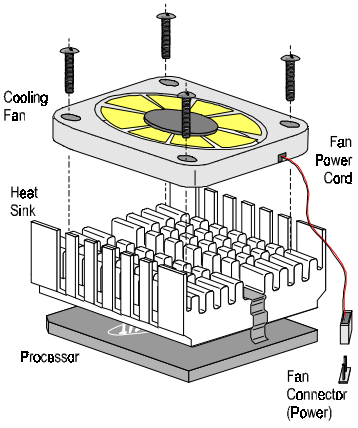
10. SETTING JUMPERS

6. CUSTOMIZING THE BOARD

6.1 PROCESSOR AND FAN

Your board will be installed with one of the available Pentium, Pentium MMX or K6 processors, and its adequate cooling fan. However, it may be necessary to reinstall or reconfigure your board with new devices.

6.1.1 Installing Microprocessor



Depending on the processor and the system in which the board is integrated, fan and/or heater may be required.

A +12V voltage is available through the J10 connector to supply the fan (The connector's pinout appears in Appendix-C).

Please refer to your processor specifications for more information.

When installing a processor, its type, core voltage, clock speed multiplier, and Core/Bus ratio value must be configured according to your CPU model.

Six jumpers are related to the processor:

W12-W13	Define the internal CPU clock speed multiplier.
W14-W15	Define the Core/Bus clock ratio.
W18	Selects the CPU type from Split-plane or Single-plane.
W19	Selects the core voltage (Vcore).

6.1.2 Processor Characteristics

Processor characteristics are summarized below:

	FCore	BCLK	PCLK	Ratio	Type	VCore
Intel Pentium 90	90	60	30	1.5	Single	3.34V
Intel Pentium 100	100	66	33	1.5	Single	3.34V
Intel Pentium 120	120	60	33	2.0	Single	3.34V
Intel Pentium 133	133	66	33	2.0	Single	3.34V
Intel Pentium 150	150	50	25	3.0	Single	3.34V
Intel Pentium 150	150	60	30	2.5	Single	3.34V
Intel Pentium 166	166	66	33	2.5	Single	3.34V
Intel Pentium 200	200	66	33	3.0	Single	3.34V
Intel Pentium 166-MMX	166	66	33	2.5	Split	2.84V
Intel Pentium 200-MMX	200	66	33	3.0	Split	2.84V
Intel Pentium 233-MMX	100	66	33	1.5	Split	2.84V
AMD K6-166	166	66	33	2.5	Split	2.94V
AMD K6-200	200	66	33	3.0	Split	2.94V
AMD K6-233	100	66	33	1.5	Split	3.24V

Careful attention should be taken when installing a processor. Faulty jumper settings may definitely damage your board.

	W12	W13	W15	W14	W18	W19				
						1-2	3-4	5-6	7-8	9-10
Intel Pentium 90	Off	On	Off	Off	1-3 / 2-4	On	Off	On	On	Off
Intel Pentium 100	On	On	Off	On	1-3 / 2-4	On	Off	On	On	Off
Intel Pentium 120	Off	On	Off	On	1-3 / 2-4	On	Off	On	On	Off
Intel Pentium 133	On	Off	Off	On	1-3 / 2-4	On	Off	On	On	Off
Intel Pentium 150	On	On	On	Off	1-3 / 2-4	On	Off	On	On	Off
Intel Pentium 150	Off	On	On	On	1-3 / 2-4	On	Off	On	On	Off
Intel Pentium 166	On	Off	On	On	1-3 / 2-4	On	Off	On	On	Off
Intel Pentium 200	On	Off	On	Off	1-3 / 2-4	On	Off	On	On	Off
Intel Pentium 166-MMX	On	Off	On	On	3-5 / 4-6	Off	Off	Off	On	Off
Intel Pentium 200-MMX	On	Off	On	Off	3-5 / 4-6	Off	Off	Off	On	Off
Intel Pentium 233-MMX	On	Off	Off	Off	3-5 / 4-6	Off	Off	Off	On	Off
AMD K6-166	On	Off	On	On	3-5 / 4-6	On	Off	Off	On	Off
AMD K6-200	On	Off	On	Off	3-5 / 4-6	On	Off	Off	On	Off
AMD K6-233	On	Off	Off	Off	3-5 / 4-6	Off	Off	On	On	Off

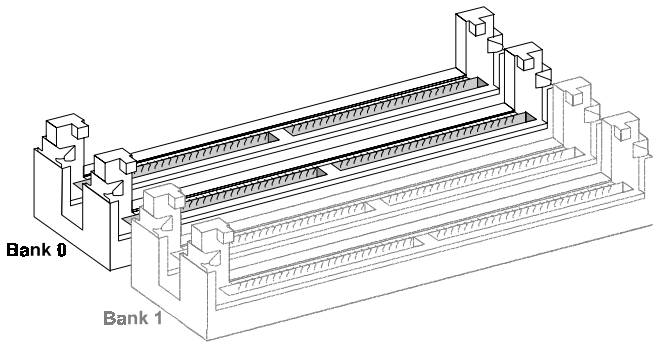
For complete details on jumper setting description, please refer to Section 9.

6.2 INSTALLING MEMORY

6.2.1 Installing DRAM

The TEK-CPCI-1000 supports FPM and EDO system memory. Memory type is single-sided or double-sided vertical SIMMs, 5V, 70ns/60ns, and can be configured from 8MB up to 512MB, using 32-bit or 36-bit modules.

The memory sockets consist of four 72-pin vertical SIMM (Single In-line Memory Module) sockets divided into two banks labeled: Bank 0 (U20 and U22) and Bank 1 (U18 and U19).



At least 8 MB of system memory (2 SIMMs or 4) must be installed on the board for proper operation. Each vertical 72-pin SIMM sockets supports the following modules:

2M x 32-bit / 36-bit = 8MB module	16M x 32-bit / 36-bit = 64MB module
4M x 32-bit / 36-bit = 16MB module	32M x 32-bit / 36-bit = 128MB module
8M x 32-bit / 36-bit = 32MB module	

NOTE

The memory banks can be populated separately or jointly. Each bank must be populated with the same SIMM capacity, however, the capacity used in one bank may be of a different capacity from the other.

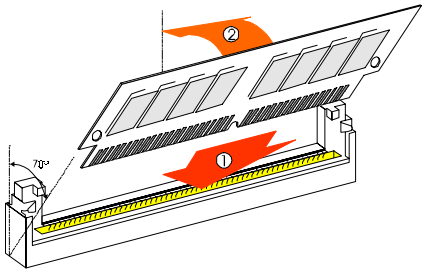
60ns maximum access time EDO DRAM devices are recommended.

The following table shows examples of recommended DRAM devices supported by the board. Many other models are also available and function equally well. Users are encouraged to check with their local distributors for comparable substitutes.

DIMM	VENDOR	PART NUMBER
2M*72 (ED0) - 16MB modules (SPD EPROM, ECC)	ROCKY MOUNTAIN RAM	2x72CEQ
4M*72 (SDRAM) - 32MB modules	ROCKY MOUNTAIN RAM	4x72CQ2x8S4E
4M*72 (ED0) - 32MB modules (SPD EPROM, ECC)	ROCKY MOUNTAIN RAM	4x72CEQ
8M*72 (ED0) - 64MB modules (SPD EPROM, ECC)	ROCKY MOUNTAIN RAM	8x72CEQ
16M*72 (SDRAM) – 128MB modules	ROCKY MOUNTAIN RAM	16x72CQ8x8S4E
16M*72 (ED0) - 128MB modules (SPD EPROM, ECC)	ROCKY MOUNTAIN RAM	16x72CEQ

6.2.2 SIMM Installation

To install the SIMMs in the sockets, proceed as follows:



1. With the board flat on the table, turn it so that the front plate is on the left.
2. Hold the module with the notch on the bottom right facing you, and insert the fingers into the socket at a 70° angle from the board. Always start inserting the module in the socket nearest the top edge of the board
3. 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.
4. Work your way by inserting the other modules, one by one, towards the lower edge of the board.

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

The following table describes which SIMM configurations may be implemented on the board, using 72-pin vertical SIMMs:

SYSTEM MEMORY	U18	U19	U20	U22
	BANK 1		BANK 0	
8MB	4MB (1Mx36)	4MB (1Mx36)	--	--
8MB	--	--	4MB (1Mx36)	4MB (1Mx36)
16MB	4MB (1Mx36)	4MB (1Mx36)	4MB (1Mx36)	4MB (1Mx36)
16MB	8MB (2Mx36)	8MB (2Mx36)	--	--
16MB	--	--	8MB (2Mx36)	8MB (2Mx36)
24MB	8MB (2Mx36)	8MB (2Mx36)	4MB (1Mx36)	4MB (1Mx36)
24MB	4MB (1Mx36)	4MB (1Mx36)	8MB (2Mx36)	8MB (2Mx36)
32MB	8MB (2Mx36)	8MB (2Mx36)	8MB (2Mx36)	8MB (2Mx36)
32MB	16MB (4Mx36)	16MB (4Mx36)	--	--
32MB	--	--	16MB (4Mx36)	16MB (4Mx36)
40MB	16MB (4Mx36)	16MB (4Mx36)	4MB (1Mx36)	4MB (1Mx36)
40MB	4MB (1Mx36)	4MB (1Mx36)	16MB (4Mx36)	16MB (4Mx36)
48MB	16MB (4Mx36)	16MB (4Mx36)	8MB (2Mx36)	8MB (2Mx36)
48MB	8MB (2Mx36)	8MB (2Mx36)	16MB (4Mx36)	16MB (4Mx36)
64MB	16MB (4Mx36)	16MB (4Mx36)	16MB (4Mx36)	16MB (4Mx36)
64MB	32MB (8Mx36)	32MB (8Mx36)	--	--
64MB	--	--	32MB (8Mx36)	32MB (8Mx36)
72MB	32MB (8Mx36)	32MB (8Mx36)	4MB (1Mx36)	4MB (1Mx36)
72MB	4MB (1Mx36)	4MB (1Mx36)	32MB (8Mx36)	32MB (8Mx36)
80MB	32MB (8Mx36)	32MB (8Mx36)	8MB (2Mx36)	8MB (2Mx36)
80MB	8MB (2Mx36)	8MB (2Mx36)	32MB (8Mx36)	32MB (8Mx36)
96MB	32MB (8Mx36)	32MB (8Mx36)	16MB (4Mx36)	16MB (4Mx36)
96MB	16MB (4Mx36)	16MB (4Mx36)	32MB (8Mx36)	32MB (8Mx36)
128MB	32MB (8Mx36)	32MB (8Mx36)	32MB (8Mx36)	32MB (8Mx36)
128MB	64MB (16Mx36)	64MB (16Mx36)	--	--
128MB	--	--	64MB (16Mx36)	64MB (16Mx36)
136MB	64MB (16Mx36)	64MB (16Mx36)	4MB (1Mx36)	4MB (1Mx36)
136MB	4MB (1Mx36)	4MB (1Mx36)	64MB (16Mx36)	64MB (16Mx36)
144MB	64MB (16Mx36)	64MB (16Mx36)	8MB (2Mx36)	8MB (2Mx36)
144MB	8MB (2Mx36)	8MB (2Mx36)	64MB (16Mx36)	64MB (16Mx36)
160MB	64MB (16Mx36)	64MB (16Mx36)	16MB (4Mx36)	16MB (4Mx36)
160MB	16MB (4Mx36)	16MB (4Mx36)	64MB (16Mx36)	64MB (16Mx36)
192MB	64MB (16Mx36)	64MB (16Mx36)	32MB (8Mx36)	32MB (8Mx36)
192MB	32MB (8Mx36)	32MB (8Mx36)	64MB (16Mx36)	64MB (16Mx36)
256MB	64MB (16Mx36)	64MB (16Mx36)	64MB (16Mx36)	64MB (16Mx36)
256MB	128MB (16Mx36)	128MB (16Mx36)	--	--
256MB	--	--	128MB (16Mx36)	128MB (16Mx36)
512MB	128MB (16Mx36)	128MB (16Mx36)	128MB (16Mx36)	128MB (16Mx36)

36-bit modules are shown, however 32-bit modules are supported.

6.3 ENABLING MEMORY CACHE

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 or L1).

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 or L2). The second level cache is unified, which means that both CPU data and instructions are stored in the cache.

System cache must be enabled and configured using the Award BIOS setup program (details in Section 12 - Software Setup).

6.4 CONFIGURING THE BOARD

Nineteen jumpers are provided to setup the board. They are listed below:

Jumper	Description
W1, W2	**Hard drive installation setup** - Use these jumpers to install hard drives on the EIDE bus or the PCI bus
W3	**I/O Base Address** - Selects the I/O base address from: 190h, 290h or 390h.
W4	**Extended BIOS mode** - Use this jumper to setup the following features: 1. *download mode* - to download serially information from a remote computer to the Flash EPROM 2. *VT100 mode* - to communicate with the board using a VT100 or ANSI terminal 3. *TEKNOR Extension* - when enabled, authorizes TEKNOR's features such as VT100, boot from Flash, save CMOS in flash, SRAM devices..., (for more information see Software Setup Section) 4. *Ethernet* - enables or disable the Ethernet interface.
W5	**Boot Mode selection** - When set to emergency, it offers the ability to upgrade the onboard BIOS from an emergency disk.
W6-W7	**RS-232/RS-485 termination resistor** - connect termination resistor for RS-232 or RS-485 operation mode on Serial Port 2.
W8	**Battery** - Enables or disables the battery on the board.
W9	**Power Fail detection** - when installed, enables Power Fail Detection.
W10	**Watchdog** - enables or disables the watchdog.
W11	**Power Fail source** - when installed, enables the Battery voltage or an external user voltage to be monitored by the power Fail Detection controller.
W12-W13	Clock Speed Multiplier - Selects the internal CPU Clock Speed Multiplier.
W14-W15	**CPU Core/Bus Ratio** - Selects the ration between the CPU Core Clock and the CPU Bus Clock.
W16	**External Cache size** - not used while the cache is auto-detected by the BIOS.
W17	**DRAM refresh rate** - selects from 60 or 66Mhz rate.
W18	**CPU type** - selects the CPU type (Single -Plane or Split-Plane).
W19	**VCORE** - selects the CPU core voltage.

Please refer to the Section 10 – *Setting Jumpers* to configure each jumper.

6.5 BIOS BOOT OPTIONS

By default, the board boots with the BIOS contained in the Boot Block Flash. The Boot Block Flash consists of a flash memory device with verification and protection features. It merges the entire BIOS code and a protected emergency code.

The Boot Block Flash appears as the easiest way to upgrade the board's BIOS as its version changes, or in case of a programming error or a data corruption.

The board provides an emergency boot jumper (W5) in the case of a BIOS corruption: when it is enabled (jumper W5 shorted), an emergency procedure is executed to update the BIOS code from a DOS file located on an emergency disk.

NOTE

A BIOS corruption is one of the symptoms of a non-functional board: it may be caused by an electrical shutdown that occurs before a BIOS update operation is completed.

The complete procedure to execute an emergency boot is described in Section F.2 (Emergency Procedure).

6.6 INSTALLING SUPERVISOR UTILITIES

6.6.1 Supervisor I/O Registers

Supervisor I/O registers are provided to configure and control special features of the board such as: watchdog, Flash, RS-422/RS-485 mode, and power fail output. These registers are two 8-bit registers locatable at three different I/O addresses, 190h/193h, 290h/293h or 390h/393h, using the W3 jumper.

Each register is bit read and write accessible, however, some are reserved for internal requirements. They are described as follows:

Register #1

Bit	Default	Function	WRITE Operation:	READ Operation:
0	0	Enable Watchdog	1=Enable / 0= Disable*	Same
1	1	Watchdog pulse	write 1-0 alternately to refresh	Same
2	0	Flash programming	1= Enable / 0= Disable (+12V)	Same
3	0	RS-485 direction	1= Read only / 0= Write only	Power Detect. or Batt. Low output
4	0	Reserved		W4 (7-8) Status (Ethernet)
5	0	Reserved		W4 (5-6) Status (TEKNOR BIOS)
6	1	Reserved		W4 (3-4) Status (VT100 mode)
7	0	Reserved		W4 (1-2) Status (Serial download)

Register #2

Bit	Default	WRITE Operation:	READ Operation:
0	0/1	Reserved * R/W	Reserved
1	0/1	Reserved * R/W	Reserved
2	1	Data output for serial number device	Same
3	1	Enable Ethernet (1=Enable ; 0=Disable)	Ethernet Status
4	0	Reserved	Not Used
5	0	Reserved	I/O base address W3 (1-2)
6	0/1	Reserved	I/O base address W3 (3-4)
7	0	Reserved* R/W	Emergency jumper (W5) status

* Read and mask before changing bits

CAUTIONS:

1. **Not all bits are R/W. Therefore, be certain to keep a mirror image of the register when programming it.**
2. **All bits are 0 after a hardware RESET or power up condition.**

As the supervisor I/O registers provide features associated to the TEKNOR Extension, the TEKNOR Extension mode must be enabled by setting the W4 jumper that controls the extended BIOS modes of the board (refer to Section 10 - *Setting Jumpers*).

6.6.2 Power Fail Monitoring

A power failure condition may be detected if a low backup battery condition occurs, or a +5V monitored power supply (user defined) falls below 4.75V.

When power failure is enabled, a power failure condition is detected if either of the two above conditions occurs. To enable power fail monitoring, the W9 jumper cap must be installed.

To select wheter to monitor the low battery or the user defined power supply voltage, use the W11 jumper.

Jumper location and configuration are described in Section 10 - *Setting Jumpers*.

6.6.3 Watchdog

The watchdog is used to monitor the CPU inactivity. After a specified duration of inactivity, the CPU will be reset.

To generate a RESET when the watchdog times out, use the W10 jumper.

▪ Working with the Watchdog

The watchdog must be enabled and refreshed by software. To enable the watchdog by software, first write "1" in the bit 0 of the I/O Register #1 (see Section 6.6.1 - *Supervisor I/O Registers*).

When enabled, the watchdog must be refreshed by the processor by writing alternatively "0" and "1" to the bit 1 of the I/O Register #1, once every 1.6 seconds to verify proper software execution. 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.

Following a reset, the watchdog is always disabled.



CAUTION

The user program must first configure the I/O Register #1 (set at base the address 190h, 290h or 390h, according to the W3 jumper setting), and must also include a refresh routine. Be certain to keep a mirror image of this register 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.

6.7 INSTALLING THE BOARD INTO A BAY

The TEK-CPCI-1000 is a mechanical Eurocard form factor board and takes advantages of the IEEE1101.10 specifications that ensure mechanical interchangeability of plug-in elements in sub-racks.

Due to the high-density pinout of the Hard Metric connector, some precautions must be taken when connecting or disconnecting a board to/from a backplane:

1. Rail guides must be installed on the enclosure to slide the board to the backplane.
2. The board insertion must not be forced if there is any mechanical resistance. *Compact*PCI specifies a keying mechanism that prevents a board from being inserted into an incompatible backplane slot. If you are having problems inserting the board, make sure the keys installed on the board and the backplane are of the same color.
3. Screw the front plate to the enclosure to firmly attach the board to its enclosure.
4. Use the extractor handles to disconnect the board and extract it from its enclosure.

6.7.1 Connector Keying

The CompactPCI connector supports guide lugs located on the board (system board and peripherals) and the backplane connectors to ensure a correct polarized mating. A proper mating is enhanced by the use of coding keys for 3.3V and 5V operation.

Coding keys prevent inadvertent installation of a 5V board in a 3.3V slot. The TEK-CPCI-1000 provides 3.3V signals. The PCI bus does not require to be keyed. Backplane connectors must always be keyed according to the signaling level.

Coding Key Colors are defined as follows:

Signaling Voltage	Key Color
3.3V	Cadmium Yellow
5V	Brilliant Blue
Universal board (5V and 3.3V)	none

6.7.2 Bus Mastering

The TEK-CPCI-1000 provides four pairs of REQ/GNT arbitration signals. This means the board is capable of interfacing up to four peripheral modules with PCI Bus Master capabilities.

When connecting the board to a backplane, be aware that one REQ/GNT pair may be already assigned to the onboard Ethernet feature.

CAUTION

With the onboard Ethernet enabled only three PCI Bus Master devices are supported.

6.7.3 Connection

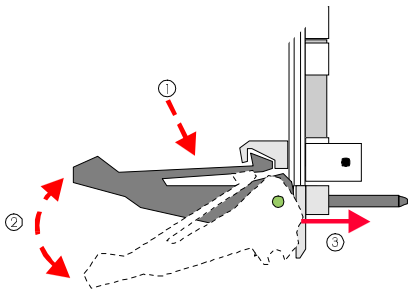
To install the TEK-CPCI-1000 board into a bay, proceed as follows:

1. Power off your CompactPCI system
2. Choose the 6U system slot
3. Remove the front plate of the slot where you intend to insert the TEK-CPCI-1000
4. Ensure the module is properly aligned with the guide-rails and slide it gently until it touches the backplane connector

> **WARNING**
>
> **1. Some mechanical parts of the guide-rail are fragile (shield contacts and clips). Do not use force to insert and connect a CompactPCI module.**
>
> **2. If there is any mechanical resistance while you insert a module, first ensure there is no mechanical obstacle and check for the alignment of all parts.**

5. To engage the board's connectors into the backplane connector, simultaneously press on the front plate and lift up the handle until the retaining clip hooks to the chassis.
6. Fasten the module using the fellow-plate fixing screw to secure the module to the system chassis.

To remove the module from the chassis, proceed as follows:



Remove the fixing screws of the front plate.

Press the handle (see ①) to disengage the retaining clip.

Press the handle to act as a lever (see ②) to disengage the CompactPCI connector from the backplane connector.

Pull on the handle and gently remove the board (see ③).

7. CONNECTING DEVICES

7.1 SUPPLYING POWER ON THE TEK-CPCI-1000

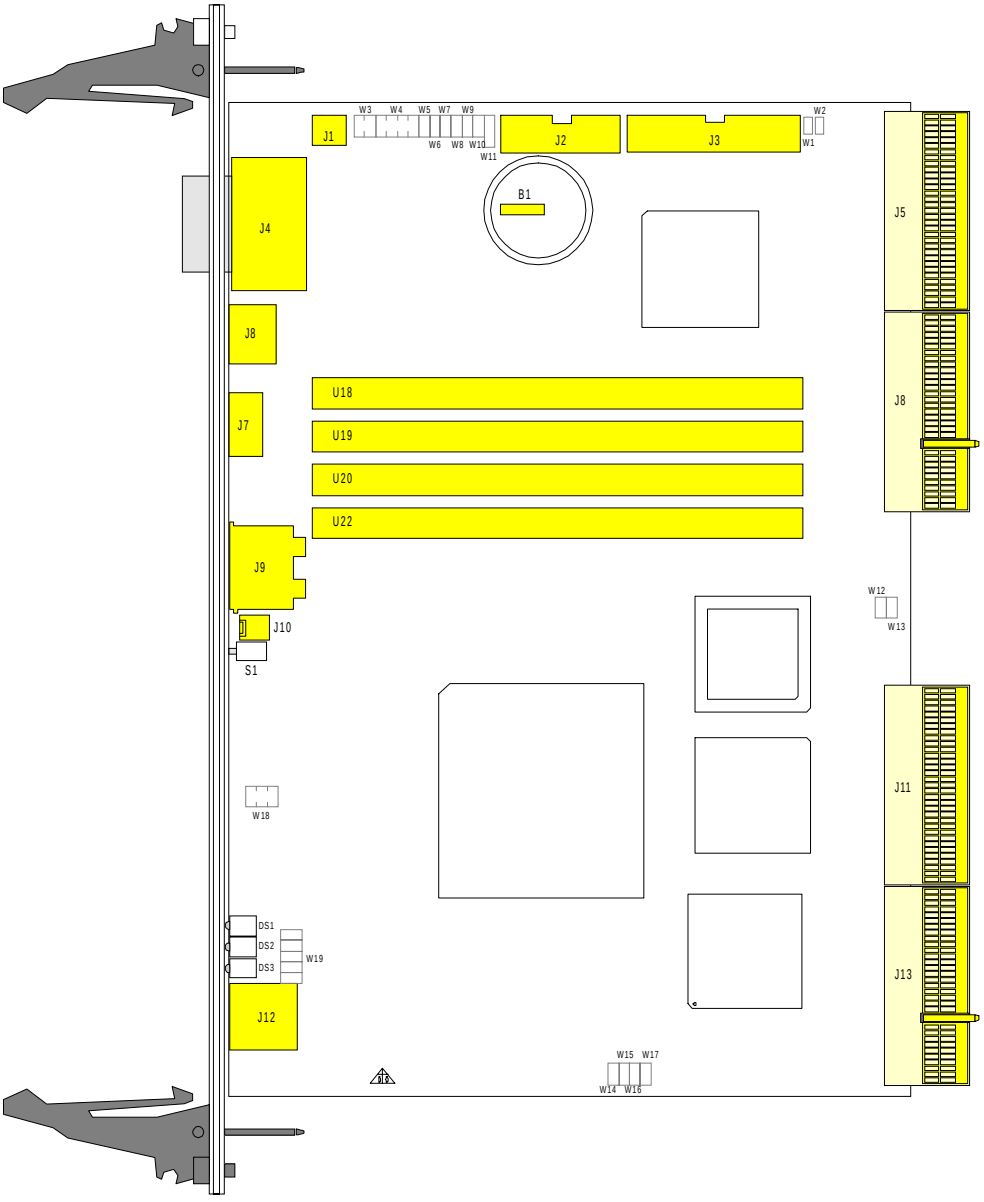
All voltages required to supply the TEK-CPCI-1000 board must be provided by the backplane, through the rear-panel PCI connector (J11, J13).

The pin assignation for the different voltages appears as follows:

+5V (VCC)	A1, A25, B2, B24, D3, D23, F1, F25
+12V	D1
GND	B4, B6, B8, B10, B16, B18, B20, B22, B26, B28, B30, B32, B34, B36, B38, B40, D5, D7, D9, D11, D15, D17, D19, D29, D31, D33, D35, D37, D39, D41, B42

For more information please refer to Section D – *Connector Pinouts*.

7.2 CONNECTOR LOCATION



7.3 SERIAL PORTS CONNECTORS (J4)

Two serial ports are provided on the board. They are 16C550 compatible and support 16-byte FIFO buffers. Serial Port 1 is buffered for RS-232 operations, while Serial Port 2 may be set for RS-232 or RS-422/RS-485.

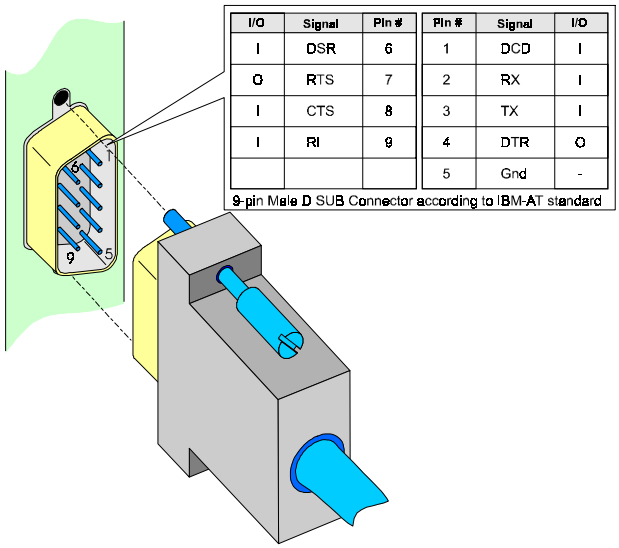
The J4 connector is a dual Serial Port connector that provides two communication ports configured as COM1 and COM2. Both act as DTE.

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

7.3.1 Using COM1

The COM1 port is buffered directly on the board for RS-232 operations. COM1 is 100% compatible with the IBM-AT serial port, it is provided through a 9-pin female D-SUB connector mounted on the front plate of the TEK-CPCI-1000.

COM1 signals are output as follows:



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 D SUB Connector according to IBM-AT standard

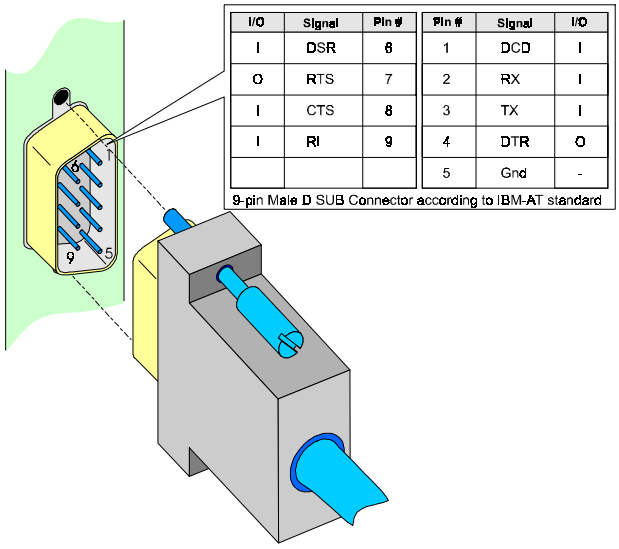
7.3.2 Using COM2

The Serial Port COM2 supports RS-232, RS-422 and RS-485 operation modes. COM2 is 100% compatible with the IBM-AT serial port in RS-232 mode. Signals are provided through a 9-pin female D-SUB connector mounted on the front plate of the TEK-CPCI-1000.

To configure the COM2 communication mode use the VIP-UP setup program (See Section 12.2 - *VIP-UP Program*).

7.3.2.1 COM2 in RS-232 mode

When configured for RS-232 operations, COM2 provides the same signal pin assignation than COM1:



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	-

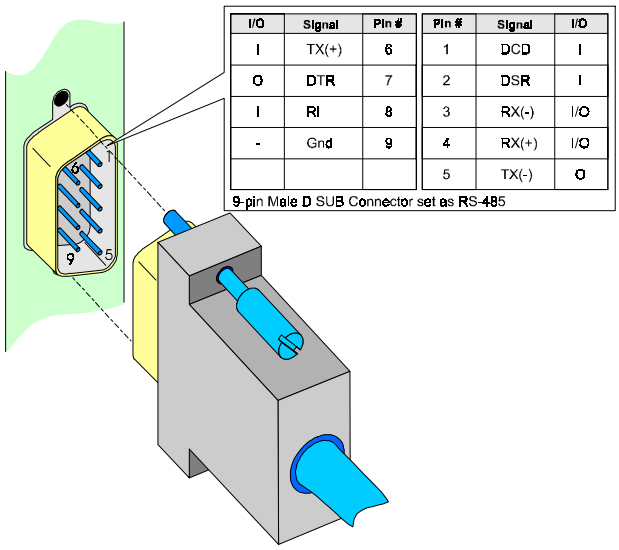
9-pin Male D SUB Connector according to IBM-AT standard

7.3.2.2 COM2 in RS-422/RS-485 mode

RS-422 and RS-485 modes allow communication using differential signals through one pair of wires (RS-485) or two (RS-422). For a better noise rejection, the use of twisted pair cable is highly recommended.

Communicating in differential mode offers some advantages such as increased speed over longer distances or improved reliability over similar RS-232 setups. RS-422 or RS-485 operation mode may be selected by software, using the VIP-UP setup program.

When set for RS-422/RS-485 operations the communication port pinout appears as follows:



I/O	Signal	Pin #
I	TX(+)	6
O	DTR	7
I	RI	8
-	Gnd	9

Pin #	Signal	I/O
1	DCD	I
2	DSR	I
3	RX(-)	I/O
4	RX(+)	I/O
5	TX(-)	O

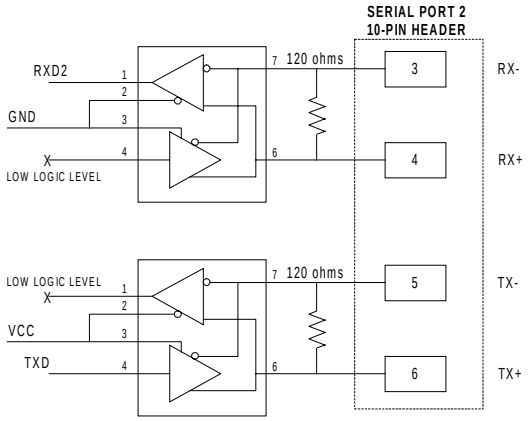
9-pin Male D SUB Connector set as RS-485

In RS-485 mode only the RX- and RX+ signals are used to interconnect the transmission lines. To change the direction of the buffer in RS-485 mode, use the RTS line.

- **RS-422 Protocol:**

The RS-422 protocol (Full Duplex) uses both RX and TX lines during a communication session. Upon a power-up or reset, the Serial Port 2 interface circuits are automatically configured for full duplex operation: pins 3 and 4 of Serial Port 2 act as receiver lines while pins 5 and 6 act as transmitter lines.

Internal circuit may be represented as follows:



There are no user software restrictions except that software must not attempt to use the handshake line because they are not connected. However, handshaking by software only (XON-XOFF) may be used.

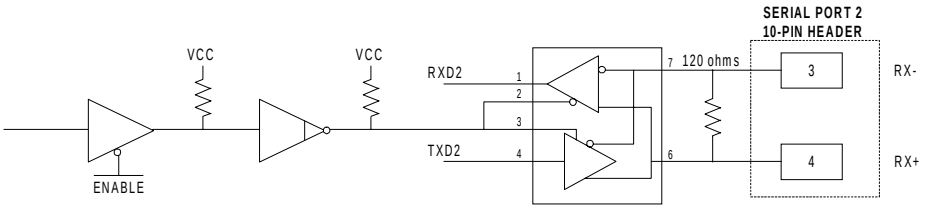
CAUTION

When working in RS-422 protocol, W6 and W7 jumper caps must be installed to connect the 120 ohms termination resistors (See Section 10 - *Jumper Settings*).

▪ RS-485 Protocol:

The RS-485 protocol (Half Duplex) also uses differential signals during a communication session. It differs from the RS-422 mode as it offers the ability to transmit and receive over the same pair of wires, and allows sharing of the communication line by multiple stations. This configuration (also known as Party Line) allows only one system to take the control of the communication line at the time.

The electrical circuit is described below:



In RS-485 mode, the RX lines (pins 3 and 4) are used as the transceiver lines, and the RTS signal is used to control the direction of the RS-485 buffer. Upon power-up or reset, the transceiver is by default in receiver mode to prevent unwanted perturbation on the line.

Party line operation mode requires termination resistors to be installed at both ends of the network.

CAUTION

When installing the TEK-CPCI-1000 at one end of the network, W6 and W7 jumper caps must be installed to connect the 120 ohms termination resistors (See Section 10 - *Jumper Settings*).

7.3.3 Software Configuration

By default, serial ports are configured for RS-232 operations. Each port must be designated by a logical COM port and a matching address using the AWARD BIOS setup program. Available features are: Disabled, Auto, COM1/3F8h, and COM2/2F8h

To select the operation mode of COM2 (RS-232, RS-422, or RS-485), use the VIP-UP setup program (See Section 12.2: *VIP-UP Program*).

The bit 3 (RTS) of the Supervisor I/O Register #1 is reserved to control the transmission operations of Serial Port 2 when set as RS-485. Writing "1" to bit 3 of the Supervisor I/O Register #1 (at 190h, 290h or 390h base address, depending on W3 jumper) 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" to avoid unwanted perturbation on the line.

7.4 PS/2 MOUSE CONNECTOR (J8)

The TEK-CPCI-1000 supports PS/2 standard mouse directly through the J8 connector located on the front plate. Mouse signals are also available through the CPCI backplane connector.

Important: when connecting a PS/2, make sure the adequate mouse driver (provided by its manufacturer) is installed.

7.5 KEYBOARD CONNECTOR (J9)

A standard AT keyboard may be connected directly through the J9 standard 5-pin DIN male connector. Keyboard signals are also available through the I/O CPCI backplane connector.

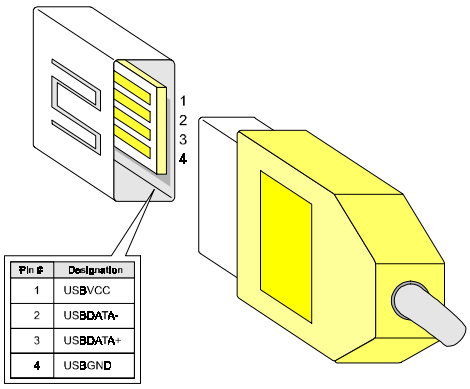
7.6 USB CONNECTOR (J7)

USB is a fast bi-directional, isochronous/asynchronous, Plug and Play capable communication bus that allows up to 127 logical connections to run on a computer.

The TEK-CPCI-1000 board fully supports the standard universal host controller interface (UHCI) and uses standard software drivers that are UHCI-compatible.

This bus has been developed to bring plug and play configuration of computer peripherals outside the box, eliminating the need to install cards into dedicated computer slots and reconfigure them. USB allows peripherals to be automatically attached, configured and detached, without reboot or setup run.

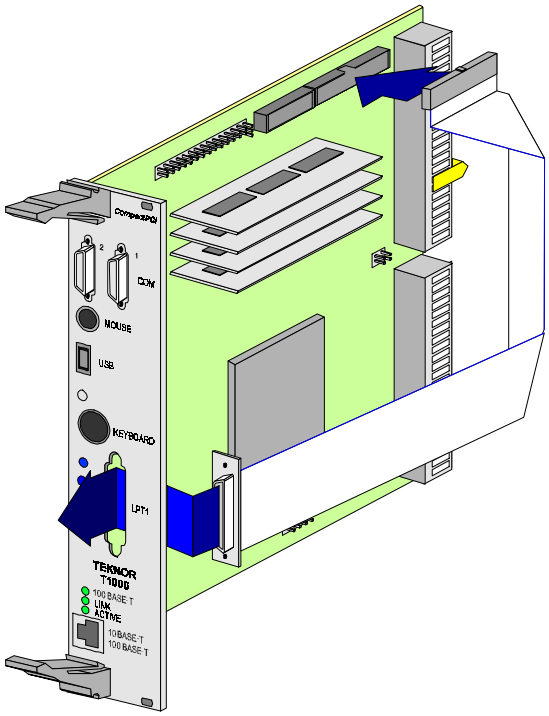
USB devices connect directly through the J7 connector located on the front plate.



USB signals are also available through the CPCI backplane connector.

7.7 PARALLEL PORT CONNECTOR (J3)

The onboard Parallel Port connector is a 26-pin male header located at the top right side of the board. A 26 pin to pin flat cable is required to output the signals from the board to the front plate.



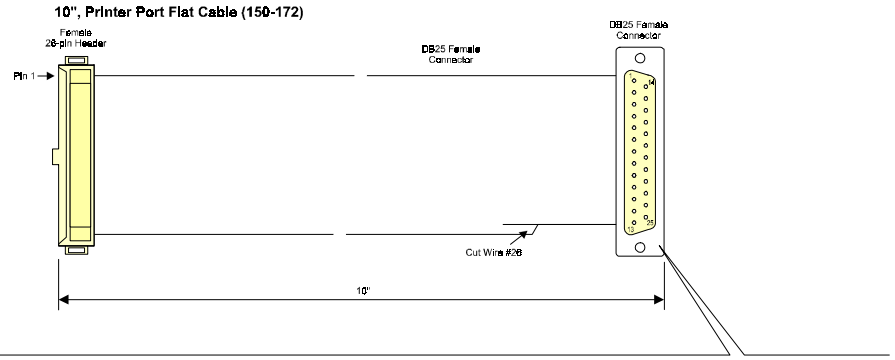
The following list includes approved vendors for the J3 connector's mating parts:

Amp 746285-6 [optional strain relief: 499252-3],
Robinson Nugent IDS-C26PK-TG,
Thomas & Betts 622-2630 [optional strain relief: 622-2641].
(Polarized IDC female socket connector).

7.7.1 Parallel Port Modes

The parallel port is bi-directional. It is compatible with PC/XT, AT, PS/2, EPP and ECP modes.

The differences between the three modes appear in the pin assignation:



Parallel Port Pinout According to Standard Mode

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

* Active low signal

Parallel Port Pinout According to EPP Mode

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

* Active low signal

Parallel Port Pinout According to ECP Mode

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

* Active low signal

[1] Compatible Mode
[2] High Speed Mode

NOTE

To operate in EPP or ECP mode, ensure the peripheral is designed to operate in this mode and the BIOS setup is configured to support it.

7.7.2 Standard Mode

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

7.7.3 EPP Mode

The EPP (Enhanced Parallel Port) mode consists of a hardware independent method of accessing a parallel port configured as EPP. It provides support for single I/O cycle as well as the high performance block I/O transfers. The EPP mode always uses the most optimum method for I/O transfers. For example, if the hardware supports it, EPP mode will perform 32-bit I/O block transfers.

EPP mode assumes that the parallel port can be used to connect more than one peripheral device using Multiplexor or Daisy Chain configurations.

Multiplexor is an external device that permits up to eight parallel port devices to share a single parallel port.

A Daisy Chain device has two port: input and output. The input port is connected either to the host parallel port or the daisy chain device in front of it. The output is used to connect the next peripheral device to the daisy chain. The last device, however, can be one without daisy chain support.

7.7.4 ECP Mode

ECP (Extended Capabilities Port) works the same as EPP mode, but it will take precedence over the EPP mode when addressing multiple logical devices in a single physical product. 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 acknowledgment from the peripheral.

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.

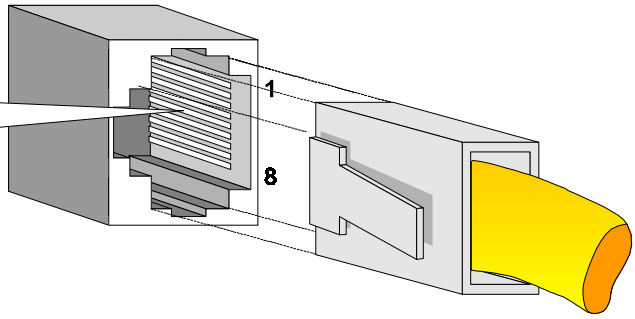
7.8 10BASE-T CONNECTOR (J12)

The TEK-CPCI-1000 supports both 10Base-T and 100Base-T on the same RJ-45 front plate connector. 10Mbps and 100Mbps network speed is automatically detected and switched.

The 10Base-T interface uses UTP (Unshielded Twisted Pair) cables, category 5, 4 or 3 (5 is better), while the 100Base-T cable must comply with the IEEE 802.3 100Base-T standard for 2 pairs Category 5 UTP cable.

Pin #	Signal	I/O
1	TX+	Transmit Data +
2	TX-	Transmit Data -
3	RX+	Receive Data +
4	N.C.	Not Connected
5	N.C.	Not Connected
6	RX-	Receive Data -
7	N.C.	Not Connected
8	N.C.	Not Connected

Ethernet 10Base-T and 100Base-T



This connection type allows links up to 100m over both shielded twisted pair and data grade (Cat. 5) unshielded twisted pair or equivalent.

The Ethernet controller resides on the PCI bus and is therefore Plug and Play by default. No manual configuration is required. A diskette entitled “Network Drivers for IN82557” is included with the Ethernet option. This diskette contains several operating system network drivers.

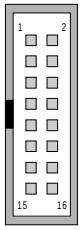
To install the drivers, run the “setup.exe” program.

For other operating system drivers and installation instructions, contact TEKNOR’s Technical Support department.

7.9 MULTI-FUNCTION CONNECTOR (J2)

The connector J2 provides all the necessary signals to output keyboard, speaker, reset, and keylock interface signals on a front plate, an interconnection module or a backplane.

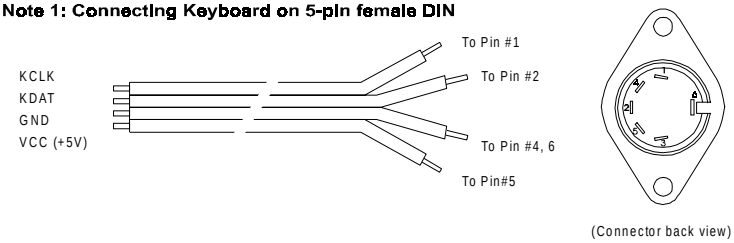
It is described as follows:



	Signals Name	Description
16	VCC (+5V)	Hard Disk Activity LED No external limiting resistor is required.
15	ACT1*	
6	VCC (+5V)	Power On LED No external limiting resistor is required.
4	GND	
9	KBINH	Keyboard Inhibition Short to disable or lock the keyboard
10	GND	
13	PBRES*	Computer Board Reset Short to reset the computer board
14	GND	
7	SPKR	Computer Board Speaker (Use 8 ohm speaker)
8	VCC (+5V)	
1	KCLK	Keyboard - See Note 1 -
3	KDAT	
2	GND	
5	VCC (+5V)	
11	DOWNLD*	Download Mode Short to enable
12	GND	

* Active low signal

Note 1: Connecting Keyboard on 5-pin female DIN



(Connector back view)

The following list includes approved vendors for the J2 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).

Each function is specified as follows:

Function	Description
Speaker	An 8 ohm speaker can be directly connected. The power stage is incorporated onboard.
Keyboard inhibit	Keyboard inhibit function is used to switch the keyboard on or off.
Download	Download function is used to transfer information to the Flash disk using a serial link connected to COM1 serial port.
Reset	A normally open push button can be used to reset the board. Reset interface is open drain, thus external logic is not required.
Hard disk activity	LED can be used to signal read and write operations on the hard disk.

7.10 MISCELLANEOUS DEVICES

7.10.1 RESET Button on the Front Plate

Use a small tool to press the Reset button to restart the board. Reset function generates a hardware reset and reboots the board.

7.10.2 Ethernet LEDs on the Front Plate

100BASE-T	Indicates 100Mbps operations when lit. The LED is off when communicating at 10Mbps.
LINK	Indicates good link status for 10Mbps and 100Mbps operations.
ACTIVE	Indicates the presence of transmit or receive activity for 10Mbps or 100Mbps operations. The LED is driven through a monostable function which ensures that even the minimum size packet generates adequate LED ON time to be visible.

7.11 CONNECTING STORAGE DEVICES

7.11.1 Connecting Hard Disks

The TEK-CPCI-1000 supports two configurations of hard disk connection:

- **Through the I/O connector** - Enhanced IDE signals are output from the board to a backplane through this connector (J5-J8). In such configuration, the backplane must be designed to receive these signals and make them available through a standard 40-pin dual row male connector for standard applications (with standard 40-pin header flat cables).
- **Through the PCI connector** - CompactPCI hard drive modules may be connected directly to the PCI bus.

Primary/Secondary and Master/Slave configurations are supported. To setup your hard disk installation, use the W1 and W2 jumpers and, conform to the following table:

Jumpers		HD Allocation	
W1	W2	Primary HD	Secondary HD
Off	Off	IDE bus	IDE bus
Off	On	PCI bus	IDE bus
On	Off	IDE bus	PCI bus
On	On	PCI bus	PCI bus

CAUTION

Please be aware that Primary and Secondary hard drives must not be allocated and installed on both PCI and IDE buses at the same time.

Such a configuration will generate a hardware conflict.

7.11.2 Connecting Floppy Disk Drives

AT floppy disk drive signals are output from the board to a backplane through the I/O rear-panel connector (J5-J8). The backplane must be designed to receive these signals and make them available through a standard 34-pin dual row male connector for standard applications (with standard 34-pin header flat cables).

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

7.11.3 Setting the BIOS

Hard disk and floppy disk drives specification must be declared using the Award BIOS setup program.

BIOS options and settings are described in Section 11.1.4 - *Standard CMOS Setup*.

7.12 BATTERY BACKUP CIRCUIT

The TEK-CPCI-1000 comes with a 350mA/h TL5186 TADIRAN battery with a shelf life of approximately 10 years (under "no-load" conditions).

⚠ CAUTIONS

1. **Removing jumper W10 will cause the set-up and real-time clock information to be lost.**
2. **The actual voltage supplied by the battery is 3.6 volts. This can be verified at pins 16-32 on the SRAM device using a standard voltmeter.**

The actual life of the battery depends on the amount of time the DC power is not applied and on the environmental (temperature) conditions. The TADIRAN TL5186 has an operating range of -55^0 to 75^0C and discharge characteristics vary with temperature.

The TADIRAN TL5186 is U.L. recognized. Its U.L. component recognition is MH12193.

⚠ WARNING

Danger of explosion if the battery is incorrectly replaced.

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

8. INSTALLING VIDEO

The TEK-CPCI-1000 does not support onboard video capabilities.

TEKNOR provides a 3U *Compact*PCI VGA module (TEK-CPCI-1002) that connects directly to the PCI bus through the backplane. The module is built over the high performance of the CL-GD5446 video controller chip from Cirrus Logic. It offers the following specifications:

- 32-bit CompactPCI data bus
- 3U format, mechanically compliant with CompactPCI
- 64-bit DRAM based with BitBLT (Bit Block Transfer) hardware acceleration
- Video playback and video capture to frame buffer
- V-Port; VMI host and Feature Connector
- VIPerVision TEK-380 interface module
- 136MHz dot clock
- 1280 x 1024 x 256 colors non-interlaced
- Standard CRT DB-15 connector
- 1 or 2Mbytes of FPM or EDO video memory

For more information, please contact the Technical Support Department at TEKNOR.

9. CONFIGURING DMA & IRQ

9.1 ALLOCATING DMA CHANNELS

The board implements 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.

DMA channels are assigned as follow:

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

NOTE

The DMA Channel for the Plug and Play Ethernet device is automatically allocated by the system BIOS among those available (Channel 3, 5, 6 or 7).

9.2 ALLOCATING IRQ LINES

Two 8259 interrupt controllers handle the interrupts as follows:

1. Seven interrupt lines are directly linked to the keyboard controller, floppy controller, timer, the real-time clock, both serial ports and the mouse.
2. The system BIOS automatically allocates IRQ5 or IRQ7 to the Parallel Port's IRQ line, depending on the settings in the AWARD BIOS. When the Parallel Port is set to 278h or 3BCh, IRQ5 is assigned. When set to 378h IRQ7 is assigned. When set to Auto IRQ5 or IRQ7 is assigned. When Disabled, IRQ5 and IRQ7 are available for onboard and external PCI/PnP devices, or for external non-PnP devices (see note 1 below).
3. Primary and Secondary IDE controllers are configured with the AWARD BIOS (Peripheral Setup option). IRQ 14 is linked to the primary IDE when the option is set to Primary or Both. IRQ 15 is linked to the secondary IDE when the option is set to Secondary or Both. IRQ 14 and IRQ 15 are available for on board/external PCI/PnP devices or external non-PnP devices (see note 1 below), when the option is set to Disabled.
4. The on board Plug and Play Ethernet is automatically allocated with an IRQ line by the system BIOS among the available PCI/PnP IRQ lines.

DMA channels are assigned as follow:

Controller # 1	
IRQ 0	Timer 0
IRQ 1	Keyboard
IRQ 2	Cascade controller # 2
IRQ 3	COM 2 *
IRQ 4	COM 1 *
IRQ 5	LPT2 * or available [1]
IRQ 6	Floppy controller *
IRQ 7	LPT1 * or available [1]

Controller # 2	
IRQ 8	Real-time clock
IRQ 9	Available [1]
IRQ 10	Available [1]
IRQ 11	Available [1]
IRQ 12	PS/2 Mouse Interface
IRQ 13	Coprocessor Error
IRQ 14	Primary IDE * or available [1]
IRQ 15	Secondary IDE * or available [1]

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

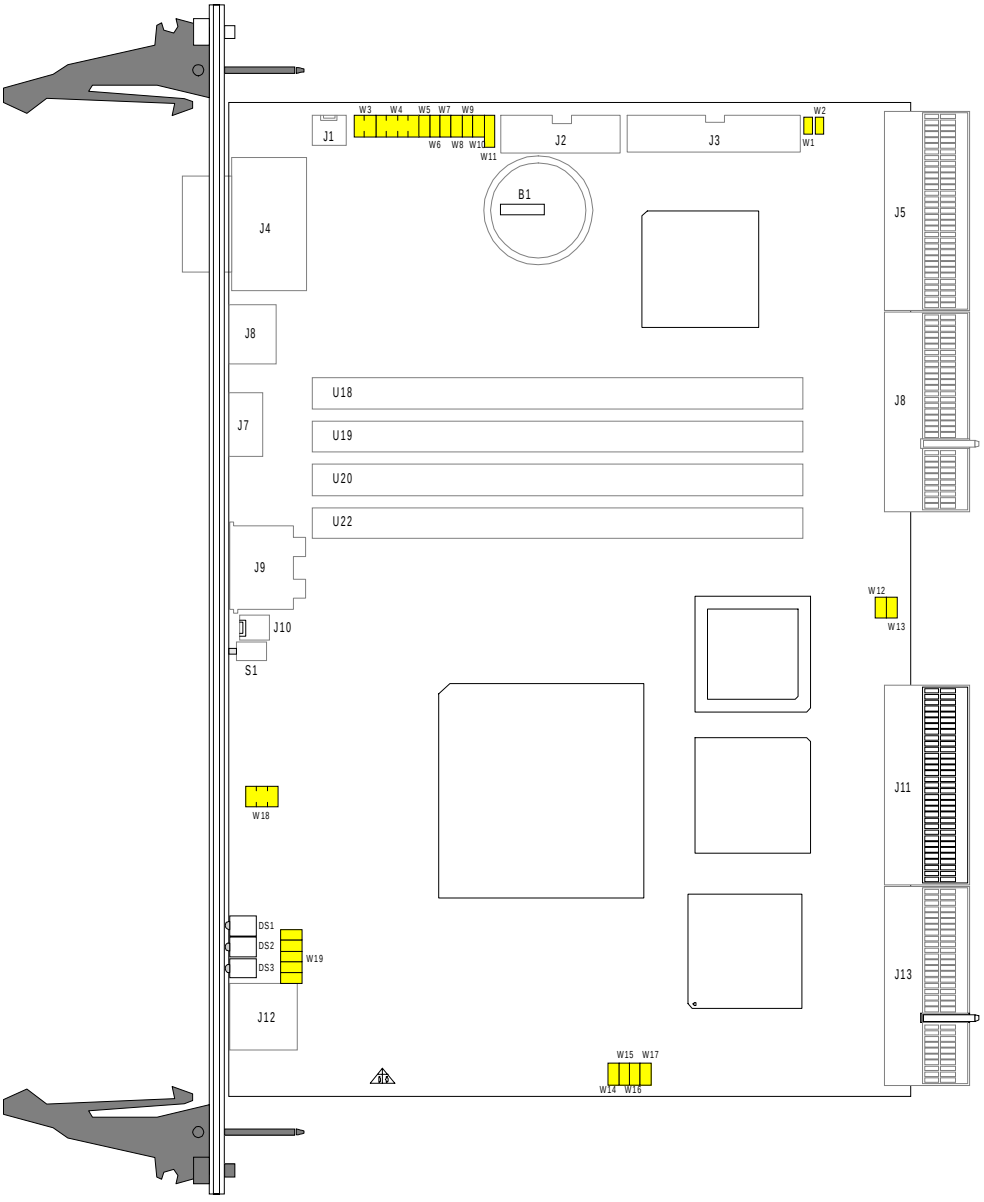
[1] Available lines service on board and external PCI/PnP devices (when set to PCI/PnP in AWARD BIOS PCI/PnP Setup screen) or an external non-PnP device (when set to ISA/EISA in AWARD BIOS PCI/PnP Setup screen).

10. Setting Jumpers

To configure the TEK-CPCI-1000 according to your application, nineteen jumpers are available:

Jumper	Description
W1, W2	**Hard drive installation setup** - Use these jumpers to install hard drives on the EIDE bus or the PCI bus.
W3	**I/O Base Address** - Selects the I/O base address from: 190h, 290h or 390h.
W4	**Extended BIOS mode** - Use this jumper to setup the following features: 1. *Download mode* - to download serially information from a remote computer to the Flash EPROM 2. *VT100 mode* - to communicate with the board using a VT100 or ANSI terminal 3. *TEKNOR Extension* - when enabled, authorizes TEKNOR's features such as VT100, boot from Flash, save CMOS in flash, SRAM devices..., (for more information see Software Setup Section) 4. *Ethernet* - enables or disable the Ethernet interface.
W5	**Boot Mode selection** - When set to emergency, it offers the ability to upgrade the onboard BIOS from an emergency disk.
W6-W7	**RS-232/RS-485 termination resistor** - connect termination resistor for RS-232 or RS-485 operation mode on Serial Port 2.
W8	**Battery** - Enables or disables the battery on the board.
W9	**Power Fail detection** - when installed, enables Power Fail Detection.
W10	**Watchdog** - enables or disables the watchdog.
W11	**Power Fail source** - when installed, enables the Battery voltage or an external user voltage to be monitored by the power Fail Detection controller.
W12-W13	**Clock Speed Multiplier** - Selects the internal CPU Clock Speed Multiplier.
W14-W15	**CPU Core/Bus Ratio** - Selects the ration between the CPU Core Clock and the CPU Bus Clock.
W16	**External Cache size** - not used while the cache is auto-detected by the BIOS.
W17	**DRAM refresh rate** - selects from 60 or 66Mhz rate.
W18	**CPU type** - selects the CPU type (Single -Plane or Split-Plane).
W19	**VCORE** - selects the CPU core voltage.

10.1 JUMPER LOCATION



10.2 CPU MODEL SELECTION; W1 AND W2

TEK-CPCI-1000 CPU Model Selection

	W12	W13	W14	W15	W18	W19				
						1-2	3-4	5-6	7-8	9-10
PENTIUM 90	off	on	off	off	1-3 / 2-4	on	off	on	on	off
PENTIUM 100	on	on	on	off	1-3 / 2-4	on	off	on	on	off
PENTIUM 120	off	on	on	off	1-3 / 2-4	on	off	on	on	off
PENTIUM 133	on	off	on	off	1-3 / 2-4	on	off	on	on	off
PENTIUM 150	on	on	off	on	1-3 / 2-4	on	off	on	on	off
PENTIUM 150	off	on	on	on	1-3 / 2-4	on	off	on	on	off
PENTIUM 166	on	off	on	on	1-3 / 2-4	on	off	on	on	off
PENTIUM 200	on	off	off	on	1-3 / 2-4	on	off	on	on	off
PENTIUM 166-MMX	on	off	on	on	3-5 / 4-6	off	off	off	on	off
PENTIUM 200-MMX	on	off	off	on	3-5 / 4-6	off	off	off	on	off
PENTIUM 233-MMX	on	off	off	off	3-5 / 4-6	off	off	off	on	off
AMD K6-166	on	off	on	on	3-5 / 4-6	on	off	off	on	off
AMD K6-200	on	off	off	on	3-5 / 4-6	on	off	off	on	off
AMD K6-233	on	off	off	off	3-5 / 4-6	off	off	on	on	off

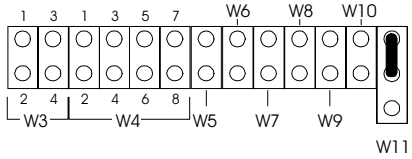
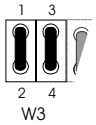
Careful attention should be taken when installing a processor: Faulty jumper settings may definitely damage both your board and your processor.

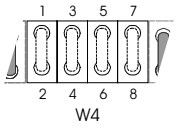
W1-W2 Bus Allocation for Hard Drives

Jumpers		HD Allocation	
W1	W2	Primary HD	Secondary HD
off	off	IDE Bus	IDE Bus
off	on	PCI Bus	IDE Bus
on	off	IDE Bus	PCI Bus
on	on	PCI Bus	PCI Bus

Installing HD on both IDE and PCI busses.
Please be aware that Primary and Secondary hard drives must not be installed on one bus simultaneously. Such a configuration will result a hardware conflict.

10.3 JUMPERS W3-W7

<table>
<tr><th>NAME</th><th>FUNCTION</th><th>CONFIGURATION (INITIAL SETTING: *)</th></tr>
<tr><td></td><td></td><td>
</td></tr>
<tr><td>W3</td><td>I/O Base Address</td><td>

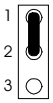
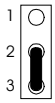
<table>
<tr><th>I/O Base Address</th><th>1-2</th><th>3-4</th></tr>
<tr><td>190h *</td><td>on</td><td>on</td></tr>
<tr><td>290h</td><td>on</td><td>off</td></tr>
<tr><td>390h</td><td>off</td><td>x</td></tr>
</table></td></tr>
<tr><td>W4</td><td>Extended BIOS Modes</td><td>These Jumpers are configured separately even though they are grouped together


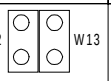
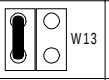
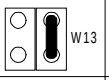
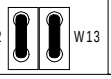
<table>
<tr><th></th><th>Jumper ON</th><th>Jumper REMOVED *</th></tr>
<tr><td>1-2</td><td>Serial Download Mode</td><td>Normal Mode</td></tr>
<tr><td>3-4</td><td>VT-100 Mode</td><td>Standard Mode</td></tr>
<tr><td>5-6</td><td>Disable TEKNOR Extension</td><td>Enable TEKNOR Extension</td></tr>
<tr><td>7-8</td><td>Ethernet Enabled</td><td>Ethernet Disabled</td></tr>
</table></td></tr>
<tr><td>W5</td><td>Boot Mode Selection</td><td> Emergency  Nornal *</td></tr>
<tr><td>W6-W7</td><td>Termination Resistors for RS-422/RS-485 Modes</td><td>

Disconnected * 

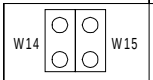
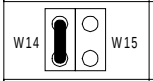
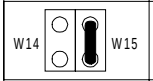
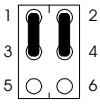
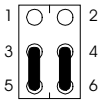
Connected</td></tr>
</table>

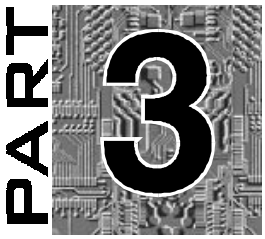
10.4 JUMPERS W8-W13

NAME	FUNCTION	CONFIGURATION (INITIAL SETTING: *)
W8	Battery	 Connected  Disconnected *
		Danger of explosion if battery is incorrectly replaced. **Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions .**
W9	Power Fail Detection	 Enabled  Disabled *
W10	Watchdog	 Enabled  Disabled *
W11	Power Fail Source	 User defined  VBAT (3.08V) *
W12 W13	Internal CPU Clock Speed Multiplier	

	CPU Bus Clock	PCI Clock
	n/a	n/a
	66MHz	33MHz
	60MHz	30MHz
	50MHz	25MHz

10.5 JUMPERS W14-W19

<table>
<tr><th>NAME</th><th>FUNCTION</th><th>CONFIGURATION (INITIAL SETTING: *)</th></tr>
<tr><td>W14
W15</td><td>CPU Core Clock / CPU Bus Clock Ratio</td><td>
<table>
<tr><th></th><th>Core / Bus Ratio</th><th>50MHz</th><th>60MHz</th></tr>
<tr><td></td><td>3 / 2</td><td>75MHz</td><td>100MHz</td></tr>
<tr><td></td><td>2 / 1</td><td>100MHz</td><td>133MHz</td></tr>
<tr><td></td><td>3 / 1</td><td>150MHz</td><td>200MHz</td></tr>
<tr><td></td><td>5 / 2</td><td>125MHz</td><td>166MHz</td></tr>
</table>
</td></tr>
<tr><td>W16</td><td>256KB External Cache</td><td> Enabled  Disabled</td></tr>
<tr><td>W17</td><td>DRAM Refresh Rate</td><td>Not used while the cache is auto-detected by the BIOS</td></tr>
<tr><td>W18</td><td>CPU Type Selection</td><td> Single-Plane  Split-Plane</td></tr>
<tr><td>W19</td><td>CPU Core Voltage Selection</td><td>
<table>
<tr><th>VCore</th><th>7-8</th><th>5-6</th><th>3-4</th><th>1-2</th></tr>
<tr><td>1.24</td><td>off</td><td>off</td><td>off</td><td>off</td></tr>
<tr><td>2.14</td><td>off</td><td>off</td><td>off</td><td>on</td></tr>
<tr><td>2.24</td><td>off</td><td>off</td><td>on</td><td>off</td></tr>
<tr><td>2.34</td><td>off</td><td>off</td><td>on</td><td>on</td></tr>
<tr><td>2.44</td><td>off</td><td>on</td><td>off</td><td>off</td></tr>
<tr><td>2.54</td><td>off</td><td>on</td><td>off</td><td>on</td></tr>
<tr><td>2.64</td><td>off</td><td>on</td><td>on</td><td>off</td></tr>
<tr><td>2.74</td><td>off</td><td>on</td><td>on</td><td>on</td></tr>
</table>
<table>
<tr><th>VCore</th><th>7-8</th><th>5-6</th><th>3-4</th><th>1-2</th></tr>
<tr><td>2.84</td><td>on</td><td>off</td><td>off</td><td>off</td></tr>
<tr><td>2.94</td><td>on</td><td>off</td><td>off</td><td>on</td></tr>
<tr><td>3.04</td><td>on</td><td>off</td><td>on</td><td>off</td></tr>
<tr><td>3.14</td><td>on</td><td>off</td><td>on</td><td>on</td></tr>
<tr><td>3.24</td><td>on</td><td>on</td><td>off</td><td>off</td></tr>
<tr><td>3.34</td><td>on</td><td>on</td><td>off</td><td>on</td></tr>
<tr><td>3.44</td><td>on</td><td>on</td><td>on</td><td>off</td></tr>
<tr><td>3.54</td><td>on</td><td>on</td><td>on</td><td>on</td></tr>
</table>
</td></tr>
</table>



PRODUCT DESCRIPTION

11. POWERING UP THE SYSTEM

12. SOFTWARE SETUP

13. VFLASH SOFTWARE

14. FLASH FILE SYSTEM II

15. UPDATING THE BIOS WITH UBIOS

16. VT100 MODE

11. POWERING UP THE SYSTEM

11.1 POWER UP

Once you are ready to power up your system:

1. Insert a bootable diskette in the 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″. The main menu appears on the screen.
   - In Standard Setup, set the date and time.
   - In other menu choices, set other options (if necessary).
3. From the main menu, press the F10 key. Type “Y” to save your setup. The system will continue the boot procedure.
4. Once the boot procedure is completed, reboot the system to make sure everything works properly.

11.2 TROUBLESHOOTING

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

1. 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.
2. Verify your boot diskette. It must be a system disk and it must be in proper working order.
3. If the system still does not start up properly, you should try booting your system with only the power cord and video monitor connected (this is the minimum required to see if the board is working).
4. If you still are not able to get your board up and running, contact our Technical Support department for assistance.

12. SOFTWARE SETUP

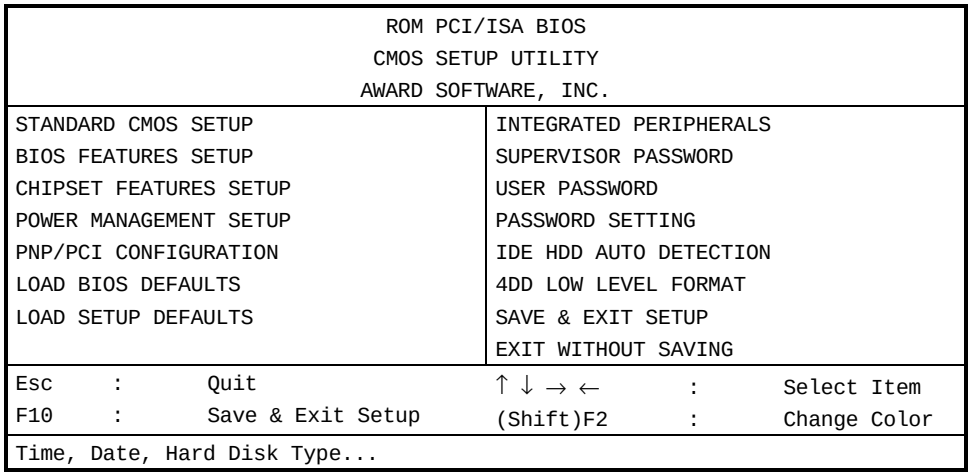
12.1 AWARD SETUP PROGRAM

The TEK-CPCI-1000 uses the AWARD BIOS setup program to configure data in the CMOS RAM. This program is EEPROM located and may be accessed by pressing the DELETE key at the appropriate time during system boot.

> **CAUTION**
>
> **Before modifying CMOS setup parameters, insure that the W8 jumper (battery) is installed to enable the CMOS backup.**
>
> **(See Section 10 - *Setting Jumpers*)**

To run the AWARD Setup program, proceed as follows:

2. Turn on or reboot the system.
3. Hit the DELETE key before or when the message - "PRESS DEL TO ENTER SETUP" appears near the bottom of the screen.
4. The main menu appears on the screen.



12.1.1 Using the AWARD BIOS Setup

All key functions are listed below:

Up/Down arrows	Move to previous/next item.
Left/Right arrows	Move to the item in the left/right hand.
Esc key	In Main Menu: Quit settings (Answer 'Y' to save changes into CMOS). In sub-menus: Exit and return to Main Menu.
PgUp/ PgDn keys	Increase/ Decrease the numeric value or make changes.
+/- keys	Increase/ Decrease the numeric value or make changes.
F1 key	Display the information associated to the selected field.
F2 and Shift F2 keys	Change color from total 16 colors: F2 to select color forward, Shift F2 to select color backward.
F5 key	In sub-menu: Restore the previous setup values from BIOS Default Table.
F6 key	In sub-menu: Load the default setup values from BIOS Default Table.
F7 key	In sub-menu: Load the setup values from the Setup Default Table .
F4, F8, F9 keys	Reserved.
F10 key	When in Main Menu: Save all the CMOS changes.

12.1.2 Save & Exit Operations

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

Save & Exit — Use this option to save the configuration stored in the CMOS RAM after a setup modification. This option will not change the values saved in Flash EPROM. To update values in the Flash, use the VIP-UP program and perform a save operation (F10).

Exit Without Saving — Use this option to exit the AWARD setup without saving the configuration to the CMOS RAM.

12.1.3 Setting Features

The main menu provides the following options:

Standard CMOS Setup	Provides all the AT-compatible BIOS standard options.
BIOS Features Setup	Provides all special enhanced features of the BIOS.
Chipset Features Setup	Provides all the features related to the chipset (Intel 430HX).
Power Management Setup	Sets the power conservation options.
PnP/PCI Configuration	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	Use this option to change, set, or disable a password. It allows access limitation to the system and the Setup, or just to the Setup.
IDE HDD Auto Detection	Automatically detects and configures 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 are minimum settings required for your system to operate.
Load Setup Defaults	The chipset default settings are provided for a maximum system performance.

Whenever you are not sure about a certain setting, you may refer to the list of default values 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 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.**

12.1.4 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 supported (Primary and Secondary), each can have two disks: Master Disk (bootable) or Slave Disk.
Drive A / Drive B	Identifies the types of floppy disk drive (A or drive B) that have been installed.
Video	Specifies the basic type of video adapter installed in the system.
Halt on	Specifies the type of errors that will stop the system during the BIOS booting procedure.
Memory	This display-only option summarizes the amount of Base, Extended and other types of memory installed in the system.

12.1.5 BIOS Features

Option	BIOS Default	Setup Default	Possible Settings	Description
Virus Warning	Dis.	Dis.	En., Dis.	When Enabled, displays a warning message if a program (usually, a virus) attempts to write to the boot sector or the partition table of the HDD. 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 and operating system installation that access the boot sector table can trigger the virus warning message. If you plan to run such a program, first disable the virus warning.
CPU Internal Cache	Dis.	En.	En., Dis.	Enables or Disables the CPU Internal Cache.
CPU External Cache	Dis.	En.	En., Dis.	Enables or Disables the CPU external Cache.
Quick Power On Self Test	Dis.	En.	En., Dis.	Select Enabled to reduce the amount of time to run the power-on self test (POST). A quick POST skips certain steps. In normal disable quick POST.
Boot Sequence	A, C	C, A	(A,C) ; (C,A) ; (C, CD, A); (CD, C, A)	Selects the boot source drive that supports the operating system (floppy disk, hard disk, or CDROM).
Swap Floppy Drive	Dis.	Dis.	En., Dis.	Effective only in systems with two FD. Select Enabled to assign physical drive B to logical drive A, and physical drive A to logical drive B.
Boot Up Floppy Seek	En.	Dis.	En., Dis.	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 On/Off to control the state of the NumLock key at the bootup. When 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.
Typematic Rate Setting	Dis.	Dis.	En., Dis.	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 char./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 ms	When 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, or only when you enter Setup.
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.

BIOS Features (continued)

Option	BIOS Default	Setup Default	Possible Settings	Description
Video BIOS Shadow	Dis.	En.	En., Dis.	Software that resides in a read-only memory (ROM) chip on a device called firmware. The Award BIOS allows shadowing of firmware
CC000-CFFFF Shadow	Dis.	Dis.	En., Dis.	such as the system BIOS, video BIOS, and similar operating instructions that come with some expansion peripherals (for example, a
D0000-D3FFF Shadow	Dis.	Dis.	En., Dis.	SCSI adaptor). Shadowing copies of firmware from ROM into system RAM, where the CPU can read it through the 16-bit or 32-bit DRAM bus.
D4000-D7FFF Shadow	Dis.	Dis.	En., Dis.	Firmware not shadowed must be read by the system through the 8-bit X-bus. Shadowing improves the performance of the system
D8000-DBFFF Shadow	Dis.	Dis.	En., Dis.	BIOS and similar firmware for expansion peripherals, but it also reduces the amount of high memory (640KB to 1MB) available for loading device drivers, etc. Enable shadowing into each section of memory separately. Many system designers hardwire shadowing of the system BIOS and eliminate a System BIOS Shadow option.
DC000-DFFFF Shadow	Dis.	Dis.	En., Dis.	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.

12.1.6 Chipset

Option	BIOS Default	Setup Default	Possible Settings	Description
Auto Configuration	En.	En.	En., Dis.	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	70ns	70ns	70ns, 60ns	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	4	4	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.
Fast 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)	x444/x 444	x444/x 444	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 number, 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	x444	X444	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	Dis.	Dis.	En., Dis.	Select Enabled to shorten the leadoff cycles and optimize performance in cacheless, 50-60 MHz, or one-bank EDO DRAM systems.
DRAM Speculative Leadoff	Dis.	Dis.	En., Dis.	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	Dis.	Dis.	En., Dis.	When Enabled, the chipset inserts one extra clock to the turn-around of back-to-back DRAM cycles.
ISA Clock	PCI CLK/4	PCI CLK/4	PCI CLK/4, PCI CLK/3	You can set the speed of the AT bus at one-third or one-fourth of the CPU clock speed.
System BIOS Cacheable	Dis.	En.	En., Dis.	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	Dis.	En.	En., Dis.	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. These two fields let you add recovery time (in bus clock cycles) for 16-bit and 8-bit I/O.

Chipset (continued)

Option	BIOS Default	Setup Default	Possible Settings	Description
16 Bit I/O Recovery Time	2	1	1, 2, 3, 4, NA	
Peer Concurrency	En.	En.	En., Dis.	Peer concurrency means that more than one PCI device can be active at a time.
Chipset Special Features	En.	En.	En., Dis.	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	En., Dis., Auto	In Auto mode, the BIOS enables memory checking automatically when it detects the presence of ECC or parity DRAM.
Single Bit Error Report	En.	En.	En., Dis.	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.
Chipset NA# Asserted	En.	En.	En., Dis.	Selecting Enabled allows pipelining, in which the chipset signals the CPU for a new memory address before all data transfers for the current cycle are complete, resulting in faster performance.
Pipeline Cache Timing	Faster	Faster	Faster, Fastest	For a secondary cache of 256KB (one bank), select Faster. For a secondary cache of 512KB (two banks), the system designer must select Fast (3-1-1-1, 2-1-1-1) or Faster (3-1-1-1, 1-1-1-1). Cache timing 3-1-1-1 is at the CPU access speed. It requires special SRAMs because the 3-1-1-1 timing is at the CPU clock rate.
Passive Release	En.	En.	En., Dis.	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	Dis.	En.	En., Dis.	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	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.

12.1.7 Power Management

Option	BIOS Default	Setup Default	Possible Settings	Description
Power Management	Dis.	Dis.	Min Saving, Max Saving, User Define, Dis.	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 1 hour in each mode (except the hard drive). **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, select Yes for better power savings.
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 VESA Display Power Management Signaling (DPMS) standard. Use the software supplied for your video subsytem to select video management values. **Blank Screen**: System only writes blanks to the video buffer.
Modem Use IRQ	3	3	NA, 3, 4, 5, 7, 9, 10, 11	Assignes an IRQ line to the modem (if any) on your system. Activity on the selected IRQ always awakens the system.
Doze Mode	Dis.	Dis.	1, ... , 40 mins, 1 hour, Dis.	After the selected period of system inactivity (1 minute to 1 hour), the CPU clock runs at lower speed while all other devices still operate at full speed.
Standby Mode	Dis.	Dis.	1, ... , 40 mins, 1 hour, Dis.	After the selected period of system inactivity (1 minute to 1 hour), the fixed disk drive and the video shut off while all other devices still operate at full speed.
Suspend Mode	Dis.	Dis.	1, ... , 40 mins, 1 hour, Dis.	After the selected period of system inactivity (1 minute to 1 hour), all devices except the CPU shut off.
HDD Power Down	Dis.	Dis.	1, 2, 3, (...), 15 mins	After the selected period of drive inactivity (1 to 15 min), the hard disk drive powers down while all other devices remain active.
Thernal Management	Dis.	Dis.	En., Dis.	Enable this option to monitor the CPU temperature. Whenever the CPU overheats, it slows down to lower the temperature.
Wake Up Events IRQ3 IRQ4 IRQ8 IRQ12	 Off Off Off Off	 On On On On	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 up the system. 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 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. 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 Management (continued)

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 (LPT2)	Off	On		
IRQ 6 (Floppy Disk)	Off	Off		
IRQ 7 (LPT 1)	Off	On		
IRQ 8 (RTC Alarm)	Off	Off		
IRQ 9 (IRQ 2 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		

12.1.8 PnP/PCI

Option	BIOS Default	Setup Default	Possible Settings	Description
Resources Controlled By	Auto	Man.	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	Dis.	Dis.	En., Dis.	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 n = 3, 4 n = 5, 7, 9, 10, 11, 12, 14, 15	PCI/ISA PnP	Leg. ISA 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.
DMA n Assigned To n = 0, 1, 3, 5, 6, 7	PCI/ ISA PnP	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.
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# Secondary IDE INT#	A B	A B	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.
Used Mem Base Address	NA	NA	NA, 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	8K	-, 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.

12.1.9 Integrated Peripherals

Option	BIOS Default	Setup Default	Possible Settings	Description
IDE HDD Block Mode	Dis.	En.	En., Dis.	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	En.	En.	En., Dis.	You may separately disable the second channel on an IDE interface installed in a PCI expansion slot.
On-Chip Primary/Secondary PCI IDE	En.	En.	En., Dis.	The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select Enabled to activate each channel separately.
IDE Primary/Secondary Mast./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. In Auto mode, the system automatically determines the best mode for each device.
USB Controller and Keyboard	Dis.	Dis.	En., Dis.	Select Enabled if your system contains an Universal Serial Bus (USB) controller and you have USB peripherals.
Onboard FDC Controller	En.	En.	En., Dis.	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	Dis., COM1/3F8, COM2/2F8, COM3/3E8, COM4/2E8, 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 communication protocol for Serial Port 2: Standard for normal operation, IrDA or ASK-IR for infra-red operation.
Duplex Select	Half	Half	Half, Full	Half for one communication at a time, Full for simultaneous communication.
TxD, RxD Active	Hi/Lo	Hi/Lo	Hi/Hi, Hi/Lo, Lo/Hi, Lo/Lo	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, Dis.	Select a logical LPT port name and matching address for the physical parallel (printer) port.
Parallel Port Mode	Nornal	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 EPP or ECP mode.
ECP Mode Use DMA	3	3	1, 3	Select a DMA channel for the port.

12.2 VIP-UP PROGRAM

12.2.1 Running the VIP-UP Program

The VIP-UP program is TEKNOR's own setup program for enabling, disabling, and relocating various hardware features.

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). The VIP-UP program is also provided on the utility disk.

At the DOS prompt, type "VIP-UP" and press ENTER.

```
                TEKNOR MICROSYSTEMS INC  --- TEK SETUP
TEKNOR BIOS Extension Address            CC000H-CFFFFH
TEKNOR BIOS Window Address               E0000H-E3FFFH
BIOS Interrupt 13h Configuration         Disabled
Flash Disk Support                       Not Installed
On Board Ethernet                        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

COM2 Operation Mode                      RS-232

↑ ↓  to select options                   ESC - Quit without saving
PgDn(+), PgUp(-) to change an option     F10 - (U)pdate Flash BIOS
```

1. Use ↑ and ↓ keyboard keys to move up and down the screen, and on to subsequent or preceding screens. As you do, the value of the selected field is highlighted.
2. Press PgDn or the "+" key to increase a value.
3. Press PgUp or the "-" key to decrease a value.

NOTE

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

12.2.2 Description

The VIP-UP options are:

TEKNOR BIOS addresses	Defines the addresses of the TEKNOR BIOS extension and the TEKNOR BIOS window.
BIOS Interrupt 13h Configuration	When enabled, this option allows the following Flash Disk Support configurations: Not Installed (default setting), Installed Bootable (Flash disk is assigned to C:\, while other disks are assigned to subsequent drive letters: D:\, E:\, ...), or Installed (the hard disks are assigned first, then the Flash disk; for example two hard disks and one Flash disk: C:\ and D:\ for hard disks, and E:\ for Flash disk).
On Board Ethernet Controller/BIOS	Enable or disable Ethernet on the board
Enter VIP-UP Message	Enable or disable the message "Press CTRL-V to enter TEKNOR VIP-UP" at the boot-up.
VT100 & Serial Download	Select VT100 & Serial Download Speed option to select the communication speed through either COM2 or COM1.
Use Flash To Store CMOS RAM SETUP	When enabled ("Yes"), the CMOS RAM Setup will be restored from Flash during each power up, as long as the battery is good. If the battery fails, the system returns to the power on default configuration. However, when the battery is replaced, the CMOS RAM Setup is restored from Flash (only the time and date could be lost).

NOTES

Modifying and saving the CMOS RAM Setup in AWARD Setup does not change the Flash copy;

To update the Flash, return to the VIP-UP Setup and update it while "Use Flash To Store CMOS RAM SETUP" is set to "Yes".

COM2 Operation Mode	Select whether Serial Port 2 will be configured for RS-232 mode or RS-485/RS-422 mode.

13. VFLASH SOFTWARE

13.1 INTRODUCTION

VFLASH is TEKNOR's Flash EPROM transfer utility program designed for TEKNOR's SBC. Its main function is to download DOS files to the Flash EPROM disk (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 Section 12).

Depending on your particular configuration, VFLASH may be used to transfer information to a Flash disk by one of two modes:

1. Directly, from your local board hard disk or floppy drive to the local FLASH EPROM disk.
2. Remotely, from a remote computer running the VFLASH program to a local FLASH EPROM disk via a serial COM port (1 or 2).

When operating a serial download, the board must be initiated consequently using the W4 jumper. In this mode, the TEK-CPCI-1000 board is set to wait for signals from the remote computer's VFLASH program.

The above sections explain how to run the program in interactive mode via menus. It is also possible to run the program without menus by using a command that specifies options, and files and parameters.

This mode is called batch mode and is described in Section 13.6.

13.1.1 Types of FLASH EPROM

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 must be met:

1. 2MB or 4MB Flash EPROM must be installed.
2. The bootable Flash EPROM partition must start from the first block.
3. The VIP-UP option “BIOS Interrupt 13h Configuration” must be enabled.
4. The Flash disk must be configured in the VIP-UP Setup as “Installed Bootable” (Available settings are: Disabled, Installed Bootable and Installed).

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, two conditions must be met:

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”.

13.1.2 VFLASH Requirements

VFLASH is designed to operate in an IBM DOS 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 the onboard Flash device, VFLASH must be running on the board.

If you need a remote computer to program the onboard Flash device (host), the board must be configured 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, 1 MB of DRAM, MS-DOS® or PC-DOS (version 2 or higher) or DR-DOS (version 3. 41 or higher).

13.2 RUNNING VFLASH

To run VFLASH, simply type "VFLASH" at the DOS prompt and press ENTER. Once the front screen is passed, the main screen appears.

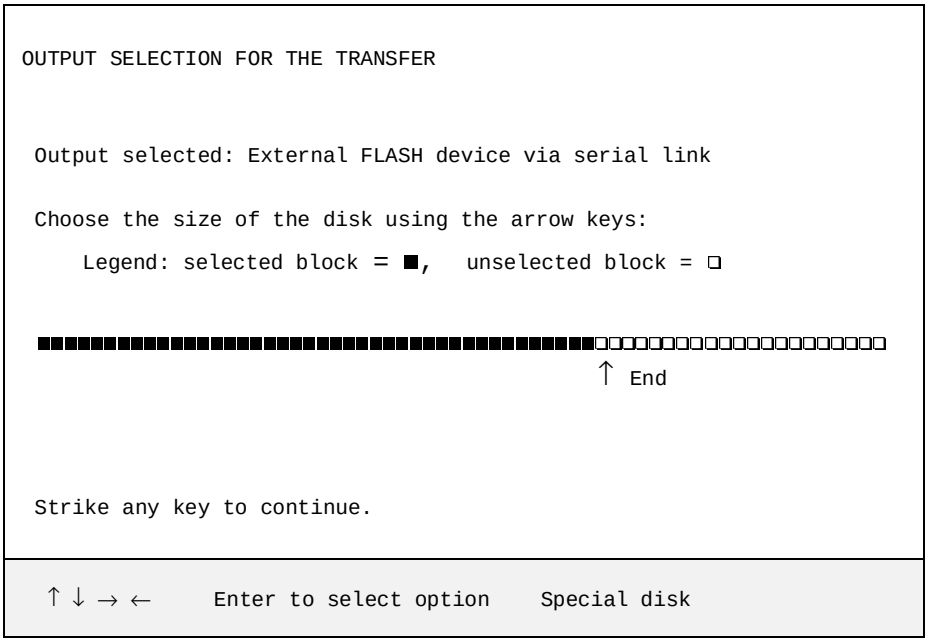
Use the up and down keys to highlight the option and then press ENTER to select an option.

On board Flash Devices	Use this option when VFLASH is run on a board with Flash EPROM to be programmed directly on the board.
External Flash Devices via a Serial Link	Use this option when VFLASH is run from a remote computer, or when your board has no floppy or hard disks, or simply because the data to transfer is on a different computer than the board 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 board.

13.3 OUTPUT SELECTION

Select the FLASH location, then press the ENTER key. The program displays the amount of available FLASH memory.

Press the ENTER key to accept the listed amount or press the "S" key to customize the amount.



13.4 FILE SELECTION

Once the output is selected, 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 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.

Use the arrow keys to highlight and mark a file for copying to Flash devices.

When selecting a subdirectory, the first two entries are: ". <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.

```
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 Untag New dir) or Enter  Block  Make bootable Done  Esc to quit
↑ ↓ → ←   Home PgUp PgDn  Volume label
```

The lower area of the screen serves as a reminder.

13.4.1 Menu Commands

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

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

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

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

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

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

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

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

VOLUME LABEL Use this function to include a disk volume label for the Flash EPROM disk. Press V to display the following message:

Volume is xxxxxxxxxxx

Volume label (11 characters, ENTER for none)?

The same operating system limitations on volume label names apply.

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

13.4.2 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: 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




Program Change Selection                          Esc to quit
↑ ↓ PgUp PgDn Home
```

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

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

The following commands are also available:

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

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

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

13.4.3 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                          Select list
```

Make a selection by choosing the corresponding number. Choosing:

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

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

13.5 FILE TRANSFER

13.5.1 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).

```
TRANSFER STATUS OF ONBOARD FLASH PROGRAMMING


Erasing of all Flash devices installed, please wait. . .

Erasing nth device. . .

Erase completed

Creating a bootable flash disk

Transferring the BOOT sector, FAT and root DIR . . .

Completed

Copying selected files. . .

Transfer completed: XX. X%

Transferring: FILENAME

Transfer complete
```

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.

13.5.2 Transfer Status of External FLASH Programming Screen

When using a serial link, a control screen displays the transfer operation status and shows each step in progress:

```
TRANSFER STATUS OF EXTERNAL FLASH PROGRAMMING

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

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

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

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

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:

1. Short Pins 1 and 2 on jumper W4. This forces Download Mode at boot up.
2. Download Mode is automatically enabled when the VT100 Mode is activated (by shorting pins 3 and 4 on jumper W4). 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 W4 (1-2) jumper. If Download Mode was entered by recognition of the code sequence, you can simply exit Download Mode and continue processing.

13.6 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.

13.6.1 Batch Mode Command Line Parameters

The command line format is as follows:

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

where:

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

[\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.

13.6.2 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.

`/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 board 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.

13.6.3 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 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

ERROR (HEX)	**NUMBER** (DECIMAL)	**DESCRIPTION**
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
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 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

14. FLASH FILE SYSTEM II

14.1 INTRODUCTION

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

Section 12 - *VFLASH Software* - explains 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:

1. 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.
2. As one read/write MS-Flash partition created by FLASH FILE SYSTEM II.
3. 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:).
4. 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 package and utilities.

14.2 SETTING UP CONFIG.SYS FOR FLASH FILE SYSTEM

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:

1. 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
   ```

2. 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.

14.3 CREATING & FORMATTING A MS-FLASH PARTITION

FLASH FILE SYSTEM II 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:

1. Run the program interactively and make selections in the menus, or
2. 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.

14.3.1 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
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 then press ENTER. When you choose menu options 1 through 6, another menu appears. To return to the main menu, press ESC. To quit MEMCARD, return to the main menu and press ESC.

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

```
Current memory card slot: 1

Letter         Type           Status         Size
-------------------------------------------------------
  D            MS-Flash       Formatted      2048K
```

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

```
This card has already been formatted.
Creating a partition will destroy all the data on the card.
Do you want to continue? (Y/N) [N]
```

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

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

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

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

4. This step is only 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.

14.3.2 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

15. UPDATING THE BIOS WITH UBIOS

15.1 INTRODUCTION

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

The program can be executed in one of two modes:

1. Interactive Mode: In this mode the program is menu-driven. This mode is explained in section 15.2.
2. Batch Mode: It is also possible to run the program without menus by a command that specifies the selected options and files with parameters. This mode is explained in section 15.3.

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.

15.2 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.

15.2.1 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:

1. Write Flash BIOS device (options 1 to 3 and 5), and
2. Retrieve a BIOS to a file (options 6 to 8 and 0).

The first group includes five options which allow you to update the Flash BIOS EPROM with a BIOS file stored on disk. The second group includes five options which allow you to copy the contents of the Flash BIOS EPROM to files on disk.

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

1. All four can be combined in a single file with the .BIN extension.
2. SVGA CRT files have the .VGA extension.
3. TEKNOR's BIOS extension file have the .EXT extension.
4. MAIN BIOS files have the .ROM extension.

Selections are made in one of two ways:

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

15.2.2 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
                        : Teknor's extension version 0.60
                        : main BIOS version 0.60
Directory:F:\LOGICIEL\UBIOS\UBIOS210.NOT
```

FILES	DOCUMENTATION
.. <DIR> B800_060.BIN B800_987.BIN B801_612.BIN	No documentation available

The screen displays three windows:

UPDATE This window displays the current BIOS files being used; it shows all types of BIOS, not just the one selected from the main menu. 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:

Letter for a Drive	By typing the desired drive letter, you can change the current drive.
↑↓ to change files or directory	Use ↑ or ↓ key to browse through the files of the current directory. When a directory is selected (see below), then the ↑ or ↓ key is used to scroll up or down the file list. To move quickly to a directory, press the F2 key and type the first letter of the desired directory next to "Scan:" (displayed in the FILES window).
<ENTER> to select	Press ENTER to select the highlighted directory or file. When "..<Dir>" is displayed, press ENTER to go up one level. 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)". Type "Y" 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	Moves up by fourteen in the current directory
PAGE DOWN	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.

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

The following message "`File name for Flash BIOS file ( )`:".is displayed below

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

1. File name for Flash BIOS file ( ): The file extension of the selected type will appear in the parentheses: .BIN, .VGA, .EXT or .ROM.
2. 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.

15.3 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 file type 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 file type. For example, if "VGA" was listed as file type, 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 (AWARD), however this is not recommended since the CMOS Setup should be updated when the main BIOS is changed.
/R	Reset the board upon completion of an operation.
/VT	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.

16. VT100 MODE

16.1 VT100 REQUIREMENTS

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

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

16.2 VT100 SETUP & CONFIGURATION

Follow these steps to set up the VT100 mode:

1. Power off your board and install jumper W4 (3-4) to enable VT100 Mode. Note: VT100 Mode runs on Serial Port1 and Serial Port2.
2. Connect the communications cable according to the VT100 Full Setup diagram.

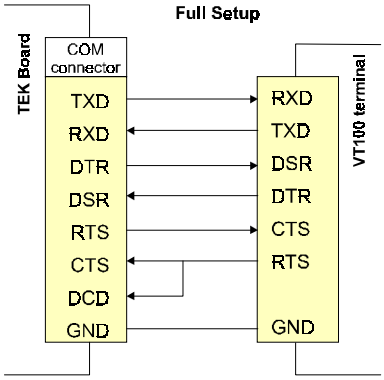
   Note: A partial cable using only the TXD and RXD lines may be used by looping back the control lines as described in the VT100 Partial Setup diagram.
3. Power on your board and run VIP-UP Setup by hitting the CTRL and V keys simultaneously, before or when the message "Press CTRL-V to enter TEKNOR VIP-UP" appears.

   At the VIP-UP screen, set the "VT100 & Serial Download Speed" at 19200bps or 9600bps.
4. You must respect this protocol:

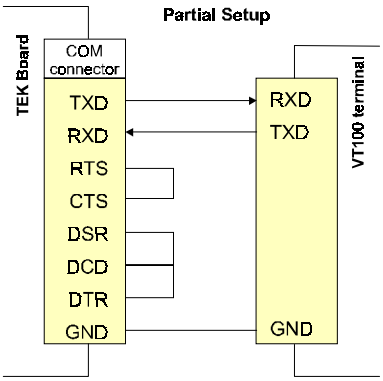
   Bits
   No Parity
   Echo Off.

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

VT100 Full Setup



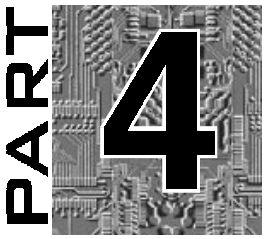
VT100 Partial Setup



16.3 RUNNING WITHOUT A TERMINAL

The board 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 VT100 Partial Setup 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.



PRODUCT DESCRIPTION

A. BOARD SPECIFICATIONS

B. MEMORY & I/O MAPS

C. ASSEMBLY TOP DIAGRAM

D. CONNECTOR LOCATIONS & PINOUTS

E. BIOS SETUP ERROR CODES

F. EMERGENCY PROCEDURE

G. LIST OF APPROVED VENDORS

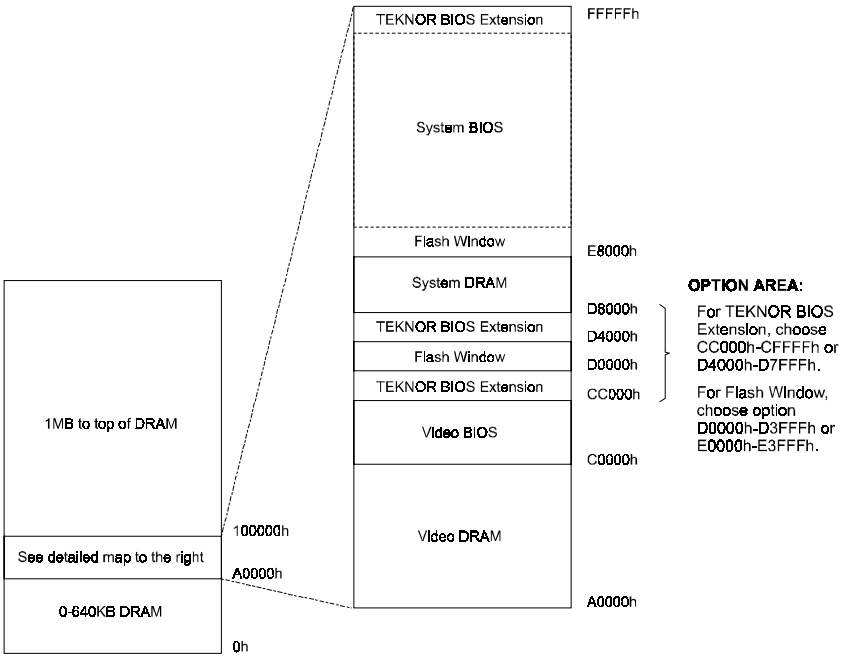
A. BOARD SPECIFICATIONS

TEK-CPCI-1000	DESCRIPTION	
Overview	Pentium/K6 based CompactPCI System Board	
Supported Microprocessors	*Intel Pentium®*	166MHz, 200MHz
	Intel Pentium MMX™	166MHz, 200MHz, 233MHz
	AMD K6	166MHz, 200MHz, 233MHz
Bus Interface	PICMG 2.0, Rev. 2.1 CompactPCI compatible, 32-bit (132MB/Sec)	
	ISA P996 AT bus on J2, via backplane connector	
System Memory	Up to 512MB DRAM, using up to four 72-pin SIMMS FPM or EDO type	
Cache Memory	Level 2: 512KB standard pipelined burst	
Flash EPROM	2MB standard, 4MB optional	
I/Os	*USB*	Two Universal Serial Bus (USB) ports, one via the front panel, one via the CPCI backplane
	Serial	Two UART serial port via the front plate. COM2 is configurable as RS-485
	Parallel	One multimode port via the front plate, through onboard header. Supports EPP and ECP
	Hard Disk	Two Enhanced IDE interfaces for up to 4 devices via the CPCI backplane
	Floppy	Two floppy disks from 360KB to 2.88MB via the CPCI backplane
	Keyboard	Standard AT keyboard via the front plate end the CPCI backplane
	Mouse	PS/2 mouse keyboard via the front plate end the CPCI backplane
Features	*BIOS*	Award BIOS 256KB Boot Block Flash BIOS for instant configuration recovery Auto configuration and extended setup Programmable CPU and memory wait states BIOS shadowing in RAM Extension for diskless, keyboardless and videoless operations Ability to boot MS-DOS and user applications from the Flash disk

TEK-CPCI-1000	DESCRIPTION	
Features (Continued)	*Power Management*	Doze, Standby, Suspend, HDD Power Down SMI/SMM Power Management support APM compatible
	Ethernet	10/100Base-T interface
	Clock	Real time clockwith battery backup
	Supervisor	Watchdog timer
	Utilities	Power failure / Low battery detector
Connectors	*CPCI (P1-2)*	32-bit PCI bus
	CPCI (P4-5)	TEKNOR defined for I/O
	Floppy	CPCI backplane
	EIDE	CPCI backplane
	Ethernet	RJ-45 on front plate
	Mouse	PS/2 5-pin on front plate ; CPCI backplane
	Serial	9-pin DSUB on front plate ; CPCI backplane
	Parallel	Onboard 26-pin shrouded header ; CPCI backplane
	USB	Front plate ; CPCI backplane
	Keyboard	Front plate ; CPCI backplane
	Speaker	20-pin male shrouded
	LEDs	On front plate
Electrical/Mechanical Characteristics	6U CPCI form factor compliant Mechanically compliant to PICMG 2.0 Re. 2.1 CPCI specification	
Dimensions	9.2 x 6.3 x 1.6 inches 233 x 160 x 41 mm	
Operating System Characteristics	PC and MS-DOS® Windows® 3.1 Windows® 95 Windows® NT NOVELL™ OS/2® WARP QNX™ UnixWare™	
Operational Characteristics	*Power Consumption*	5 Amps @ 5volts (varies with CPU)
	MTBF - MIL-HDBK-217F	Over 100,000 hours
	Agency Approvals (Pending)	Designed to meet or exceed:
	. *Safety*	UL 1950 ; C22.2 Mo950 ; EN 60950 ; IEC 950
	. *EMC*	FCC 47 CFR Part 15 ; EN55022 ; CISPR22 ; EN50082
Environnemental Conditions	Operating Temperature	0 to 50°C (varies with CPU)
	Storage Temperature	-40 to 72°C
	Humidity	5% to 95%, RH 40°C
	Shock and Vibration	IEEE 1101 compliant
	Supply Voltage	+5V ±5% ; +12V ±5%

B. MEMORY & I/O MAPS

B.1 MEMORY MAP DIAGRAM



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	E0000-E3FFF	Flash Window
D8000-DFFFF		System DRAM
E0000-FFFFF		System BIOS
100000-Top of DRAM		1 MB - Top of DRAM

NOTE

The System BIOS includes relocatable 16 KB segments for the TEKNOR BIOS Extension plus 16 KB Flash Window.

B.2 I/O MAPPING

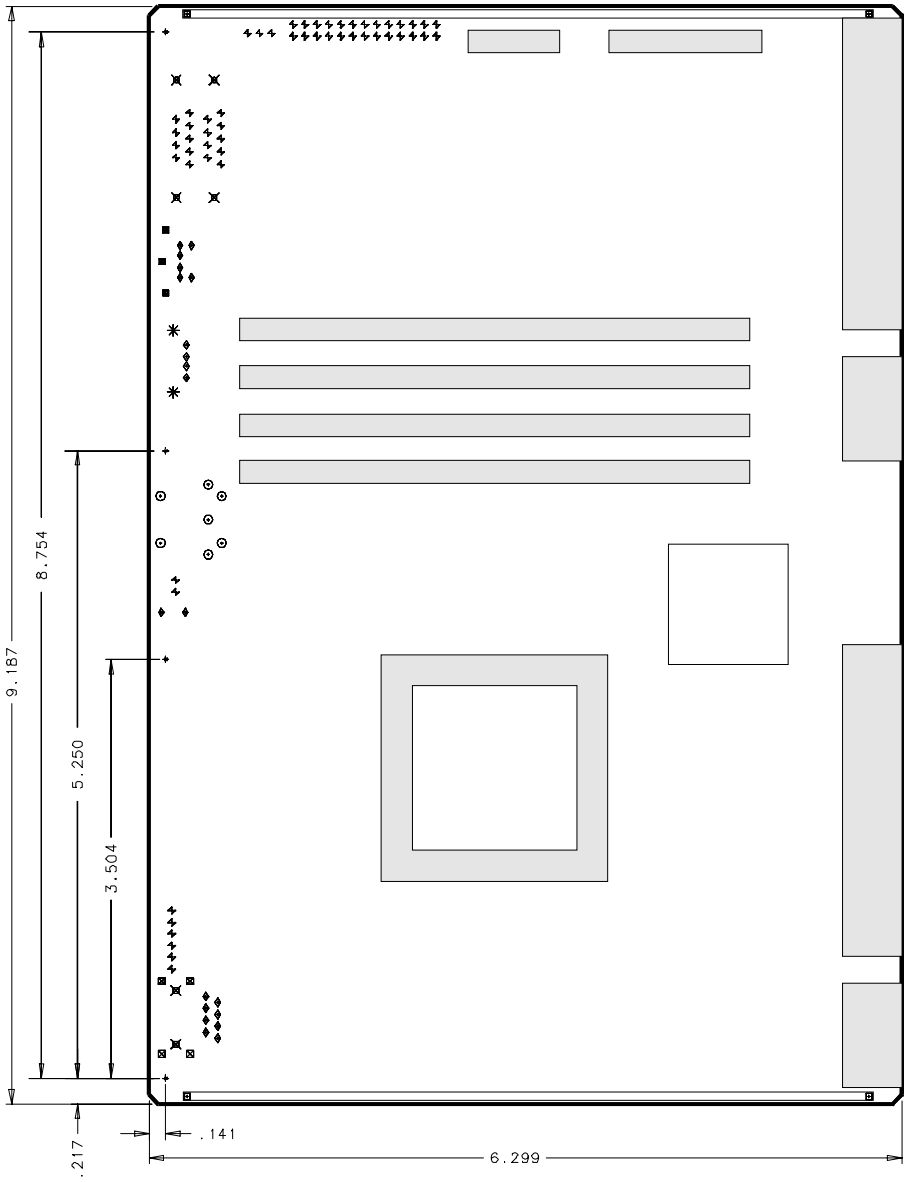
ADDRESS	OPTIONAL ADDRESS			FUNCTION
000-00F				DMA Controller 1
020-03F				Interrupt Controller 1
040-043				Timer
060-064				Keyboard (8742)
070-071				Real-time clock, NMI mask
080-09F				DMA Page Register
0A0-0BF				Interrupt Controller 2
0C0-0DF				DMA Controller 2
0EC-0EF				Configuration Registers
190-197	290-297	390-397		TEKNOR Control Port
0F0-0FF				Math Coproc/ Config. Reg.
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

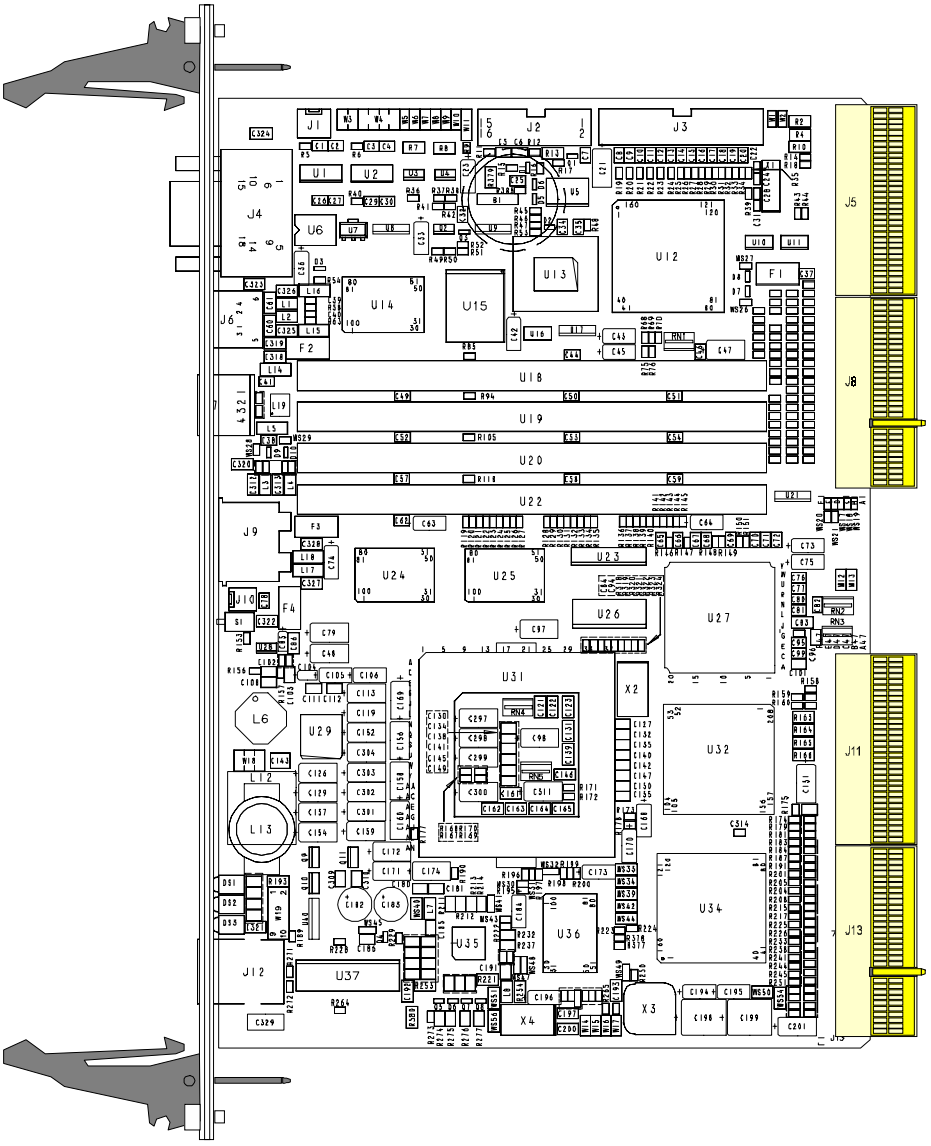
The I/O addresses for the onboard Plug and Play Ethernet device are automatically allocated by the System BIOS.

C. BOARD DIAGRAMS

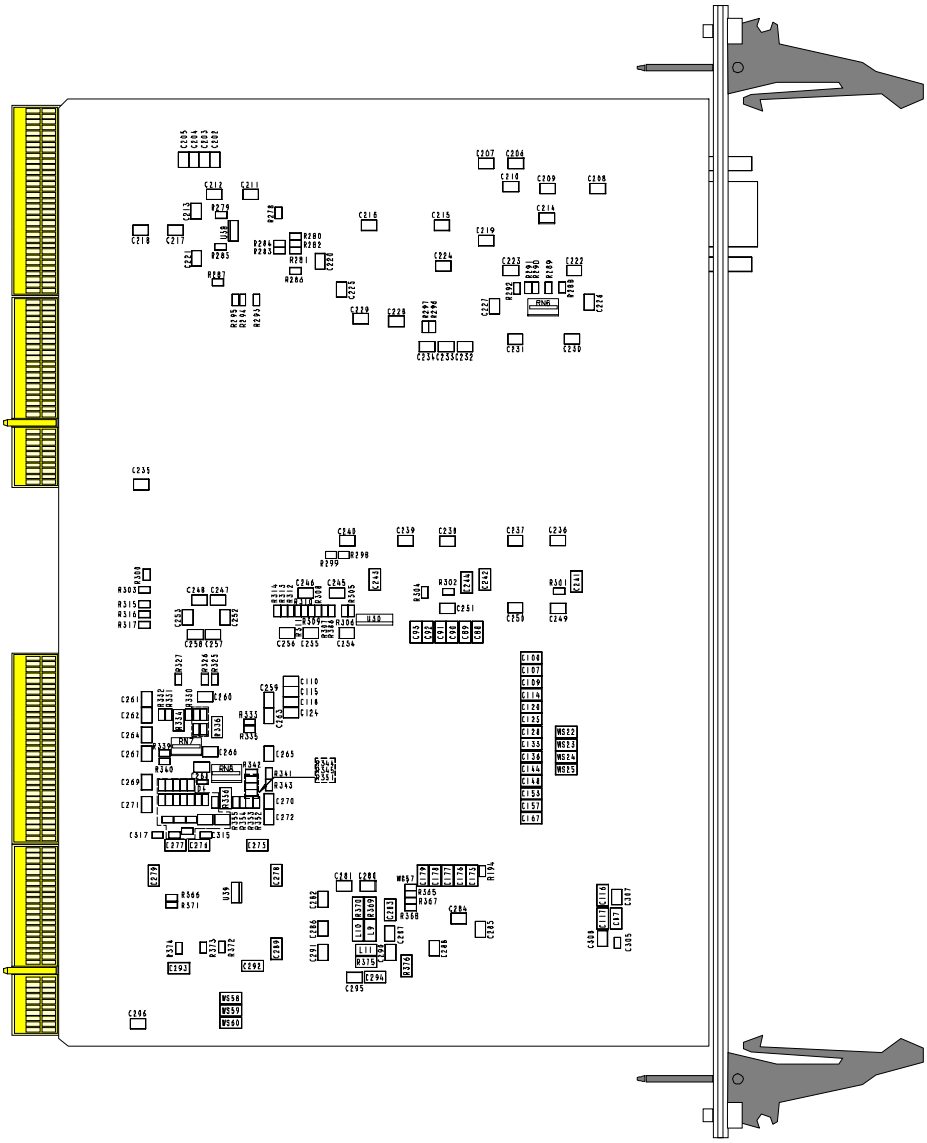
C.1 MECHANICAL SPECIFICATIONS



C.2 ASSEMBLY - TOP DIAGRAM

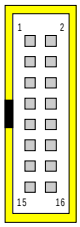


C.3 ASSEMBLY - BOTTOM DIAGRAM



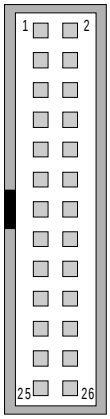
D. CONNECTOR PINOUTS

D.1 MULTI-FUNCTION CONNECTOR - (J2)

Pin Number / Signal Flow / Signal			Top View	Pin Number / Signal Flow / Signal		
KCLK	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
ACT1*	O	15		16	-	VCC (+5V)

* Active low signal

D.2 PARALLEL PORT CONNECTOR (J3) - STANDARD MODE

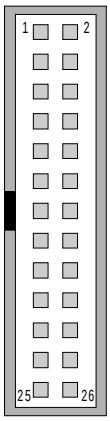
Signal	I/O	Pin #	Top View	Pin #	I/O	Signal
STROBE*	O	1		2	O	AUTOFD*
PD0	I/O	3		4	I	ERROR*
PD1	I/O	5		6	O	INIT*
PD2	I/O	7		8	O	SELECTIN*
PD3	I/O	9		10	-	GND
PD4	I/O	11		12	-	GND
PD5	I/O	13		14	-	GND
PD6	I/O	15		16	-	GND
PD7	I/O	17		18	-	GND
ACK*	I	19		20	-	GND
BUSY	I	21		22	-	GND
PE	I	23		24	-	GND
SELECT	I	25		26	-	GND

* Active low signal

D.3 PARALLEL PORT CONNECTOR (J3) - EPP MODE

Signal	I/O	Pin #
WRITE*	O	1
PD0	I/O	3
PD1	I/O	5
PD2	I/O	7
PD3	I/O	9
PD4	I/O	11
PD5	I/O	13
PD6	I/O	15
PD7	I/O	17
INTR	I	19
WAIT*	I	21
Not Used	-	23
Not Used	-	25

Top View



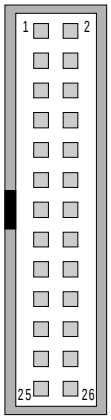
Pin #	I/O	Signal
2	O	DATASTB*
4	-	Not Used
6	-	Not Used
8	O	ADDRSTRB*
10	-	GND
12	-	GND
14	-	GND
16	-	GND
18	-	GND
20	-	GND
22	-	GND
24	-	GND
26	-	GND

* Active low signal

D.4 PARALLEL PORT CONNECTOR - ECP MODE (J3)

Signal	I/O	Pin #
STROBE*	O	1
PD0	I/O	3
PD1	I/O	5
PD2	I/O	7
PD3	I/O	9
PD4	I/O	11
PD5	I/O	13
PD6	I/O	15
PD7	I/O	17
ACK*	I	19
BUSY, PERIPHACK[2]	I	21
PERROR, ACKREVERSE[2]	I	23
SELECT	I	25

Top View



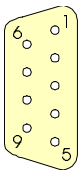
Pin #	I/O	Signal
2	O	AUTOFD*, HOSTAC K[2]
4	I	FAULT*[1], PERIPHRQST*[2]
6	O	INIT*[1], REVERSERQST*[2]
		SELECTIN*[1,2]
8	O	GND
10	-	GND
12	-	GND
14	-	GND
16	-	GND
18	-	GND
20	-	GND
22	-	GND
24	-	GND
26	-	

* Active low signal [1] Compatible Mode [2] High Speed Mode

D.5 COM1 - RS-232 (J4A)

Pin Number	Signal Flow	Signal
DCD 1	I	1
SIN 1	I	3
SOUT 1	O	5
DTR 1	O	7
GND	-	9

Top View

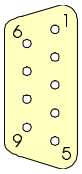


Pin Number	Signal Flow	Signal
2	I	DSR 1
4	O	RTS 1
6	I	CTS 1
8	I	RI 1
10	-	Not Connected

D.6 COM2 - RS-232 (J4B)

Pin Number	Signal Flow	Signal
DCD 2	I	1
SIN 2	I	3
SOUT 2	O	5
DTR 2	O	7
GND	-	9

Top View

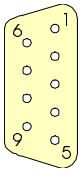


Pin Number	Signal Flow	Signal
2	I	DSR 2
4	O	RTS 2
6	I	CTS 2
8	I	RI 2
10	-	Not Connected

D.7 COM2 - RS-422/RS-485 MODE (J4B)

Pin Number	Signal Flow	Signal
DCD 2	I	1
RX(-)	I/O	3
TX(-)	O	5
DTR 2	O	7
GND	-	9

Top View



Pin Number	Signal Flow	Signal
2	I	DSR 2
4	I/O	RX(+)
6	I	TX(+)
8	I	RI 2
10	-	Not Connected

D.8 PS/2 MOUSE CONNECTOR (J6)

Pin #	Signal
1	MDATA
2	Not connected
3	GND

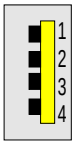


Pin #	Signal
4	VCC
5	MCLK
6	GND

D.9 USB CONNECTOR (J7)

Pin #	I/O	Signal
1	-	VCC
2	I/O	P1-
3	I/O	P1+
4	-	GND

Top View



D.10 KEYBOARD CONNECTOR (J9)

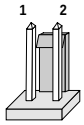
Pin #	Signal
1	KBCLK
2	KBDAT
3	Not Connected



Pin #	Signal
4	GND
5	VCC
6	GND

D.11 FAN CONNECTOR (J10)

Pin #	Signal
1	+12V DC
2	GND



D.12 ETHERNET 10/100 BASE-TX RJ-45 CONNECTOR (J12)

Pin #	I/O	Signal
1	O	TD+
3	I	RD+
5	-	Not Connected
7	-	Not Connected
9	-	CGND

Pin #	I/O	Signal
2	O	TD-
4	-	Not Connected
6	I	RD-
8	-	Not Connected
10	-	CGND

D.13 CPCI-BUS CONNECTOR

	ROW "A"				ROW "B"				ROW "C"			
	#	Ref.	SIGNAL	I/O	#	Ref.	SIGNAL	I/O	#	Ref.	SIGNAL	I/O
	1	A1	+5V	-	1	B1	-12V	-	1	C1	/TRST	IN
	2	A2	TCK	IN	2	B2	+5V	-	2	C2	TMS	IN
	3	A3	/INTA	O/D	3	B3	/INTB	O/D	3	C3	/INTC	O/D
	4	A4	BRSV1	-	4	B4	GND	-	4	C4	VI/O	-
	5	A5	BRSV2	-	5	B5	BRSV3	-	5	C5	/RST	IN
	6	A6	/REQ0	T/S	6	B6	GND	-	6	C6	+3.3V	-
	7	A7	AD30	T/S	7	B7	AD29	T/S	7	C7	AD28	T/S
	8	A8	AD26	T/S	8	B8	GND	-	8	C8	VI/O	-
	9	A9	/C/BE3	T/S	9	B9	IDSEL	T/S	9	C9	AD23	T/S
	10	A10	AD21	T/S	10	B10	GND	-	10	C10	+3.3V	-
	11	A11	AD18	T/S	11	B11	AD17	T/S	11	C11	AD16	T/S
J13 (P1)	15	A15	+3.3V	-	15	B15	/FRAME	STS	15	C15	/IRDY	STS
	16	A16	/DEVSEL	STS	16	B16	GND	-	16	C16	VI/O	-
	17	A17	+3.3V	-	17	B17	SDONE	I/O	17	C17	/SBO	I/O
	18	A18	/SERR	O/D	18	B18	GND	-	18	C18	+3.3V	-
	19	A19	+3.3V	-	19	B19	AD15	T/S	19	C19	AD14	T/S
	20	A20	AD12	T/S	20	B20	GND	-	20	C20	VI/O	-
	21	A21	+3.3V	-	21	B21	AD9	T/S	21	C21	AD8	T/S
	22	A22	AD7	T/S	22	B22	GND	-	22	C22	+3.3V	-
	23	A23	+3.3V	-	23	B23	AD4	T/S	23	C23	AD3	T/S
	24	A24	AD1	T/S	24	B24	+5V	-	24	C24	VI/O	-
	25	A25	+5V	-	25	B25	/REQ64	STS	25	C25	BRSV5	O/C
-------	----	-----	----------	-------	----	-----	----------	-------	----	-----	----------	-------
-	26	A1	--	-	26	B1	--	-	26	C1	--	-
	27	A2	CLK1	-	27	B2	GND	-	27	C2	/REQ1	-
	28	A3	CLK2	-	28	B3	CLK3	-	28	C3	/SYSEN	-
	29	A4	CLK4	-	29	B4	GND	-	29	C4	/GNT3	-
	30	A5	VI/O	-	30	B5	BRSV8	-	30	C5	/C/BE7	T/S
	31	A6	/C/BE5	T/S	31	B6	GND	-	31	C6	VI/O	-
	32	A7	AD63	T/S	32	B7	AD62	T/S	32	C7	AD61	T/S
	33	A8	AD59	T/S	33	B8	GND	-	33	C8	VI/O	-
	34	A9	AD56	T/S	34	B9	AD55	T/S	34	C9	AD54	T/S
	35	A10	AD52	T/S	35	B10	GND	-	35	C10	VI/O	-
	36	A11	AD49	T/S	36	B11	AD48	T/S	36	C11	AD47	T/S
J11 (P2)	37	A12	AD45	T/S	37	B12	GND	-	37	C12	VI/O	-
	38	A13	AD42	T/S	38	B13	AD41	T/S	38	C13	AD40	T/S
	39	A14	AD38	T/S	39	B14	GND	-	39	C14	VI/O	-
	40	A15	AD35	T/S	40	B15	AD34	T/S	40	C15	AD33	T/S
	41	A16	BRSV5	-	41	B16	GND	-	41	C16	/FAL	-
	42	A17	BRSV6	-	42	B17	BRSV9	-	42	C17	/DEG	-
	43	A18	BRSV7	-	43	B18	GND	-	43	C18	/PRST	-
	44	A19	USR1	-	44	B19	USR6	-	44	C19	USR11	-
	45	A20	USR2	-	45	B20	USR7	-	45	C20	USR12	-
	46	A21	USR3	-	46	B21	USR8	-	46	C21	USR13	-
	47	A22	USR4	-	47	B22	USR9	-	47	C22	USR14	-
			USR5	-			USR10	-			USR15	-

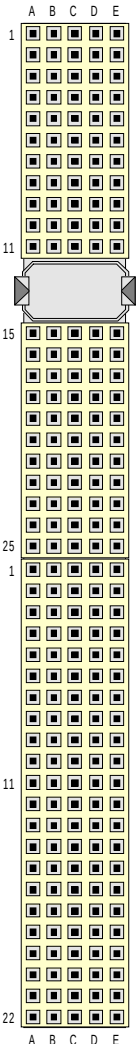
-	Nothing	O/C	Open Collector	STS	Sustained tri-state
IN	Input	O/D	Open Drain	T/S	Tri-State
I/O	In/Out	OUT	Output		

RSVxxx	Reserved Lines
BRSxxxx	Bussed Reserved Lines
VI/O	Connected to +5V

	ROW "D"				ROW "E"			
	#	Ref.	SIGNAL	I/O	#	Ref.	SIGNAL	I/O
	1	D1	+12V	-	1	E1	+5V	-
	2	D2	TDO	OUT	2	E2	TDI	IN
	3	D3	+5V	-	3	E3	/INTD	O/D
	4	D4	INTP	IN	4	E4	INTS	IN
	5	D5	GND	-	5	E5	/GNT0	T/S
	6	D6	CLK	IN	6	E6	AD31	T/S
	7	D7	GND	-	7	E7	AD27	T/S
	8	D8	AD25	T/S	8	E8	AD24	T/S
	9	D9	GND	-	9	E9	AD22	T/S
	10	D10	AD20	T/S	10	E10	AD19	T/S
	11	D11	GND	-	11	E11	/C/BE2	T/S
J13 (P1)	15	D15	GND	-	15	E15	/TRDY	STS
	16	D16	/STOP	STS	16	E16	/LOCK	STS
	17	D17	GND	-	17	E17	/PERR	STS
	18	D18	PAR	T/S	18	E18	/C/BE1	T/S
	19	D19	GND	-	19	E19	AD13	T/S
	20	D20	AD11	T/S	20	E20	AD10	T/S
	21	D21	M66EN	-	21	E21	/C/BE0	T/S
	22	D22	AD6	T/S	22	E22	AD5	T/S
	23	D23	+5V	-	23	E23	AD2	T/S
	24	D24	AD0	T/S	24	E24	/ACK64	STS
	25	D25	+3.3V	-	25	E25	+5V	-
-------	-----	------	----------	--------	-----	------	----------	--------
-	26	D1	--	-	26	E1	--	-
	27	D2	/GNT1	-	27	E2	/REQ2	-
	28	D3	/GNT2	-	28	E3	/REQ3	-
	29	D4	/REQ4	-	29	E4	/GNT4	T/S
	30	D5	GND	T/S	30	E5	/C/BE6	T/S
	31	D6	/C/BE4	-	31	E6	PAR64	T/S
	32	D7	GND	T/S	32	E7	AD60	T/S
	33	D8	AD58	-	33	E8	AD57	T/S
	34	D9	GND	T/S	34	E9	AD53	T/S
	35	D10	AD51	-	35	E10	AD50	T/S
J11 (P2)	36	D11	GND	T/S	36	E11	AD46	T/S
	37	D12	AD44	-	37	E12	AD43	T/S
	38	D13	GND	T/S	38	E13	AD39	T/S
	39	D14	AD37	-	39	E14	AD36	T/S
	40	D15	GND	-	40	E15	AD32	-
	41	D16	/REQ5	-	41	E16	/GNT5	-
	42	D17	GND	-	42	E17	BRSV10	-
	43	D18	/REQ6	-	43	E18	/GNT6	-
	44	D19	USR16	-	44	E19	USR 21	-
	45	D20	USR17	-	45	E20	USR22	-
	46	D21	USR18	-	46	E21	USR23	-
	47	D22	USR19	-	47	E22	USR24	-
			USR20				USR25	

PINOUT

(Top View)



D.14 CPCI-I/O CONNECTOR

	ROW "A"				ROW "B"				ROW "C"			
	#	Ref.	SIGNAL	I/O	#	Ref.	SIGNAL	I/O	#	Ref.	SIGNAL	I/O
	1	A1	/DRVDENS	-	1	B1	FGND	-	1	C1	/INDEX	IN
	2	A2	FGND	IN	2	B2	DRVSELA	-	2	C2	/MTR-ON2	IN
	3	A3	/STEP	O/D	3	B3	EDOUT	O/D	3	C3	HDOUT	O/D
	4	A4	/TRACK0	-	4	B4	FGND	-	4	C4	RD_DATA	-
	5	A5	DSKCHG	-	5	B5	/WR-PROT	-	5	C5	I2GND	IN
	6	A6	+5V	-	6	B6	KBMOUVC	-	6	C6	KBCLK	-
	7	A7	MOUCLK	T/S	7	B7	C	T/S	7	C7	SPEAKER	T/S
	8	A8	HD8A	T/S	8	B8	MOUDATA	-	8	C8	/DACKA	-
	9	A9	HD10A	T/S	9	B9	HD6A	T/S	9	C9	HD11A	T/S
	10	A10	HD2A	T/S	10	B10	HD4A	-	10	C10	HD1A	-
	11	A11	HD15A	T/S	11	B11	HD13A	T/S	11	C11	/IOWA	T/S
							HDGND					
J8 (P4)	15	A15	BALEA	-	15	B15		STS	15	C15	/IOCS16A	STS
	16	A16	HDA1A	STS	16	B16	IRQA	-	16	C16	/CS0A	-
	17	A17	HD7B	-	17	B17	HDA0A	I/O	17	C17	HD6B	I/O
	18	A18	HD5B	O/D	18	B18	HD8B	-	18	C18	HD4B	-
	19	A19	HD12B	-	19	B19	HD10B	T/S	19	C19	HD13B	T/S
	20	A20	HD0B	T/S	20	B20	HD2B	-	20	C20	/DACKB	-
	21	A21	IOCHRDYB	-	21	B21	HD15B	T/S	21	C21	IRQB	T/S
	22	A22	HDGND1	T/S	22	B22	BALEB	-	22	C22	HDA0B	-
	23	A23	/ACTIVEB	-	23	B23	HDA1B	T/S	23	C23	/IOCS16B	T/S
	24	A24	USBVCC	T/S	24	B24	HDGND	-	24	C24	USBDATA+	-
	25	A25	FWPOWER	-	25	B25	USBDATA-	STS	25	C25	FWP1+	O/C
-------	----	-----	----------	--------	----	-----	FWP1	--------	----	-----	----------	--------
	26	A1	-	-	26	B1	----------	-	26	C1	-	-
	27	A2	-12V	-	27	B2	-	-	27	C2	-5V	-
	28	A3	/IOCHK	-	28	B3	GND	-	28	C3	RESETDRV	-
	29	A4	SD5	-	29	B4	GND	-	29	C4	SD3	T/S
	30	A5	SD0	-	30	B5	SD4	-	30	C5	IOCHRDY	-
	31	A6	IRQ9	T/S	31	B6	+5V	-	31	C6	GND	T/S
	32	A7	GND	-	32	B7	DRQ2	T/S	32	C7	GND	-
	33	A8	SA19	T/S	33	B8	/SMEMR	-	33	C8	SA17	T/S
	34	A9	SA14	T/S	34	B9	SA18	T/S	34	C9	SA12	-
	35	A10	SA9	T/S	35	B10	SA13	-	35	C10	SA7	T/S
J5 (P5)	36	A11	SA4	T/S	36	B11	SA8	T/S	36	C11	SA2	-
	37	A12	GND	-	37	B12	SA3	-	37	C12	DRQ3	T/S
	38	A13	/REFRESH	T/S	38	B13	/DACK3	T/S	38	C13	SYSCLK	-
	39	A14	IRQ6	T/S	39	B14	GND	-	39	C14	IRQ4	T/S
	40	A15	T/C	T/S	40	B15	IRQ5	T/S	40	C15	OSC	-
	41	A16	LA23	-	41	B16	GND	-	41	C16	LA21	-
	42	A17	LA18	-	42	B17	LA22	-	42	C17	GND	-
	43	A18	SD8	-	43	B18	LA17	-	43	C18	SD10	-
	44	A19	SD13	-	44	B19	SD9	-	44	C19	SD15	-
	45	A20	/IOCS16	-	45	B20	SD14	-	45	C20	IRQ10	-
	46	A21	IRQ14	-	46	B21	GND	-	46	C21	/DACK0	-
	47	A22	/DACK5	-	47	B22	IRQ15	-	47	C22	/DACK6	-
			/DACK7	-			DRQ5	-			BALE	
							DRQ7					

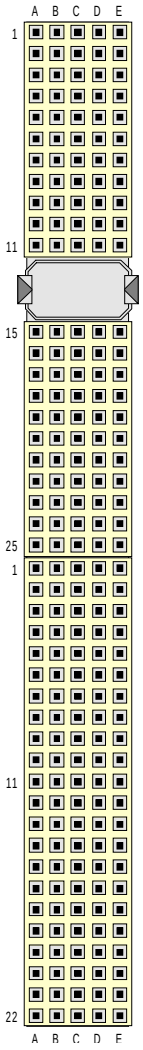
-	Nothing	O/C	Open Collector	STS	Sustained tri-state
IN	Input	O/D	Open Drain	T/S	Tri-State
I/O	In/Out	OUT	Output		

RSVxxx	Reserved Lines
BRSxxxx	Bussed Reserved Lines
VI/O	Connected to +5V

	ROW "D"				ROW "E"			
	#	Ref.	SIGNAL	I/O	#	Ref.	SIGNAL	I/O
	1	D1	/MTR-ON1	-	1	E1	DRVSELB	-
	2	D2	FGND	OUT	2	E2	/DIR-CTR	IN
	3	D3	/WR_DATA	-	3	E3	/WR-EN	O/D
	4	D4	FGND	IN	4	E4	HEAD-SEL	IN
	5	D5	I2CLK	-	5	E5	I2DATA	T/S
	6	D6	KBDATA	IN	6	E6	KBMOUGND	T/S
	7	D7	DREQA	-	7	E7	HD7A	T/S
	8	D8	HD9A	T/S	8	E8	HD5A	T/S
	9	D9	HD3A	-	9	E9	HD12A	T/S
	10	D10	HD14A	T/S	10	E10	HD0A	T/S
	11	D11	/IORA	-	11	E11	IOCHRDYA	T/S
J8 (P4)	15	D15	HDGND	-	15	E15	HDA2A	STS
	16	D16	/CS1A	STS	16	E16	/ACTIVEA	STS
	17	D17	DREQB	-	17	E17	HD9B	STS
	18	D18	HD11B	T/S	18	E18	HD3B	T/S
	19	D19	HD1B	-	19	E19	HD14B	T/S
	20	D20	/IOWB	T/S	20	E20	/IORB	T/S
	21	D21	HDGND	-	21	E21	HDA2B	T/S
	22	D22	/CS0B	T/S	22	E22	/CS1B	T/S
	23	D23	HDGND	-	23	E23	/HDRST	T/S
	24	D24	USBGND	T/S	24	E24	FWGND	STS
	25	D25	FWP2-	-	25	E25	FWP2+	-
-------	-----	-----	----------	--------	-----	-----	----------	--------
-	26	D1	--	-	26	E1	-	-
	27	D2	GND	-	27	E2	+12V	-
	28	D3	SD7	-	28	E3	SD6	-
	29	D4	SD2	-	29	E4	SD1	T/S
	30	D5	GND	T/S	30	E5	AEN	T/S
	31	D6	/0WS	-	31	E6	/SMEMW	T/S
	32	D7	/IOW	T/S	32	E7	/IOR	T/S
	33	D8	SA16	-	33	E8	SA15	T/S
	34	D9	SA11	T/S	34	E9	SA10	T/S
	35	D10	SA6	-	35	E10	SA5	T/S
	36	D11	SA1	T/S	36	E11	SA0	T/S
J5 (P5)	37	D12	/DACK1	-	37	E12	DRQ1	T/S
	38	D13	GND	T/S	38	E13	IRQ7	T/S
	39	D14	IRQ3	-	39	E14	/DACK2	T/S
	40	D15	GND	-	40	E15	/SBHE	-
	41	D16	LA20	-	41	E16	LA19	-
	42	D17	/MEMR	-	42	E17	/MEMW	-
	43	D18	SD11	-	43	E18	SD12	-
	44	D19	GND	-	44	E19	/MEMCS16	-
	45	D20	IRQ11	-	45	E20	IRQ12	-
	46	D21	DRQ0	-	46	E21	/MASTER	-
	47	D22	DRQ6	-	47	E22	+5V	-
			GND				GND	

PINOUT

(Top View)



E. BIOS SETUP ERROR CODES

E.1 POST BEEP

POST beep codes are defined in the BIOS to provide low level tone indication when an error occurs during the BIOS initialization.

Beep codes consist of a combination of long and short beeps. They are described as follows:

Beep Codes

Post code	Beep Code	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 reset.

LEGEND

Symbol	Description
*	1 Beep code
-	Silence

E.2 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".

E.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 the 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.

E.4 POST CODES

NOTE

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

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	

F. EMERGENCY PROCEDURE

Follow this procedure only in case of emergency such as a critical error occurred 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:

1. No POST code on a power up (when using a POST card).
2. TEKNOR BIOS extension is not present even if jumper W5 is not installed.
3. System stops at POST 41(when using a POST card) and associated beep code is generated (Refer to Section E.1).
4. Board does not boot, even after following all the steps indicated in the Read Me First section.

F.1 EMERGENCY PROCEDURE

To run an EMERGENCY PROCEDURE, proceed as follows:

1. Remove battery jumper (W8) even if it is set to internal or external.
2. Disable the Power Fail Detection function (W9 removed).
3. Be sure that your Supervisor I/O base address is set to 190h: jumper W3 (1-2, 3-4 shorted).
4. Install the EMERGENCY jumper (J5).
5. Connected a 1.44MB floppy drive (drive A) to the board, and insert the EMERGENCY diskette in it.
6. Power on the board. (Note that no VGA is present during this procedure.)
7. Boot block flash update will be completed when the POST code 55 is displayed (when using a POST card) or the associated beep code sounds (indicated in Section E-5).
8. After the procedure is successfully completed, power down the board, remove the EMERGENCY jumper (W5), install your battery and Power Fail Detection jumpers. Set the Supervisor I/O base address as it was previously and power up the board.

   The boot block flash BIOS should be correctly programmed and the system should run properly.

NOTE

If the emergency disk has been lost, see section F.2 Generate a Emergency Floppy Diskette.

F.2 GENERATE AN EMERGENCY FLOPPY DISKETTE:

Use a system that has a 1.44 Mbytes 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.
5. The program may display one of the following messages:

   "Emergency Code transferred"
   The emergency diskette has been successfully created. Take the appropriate actions and restart from the step 4) when you see the following messages.

   "Write to disk failure!"
   Verify if your floppy diskette is write-protected.

   "The file to program in flash was not found"
   Be sure that EMERDISK.TEK file is in your current path.

   "Unable to read the binary file" or "Unable to close the opened file"
   Possible floppy diskette corruption or bad data transfer between floppy disk and host system.

   "Unable to allocate a memory block of 256 Kbytes"
   Not enough memory to run the WDISK program.

G. LIST OF APPROVED VENDORS

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

G.1 DRAM (U18,19,20,22)

EDO and FPM DRAM devices with parity bit and page mode at 70ns maximum access time are recommended. Please refer to the following list to see examples of recommended manufacturers and devices.

The following table shows examples of recommended devices supported by the board. Many other models are also available and function equally well. Users are encouraged to check with their local distributors for comparable substitutes.

DIMM	VENDOR	PART NUMBER
2M*72 (ED0) - 16MB modules (SPD EPROM, ECC)	ROCKY MOUNTAIN RAM	2x72CEQ
4M*72 (SDRAM) - 32MB modules	ROCKY MOUNTAIN RAM	4x72CQ2x8S4E
4M*72 (ED0) - 32MB modules (SPD EPROM, ECC)	ROCKY MOUNTAIN RAM	4x72CEQ
8M*72 (ED0) - 64MB modules (SPD EPROM, ECC)	ROCKY MOUNTAIN RAM	8x72CEQ
16M*72 (SDRAM) – 128MB modules	ROCKY MOUNTAIN RAM	16x72CQ8x8S4E
16M*72 (ED0) - 128MB modules (SPD EPROM, ECC)	ROCKY MOUNTAIN RAM	16x72CEQ

G.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**
Fan Connector (J10)	Leoco 2530 S020013 (housing), Leoco 2533 TCB00A0 (crimp); Molex 22-01-3027 (housing), Molex 08-50-0114 (crimp).
Multi-Function (J2)	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)	Amp 746285-1 [499252-5*], Robinson Nugent IDS-C10PK-TG, Thomas & Betts 622-1030 [622-1041*]. (10-pin flat cable connector).
Parallel Port (J3)	Amp 746285-6 [optional strain relief: 499252-3], Robinson Nugent IDS-C26PK-TG, Thomas & Betts 622-2630 [optional strain relief: 622-2641]. (Polarized IDC female socket connector).

* optional strain relief part number shown in square brackets

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: the TEKNOR Invoice #, your Purchase Order #, and the Serial Number of the defective board.

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**

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

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP