




PCI-936

PENTIUM PROCESSOR PCI-ISA SBC
Technical Reference Manual
Version 2 . 3 (Jul 2002)

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ftp://ftp.kontron.ca/support/Product_Manuals/



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FOREWORD

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READ ME FIRST

WARNINGS

Take heed of these warnings that concern the PCI-936:



Installing a Processor

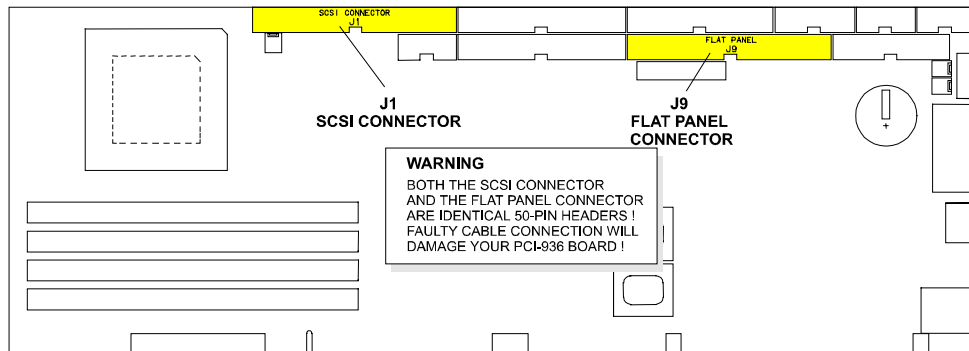
Careful attention should be taken when installing a processor:
Faulty jumper settings may definitely damage your processor.



SCSI & Flat Panel 50-Pin Connectors

Careful attention should be taken when connecting SCSI or Flat Panel cables to the PCI-936 board, since both the **J1** SCSI connector and the **J9** Flat Panel connector are 50-pin headers.

Faulty connections will damage the PCI-936 board!





Adapter cables

When connecting Serial Ports, the use of Taiwanese adapter cables is not recommended, since the pinout is often incorrect. The direct crimp design offered by KONTRON allows the simplest cable assembly. All these cables are available from KONTRON by contacting the Sales department.

IMPORTANT INFORMATION

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



Powering up the system

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

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



Battery Configuration

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



Exercise Caution while Replacing Lithium Battery

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.



Preventing Viruses

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

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

CHANGES BETWEEN REVISIONS OF THE BOARD



Changes Between Revision 1 And Revision 0

- USB Connector (J7) pinout modified to meet “Industry Standard”.
- Feature Connector (J11) replaced by VPORT.
- Thermal Management is supported
- Support of external 8-bit VPORT via 26-pin male header (J11).
- Support 3.3-Volt and 5-Volt Flat Panel.
- Standard 4-pin PS/2 mouse header (J25) added.
- Jumper W24 (Voltage Level Selection for Flat Panel) added.
- Jumper W1 (First-Level Cache Write-Back Write-Through Selection) removed.



Changes Between Revision 2 And Revision 1

- Rev. 2 boards support Pentium MMX 166/200/233 and K6 166/200 processors

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PART

1

PRODUCT DESCRIPTION

- 1. PRODUCT OVERVIEW**
 - 2. FEATURES**
 - 3. COMPATIBILITY WITH KONTRON PRODUCTS**
-

1. PRODUCT OVERVIEW

The PCI-936 is a Pentium / K6 (Intel / AMD) PCI and PC/AT compliant industrial Single Board Computer (SBC) based on the full size PC/AT card with onboard video capabilities.

The board may be installed into a standard passive ISA backplane, or into a PCI Industrial Computer Manufacturers Group (PICMG) passive PCI-ISA backplane.

The SBC and backplane assembly is used as a substitute for the standard PC motherboard, and in general includes all of the standard interfaces and peripherals that are normally included in a top of the line PC.

This compact solution allows an industrial user the possibility of designing a system that uses standard x86 software and peripherals, but in an industrial environment where reliability, integration and service are of major concern.

The PCI-936 uses Intel 430 HX (Triton II) chipset. This chipset is fully compliant with the PCI Local Bus Specification, Revision 2.1, and is implemented with a north & south bridge architecture. A full implementation of the PCI revision 2.1 specification allows the PCI-936 to efficiently use the PCI bus.

2. FEATURES

The PCI-936 includes the following features:

- **Microprocessor supported** (maximum internal CPU clock speed):
 - Intel Pentium: 100, 120, 133, 150, 166 and 200MHz
 - Intel Pentium MMX: 166, 200 and 233MHz
 - AMD K6: 166 and 200MHz
- **Cache:** The PCI-936's cache is implemented with synchronous SRAM. This feature enhances the operation of the circuit by eliminating wait states on cache accesses. Cache size options include 256KB and 512KB.
- **Intel Triton II Chipset:**
 - Flexible CPU interface including full write-back internal and external cache operation.
 - Concurrent CPU/cache and PCI/DRAM operation.
 - Synchronous Pipelined Burst SRAM cache.
 - EDO as well as Fast Page Mode DRAM access.
 - Parity or ECC support.
 - Full functional compliance of the PCI interface.
 - Enhanced IDE support.
 - Plug and Play compatibility.
 - Power management.
 - Supervisor Utilities.
 - USB Support
- **Video:** The PCI-936 is implemented with advanced video functions including the C&T 65550 video chip from the Chips & Tech family. It offers significant improvements over previous generation devices. Its features are:
 - 64-bit graphics engine.
 - Video playback acceleration.
 - 24-bit color video DAC.
 - Hardware Windows acceleration.
 - 32-bit PCI host interface.
 - Supports non-interlaced CRT resolutions up to 1280 x 1024 pixels (256 colors).
Compatible with CGA, EGA, Hercules, MDA, VGA, SVGA, XGA, and SXGA.
 - Supports Flat Panel resolutions up to 1024x768x64K Colors.
 - Simultaneous CRT/Flat Panel Capability.
 - Supports video memories up to 2MB.
 - VPORT (Asynchronous Digital Video) support.

- **System Memory:**
 - Four vertical 72-pin SIMM sockets support DRAM memory configurations from 8 to 512 MB.
 - Uses standard 5V, 70ns/60ns single-sided or double-sided 72-pin SIMMs.
 - Supports 1Mx36, 2Mx36, 4Mx36, 8Mx36, 16Mx32, 32Mx32 modules.
- **Flash Disk:** includes a bootable Flash Disk device with capacities of 2 or 4 MB.
- **Bus Support:**
 - ISA Bus (IEEE P966 Specification). High-drive buffers let the PCI-936 drive up to 20 slots.
 - PCI Local Bus Specification, Revision 2.1.
- **PICMG interface:** This includes an interface to the ISA bus and the PCI bus. The PCI-936 can support memory data streaming up to 112MB/s. The PCI-936 provides concurrent PCI master and CPU/DRAM operations. It also implements “delayed transaction” to increase the availability of the PCI bus.
- **Enhanced IDE interface:** Enhance IDE controller can drive up to four IDE devices with transfer rates up to 22MB/s. The PCI-936 includes two separate IDE data bus and control signals.
- **SCSI interface:** This interface is implemented with a PCI Ultra SCSI controller. The circuit uses a Symbios 53C860 controller to perform this function.
- **Ethernet:** 100Base-Tx or 10 Base-T interface is implemented with Intel’s 82557 Ethernet Controller. The IC resides on the PCI bus, which allows very high transfer rates to and from DRAM.
- **Operating Systems:** Runs all operating systems developed for x86 processors: DOS, Windows 3.1, OS/2, Windows 95, Windows NT, UNIX, QNX and NOVELL 4.10, etc.
- **BIOS and license:** Award CPU BIOS, Chips & Tech Video BIOS, Symbios SCSI BIOS.

3. COMPATIBILITY WITH KONTRON PRODUCTS

The PCI-936 is a direct spin-off of the VIPer820 and T1000 products and is Kontron's answer to Triton II customer requests.

The board supports processor speeds of up to 233MHz. The major difference between the PCI-936 and previous full size PCI boards is the Triton II chipset, the 100 Base-Tx Ethernet and the USB Support.

The PCI-936 meets these specifications while using the same form factor as the PCI-933 (i.e., PC/AT and PICMG), except for flat panel interface, which is compatible with that of PCI-932. The assembly includes an onboard switching regulator to provide power to the Pentium CPU, which results in a more efficient use of power.

This SBC is designed to plug into a standard passive ISA backplane, or into an industry standard PICMG passive backplane.

CONNECTING AND INSTALLING

PART **2**

- 4. STATIC ELECTRICITY PRECAUTIONS**
 - 5. UNPACKING**
 - 6. INSTALLING AND WORKING WITH SYSTEM COMPONENTS**
 - 7. INSTALLING STORAGE DEVICES**
 - 8. INSTALLING VIDEO**
 - 9. INSTALLING PERIPHERALS**
 - 10. INSTALLING ETHERNET**
-

4. STATIC ELECTRICITY PRECAUTIONS

Since static electricity can damage a board, the following precautions should be taken whenever you handle the PCI-936:

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

5. UNPACKING

Follow these recommendations while unpacking:

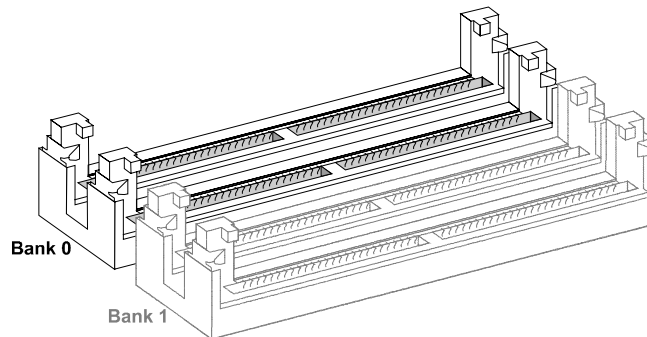
- û Observe the Static Electricity Precautions (Section 4).
- û After opening the box, save it and the packing material for possible future shipment.
- û Remove the board from its antistatic wrapping and place it on a grounded surface.
- Inspect the board for damage. If there is any damage, or items are missing, notify Kontron immediately

6. INSTALLING & WORKING WITH SYSTEM COMPONENTS

6.1. INSTALLING SYSTEM MEMORY

6.1.1 72-PIN SIMM CONFIGURATION AND LOCATION

The memory sockets consist of four 72-pin vertical SIMM (Single In-line Memory Module) sockets divided into two banks labeled: Bank 0 (U22 and U27) and Bank 1 (U31 and U36).



At least 8 MB of system memory (2 SIMMs or 4) must be installed on the PCI-936 for proper operation. Memory can be configured from 8 MB to 512 MB on the PCI-936 board using 32-bit or 36-bit SIMM devices.

Each of the 72-pin vertical SIMM sockets on the board can accept the following 32-bit or 36-bit modules:

1M x 32-bit / 36-bit = 4MB module
2M x 32-bit / 36-bit = 8MB module
4M x 32-bit / 36-bit = 16MB module

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

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

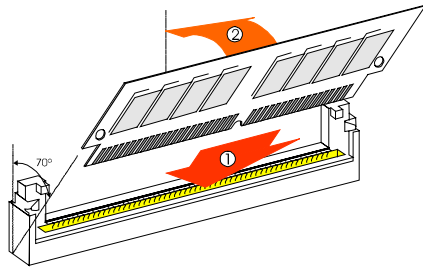
DRAM devices with parity bit and page mode at 70ns maximum access time are recommended. Consult Table 6-1 to see examples of recommended DRAM devices on the PCI-936. Many other models are available and function equally well. Users are encouraged to check with their local distributors for comparable substitutes.

TABLE 6-1: Recommended DRAM Devices

DRAM	Vendor	Part Number	DRAM	Vendor	Part Number	
1M*36	MICRON	MT9D136M-7	16M*32	UNIGEN	UG232E3244HKG-6	
	NEC	MC-4210000A36B-70				
	SAMSUNG	KMM5361000B-7	4M*36	HYUNDAI	HYM536410AM-70	
	TI	TM124MBK36R-70				
TOSHIBA	THM361020AS-70	MITSUBISHI				MH4M36ANXJ-7
2M*36	HITACHI	HB56D236B2-7C	NEC	MC-424000A36BH-70		
	HITACHI	HB56D236BS-7BC				
	HITACHI	HB56D236BW-7B	NEC	MC-424000A36BJ-70		
	HITACHI	HB56D236BW-7C				
	HYUNDAI	HYM536220W-70	SAMSUNG	KMM5364100-7		
	MICRON	MT18D236M-7				
	NEC	MC422000A36B-70	TOSHIBA	THM3640205-70		
	SAMSUNG	KMM5362000B-7				
	TOSHIBA	THM362040AS-60	8M*36	HITACHI	HB56D836BR-70A	
	TOSHIBA	THM362040AS-70				
			TOSHIBA	THM368020S-70		
		TOSHIBA	THM368020SG-70			
		32M*32	UNIGEN	UG216E3264HKG-6		

6.1.2 SIMM INSTALLATION

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



- With the board flat on the table, turn it so that the sockets are at the end of the board closest to you.
- Hold the module with the notch on the bottom right facing you, and insert the connector into the socket at a 70° angle from the board. Always start inserting the module in the socket nearest the center of the board. Then work your way by inserting the other modules, one by one, towards the exterior edge of the board.
- Snap the module to a vertical position in the socket. The module is fully inserted when the retaining pegs snap into the holes at each end of the module.

To remove the SIMMs from the sockets, pull on the retaining pegs 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:

TABLE 6-2: PCI-936 SIMM Configurations: 8MB - 256MB

SYSTEM MEMORY	U31	U36	U22	U27
	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)

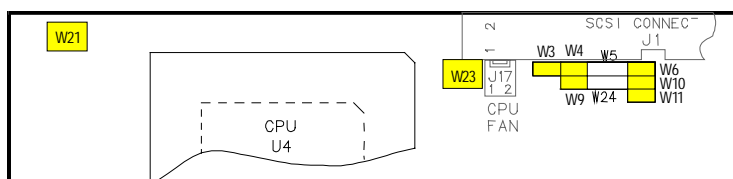
36-bit modules are shown, however 32-bit modules are supported.

6.2. INSTALLING MICROPROCESSOR & FAN

Normally, your PCI-936 will be installed with one of the available Pentium, Pentium MMX or K6 processors and its cooling fan. However, it may be necessary to reinstall or reconfigure your board.

6.2.1 INSTALLING MICROPROCESSOR

The location of the microprocessor and related jumpers are shown as follows:



W4 and W9

Select the desired multiplier for the internal CPU clock speed: 1.5x, 2x, 2.5x, 3x or 3.5x

W21

Selects the CPU type - Single supply or Split plane CPU.

W3, W6, W10 and W11

Select the desired external CPU clock (Bus) speed: 50MHz, 60MHz or 66MHz

W23

Selects the CPU core voltage: 2.5V, 2.8V, 2.9V, 3.3V.

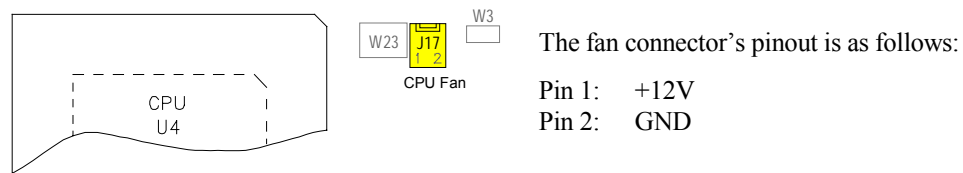
All of the possible configurations of CPU related jumpers appear on the following table:

	W4	W9	W3	W6	W10	W11	W21	W23
Intel Pentium 100	Off	Off	On	Off	On	On	3-5 / 4-6	3-5
Intel Pentium 120	On	Off	Off	On	Off	Off	3-5 / 4-6	3-5
Intel Pentium 133	On	Off	On	Off	On	On	3-5 / 4-6	3-5
Intel Pentium 150	On	On	Off	On	Off	Off	3-5 / 4-6	3-5
Intel Pentium 166	On	On	On	Off	On	On	3-5 / 4-6	3-5
Intel Pentium 200	Off	On	On	Off	On	On	3-5 / 4-6	3-5
Intel Pentium 166-MMX	On	On	On	Off	On	On	1-3 / 2-4	4-6
Intel Pentium 200-MMX	Off	On	On	Off	On	On	1-3 / 2-4	4-6
Intel Pentium 233-MMX	Off	Off	On	Off	On	On	1-3 / 2-4	4-6
AMD K6-166	On	On	On	Off	On	On	1-3 / 2-4	2-4
AMD K6-200	Off	On	On	Off	On	On	1-3 / 2-4	2-4

6.2.2 FAN CONNECTOR

The fan connector appears as follows:

DIAGRAM 6-1: J17 Fan Connector



The following list includes approved vendors for the J17 connector's mating parts:

- Leoco 2530 S020013 (housing),
- Leoco 2533 TCB00A0 (crimp);
- Molex 22-01-3027 (housing),
- Molex 08-50-0114 (crimp).

6.3. ENABLING CACHE MEMORY

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

System cache is enabled and configured in the AWARD BIOS Setup program (details in Section 14 - Software Setup).

6.4. SELECTING BIOS BOOT OPTIONS

By default, the PCI-936 boots with the BIOS contained into the Boot Block Flash. The Boot Block Flash consists in a flash memory device with verification and protection features that 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.

In the case of a BIOS corruption, the PCI-936 provides an emergency boot jumper (J13). When the emergency boot is enabled (jumper J13 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).

6.5. INSTALLING SUPERVISOR UTILITIES

6.5.1 SUPERVISOR I/O REGISTERS

Two supervisor I/O registers are provided to set and control special features of the board such as: watchdog, Flash, RS-485, and power fail output. These registers are two 8-bit registers that can be located at three different I/O addresses, 190h/193h, 290h/293h or 390h/393h, using the J19 jumper. Each register is bit read and write accessible; however, some are reserved for internal requirements. They are described as follows:

TABLE 6-3: Register 190H, 290H or 390H

Bit #	Bit Value *	Function	WRITE mode:	READ mode:
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		W22 (7-8) Status
5	0	Reserved		W22 (5-6) Status
6	1	Reserved		W22 (3-4) Status
7	0	Reserved		W22 (1-2) Status

* Default values

TABLE 6-4: Register 193H, 293H or 393H

Bit #	Bit Value *	WRITE Function:	READ Function:
0	0/1	Reserved ** R/W	Reserved
1	0/1	Reserved ** R/W	Reserved
2	1	Dual Stage Watchdog R/W ; 1: Disable 0: Enable	Same
3	1	Clear History ; 1: Normal 0: Clear	1: Last reset caused by watchdog
4	0	Reserved	1: Last reset caused by push-button reset
5	0	Reserved	0: First level watchdog timed out
6	0/1	Reserved	Reserved, SADI
7	0	Reserved* R/W	Reserved

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

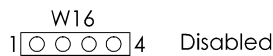
As the supervisor I/O registers provide features associated to the TEKNOR Extension, the TEKNOR Extension mode must be enabled using the W22 jumper which controls the extended BIOS modes of the board (refer to Section 12 - Setting Jumpers).

6.5.2 POWER FAIL DETECTION

Power failure conditions may be detected if a low backup battery condition occurs, or the monitored +5V power supply falls below 4.75V.

If either of the two above conditions occur, the PFO (Power Fail Output signal) goes low. To generate a non-maskable interrupt (NMI) when the PFO goes low, set W16 jumper to position 1-2.

W16 IOCHK Select



6.5.3 WATCHDOG DETECTION

The single stage watchdog time-out detector is used to monitor the output of the first stage watchdog time-out.

To generate a non-maskable interrupt (NMI) when the first stage watchdog times out, set the W16 jumper to position 3-4.


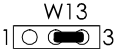

6.5.4 WATCHDOG TIMERS

The Watchdog is used to control the CPU inactivity. It functions according to a specified duration of inactivity from when it will reset the CPU.

The watchdog can be: Dual-Stage, Single-Stage, or disabled, using W13 jumper for setting.

Jumper W13 must be installed to enable one watchdog configuration. If removed, the watchdog is disabled.

The W13 settings are shown below (* = initial setting):

W13	Watchdog Timer		Dual-Stage Watchdog
			Single-Stage Watchdog
			Watchdog Disabled

Single Stage Watchdog:

The first stage Watchdog must also be enabled and refreshed by software. To enable the first stage Watchdog by software, first write "1" in bit "0" at address 190H (or at 290H or 390H depending on the W19 jumper setting).

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

Following a reset, the Watchdog is always disabled.

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



Caution:

The user program must provide the first access to address 190H (or at 290H or 390H depending on the W19 jumper setting), and must also include the refresh routine. In addition, be certain to keep a mirror image of register 190H (or 290H or 390H) when programming it. This is necessary since the register is a write-only user register and, as a result, is not used by the system BIOS.

Dual Stage Watchdog

The dual stage watchdog consists of two watchdogs (MAX691) in cascade and is enabled and refreshed similarly to the single stage watchdog.

To enable the dual stage watchdog, first write “1” in bit “0” at address 190H (or at 290H or 390H, depending on the W19 jumper setting). Then write “0” in bit “2” at address 193H (or at 293H or 393H, depending on the W19 jumper setting).

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

If a hardware or software failure occurs such as the first Watchdog is not refreshed, its time-out output (WDO1), when tied to ISA’s IOCHK signal (jumper W16 set to 3-4), can be used to generate a NMI to the CPU. In this case, the interrupt service routine could try to correct the failure and re-enable pulses to the first Watchdog. The service routine has 1.6 second to resume normal operation of the system otherwise the second Watchdog times-out and resets the system.

TABLE 6-5: Watchdog Timer Register

Address		Status	Register
190H, 290H OR 390H:	Bit 0	Read/Write	Watchdog enable
190H, 290H OR 390H:	Bit 1	Read/Write	Watchdog refresh
193H, 293H OR 393H:	Bit 5	Read Only	First Stage Watchdog Status 1: Normal 0: Timed Out

6.5.5 SYSTEM RESET HISTORY STATUS

A special circuit allows the user to determine the cause of the last system reset. The bits 3 and 4 at address 193H or (293H or 393H) record the following possibilities:

TABLE 6-6: System Reset History Status

Bit 4: PBRES	BIT 3: WDO	Description
0	0	Normal Operation
0	1	Watchdog caused the last system reset
1	0	Push-button reset caused the last system reset
1	1	Undetermined

To reset the status, write “0” the “1” in bit “3” at address 193H or (293H or 393H). After this operation, PBRES (bit 4) and WDO (bit 3) should be set to “0”. The bits are also reset after a power-up.

6.6. INSTALLING PCI-936 IN PASSIVE BACKPLANE

The PCI-936 will operate on any PCI-ISA passive backplane, provided it complies with the PCI INDUSTRIAL COMPUTER MANUFACTURERS GROUP, Revision 2.1 specification. The board may be installed into a TEK-950 PCI-ISA Passive Backplane, which has three PCI slots, five ISA slots, and a PCI-ISA for the Industrial Single Board Computer.

Since the PCI-936 is also fully IBM AT compatible, it can also be installed on any standard ISA passive backplane, if PCI expansion slots are not needed.

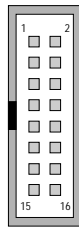




Note:

The PCI-936 chipset does not support address stepping (described in the PCI Local Bus Specification). To ensure proper detection of PCI adapter cards, 33Ω or less resistors should be used on the backplane’s ID SELECT signal address lines (between the CPU slot and each PCI slot. All Kontronm PCI backplanes include this specific feature. For more information, contact Kontron’s Technical Support department.

6.7. CONNECTING INTERFACE DEVICES (KEYBOARD, SPEAKER, RESET, LED)

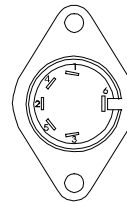
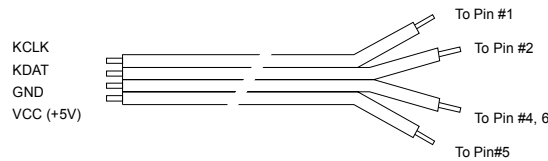
Connector J4 provides all the necessary signals for connecting the keyboard, speaker, reset, and keylock interface devices. It is described as follows:



	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

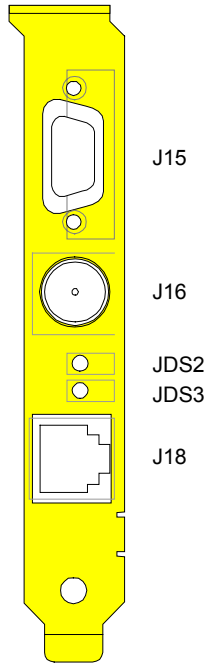
Note 1: Connecting Keyboard on 5-pin female DIN



(Connector back view)

The following list includes approved vendors for the J4 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).



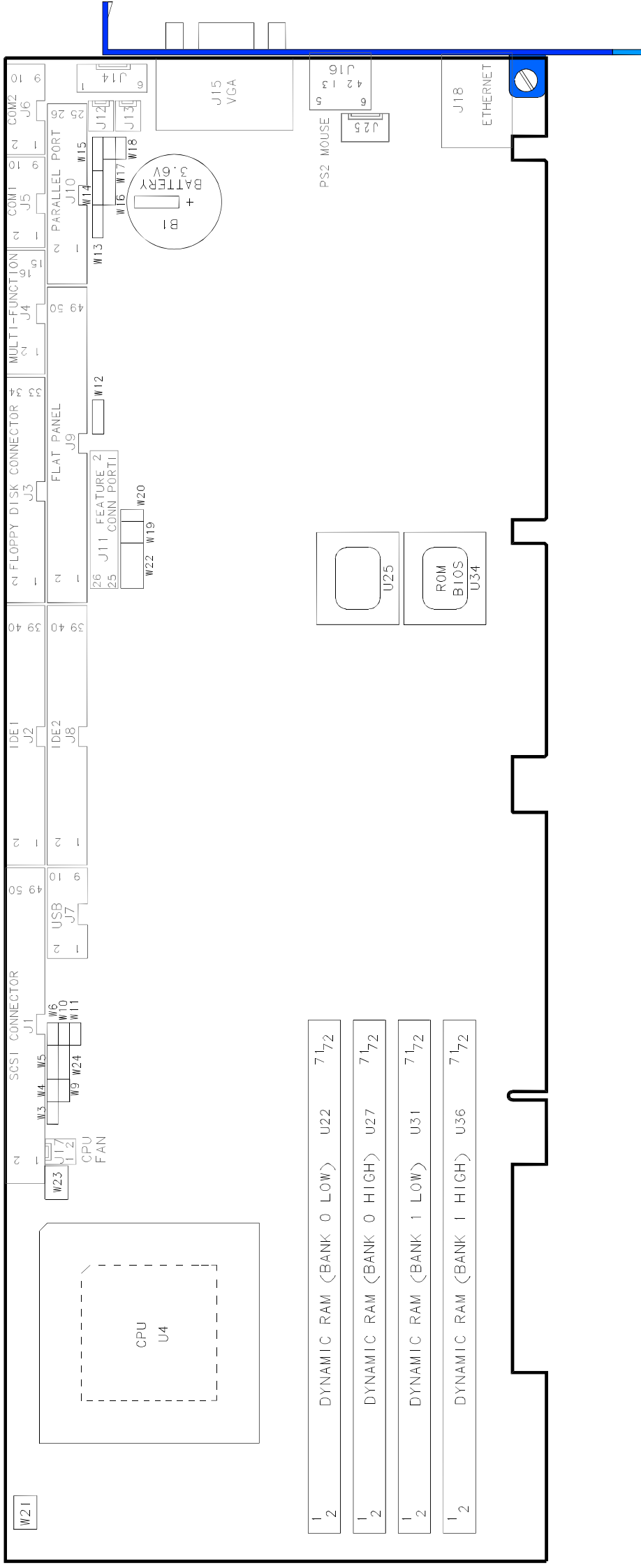
6.8. CONNECTING A MONITOR

The CRT monitor connects directly to J15: standard VGA DB15 female connector.

6.9. CONNECTING A MOUSE

The PS/2 mouse may be directly connected to a standard connector (J16) available on the board's bracket. Mouse signals are also available through the J25 4-pin header.

SYSTEM COMPONENT OVERVIEW



- 1 2 DYNAMIC RAM (BANK 0 LOW) U22 7 1/2
- 1 2 DYNAMIC RAM (BANK 0 HIGH) U27 7 1/2
- 1 2 DYNAMIC RAM (BANK 1 LOW) U31 7 1/2
- 1 2 DYNAMIC RAM (BANK 1 HIGH) U36 7 1/2

7. INSTALLING STORAGE DEVICES

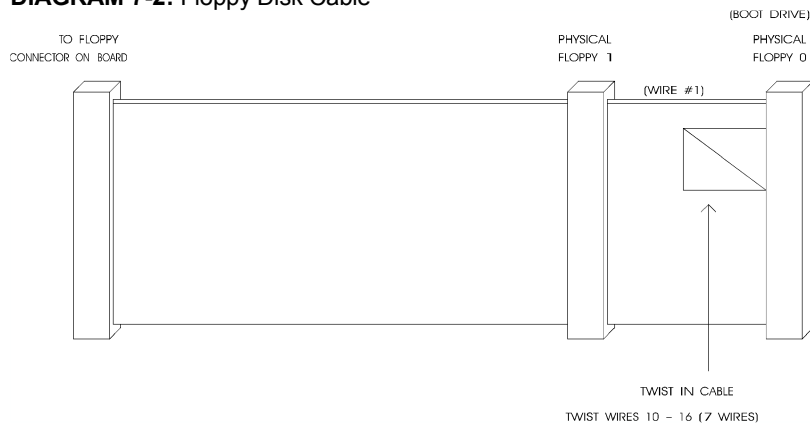
7.1. CONNECTING A FLOPPY DRIVE

The installation of the floppy drives is done via a standard IBM 34-pin flat ribbon cable that connects to J3.

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

- Amp 746285-8 [optional strain relief: 499252-6],
 - Robinson Nugent IDS-C34PK-TG,
 - Thomas & Betts 622-3430 [optional strain relief: 622-3441].
- (34-pin flat cable connector).

DIAGRAM 7-2: Floppy Disk Cable



7.1.1 FLOPPY SOFTWARE SETUP

AWARD Setup

Starting from the AWARD Setup program main menu, use the following procedure to complete the setup:

- From the Main Menu, select the Standard CMOS Setup option.
- In the Standard CMOS Setup menu, use the arrow keys to highlight the Drive A: or Drive B: option (depending on the installation of your Floppy drive).
 - Select the category identifying the types of Floppy disk drive A or drive B that have been installed in the computer.

TABLE 7-1: Floppy Drive options

Option	Description
None	No Floppy drive installed.
360KB, 5.25 in.	5-1/4 inch PC-type standard drive; 360KB capacity.
1.2MB, 5.25 in.	5-1/4 inch AT-type high-density drive; 1.2MB capacity.
720KB, 3.5 in.	3-1/2 inch double-sided drive; 720KB capacity.
1.44MB, 3.5 in.	3-1/2 inch double-sided drive; 1.44MB capacity.
2.88MB, 3.5 in.	3-1/2 inch double-sided drive; 2.88MB capacity.

7.1.2 FLOPPY CONNECTOR PINOUT

Please refer to the J3 Floppy connector's pinout in Section D-7 (Connector Pinouts).

7.2. ENHANCED IDE DEVICES

7.2.1 ENHANCED IDE CONNECTORS LOCATION & HOOK-UP

For hooking up either IDE connector, a 40-pin dual row header signal connector is required. This connector handles all command, data and status I/O lines. Its maximum cable length is 18 inches. It connects directly with the onboard 40-pin male header connector at J2 or J8.

The following list includes approved vendors for the J2 and J8 connectors' mating parts:

- Amp 746285-9 [optional strain relief: 499252-1],
- Robinson Nugent IDS-C40PK-TG,
- Thomas & Betts 622-4030 [optional strain relief: 622-4041].
(40-pin flat cable connector).

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

Attach one end of the SCSI cable to the J1 SCSI 50-pin connector. Make sure line 1 of the cable is matched with pin 1 of connector J1.

Attach the other end to your SCSI device, making sure line 1 is matched with pin 1 on your device.

You must also install a cable from your power supply to your SCSI device.

7.3.1.4. Software setting

Follow installation instructions provided with your SCSI peripheral device.



Caution:

Each device must be assigned a unique identifier called a SCSI Target ID. The lower the ID, the lower the priority level of the device in the SCSI subsystem. The host adapter is usually assigned the highest priority level (15 or 7). Table 7-4 lists common SCSI Target IDs.

To change SCSI parameters, press CTRL-C when prompt during boot-up.

TABLE 7-2: Common SCSI Target IDs

SCSI Device	Commonly Used IDs
Host Adapter	15 or 7
Hard Disks	0,1,2,3
CD-ROM	4,5
Tape drive	5,6

7.3.2 INSTALLING OTHER SCSI DEVICES

To install any of the following: CD-ROM, Magneto-Optical/Removable Disk Drive, Tape Drive, Write Once Read Many (WORM) and scanners, please use the SCSI diskette that you received with your PCI-936. A special utility will install all the necessary drivers.

8. INSTALLING VIDEO

8.1. VIDEO CONTROLLER

8.1.1 INSTALLING VIDEO DRIVERS

The video controller has specific drivers for various operating systems. Drivers, must be installed using the Utility Disk containing the video drivers, which came with your PCI-936. For any driver that is not on the Utility Disk, please contact the Technical Support department.

8.1.2 DISABLING VIDEO CONTROLLER

The video controller can be disabled by shorting pins 7 and 8 on the W22 jumper.

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

8.2. INSTALLING CRT VIDEO DISPLAY

8.2.1 CONNECTING CRT VIDEO DISPLAY

The CRT display connects directly to the standard VGA DB15 female on the edge bracket.

The complete connector pinout is given [Section C-3](#).

8.2.2 VPORT

The PCI-936 supports an external 8-bit VPORT via 26-pin male header. This VPORT is compatible with Kontron's VIPer vision TEK-380 interface, but the PCI-936 board does not provide mounting holes for attachment of the TEK-380. The TEK-380 can be connected through a ribbon cable and the power is supplied by the VPORT connector.

8.3. FLAT PANEL

8.3.1 FLAT PANEL CONNECTOR PINOUT

When connecting a flat panel, customized cable is needed to connect the panel to the board. The pinout of this cable depends on the Flat Panel model you use.

8.3.2 FLAT PANEL INSTALLATION

The myriad of Flat Panel displays available makes it virtually impossible for us to show every type of configuration that exists. For your convenience, we have published the PCI-936 FLAT PANEL CONFIGURATION GUIDE; this handy manual charts out the cabling, jumper settings, and other special requirements for some of the most popular displays.

The name of the Flat Panel BIOS file (.BFP extension) to be used to update the Flash EPROM BIOS is also included in that guide; refer to Section 17 to perform a VGA BIOS file update with the UBIOS software.

8.3.2.1. FLAT PANEL POWER SUPPLY SELECTION

PCI-936 supports 3.3-Volt and 5-Volt power for flat panel. The selection of the flat panel power supply using the jumper W24 setting are shown below.



Please contact our Sales or Technical Support departments for more information on Flat Panel applications.

9. INSTALLING PERIPHERALS

9.1. SERIAL PORTS

Two serial ports are provided on the TEK-936. They are 16C550 compatible serial ports which have internal 16-byte FIFO buffers for more efficient data transfers.

Serial Port 1 is buffered for RS-232 operations, while Serial Port 2 may be set as RS-232 or RS-422/RS-485.

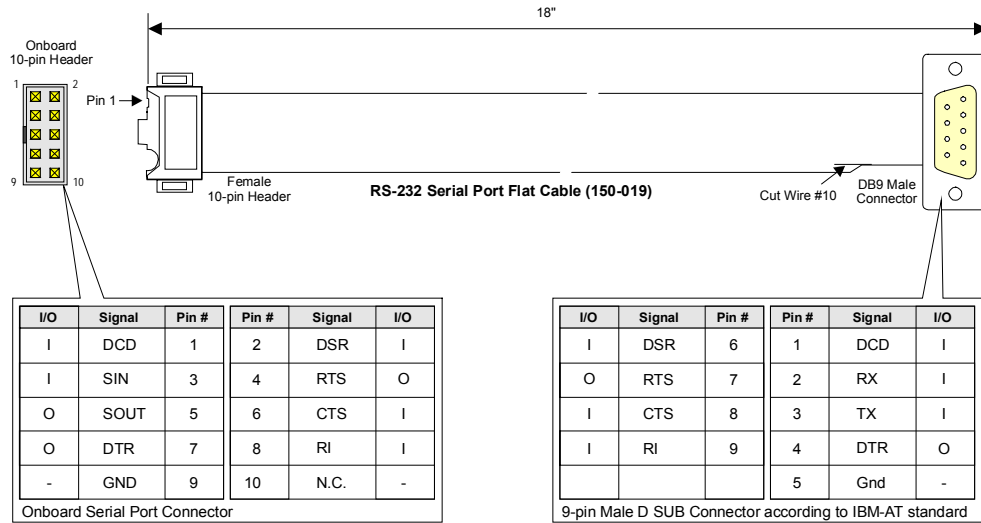
The following list includes approved vendors for the J5 and J6 connectors' mating parts:

- Amp 746285-1 [optional strain relief: 499252-5],
- Robinson Nugent IDS-C10PK-TG,
- Thomas & Betts 622-1030 [optional strain relief: 622-1041].
(10-pin flat cable connector).

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

9.1.1 Serial Port 1 (J5) RS-232

The Serial Port 1 is configured as RS-232. With the IBM 9-pin DSUB Standard, Serial Port 1 is 100% compatible with the IBM-AT serial port.



Kontron offers a 10-pin header to 9-pin DSUB cable for IBM-AT compatibility. This can be purchased from Kontron or a cable can be made with a flat cable, a 10-pin flat cable crimp header and a 9-pin DSUB flat cable crimp connector.



Note:

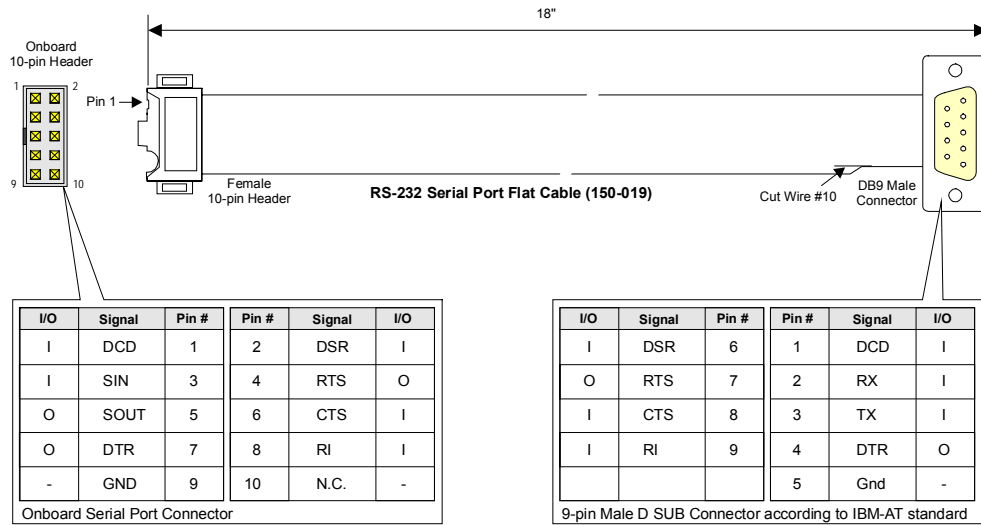
The use of Taiwanese adapter cables is not recommended, since the pinout is often incorrect. The direct crimp design offered by Kontron allows the simplest cable assembly. All these cables are available from Kontron by contacting the Sales Department.

9.1.2 Serial Port 2 (J6)

By default, the Serial Port 2 is set as RS-232. In this configuration, it functions the same as Serial Port 1, with the same pinout. However, the Serial Port 2 may be set for RS-422/RS-485 operations, using the VIP-UP application.

9.1.2.1. RS-232 Mode

As an RS-232 port, and with the IBM 9-pin DSUB Standard, Serial Port 2 is 100% compatible with the IBM-AT serial port. To output RS-232 signals from the 10-pin onboard connector to a 9-pin DSUB connector, please refer to the following diagram:



Kontron offers a 10-pin header to 9-pin DSUB cable for IBM-AT compatibility. This can be purchased from Kontron or a cable can be made with a flat cable, a 10-pin flat cable crimp header and a 9-pin DSUB flat cable crimp connector. The direct crimp design offered by Kontron allows the simplest cable assembly. All these cables are available from Kontron by contacting the Sales department.

9.1.2.2. RS-422/RS-485 Mode

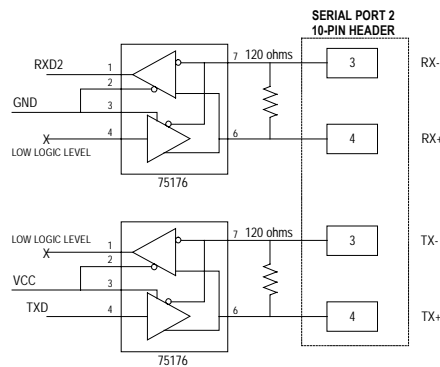
When configured for RS-422/RS-485 operations, the Serial Port 2 can transmit and receive differential signals, in either full-duplex or party line communication.

Communicating with differential signals requires a pair of wires for the transmission and a pair of wires for the reception (RS-422). For a better noise rejection, the use of twisted pair cable is highly recommended. This will enable faster serial transmissions over greater distances than with the common RS-232 protocol.

When using RS-422/485 mode, Serial Port 2 requires hardware and software settings:

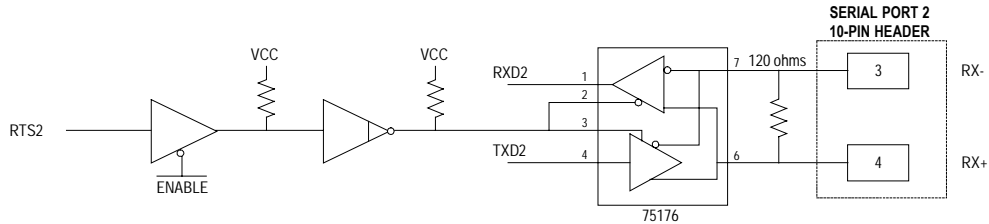
- . If required, use W17 and W18 jumpers to connect the RS-485 termination resistance (RS-485 only)
- . Select a logical COM port and matching address using the AMI BIOS setup program (Available features are: Disabled, Auto, COM1/3F8h/IRQ4, COM2/2F8h/IRQ3, COM3/3E8h/IRQ3, COM4/3E8h/IRQ4)
- . Select the desired COM port operation mode (RS-422 or RS-485) using the VIP-UP setup program

RS-422 - Full Duplex Operation: The RS-422 protocol uses both RX and TX lines during a communication session. Upon power-up or reset, the Serial Port 2 interface circuits are automatically configured for full duplex operation: pins 3 and 4 of J6 act as the receiver lines and pins 5 and 6 act as the transmitter lines.



There are no software implementation requirements except that software must not attempt to use the handshake line because they are not connected. Therefore, software handshaking (XON-XOFF) may be used.

RS-485 - Party Line Operation: The RS-485 offers the ability to transmit and receive over the same pair of wires (RX outputs: pins 3 and 4), and share the same communication line with multiple stations. To ensure this configuration, only one system takes the control of the communication line at the time.

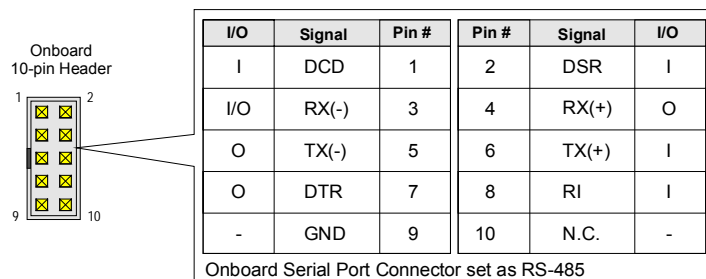


The RS-485 protocol offers some advantages such as increased speed over long distances, improved reliability over similar RS-232 setups, ability to share the transmission line, less cabling requirements than RS-422 protocol, etc...

To enable party line operation, the software must write "1" to bit 3 at I/O register (at 190H, 290H or 390H base address, depending on W9 jumper). This allows the transceiver (pins 3 and 4 of J6) to be controlled by the RTS signal. Upon power-up or reset, the transceiver is by default in "receiver mode" in order to preventing unwanted perturbation on the line.

In RS-485 mode, only both ends of the network must be terminated (120-ohm resistors). Termination resistors (R188 and R189) are available on the PCI-936: If the board is installed at one end of the network, these resistors may be installed using the W17 and W18 jumpers.

Pinout : When configured for RS-422/485 communication mode, the pin assignment for the onboard Serial Port 2 appears as follows:

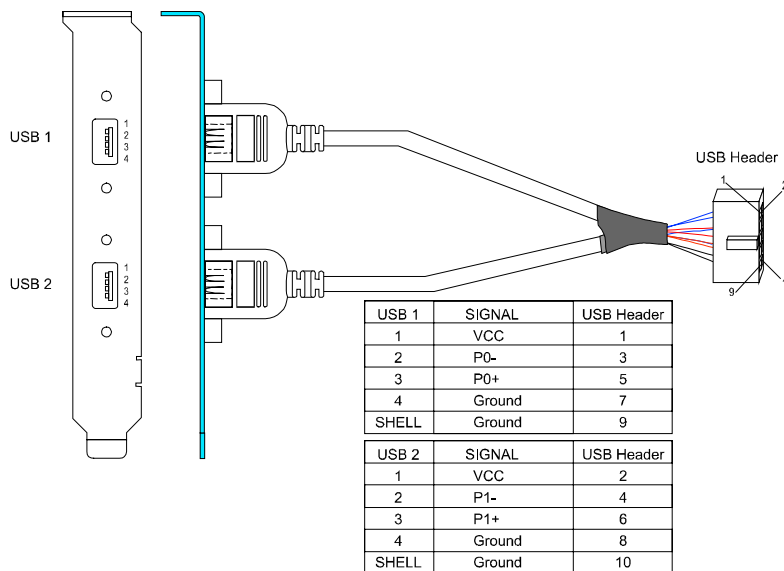


9.2. USB PORT (Connector - J7)

The USB port permits the direct connection of two USB connectors with an external hub. The PCI-936 board fully supports the standard universal host controller interface (UHCI) and uses standard software drivers that are UHCI-compatible. Features of the USB include:

- . Plug and Play, Hot Pluggable Peripherals and Power Management capabilities.
- . Automatic mapping of function to driver and configuration.
- . Support for isochronous and asynchronous transfer types over the same set of wires.
- . Support for up to 127 logical connections.
- . Support for full speed (12Mbps) and low speed (1.5Mbps) USB connection. Full speed connections require shielded cabling.
- . Guaranteed bandwidth and low latencies appropriate for telephony, audio, and other applications.
- . Error handling and fault recovery mechanisms built into protocol.

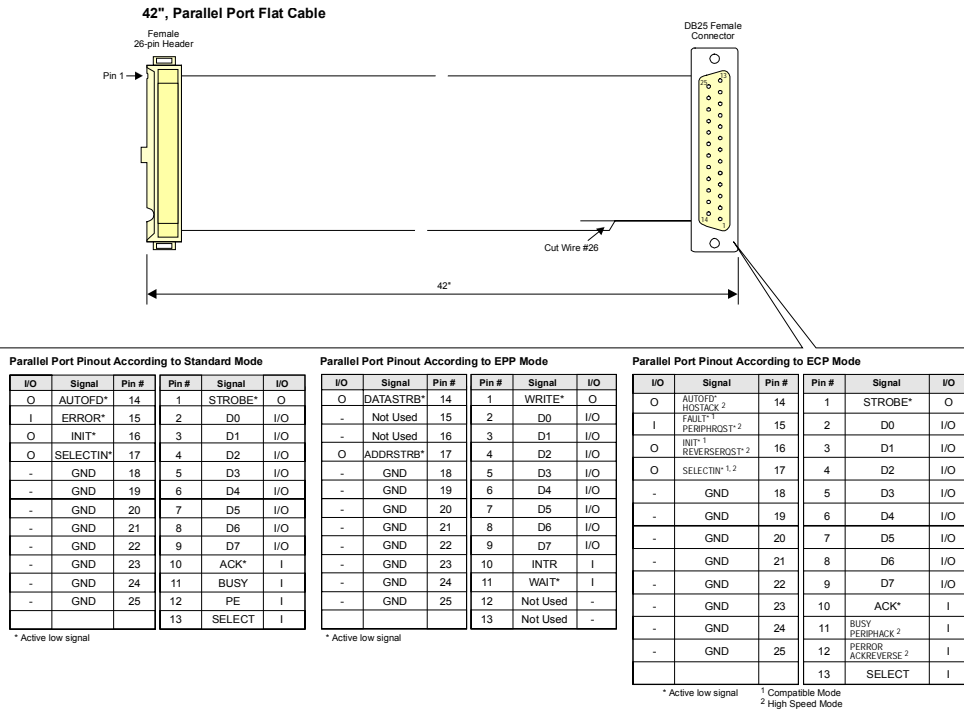
The J7 USB (Universal Serial Bus) connector's pinout appears as follows:



9.3. PARALLEL PORT

The PCI-936 provides a bi-directional parallel port, compatible with PC/XT, AT, PS/2, EPP and ECP modes.

To date, only a few products can operate in EPP or ECP mode. To operate in EPP or ECP mode, the peripheral must be designed to operate in this mode and the BIOS setup must be configured to support it. The differences between the three modes appear in the pin assignation.



The parallel port connector (J10) is a male 26-pin header located at the top right side of the board.

The following list includes approved vendors for the J10 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).

9.3.1.1. Standard Mode

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

9.3.1.2. 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 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 ports: input and output. The input port is connected either to the host parallel port or to 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.

9.3.1.3. 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.

10. INSTALLING ETHERNET

10.1. SETTING UP ETHERNET

10.1.1 CABLING

The PCI-936 Ethernet output may be set for 10Base-T or 100Base-T operation modes:

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 10Base-T standard for 2 pairs Category 5 UTP cable.

10.1.2 CONFIGURATION

The Ethernet controller on the PCI-936 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 Kontron's Technical Support department.

10.2. ETHERNET CONNECTORS

The pinout for the 10/100 Base-Tx connector appears in Table 10-1.

TABLE 10-1: Ethernet 10/100 Base-Tx RJ45 Connector (J18) – Pinout

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

10.3. ETHERNET LEDs STATUS

The PCI-936 is equipped with two LEDs showing the transmission and reception status as well as the link type. The LEDs can be seen on bracket when the Ethernet option is installed.

LED DS3 blinks when transmitting or receiving packets.

LED DS2 goes on when a 100-Base-Tx link is established. The LED is off when the link is at 10Mb per second.

ONBOARD FEATURES

PART



3

11. **CONFIGURING DMA & IRQ**
 12. **SETTING JUMPERS**
 13. **POWERING UP THE SYSTEM**
 14. **SOFTWARE SETUP**
-

11. CONFIGURING DMA & IRQ

11.1. ALLOCATING DMA CHANNELS

The PCI-936 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 ECP mode of the parallel port. Channel 2 is reserved for the floppy controller and Channel 4 is used to cascade Channels 0 through 7 to the microprocessor. The DMA Channel for the Plug and Play Ethernet device is automatically allocated by the system BIOS among those available (Channels.

TABLE 11-1: DMA Channels

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)

11.2. ALLOCATING IRQ LINES

Two 8259 interrupt controllers handle the interrupts on the PCI-936 as follows:

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

TABLE 11-2: IRQ Lines

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

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

¹ Available lines service on board and external PCI/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).

TABLE 12-1: Jumper Settings



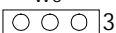
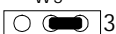
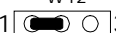
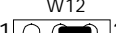
NAME	FUNCTION	CONFIGURATION (INITIAL SETTING: *)																																																																																																												
W3, W4, W6, W9, W10, W11, W21, W23 - CPU Type Selection																																																																																																														
		<table border="1"> <thead> <tr> <th></th> <th>W3</th> <th>W4</th> <th>W6</th> <th>W9</th> <th>W10</th> <th>W11</th> <th>W21</th> <th>W23</th> </tr> </thead> <tbody> <tr> <td>PENTIUM 100</td> <td>on</td> <td>off</td> <td>off</td> <td>off</td> <td>on</td> <td>on</td> <td>3-5 / 4-6</td> <td>3-5</td> </tr> <tr> <td>PENTIUM 120</td> <td>off</td> <td>on</td> <td>on</td> <td>off</td> <td>off</td> <td>off</td> <td>3-5 / 4-6</td> <td>3-5</td> </tr> <tr> <td>PENTIUM 133</td> <td>on</td> <td>on</td> <td>off</td> <td>off</td> <td>on</td> <td>on</td> <td>3-5 / 4-6</td> <td>3-5</td> </tr> <tr> <td>PENTIUM 150</td> <td>off</td> <td>on</td> <td>on</td> <td>on</td> <td>off</td> <td>off</td> <td>3-5 / 4-6</td> <td>3-5</td> </tr> <tr> <td>PENTIUM 166</td> <td>on</td> <td>on</td> <td>off</td> <td>on</td> <td>on</td> <td>on</td> <td>3-5 / 4-6</td> <td>3-5</td> </tr> <tr> <td>PENTIUM 200</td> <td>on</td> <td>off</td> <td>off</td> <td>on</td> <td>on</td> <td>on</td> <td>3-5 / 4-6</td> <td>3-5</td> </tr> <tr> <td>PENTIUM 166-MMX</td> <td>on</td> <td>on</td> <td>off</td> <td>on</td> <td>on</td> <td>on</td> <td>1-3 / 2-4</td> <td>4-6</td> </tr> <tr> <td>PENTIUM 200-MMX</td> <td>on</td> <td>off</td> <td>off</td> <td>on</td> <td>on</td> <td>on</td> <td>1-3 / 2-4</td> <td>4-6</td> </tr> <tr> <td>PENTIUM 233-MMX</td> <td>on</td> <td>off</td> <td>off</td> <td>off</td> <td>on</td> <td>on</td> <td>1-3 / 2-4</td> <td>4-6</td> </tr> <tr> <td>AMD K6-166</td> <td>on</td> <td>on</td> <td>off</td> <td>on</td> <td>on</td> <td>on</td> <td>1-3 / 2-4</td> <td>2-4</td> </tr> <tr> <td>AMD K6-200</td> <td>on</td> <td>off</td> <td>off</td> <td>on</td> <td>on</td> <td>on</td> <td>1-3 / 2-4</td> <td>2-4</td> </tr> </tbody> </table>		W3	W4	W6	W9	W10	W11	W21	W23	PENTIUM 100	on	off	off	off	on	on	3-5 / 4-6	3-5	PENTIUM 120	off	on	on	off	off	off	3-5 / 4-6	3-5	PENTIUM 133	on	on	off	off	on	on	3-5 / 4-6	3-5	PENTIUM 150	off	on	on	on	off	off	3-5 / 4-6	3-5	PENTIUM 166	on	on	off	on	on	on	3-5 / 4-6	3-5	PENTIUM 200	on	off	off	on	on	on	3-5 / 4-6	3-5	PENTIUM 166-MMX	on	on	off	on	on	on	1-3 / 2-4	4-6	PENTIUM 200-MMX	on	off	off	on	on	on	1-3 / 2-4	4-6	PENTIUM 233-MMX	on	off	off	off	on	on	1-3 / 2-4	4-6	AMD K6-166	on	on	off	on	on	on	1-3 / 2-4	2-4	AMD K6-200	on	off	off	on	on	on	1-3 / 2-4	2-4
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 Careful attention should be taken when installing a processor: Faulty jumper settings may definitely damage both your processor and your board.																																																																																																														
W5	SCSI Termination	<p>W5 1  3 Controlled by software</p> <p>W5 1  3 Disabled by hardware</p> <p>W5 1  3 Controlled by hardware (board is terminated) *</p>																																																																																																												
W12	Flat Panel Clock Shift	<p>W12 1  3 Inverted</p> <p>W12 1  3 Normal *</p>																																																																																																												

TABLE 12-2: Jumper Settings (Continued)

NAME	FUNCTION	CONFIGURATION (INITIAL SETTING: *)
W13	Watchdog Timer	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> </div> <div> <p>Dual-Stage Watchdog</p> </div> </div> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> </div> <div> <p>Single-Stage Watchdog*</p> </div> </div> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> </div> <div> <p>Watchdog Disabled</p> </div> </div>
W14 W15	VBAT Internal Battery	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> </div> <div> <p>Onboard Battery</p> </div> </div> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> </div> <div> <p>External Battery *</p> </div> </div> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> </div> <div> <p>No Battery</p> </div> </div>
<div style="background-color: yellow; border: 1px solid black; padding: 5px; display: flex; align-items: center; justify-content: center;"> <p>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 .</p> </div>		
W16	IOCHK Select	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> </div> <div> <p>From Power Fail Output</p> </div> </div> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> </div> <div> <p>From Watchdog Stage 1</p> </div> </div> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> </div> <div> <p>Disabled *</p> </div> </div>
J13	BIOS boot selection	<div style="display: flex; align-items: center; justify-content: space-around;"> <div style="text-align: center;"> <p>Normal*</p> </div> <div style="text-align: center;"> <p>Emergency (boot block flash)</p> </div> </div>
W17 W18	RS485 Termination Setting	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>With Termination</p> </div> <div style="text-align: center;"> <p>Without Termination *</p> </div> </div>

TABLE 12-3: Jumper Settings (Continued)

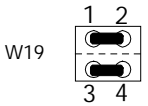
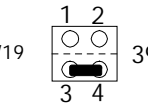


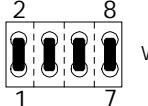
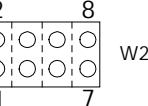
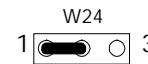
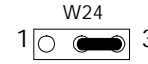
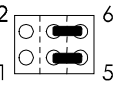
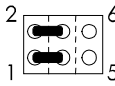
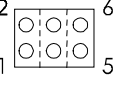
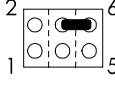
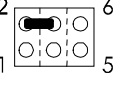
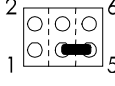
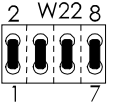
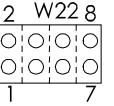
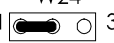
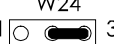
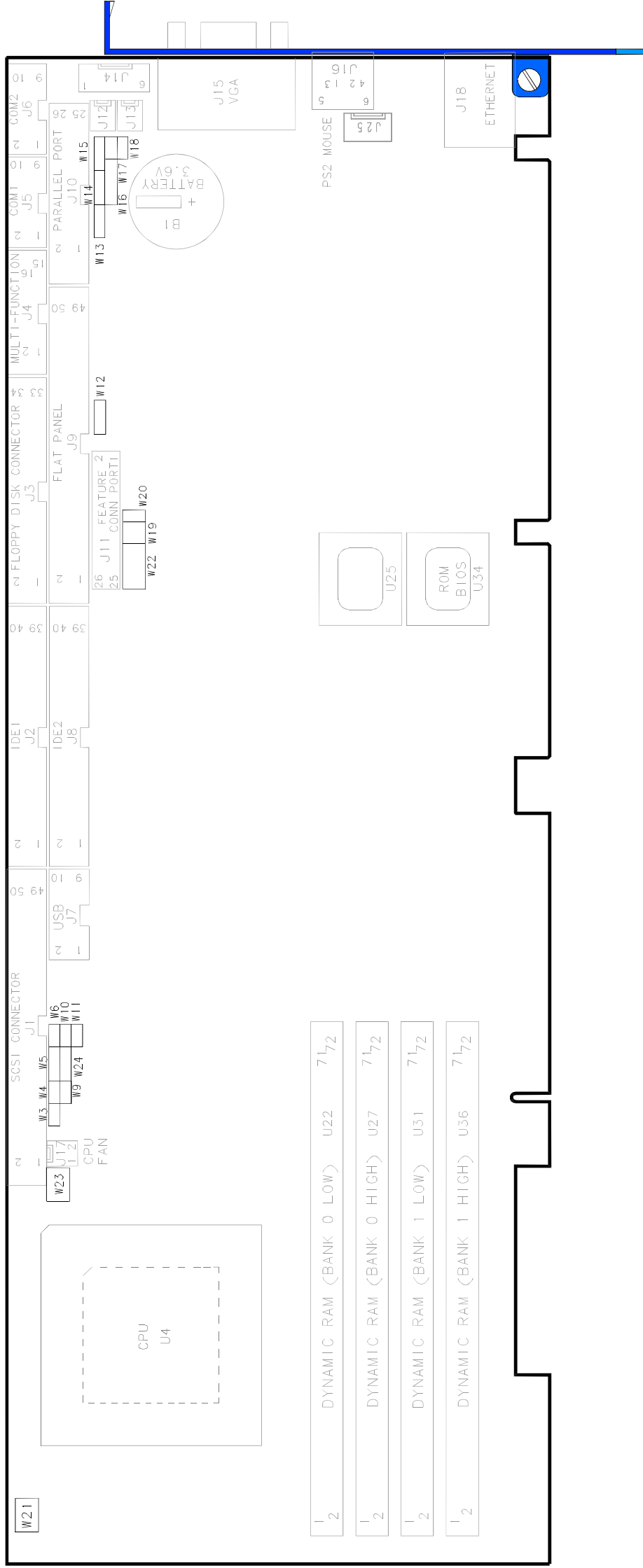
NAME	FUNCTION	CONFIGURATION (INITIAL SETTING: *)	
W19	Supervisor I/O: Base address	 <p>W19 190H *</p>	 <p>W19 390H</p>
W20	Ethernet Enabling	 <p>W20</p> <p>Disabled</p>	 <p>W20</p> <p>Enabled *</p>
W22	Extended BIOS Modes (These jumpers are configured separately, even though they are grouped together here)	<p>1-2: Serial Download Mode 3-4: VT100 Mode 5-6: Disable TEKNOR Extension 7-8: Disable Onboard VGA Controller</p>  <p>W22</p>	<p>1-2: Normal Mode * 3-4: Standard Mode * 5-6: Enable TEKNOR Extension * 7-8: Enable Onboard VGA Controller *</p>  <p>W22</p>
W24	Flat Panel Power Selection	 <p>W24 3.3 volt selection</p>  <p>W24 5 volt selection*</p>	

TABLE 12-4: Jumper Settings: W17-W20

NAME	FUNCTION	CONFIGURATION (INITIAL SETTING: *)	
W21	CPU Type Selection	 Single Supply CPU *	 Split-Plane CPU
W23	CPU Core Voltage Selection	 2.5V	 2.8V
		 2.9V	 3.3V *
W22	Extended BIOS Modes (These jumpers are configured separately, even though they are grouped together here)	1-2: Serial Download Mode 3-4: VT100 Mode 5-6: Disable TEKNOR Extension 7-8: Disable Onboard VGA Controller	1-2: Normal Mode * 3-4: Standard Mode * 5-6: Enable TEKNOR Extension * 7-8: Enable Onboard VGA Controller *
			
W24	Flat Panel Power Selection	 3.3 volt selection	 5 volt selection*

JUMPER LOCATION



13. POWERING UP THE SYSTEM

13.1. Connecting Power Supply (J14)

Power can be drawn on the PCI-936 using on-board 6-pin power connector (J14).

TABLE 13-1: Power Connector (J14) pinout

Pin number	Signal
1	VCC
2	GND
3	GND
4	+12
5	GND
6	VCC

13.2. Powering Up

You are now ready to power up your system.

1. Insert a bootable diskette in drive A to start your system with DOS.
2. Hit the DELETE key before or when this message appears near the bottom of the screen:
"Press DEL to enter SETUP". 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.

13.3. Troubleshooting

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

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

14. SOFTWARE SETUP

14.1. THE AWARD SETUP PROGRAM

14.1.1 ACCESSING THE AWARD SETUP PROGRAM

The PCI-936 uses the AWARD Setup program, a setup utility in EEPROM that is accessed by pressing the DELETE key at the appropriate time during system boot. This utility is used to set configuration data in CMOS RAM.



CAUTION

Before modifying CMOS setup parameters, insure that the W14 and W15 Battery Selection jumpers are installed to enable the CMOS backup.
(See section 12, "Setting Jumpers")

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

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

The actual menu screen appears below:

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	PASSWORD SETTING
PNP/PCI CONFIGURATION	IDE HDD AUTO DETECTION
LOAD BIOS DEFAULTS	4DD LOW LEVEL FORMAT
LOAD SETUP DEFAULTS	SAVE & EXIT SETUP
	EXIT WITHOUT SAVING
Esc : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift)F2 : Change Color
Time, Date, Hard Disk Type...	

14.1.2 USING AWARD SETUP

The arrow keys (↑ ↓ → ←) are used to highlight items on the menu and the PageUp and PageDown keys are used to change the entry values for the highlighted item. To select an entry, press the Enter key. Also, you can press the F1 key to obtain help information or the Esc key to leave an option, close a menu or to quit the program.

Table 14-1 provides more details on how to navigate in the Setup program:

TABLE 14-1

Up arrow (↑)	Move to previous item.
Down arrow (↓)	Move to next item.
Left arrow (←)	Move to the item in the left hand.
Right arrow (→)	Move to the item in the 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 key	Increase the numeric value or make changes.
PgDn key	Decrease the numeric value or make changes.
+ key	Increase the numeric value or make changes.
- key	Decrease the numeric value or make changes.
F1 key	General help.
F2 and Shift F2 keys	Change color from total 16 colors: F2 to select color forward, Shift F2 to select color backward.
F4 key	Reserved.
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 .
F8 key	Reserved.
F9 key	Reserved.
F10 key	When in Main Menu: Save all the CMOS changes.

The Main Menu includes the following categories:

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

14.1.3 SAVING CONFIGURATIONS & EXITING AWARD SETUP

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

Save & Exit

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

Exit Without Saving

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

14.1.4 STANDARD CMOS SETUP

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

Date/Time	The current values for each category are displayed. Enter new values through the keyboard.
Hard Disks	Two IDE controllers are defined on the PCI-936 board (Primary and Secondary), each can have two disks: Master Disk (bootable) or Slave Disk.
Drive A / Drive B	Select the category identifying the types of floppy disk drive A or drive B that have been installed in the computer.
Video	This option specifies the basic type of display adapter card installed in the system.
Halt on	This option specifies the type of errors that will stop the system during the BIOS booting procedure. The settings are All errors, No errors, All but keyboard (default setting), All but diskette and All but disk/key.
Memory	This display-only option summarizes the amount of Base, Extended and other types of memory installed in the system.

14.1.5 BIOS FEATURES SETUP

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

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

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

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

TABLE 14-2: BIOS Features Setup

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

14.1.6 CHIPSET FEATURES SETUP

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

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

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

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



CAUTION

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

TABLE 14-3: Chipset Setup

Option	BIOS Defaults	Setup Defaults	Possible Settings	Description
Auto Configuration	Enabled	Enabled	Enabled, Disabled	Auto Configuration selects predetermined optimal values of chipset parameters. When Disabled, chipset parameters revert to setup information stored in CMOS. Many fields in this screen are not available when Auto Configuration is Enabled.
DRAM Timing	70 ns	70ns	70 ns, 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 might cause memory errors.
RAS to CAS Delay	3	3	3, 2	When DRAM is refreshed, both rows and columns are addressed separately. This setup item allows you to determine the timing of the transition from RAS to Column Address Strobe (CAS).
DRAM Read Burst (EDO/FPM)	x444/x444	x444/x444	x444/x444, x333/x444, x222/x333	Sets the timing for reads from EDO (Extended Data Output) or FPM (Fast Page Mode) memory. The lower the timing numbers, the faster the system addresses memory. Selecting timing numbers lower than the installed DRAM is able to support can result in memory errors.
DRAM Write Burst Timing	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	Disabled	Disabled	Enabled, Disabled	Select Enabled to shorten the leadoff cycles and optimize performance in cacheless, 50-60 MHz, or one-bank EDO DRAM systems.
DRAM Speculative Leadoff	Disabled	Disabled	Enabled, Disabled	A read request from the CPU to the DRAM controller includes the memory address of the desired data. When Enabled, Speculative Leadoff lets the DRAM controller pass the read command to memory slightly before it has fully decoded the address, thus speeding up the read process.
Turn-Around Insertion	Disabled	Disabled	Enabled, Disabled	When Enabled, the chipset inserts one extra clock to the turn-around of back-to-back DRAM cycles.
ISA Clock	PCI CLK/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	Disabled	Enabled	Enabled, Disabled	Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may occur.
Video BIOS Cacheable	Disabled	Enabled	Enabled, Disabled	Selecting Enabled allows caching of the video BIOS ROM at C0000h to C7FFFh, resulting in better video performance. However, in any program writes to this memory area, a system error may occur.
8/16 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.
16 Bit I/O Receiving Time	2	1	1, 2, 3, 4, NA	
Peer Concurrency	Enabled	Enabled	Enabled, Disabled	Peer concurrency means that more than one PCI device can be active at a time.
Chipset Special Features	Disabled	Enabled	Enabled, Disabled	When Disabled, the chipset behaves as if it were the earlier Intel 82430FX chipset.
DRAM ECC/PARITY Select	Parity	Parity	ECC, Parity	Set this option according to the type of DRAM installed in your system: error-correcting code (ECC) or parity (default).
Memory Parity/ECC Check	Auto	Auto	Enabled, Disabled, Auto	In Auto mode, the BIOS enables memory checking automatically when it detects the presence of ECC or parity DRAM.
Single Bit Error Report	Enabled	Enabled	Enabled, Disabled	If ECC is enabled, selecting Enabled here tells the system to report an error when a correctable single-bit error occurs.
L2 Cache Cacheable Size	64MB	64MB	64MB, 512MB	Select 512MB only if your system RAM is greater than 64MB.
Chipset NA# Asserted	Enabled	Enabled	Enabled, Disabled	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	Enabled	Enabled	Enabled, Disabled	When Enabled, CPU to PCI bus accesses are allowed during passive release otherwise the arbiter only accepts another PCI master access to local DRAM.
Delayed Transaction	Disabled	Disabled	Enabled, Disabled	The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select Enabled to support compliance with PCI specifications version 2.1.
Memory Hole Location	None	None	512K-640K, 15M-16M	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.
TEKNOR Base Port Location	190h	190h	190h, 290h, 390h	This parameter must reflect the jumper settings for TEKNOR I/O Base Port.

14.1.7 POWER MANAGEMENT SETUP

This part of the setup sets power conservation options.

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

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

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

TABLE 14-4: Power Management Setup

Option	BIOS Defaults	Setup Defaults	Possible Settings	Description
Power Management	Disabled	Disabled	Min Saving, Max Saving, User Define, Disabled	This option allows you to select the type (or degree) of power saving for Doze, Standby, and Suspend modes. Max Saving: Maximum power savings. Only available for SL CPUs. 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 on your system, selecting Yes gives better power savings.
Video Off Method	Disabled	Disabled	V/H SYNC + Blank, DPMS, Blank Screen	Determines the manner in which the monitor is blanked. V/H SYNC + Blank: System turns off vertical and horizontal synchronization ports and writes blanks to the video buffer. DPMS Support: Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards Association (VESA). Use the software supplied for your video subsystem to select video management values.
Modem Use IRQ	NA	NA	NA, 3, 4, 5, 7, 9, 10, 11	Blank Screen: System only writes blanks to the video buffer. Name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system.
PM Timers				The following modes are Green PC power saving functions. They are user-configurable only during User Defined Power Management mode.
Doze Mode	Disabled	Disabled	1, 2, 4, 6, 8, 10, 20, 30, 40 mins, 1 hour, Disabled	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	Disabled	Disabled	1, 2, 4, 6, 8, 10, 20, 30, 40 mins, 1 hour, Disabled	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	Disabled	Disabled	1, 2, 4, 6, 8, 10, 20, 30, 40 mins, 1 hour, Disabled	After the selected period of system inactivity (1 minute to 1 hour), all devices except the CPU shut off.
HDD Power Down	Disabled	Disabled	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.
Wake Up Events			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.
IRQ3	Off	On		
IRQ4	Off	On		
IRQ8	Off	On		
IRQ12	Off	On		
Power Down and Resume Events	Off	On	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		

14.1.8 PnP/PCI SETUP

This part of the setup sets PnP/PCI options.

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

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

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

TABLE 14-5: PnP/PCI Setup

Option	BIOS Defaults	Setup Defaults	Possible Settings	Description
Resources Controlled By	Auto	Manual	Auto, Manual	The Award Plug and Play BIOS can automatically configure all the boot and Plug and Play compatible devices. If you select Auto, all the interrupt requests (IRQs) and DMA assignment fields disappear, as the BIOS automatically assigns them.
Reset Configuration Data	Disabled	Disabled	Enabled, Disabled	Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot.
IRQ <i>n</i> Assigned To			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 <i>n</i> Assigned To			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#	A	A	A, B, C, D	Each PCI peripheral connection is capable of activating up to four interrupts: INT# A, INT# B, INT# C and INT# D. By default, a PCI connection is assigned INT# A. Assigning INT# B has no meaning unless the peripheral device requires two interrupt services rather than just one. Because the PCI IDE interface in the chipset has two channels, it requires two interrupt services. The primary and secondary IDE INT# fields default to values appropriate for two PCI IDE channels, with the primary PCI IDE channel having a lower interrupt than the secondary.
Secondary IDE INT#	B	B	A, B, C, D	
Used Mem Base Address	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, 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.

14.1.9 INTEGRATED PERIPHERALS SETUP

This part of the setup sets Integrated Peripherals options.

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



NOTE

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

TABLE 14-6: Integrated Peripherals Setup

Option	BIOS Defaults	Setup Defaults	Possible Settings	Description
IDE HDD Block Mode	Disabled	Enabled	Enabled, Disabled	Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.
PCI Slot IDE 2nd Channel	Enabled	Enabled	Enabled, Disabled	You may separately disable the second channel on an IDE interface installed in a PCI expansion slot.
On-Chip Primary/Secondary PCI IDE	Enabled	Enabled	Enabled, Disabled	The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select Enabled to activate each channel separately.
IDE Primary/Secondary Master/Slave PIO	0	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	Enabled	Enabled	Enabled, Disabled	Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals.
Onboard FDC Controller	Enabled	Enabled	Enabled, Disabled	Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field.
Onboard Serial Port 1/2	Auto	Auto	Disabled, 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, Auto	Select a logical COM port name and matching address for the first and second serial ports.
Onboard Parallel Port	378/IRQ7	378/IRQ7	378/IRQ7, 278/IRQ5, 3BC/IRQ7, Disabled	Select a logical LPT port name and matching address for the physical parallel (printer) port.
Parallel Port Mode	ECP+EPP 1.9	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.

14.2. THE VIP-UP PROGRAM

14.2.1 ACCESSING THE VIP-UP PROGRAM

The VIP-UP program is Kontron's own Setup program for enabling / disabling / relocating various hardware features on the PCI-936.

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

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

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

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

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

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.

14.2.2 VIP-UP SCREEN

TEKNOR INC --- TEK SETUP	
TEKNOR BIOS Extension Address	CC000H-CFFFFH
TEKNOR BIOS Window Address	E0000H-E3FFFFH
BIOS Interrupt 13h Configuration	Disabled
Flash Disk Support	Not Installed
On Board SCSI Controller/BIOS	Enabled
Enter VIP-UP Message	Displayed 3 seconds
VT100 & Serial Download Speed	19200 BPS
VT100 & Serial Download Serial Port	COM1: 3F8H
Use Flash To Store CMOS RAM SETUP	No
Flat Panel VGA Controller Display Mode	CRT Only
COM2 Operation Mode	RS-232
- to select options	ESC - Quit without saving
PgDn(+), PgUp(-) to change an option	F10 - (U)pdate Flash BIOS

The VIP-UP options are:

1. Selection of TEKNOR BIOS addresses: The addresses of the TEKNOR BIOS extension and the TEKNOR BIOS window are set in the top part of the screen.
2. BIOS Interrupt 13h Configuration: When enabled, this option allows the following Flash Disk Support configurations: Not Installed (default setting), Installed Bootable (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).
3. On Board SCSI Controller/BIOS: This option allows the user to enable or disable the on board SCSI controller.
4. Enter VIP-UP Message: This option allows the user to enable or disable the message "Press CTRL-V to enter TEKNOR VIP-UP" at the top of the screen upon boot-up.

5. VT100 & Serial Download: The VT100 & Serial Download Speed option is for selecting the desired speed for the VT100 and Download modes. The VT100 & Serial Download Serial Port option allows the use of either COM2 or COM1 for the VT100/Serial Download Mode hookup.
6. Use Flash To Store CMOS RAM SETUP: When this option is set to "Yes", the CMOS RAM Setup will be restored from Flash 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).



NOTE

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

7. Flat Panel VGA Controller Display Mode: This option allows the user to set the display mode for the video controller. The following settings are available: CRT Only (default), Flat Panel Only or Simultaneous (CRT and Flat Panel are allowed).
8. COM2 Operation Mode: This option allows the user to select whether Serial Port 2 will be configured as an RS-232 type or an RS-485 type.

SOFTWARE & ON-BOARD UTILITIES

PART

4

- 15. **VFLASH SOFTWARE**
 - 16. **FLASH FILE SYSTEM II**
 - 17. **UPDATING BIOS WITH UBIOS**
 - 18. **VT100 MODE**
 - 19. **DOWNLOAD MODE**
-

15. VFLASH SOFTWARE

15.1. INTRODUCTION

VFLASH is Kontron's Flash EPROM transfer utility program for single board computers. Its main function is to download DOS files to the 2 or 4 MB Flash EPROM disk U45, also referred to as data Flash.

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

However, with the FLASH FILE SYSTEM II software from Microsoft, Flash EPROM disks are read/write and may be accessed via DOS commands (this utility is covered in Section 15).

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

15.1.1 VFLASH SOFTWARE OVERVIEW

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

1. If your PCI-936 is equipped with hard or floppy drives, then VFLASH downloads data directly on the board's Flash EPROM disk.
2. If your PCI-936 does not have floppy or hard drives, then VFLASH must be run from a remote computer which downloads data to the PCI-936 board via a serial link on Serial Port 1 or Serial Port 2. This mode is recognized in the BIOS extension as Download Mode and is enabled by installing jumper W22 (1-2) on the PCI-936; in this mode, the PCI-936 board waits for signals from the remote computer's VFLASH software.

The first screen of the VFLASH software allows you to choose between direct and serial downloading. The next screen is where the address and size of the Flash partition to create are determined (the screens are explained in section 15.03 - OUTPUT SELECTION).

The next step is to select the files in the FILE SELECTION screen, which are to be transferred to the Flash EPROM disk (explained in section 15.04 - FILE SELECTION).

The next screen is the LIST OF SELECTED FILES; here the file listing can be verified and modified, duplicate files can be renamed or erased, and the Flash disk can be written (also explained in section 15.04 - FILE SELECTION).

Finally, the last screen to appear is the TRANSFER STATUS OF ONBOARD FLASH PROGRAMMING or the TRANSFER STATUS OF EXTERNAL FLASH PROGRAMMING; this screen displays each of the transfer operations in progress (explained in section 15.05 - FILE TRANSFER).

The above sections explain how to run the program in interactive mode via menus, but it is also possible to run the program without menus by a command which specifies the selected options and files with parameters; this mode is called batch mode (explained in section 15.06 - BATCH MODE).

15.1.2 TYPES OF FLASH EPROM DISKS

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

BOOTABLE FLASH DISK

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

To boot from Flash EPROM four conditions must be met:

- You must have the optional 2-MB or 4-MB Flash EPROM installed at U34.
- The bootable Flash EPROM partition must start from the first block.
- The VIP-UP option “BIOS Interrupt 13h Configuration” must be set to Enabled.
- The Flash disk must be configured in the VIP-UP Setup as “Installed Bootable”. To do so, you must change the value of the Flash Disk Support option on VIP-UP’s second screen from Disabled to Installed Bootable.

NON-BOOTABLE FLASH DISK:

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

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

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

15.1.3 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 Flash device on the PCI-936, VFLASH must be running on the board.

If you need a remote computer to program Flash device on the PCI-936 (host), then the board must be in Download Mode and VFLASH must be running on the remote computer. A serial cable must be connected between the remote computer and either the Serial Port 1 or Serial Port 2, as it would be in VT100 mode (the remote computer is cabled like a VT100 terminal, see Section 18 - 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).

15.2. RUNNING VFLASH

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

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

**On board Flash
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 PCI-936 has no floppy or hard disks, or simply because the data to transfer is on a different computer than the PCI-936 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 PCI-936.

15.3. OUTPUT SELECTION

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

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



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

To set the size of the disk, type "E" and move the END pointer to the desired location for the end of the disk by using the left and right arrow keys.

OUTPUT SELECTION FOR THE TRANSFER

Output selected: On board FLASH devices.

Type "B" to choose where the disk begins,
"E" to set where it ends.

Legend: selected block = , unselected block = 



↑ Begin

ORDER:#2, ADDRESS: 20000h, DISK SIZE: 640 Kbytes (min: 128K-b)

Disk will start from the 2nd block (address : 20000 hex).
The size of the disk is: 640 K-bytes.

Strike any key to continue.

↑↓→← **Enter** to select option **Special disk**

15.4. FILE SELECTION

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

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

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

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

Highlighted files are marked for copying to Flash devices.

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

Entries marked as "Drive A:" or "Drive B:" allow you to change drives/directories or to select files. "DRIVE A/B: TO CHOOSE FILES" is used to select files. "DRIVE A/B: COMPLETE COPY" is used to make an exact copy of a floppy disk to Flash. This last function resembles a DOS DISKCOPY command. When this mode of transfer is chosen, no other files can be sent along with the diskette files.

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

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

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

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

15.4.1 MENU COMMANDS

TAG

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

UNTAG

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

BLOCK

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

ENTER

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

DONE

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

ESC

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

VOLUME LABEL

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

Volume is xxxxxxxxxxxx

Volume label (11 characters, ENTER for none)?

The same operating system limitations on volume label names apply.

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

15.4.2 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: xxxxxxxxxxxx			
AFIRST.ASM	AFIRST.BAK	AFIRST.OBJ	ASECOND.ASM
ASECOND.BAK	ASECOND.OBJ	ATTR2.PAS	BOOTDIR.BAK
BOOTDIR.BAK	BOOTDIR.PAS	COMM.ASM	COMM.BAK
COMM.OBJ	COMMANDE.PAS	COPYXB.BAK	COMMBAK.BAK
COPYXAC.BAK	COPYXAC.BAK	COMMBAK.ASM	ECRANSFX.DOC
Program Change Selection ↑↓PgUp PgDn Home		Esc to quit	

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.

15.4.3 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: xxxxxxxxxxxx

AFIRST.ASM      AFIRST.BAK      AFIRST.OBJ      ASECOND.ASM
ASECOND.BAK     ASECOND.OBJ     ATTR2.PAS       BOOTDIR.BAK
BOOTDIR.BAK    BOOTDIR.PAS     COMM.ASM        COMM.BAK
COMM.OBJ        COMMANDE.PAS    COPYXB.BAK      COMMBAK.BAK
COPYXAC.BAK     COPYXAC.BAK     COMMBAK.ASM     ECRANSFX.DOC

=====  DUPLICATE FILES MENU  =====

E:\BOOTDIR.BAK
E:\TF\BOOTDIR.BAK

1:Rename duplicate(s) (file.ext,file1.ext,etc)
2:Rename or erase duplicate(s)
3:Eraseremainingduplicates
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.

15.5. FILE TRANSFER

15.5.1 TRANSFER STATUS OF ONBOARD FLASH PROGRAMMING SCREEN

This screen displays each of the transfer operations in progress:

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

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

TRANSFER STATUS OF 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

15.5.2 TRANSFER STATUS OF EXTERNAL FLASH PROGRAMMING SCREEN

When a serial link is used, this screen is displayed. It displays the transfer operation status. It shows each step in progress:

1. The devices are erased (this may take some time).
2. The base system information is transferred, followed by the file data itself.
3. The data progress is displayed by XX% 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 W22. This forces Download Mode at boot up.
2. Download Mode is automatically enabled when VT100 Mode is activated by shorting Pins 3 and 4 on jumper W22. 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 that is forced on at setup by the W22 (1-2) jumper. If Download Mode was entered by recognition of the code sequence, you can simply exit Download Mode and continue processing.

TRANSFER STATUS OF EXTERNAL FLASH PROGRAMMING
Erasing 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

15.6. 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.

15.6.1 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 (see section 14.04 for more information).

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

15.6.2 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 in either 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 PCI-936 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.

15.6.3 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	Insufficient data space or directory space to copy all desired files
A	10	Bad checksum (problem with serial link)
B	11	Non Hex code received (problem with serial link)
C	12	Error transferring data. Unusable Flash drive
D	13	No files to transfer in selected directory
E	14	Unable to open a file to be copied
F	15	Media not yet supported
10	16	Communications or device error while transferring files. Unusable flash drive.
11	17	Unable to read transfer source drive
12	18	Insufficient Flash space to store files
13	19	Unrecognized Flash device type
14	20	Programming failure on devices
15	21	Cannot select any file from actual Flash disk
16	22	Unable to find source files
17	23	Cannot specify starting device on remote system
18	24	Cannot find starting Flash bank address
19	25	Communication error while reading Flash bank content
1A	26	External device cannot be erased properly
1B	27	Unsupported serial download function
1C	28	Flash content does not verify with source
1D	29	No device found in specified starting socket
1E	30	Cannot create a Flash disk of specified size
1F	31	Communication error when reading Flash identification code
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

ERROR (HEX)	NUMBER (DECIMAL)	DESCRIPTION
24	36	Insufficient Flash or EPROM space to include the volume label entry
25	37	Cannot make EPROM with same [source] and [destination] path
26	38	EPROM filename already exist
27	39	EPROM filename path not found
28	40	Selected drive for EPROM files not ready
29	41	Invalid EPROM filename or disk error
2A	42	Not enough disk space to copy EPROM files
2B	43	Not enough memory for data buffer
2C	44	Command line option "/TEKXXX" is invalid
2D	45	486SLC internal registers are different from BIOS setup
2E	46	The 486SLC cache is not disabled over the Flash device(s)
2F	47	Unable to erase the nth device
30	48	No VIPer BIOS found
31	49	The source diskette must be DOS Version 4 and up
32	50	Flash ID command to BIOS or data Flash must be issued first

16. FLASH FILE SYSTEM II

16.1. INTRODUCTION

With FLASH FILE SYSTEM II, a read/write MS-Flash partition can be created in the 2MB or 4MB Flash EPROM device (located at U45). Such a partition can be accessed via the DOS commands.

Section 15 - VFLASH Software - explained how a read-only Flash partition is created with VFLASH and how data can be stored in files with the VFLASH Transfer Utility.

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

- As one read-only partition, created by VFLASH. This partition can be created as a bootable or non-bootable disk. See Section 15 for more information.
- As one read/write MS-Flash partition created by FLASH FILE SYSTEM II.
- As a combination of the above two: one read-only VFLASH partition, followed by one MS-Flash read/write partition. The system will set up both as a different drive, with the MS-Flash disk always the last. For example, VIP-UP can set up the VFLASH disk as "Installed Bootable" (C:), other physical hard disks as D: and E:, while the MS-Flash disk, in this case, would automatically be set up as the next drive letter, that is F:. Another example could be only one hard disk, with the following setup: hard disk (C:), VFLASH disk "Installed" (D:) and MS-Flash disk (E:).
- The fourth possible configuration is similar to the previous one except that space (one or more memory blocks) is left between the VFLASH disk and the MS-Flash disk. This non-partitioned space can be used by special applications to store data; this can only be done safely if one knows the exact address of these memory blocks.

FLASH FILE SYSTEM II can be purchased from Kontron and is not part of the standard PCI-936 package and utilities.

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

16.2. SETTING UP CONFIG.SYS FOR FLASH FILE SYSTEM II

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

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

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

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

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

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

where X can be replaced by the appropriate number of blocks that 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 that 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.

16.3. CREATING & FORMATTING AN MS-FLASH PARTITION

FLASH FILE SYSTEM II on the PCI-936 allows only one MS-Flash read/write partition on the data Flash device.

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

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



Caution:

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

16.3.1 USING MEMCARD MENU OPTIONS

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

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

```
PC Memory Card Setup Program Version 2.00
(C) 1991-1992 Microsoft Corporation
Memcard Options
Current memory card slot: 1 of 2 slots
Choose one of the following:
    1. Create and format a new partition
    2. Format an existing partition
    3. Delete a partition
    4. Display partition information
    5. Erase entire memory card
    6. Check memory card and fix errors
    7. Select next memory card slot
Enter your choice. [4]
To quit Memcard, press ESC.
```

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

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

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

Current memory card slot: 1			
Letter	Type	Status	Size

D	MS-Flash	Formatted	2048K

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.

16.3.2 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
```


17. UPDATING BIOS WITH UBIOS

17.1. INTRODUCTION

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

The program can be executed in one of two modes:

- **Interactive Mode:** In this mode, the program is menu-driven. This mode is explained in section 17.2.
- **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 17.3.

Both the Interactive Mode and the Batch Mode are available in VT100 mode (Section 18). The small differences will be explained in the sections noted above.

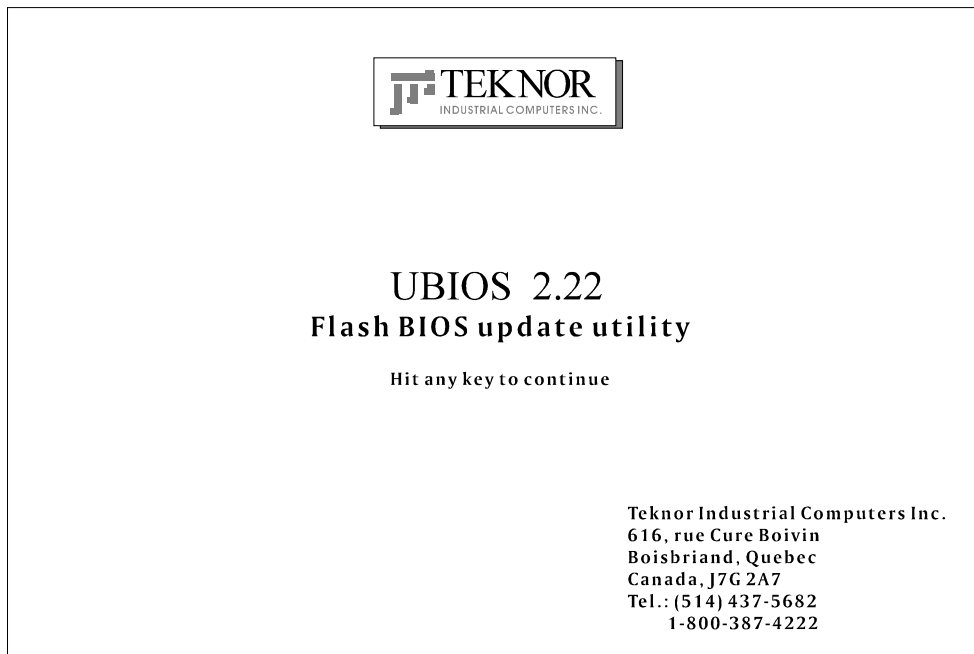


Note:

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.

17.2. 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.

17.2.1 MAIN MENU

An example of the main menu appears below:

```

                                     UBIOS 2.22

Write Flash BIOS device              Retrieve a BIOS to a file
1-Update all BIOS                    6-Copy all BIOS
2-Update VGA BIOS                    7-Copy VGA BIOS
3-Update Teknor's BIOS extension     8-Copy Teknor's BIOS extension

5-Update main BIOS                  0-Copy main BIOS
```

The main menu displays two groups of options:

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

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

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

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

Selections are made in one of two ways:

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

17.2.2 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
-----
B800_060.BIN  <DIR>                  No documentation available
B800_987.BIN
B801_612.BIN

```

The screen displays three windows:

UPDATE This window displays the current BIOS files being used; it shows all types of BIOS, not just the one selected from the main menu. At the bottom of this window, the current directory is also displayed.

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

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

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

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

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

17.2.3 FLASH BIOS COPY MENU

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

```
FLASH BIOS COPY
You are currently using version 0.60
File name for extension BIOS file (.EXT):
```

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

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

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

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

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

17.3. UBIOS - BATCH MODE

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

The command line format is as follows:

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

[operation]	is the Flash BIOS operation you wish to perform, and can be replaced with one of two letters: U for Update, or C for Copy.
[filetype]	is the filetype of the BIOS file to program (with an update operation) or to create (with a copy operation), and can be replaced with one of the following: ALL for All BIOS files in a single file with the .BIN extension, VGA for VGA BIOS file with the .VGA extension, TEKNOR For TEKNOR's BIOS extension with the .EXT extension, MAIN for Main BIOS with the .ROM extension.
[filename]	is the name of the BIOS file to program (with an update operation) or to create (with a copy operation), and can be replaced with the filename which corresponds to the filetype. For example, if "VGA" was listed as filetype, then the filename could be "FLAT.BFP".
[options]	these are optional parameters that may be added: /C This option will no 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 Instructs UBIOS to reset the board upon completion of an operation. /VT This option allows a visual monitoring of the Flash BIOS update/copy operation in VT100 mode.

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

18. VT100 MODE

18.1. 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.

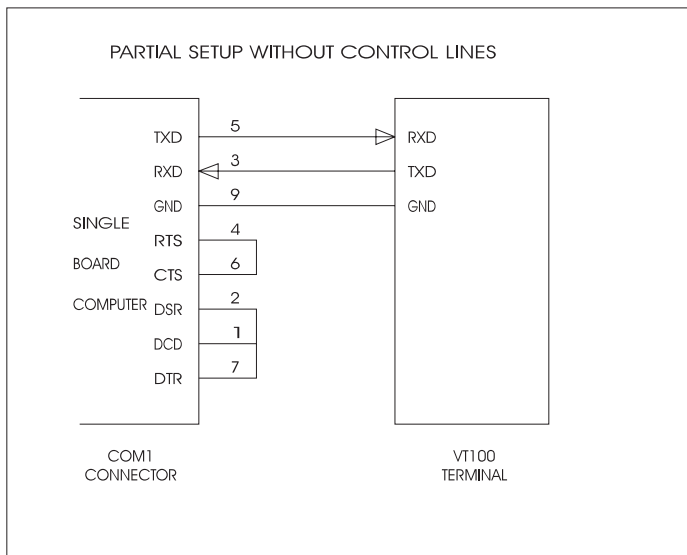
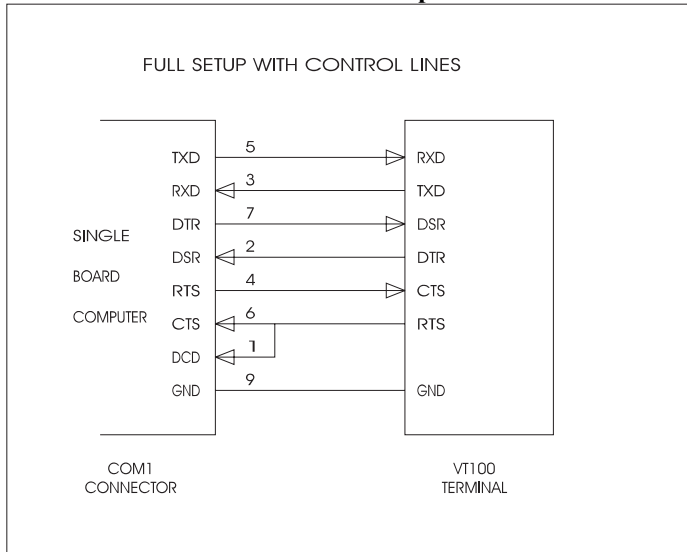
18.2. VT100 SETUP & CONFIGURATION

Follow these steps for setting up VT100 Mode:

- Power off your PCI-936 and install jumper W22 (3-4) to enable VT100 Mode. Note: VT100 Mode runs on UART1 and UART2.
- Connect the communications cable as shown in Diagram 18-1. Note: If you do not require a full cable for your terminal, you can set up a partial cable by using only the TXD and RXD lines. The control lines can be ignored by looping them back as shown in Diagram 18-2.
- Power on your PCI-936 and run VIP-UP Setup by hitting the CTRL and V keys simultaneously, before or when you see the message "Press CTRL-V to enter TEKNOR VIP-UP" at the top of the screen. On the VIP-UP screen, set the "VT100 & Serial Download Speed" at 19200 BPS or 9600 BPS.
- You must respect this protocol:
 - Bits
 - No Parity
 - Echo Off.

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

DIAGRAM 18-1: VT100 Full Setup
DIAGRAM 18-2: VT100 Partial Setup



18.3. RUNNING WITHOUT A TERMINAL

The PCI-936 can boot up without a screen or terminal attached. However, if VT100 Mode is desired, but the terminal is to be disconnected, you must ensure the control lines are in an active state. Failing this, the system may "hang" while waiting for the control lines to become active. Wiring the system according to Diagram 18-2 allows the lines to remain active. This does not apply if the VT100 jumper is not set.

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

19. DOWNLOAD MODE

Information can be downloaded to the Flash EPROM disk on the PCI-936 by running VFLASH on a remote computer and using a serial link. This is referred to as Download Mode and is enabled by installing jumper W22 (1-2).

Refer to Section 15 for more information on running VFLASH in Download Mode.

APPENDICES

PART **5**

- A. BOARD SPECIFICATIONS**
 - B. MEMORY & I/O MAPS**
 - C. BOARD DIAGRAMS**
 - D. CONNECTORS LOCATIONS & PINOUTS**
 - E. BIOS SETUP ERROR CODES**
 - F. EMERGENCY PROCEDURE**
 - G. LIST OF APPROVED VENDORS**
 - H. GETTING HELP**
-

A. BOARD SPECIFICATIONS

A.1 Electrical

- Conforms to the electrical specifications in the IEEE P996 Bus Specification (PC/AT), the PCI Local Bus Specification Revision 2.1, and the PICMG Revision 2.
- Power consumption (estimated):

TABLE A-1: Power Consumption (Estimated)

SUPPLY CURRENT	P-75	P-100	P-120	P-133	P-150	P-166	P-200
+5V	3.7 A	3.9 A	4.1 A	3.8 A	3.9 A	4.18 A	4.4 A
+5V (Suspend)	2A	2A	2A	2A	2A	2A	2A
+12V	7.6 mA	7.6 mA	7.6 mA	7.6 mA	7.6 mA	7.6 mA	7.6 mA

* Measured with 16MB DRAM, 512KB Cache, 2MB Video DRAM, SCSI, Ethernet, Keyboard, Floppy and Hard Disk installed.

- Electromagnetic Interference (EMI): EMI emissivity and susceptibility standards (FCC, TUV): Designed to meet class A.
- Electrostatic Discharge (ESD): Designed to meet ESD requirements as specified in the IEC 801-3 specification.

A.2 Mechanical

- Please refer to the mechanical specification diagram in Appendix C Board Diagrams.
-

A.3 Environmental

- Operating Temperature:

Table A-2 shows the ambient operating temperature ranges with heatsink and fan for typical and worst cases processor power dissipation. These are calculated values based on processor dissipation figures from the manufacturer, using a heatsink and fan assembly with a θ_{ca} of 2.5°C/W, and no other airflow. Actual processor power dissipation varies, and depends on the level of processor activity required by each application.

Note that these figures can be improved by using a heatsink assembly with a lower θ_{ca} , or by increasing airflow.

TABLE A-2: Operating Temperature

CPU Speed	Temp. Range (Typical)	Temp. Range (Worst Case)
Pentium 75MHz	0 to 62.5°C	0 to 50°C
Low-Power Pentium 75MHz	0 to 69°C	N/A
Pentium 90MHz	0 to 61.3°C	0 to 47.5°C
Low-Power Pentium 90MHz	0 to 65°C	N/A
Pentium 100MHz	0 to 60.3°C	0 to 44.8°C
Pentium 120MHz	0 to 57.4°C	0 to 38°C
Pentium 133MHz	0 to 59.3°C	0 to 42°C
Pentium 150MHz	0 to 57.8°C	0 to 41°C
Pentium 166MHz	0 to 56.5°C	0 to 33.8°C
Pentium 200MHz	0 to 53.8°C	0 to 31.3°C

- Storage Temperature: Ambient temperature range of -65°C to +125°C.
- Non-condensing Relative Humidity: 5% - 95%.

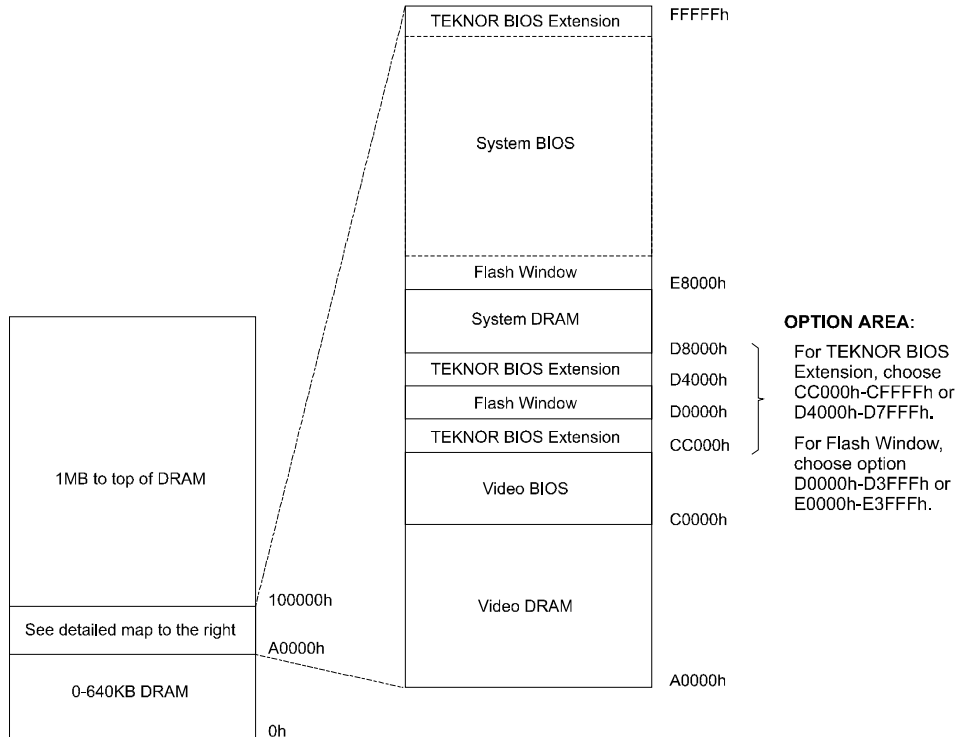
A.4 Reliability

- MTBF (Mean Time Between Failure) with Pentium 100, is estimated at 128 074 hours, for an operating temperature of 20°C.

B. MEMORY & I/O MAPS

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

Figure B-1: Memory Map Diagram



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

On the following page, the memory map is displayed in a tabular format. See TABLE B-1.

TABLE B-1: Memory Map

ADDRESS	OPTIONAL ADDRESS	FUNCTION
00000-9FFFF		0-640 KB DRAM
A0000-BFFFF		Video DRAM
C0000-CBFFF		Video BIOS
CC000-CFFFF	D4000-D7FFF	TEKNOR BIOS Extension
D0000-D3FFF	E0000-E3FFF	Flash Window
D8000-DFFFF		System DRAM
E0000-FFFFFF		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.

TABLE B-2: I/O Map

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 On Board Plug and Play SCSI and Ethernet devices are automatically allocated by the System BIOS.

C. BOARD DIAGRAMS

Block Diagram

Mechanical Diagram

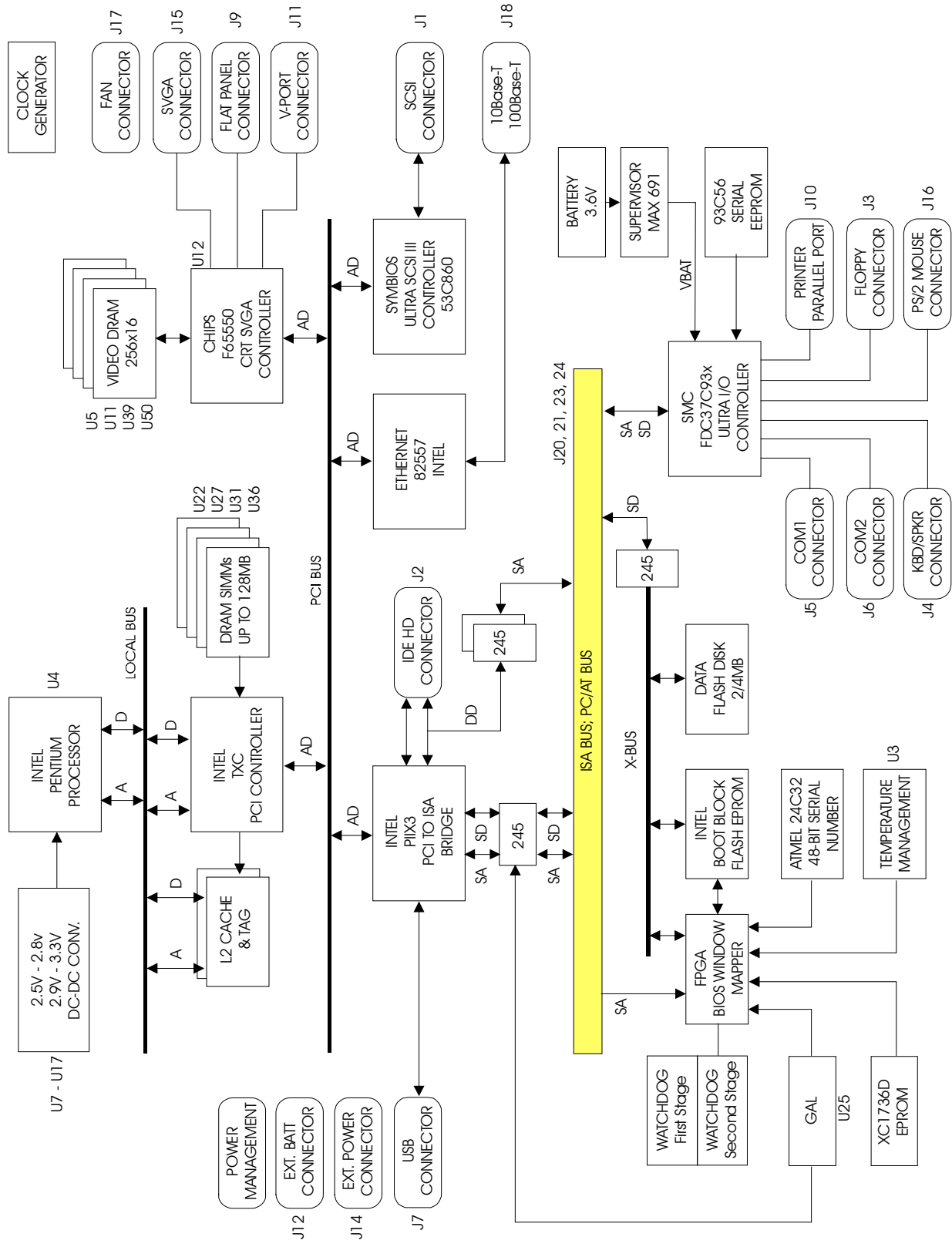
Configuration Diagram

Assembly Top Diagram

Assembly Bottom Diagram

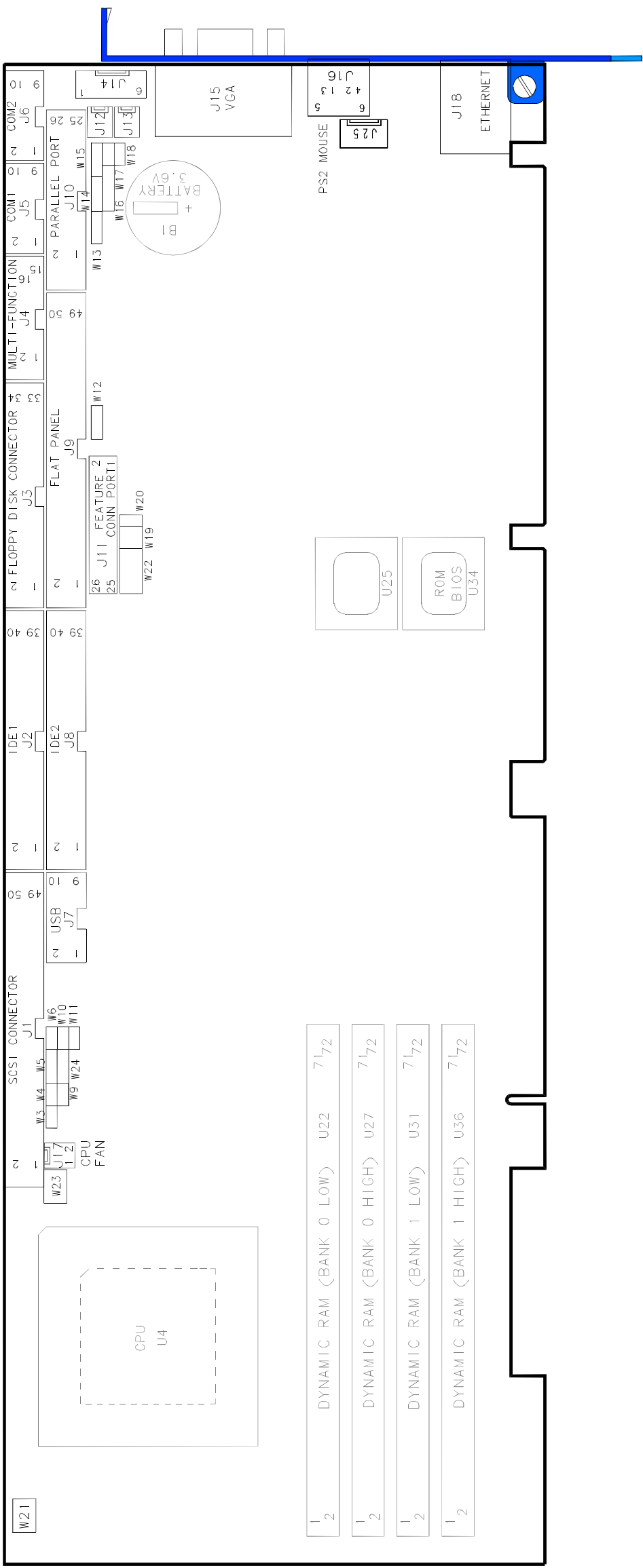
C-1 Block Diagram

DIAGRAM C-1: PCI-936 Block Diagram



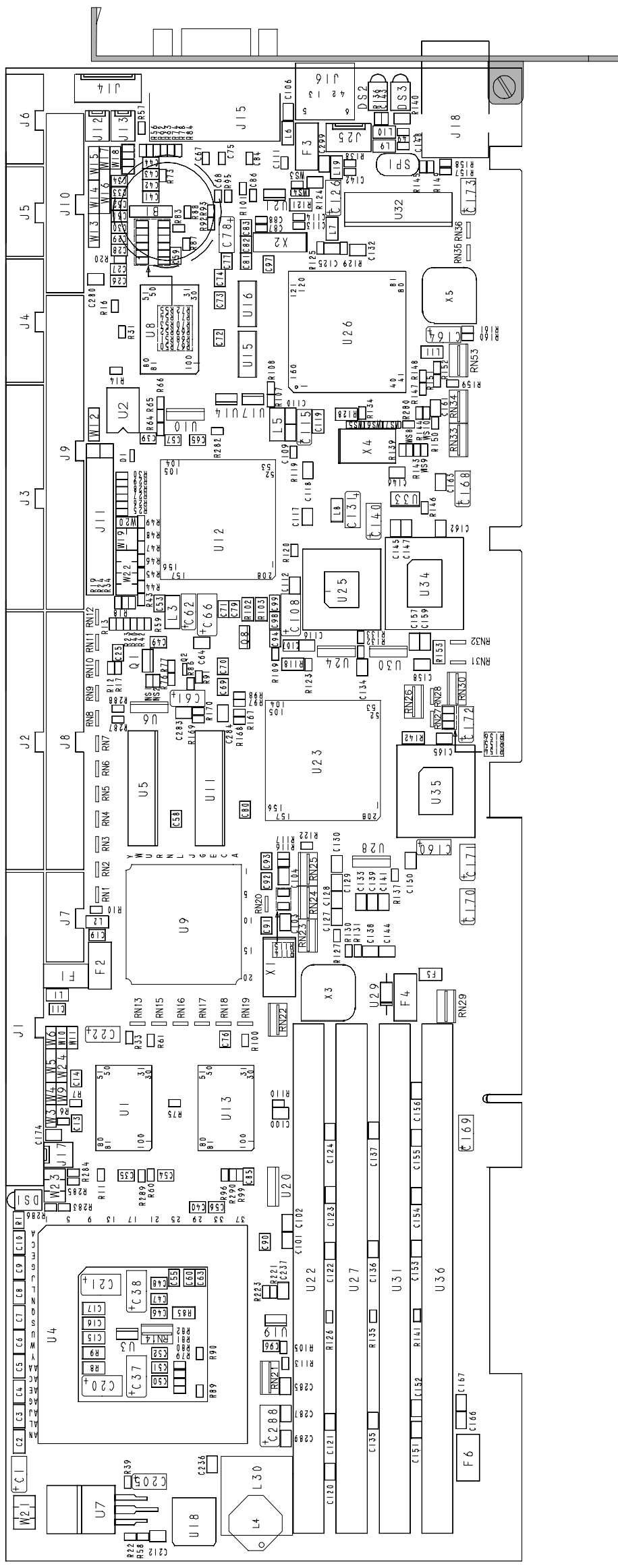
C-3 CONFIGURATION DIAGRAM

DIAGRAM C-3: PCI-936 Configuration Diagram



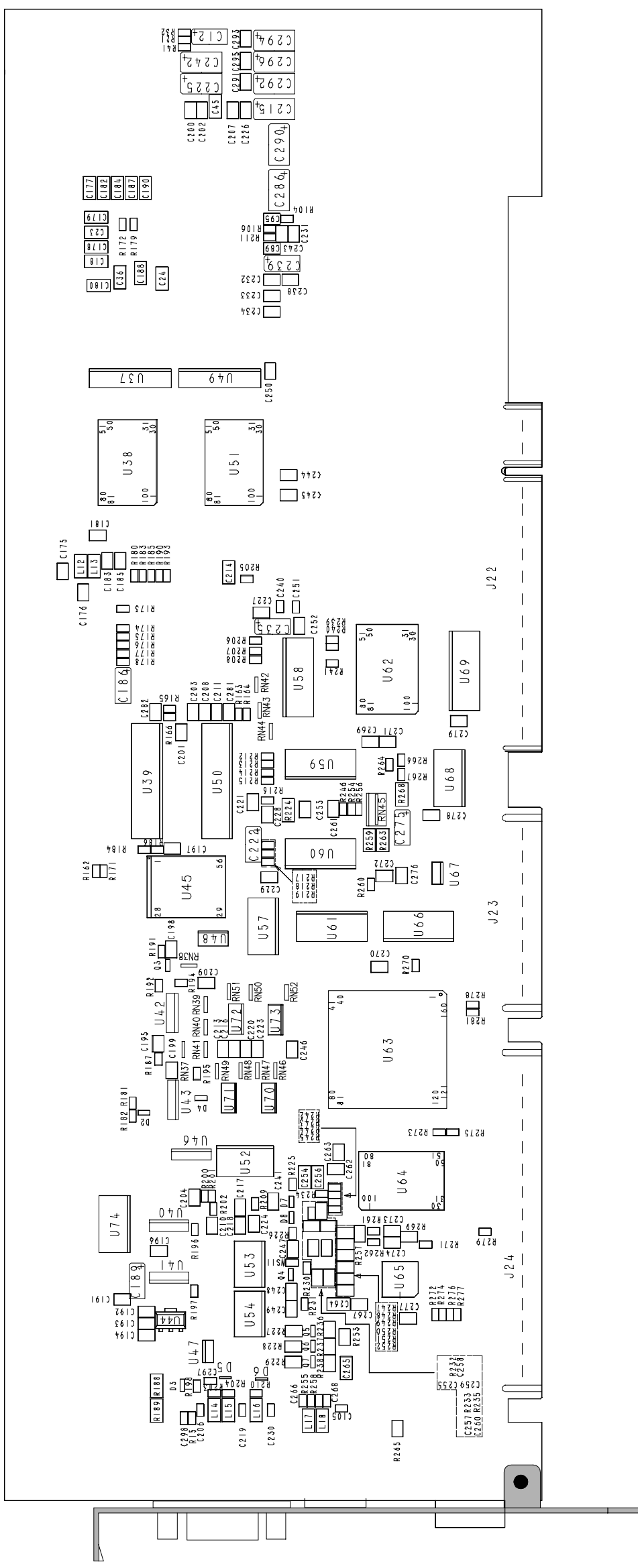
C-4 ASSEMBLY TOP DIAGRAM

DIAGRAM C-4: PCI-936 Assembly Top Diagram



C-5 ASSEMBLY BOTTOM DIAGRAM

DIAGRAM C-5: PCI-936 Assembly Bottom Diagram



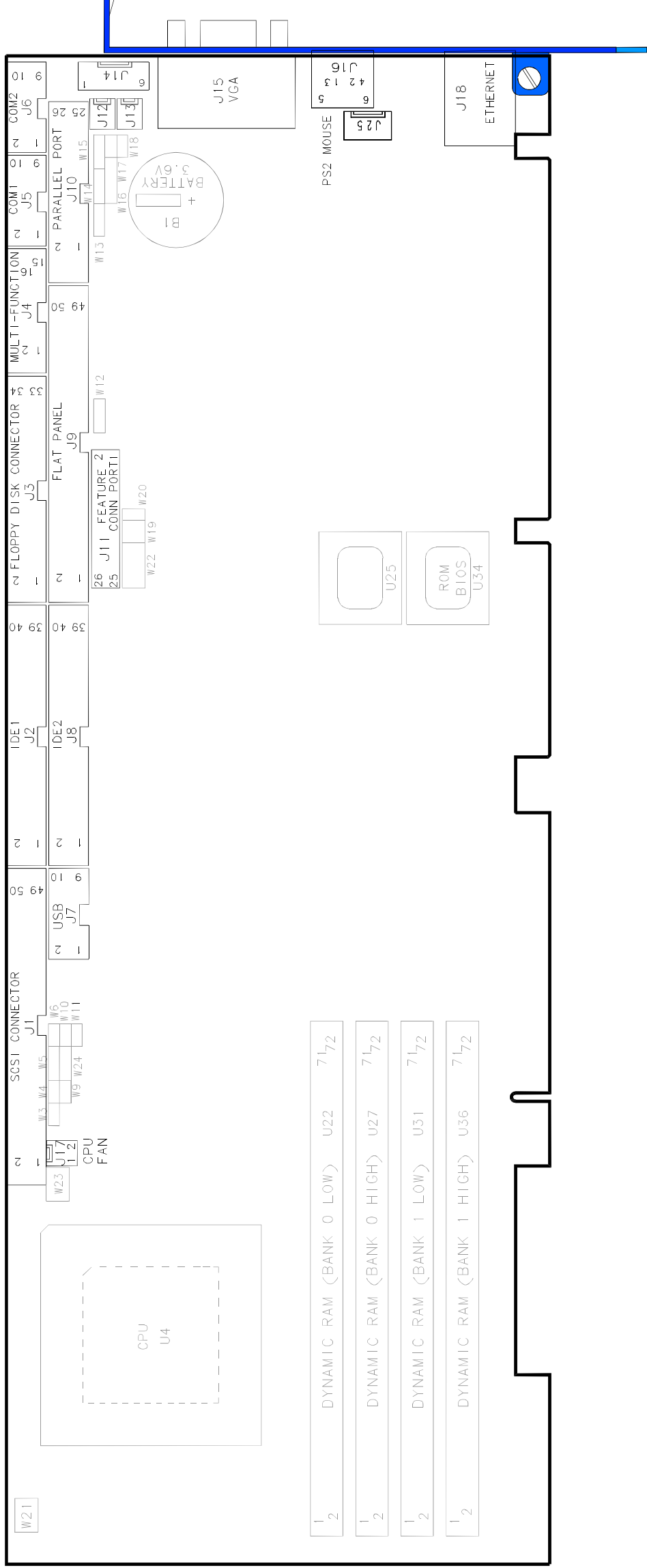
D. CONNECTOR LOCATIONS & PINOUTS

D.1 Location of Connectors on the Board

Diagram D.1 on the next page shows the connector locations on the board.

D-1 Connector Locations

DIAGRAM D-1: PCI-936 Connector Locations



D.2 Connector Pinouts

D.2.1 PCI Ultra SCSI Interface Connector (J1) - Pinout

Pin #	Signal	Pin #	Signal
1	GND	2	SD0
3	GND	4	SD1
5	GND	6	SD2
7	GND	8	SD3
9	GND	10	SD4
11	GND	12	SD5
13	GND	14	SD6
15	GND	16	SD7
17	GND	18	SDP
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	N.C.	26	Term Power
27	GND	28	GND
29	GND	30	GND
31	GND	32	SATN
33	GND	34	GND
35	GND	36	SBSY
37	GND	38	SACK
39	GND	40	SRST
41	GND	42	SMSG
43	GND	44	SSEL
45	GND	46	SCD
47	GND	48	SREQ
49	GND	50	SIO

D.2.2 Enhanced IDE Connectors (J2 and J8) - Pinout

	Pin #	Signal Flow	Signal	Pin #	Signal Flow	Signal
P R I M A R Y I D E (J2)	1	O	RESET*	2	-	GND
	3	I/O	HD7	4	I/O	HD8
	5	I/O	HD6	6	I/O	HD9
	7	I/O	HD5	8	I/O	HD10
	9	I/O	HD4	10	I/O	HD11
	11	I/O	HD3	12	I/O	HD12
	13	I/O	HD2	14	I/O	HD13
	15	I/O	HD1	16	I/O	HD14
	17	I/O	HD0	18	I/O	HD15
	19	-	GND	20	-	Not Connected
	21	I	DMA REQ 0	22	-	GND
	23	O	IOW*	24	-	GND
	25	O	IOR*	26	-	GND
	27	I	IOCHRDY	28	O	Pulled Up
	29	I	DMA ACK 0*	30	-	GND
	31	I	IRQ14	32	-	IOCS16*
	33	O	SA1	34	-	GND
	35	O	SA0	36	O	SA2
	37	O	CS1*	38	O	CS3*
39	I	ACTIVE*	40	-	GND	
S E C O N D A R Y I D E (J8)	1	O	RESET*	2	-	GND
	3	I/O	HD7	4	I/O	HD8
	5	I/O	HD6	6	I/O	HD9
	7	I/O	HD5	8	I/O	HD10
	9	I/O	HD4	10	I/O	HD11
	11	I/O	HD3	12	I/O	HD12
	13	I/O	HD2	14	I/O	HD13
	15	I/O	HD1	16	I/O	HD14
	17	I/O	HD0	18	I/O	HD15
	19	-	GND	20	-	Not Connected
	21	I	DMA REQ 1	22	-	GND
	23	O	IOW*	24	-	GND
	25	O	IOR*	26	-	GND
	27	I	IOCHRDY	28	O	Pulled Up
	29	I	DMA ACK 1*	30	-	GND
	31	I	IRQ0	32	-	IOCS16*
	33	O	SA1	34	-	GND
	35	O	SA0	36	O	SA2
	37	O	CS1*	38	O	CS3*
39	I	ACTIVE*	40	-	GND	

* Active low signal

D.2.3 Floppy Disk Connector (J3) - Pinout

Pin Number	Signal Flow	Signal	Pin Number	Signal Flow	Signal
1	-	GND	2	O	DRV DENS. SEL. 0*
3	-	GND	4	-	Not Connected
5	-	GND	6	-	Not Connected
7	-	GND	8	I	INDEX*
9	-	GND	10	O	MOTOR ON 0,1*
11	-	GND	12	O	DRIVE SELECT B*
13	-	GND	14	O	DRIVE SELECT A*
15	-	GND	16	O	MOTOR ON 2*
17	-	GND	18	O	DIR CONTROL*
19	-	GND	20	O	STEP*
21	-	GND	22	O	WRITE DATA*
23	-	GND	24	O	WRITE ENABLE*
25	-	GND	26	I	TRACK 0*
27	-	GND	28	I	WRITE PROTECT*
29	-	Media ID1	30	I	READ DATA*
31	-	GND	32	O	HEAD SELECT*
33	-	Media ID0	34	I	DSKCHG*

* Active low signal

D.2.4 Multi-Function Connector - (J4) - Pinout
Keyboard, Speaker, Reset, LED

Pin Number			Pin Number		
Signal Flow		Signal	Signal Flow		Signal
Signal			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.2.5 Serial Port 1 - (J5) RS-232 - Pinout

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

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.2.6 Serial Port 2 - (J6) RS-232 - Pinout

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

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.2.7 Serial Port 2 - (J6) RS-422/RS-485 - Pinout

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

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

D.2.8 USB Connector (J7) - Pinout

Pin #	I/O	Signal	Pin #	I/O	Signal
1	O	VCC	2	I/O	VCC
3	I/O	P0-	4	O	P1-
5	O	P0+	6	O	P1+
7	I/O	GND	8	I/O	GND
9	O	GND	10	O	GND

D.2.9 Flat Panel Connector (J9) - Pinout

Pin #	Signal	Pin #	Signal
1	ENAVDD	2	VCC (+3.3 V or 5V)
3	ENAVEE	4	STNDBYE*
5	ENABLK	6	GND
7	M/DE	8	ACTI
9	GND	10	LP/DE
11	FLM	12	GND
13	SHFCLK	14	GND
15	P0	16	P1
17	GND	18	P2
19	P3	20	GND
21	P4	22	P5
23	GND	24	P6
25	P7	26	GND
27	P8	28	P9
29	GND	30	P10
31	P11	32	GND
33	P12	34	P13
35	GND	36	P14
37	P15	38	GND
39	P16	40	P17
41	GND	42	P18
43	P19	44	GND
45	P20	46	P21
47	GND	48	P22
49	P23	50	GND

 **Note:**

1. VCC active only when ENAVDD is active high.
2. Voltage level selectable via jumper W24.
3. Voltage level same as VCC on pin 2. Tristated when ENAVDD (pin #1) is inactive low.

D.2.10 Parallel Port Connector (J10) - Standard Mode

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

Pin #	I/O	Signal
2	O	AUTOFD*
4	I	ERROR*
6	O	INIT*
8	O	SELECTIN*
10	-	GND
12	-	GND
14	-	GND
16	-	GND
18	-	GND
20	-	GND
22	-	GND
24	-	GND
26	-	GND

* Active low signal

D.2.11 Parallel Port Connector (J10) - EPP Mode

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

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.2.12 Parallel Port Connector (J10) - ECP Mode

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

Pin #	I/O	Signal
2	O	AUTOFD*, HOSTACK ²
4	I	FAULT* ¹ , PERIPHRQST* ²
6	O	INIT* ¹ , REVERSERQST* ²
8	O	SELECTIN* ^{1,2}
10	-	GND
12	-	GND
14	-	GND
16	-	GND
18	-	GND
20	-	GND
22	-	GND
24	-	GND
26	-	GND

* Active low signal

¹ Compatible Mode² High Speed Mode**Note:**

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

D.2.13 VPORT Connector (J11) - Pinout

Pin #	Signal	Pin #	Signal
Y1	Data 0/8	Z1	GND
Y2	Data 1/9	Z2	GND
Y3	Data 2/10	Z3	GND
Y4	Data 3/11	Z4	SDA
Y5	Data 4/12	Z5	VREF
Y6	Data 5/13	Z6	Not Connected
Y7	Data 6/14	Z7	VCC
Y8	Data 7/15	Z8	GND
Y9	SCL	Z9	GND
Y10	HREF	Z10	GND
Y11	Not Connected	Z11	GND
Y12	Not Connected	Z12	VCLK
Y13	GND	Z13	Not Connected

D.2.14 External Battery Connector (J12) - Pinout

Pin Number	Signal
1	External Battery
2	GND

D.2.15 Emergency BIOS Boot (J13) - Pinout

Pin Number	Signal
1	EMER*
2	GND

* Active low signal

D.2.16 External Power Connector (J14) - Pinout

Pin #	Signal
1	VCC
2	GND
3	GND
4	+12
5	GND
6	VCC

D.2.17 VGA Connector (J15) - Pinout

Pin #	Signal	Pin #	Signal	Pin #	Signal
1	RED	6	ANALOG GND	11	Not Connected
2	GREEN	7	ANALOG GND	12	SDA
3	BLUE	8	ANALOG GND	13	HSYNC
4	Not Connected	9	Not Connected	14	VSYNC
5	GND	10	GND	15	SCL

D.2.18 PS/2 Mouse Connector (J16) Din

Pin #	Signal	Pin #	Signal
1	MDATA	4	VCC
2	Not connected	5	MCLK
3	GND	6	GND

D.2.19 Fan Connector (J17) - Pinout

Pin Number	Signal
1	+12V
2	GND

D.2.20 Ethernet 10/100 Base-Tx RJ-45 Connector (J18) - Pinout

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.2.21 PS/2 Mouse Connector (J25) - Pinout

Pin #	Signal
1	MCLK
2	GND
3	MDATA
4	VCC

D.2.22 PCI Bus Connector A1-A30 and B1-B30 (J19 and J22)

A SIDE

I/O PIN	Signal Name	I/O
A1	VCC (+5V)	-
A2	+12V	-
A3	Not Connected	-
A4	TD	-
A5	VCC	-
A6	INTA*	I
A7	INTC*	I
A8	VCC (+5V)	-
A9	P CLK4-Slot 3	O
A10	VCC (+5V)	-
A11	P CLK4-Slot 4	O
A12	GND	-
A13	GND	-
A14	GNT1*	O
A15	P RST*	O
A16	VCC (+5V)	-
A17	CON_GNT0*	O
A18	GND	-
A19	REQ2*	I
A20	AD30	I/O
A21	Not Connected	-
A22	AD28	I/O
A23	AD26	I/O
A24	GND	-
A25	AD24	I/O
A26	GNT2*	O
A27	Not Connected	-
A28	AD22	I/O
A29	AD20	I/O
A30	GND	-

B SIDE

I/O PIN	Signal Name	I/O
B1	-12V	-
B2	Not Connected	-
B3	GND	-
B4	TD	-
B5	VCC (+5V)	-
B6	VCC (+5V)	-
B7	INTB*	I
B8	INTD*	I
B9	REQ3*	I
B10	REQ1*	I
B11	GNT3*	O
B12	GND	-
B13	GND	-
B14	P CLK3-Slot 1	O
B15	GND	-
B16	P CLK3-Slot 2	O
B17	GND	-
B18	CON_REQ0*	I
B19	VCC (+5V)	-
B20	AD31	I/O
B21	AD29	I/O
B22	GND	-
B23	AD27	I/O
B24	AD25	I/O
B25	Not Connected	-
B26	C/BE3*	I/O
B27	AD23	I/O
B28	GND	-
B29	AD21	I/O
B30	AD19	I/O

* Active low signal

D.2.23 PCI Bus Connector A31-E62 and B31-F62 (J19 and J22)

A SIDE

I/O PIN	Signal Name	I/O
A31	AD18	I/O
A32	AD16	I/O
A33	Not Connected	-
A34	FRAME*	O
A35	GND	-
A36	TRDY*	I
A37	GND	-
A38	STOP*	I
A39	Not Connected	-
A40	SDONE	I/O
A41	SBO*	I/O
A42	GND	-
A43	PAR	I/O
A44	AD15	I/O
A45	Not Connected	-
A46	AD13	I/O
A47	AD11	I/O
A48	GND	-
A49	AD9	I/O
A50	Connector Key	-
A51	Connector Key	-
A52	C/BE0*	I/O
A53	Not Connected	-
A54	AD6	I/O
A55	AD4	I/O
A56	GND	-
A57	AD2	I/O
A58	AD0	I/O
A59	VCC (+5V)	-
A60	REQ64*	I/O
A61	VCC (+5V)	-
A62	VCC (+5V)	-

B SIDE

I/O PIN	Signal Name	I/O
B31	Not Connected	-
B32	AD17	I/O
B33	C/BE2*	I/O
B34	GND	-
B35	IRDY*	O
B36	Not Connected	-
B37	DEVSEL*	I
B38	GND	-
B39	PLOCK*	I/O
B40	PERR*	I/O
B41	Not Connected	-
B42	SERR*	I/O
B43	Not Connected	-
B44	C/BE1*	I/O
B45	AD14	I/O
B46	GND	-
B47	AD12	I/O
B48	AD10	I/O
B49	GND	-
B50	Connector Key	-
B51	Connector Key	-
B52	AD8	I/O
B53	AD7	I/O
B54	Not Connected	-
B55	AD5	I/O
B56	AD3	I/O
B57	GND	-
B58	AD1	I/O
B59	VCC (+5V)	-
B60	ACK64*	I/O
B61	VCC (+5V)	-
B62	VCC (+5V)	-

* Active low signal

D.2.24 ISA Bus Connector C and D (J20 and J23) - Pinout

C Side

I/O PIN	Signal Name	I/O
C1	SBHE*	I/O
C2	LA23	I/O
C3	LA22	I/O
C4	LA21	I/O
C5	LA20	I/O
C6	LA19	I/O
C7	LA18	I/O
C8	LA17	I/O
C9	MEMR*	I/O
C10	MEMW*	I/O
C11	SD08	I/O
C12	SD09	I/O
C13	SD10	I/O
C14	SD11	I/O
C15	SD12	I/O
C16	SD13	I/O
C17	SD14	I/O
C18	SD15	I/O

D Side

I/O PIN	Signal Name	I/O
D1	MEMCS16*	I
D2	IOCS16*	I
D3	IRQ10	I
D4	IRQ11	I
D5	IRQ12	I
D6	IRQ15	I
D7	IRQ14	I
D8	DACK0*	O
D9	DRQ0	I
D10	DACK5*	O
D11	DRQ5	I
D12	DACK6*	O
D13	DRQ6	I
D14	DACK7*	O
D15	DRQ7	I
D16	VCC (+5V)	-
D17	MASTER*	I
D18	GND	-

* Active low signal

D.2.25 ISA Bus Connector A and B (J21 and J24) - Pinout

A SIDE			B SIDE		
I/O PIN	Signal Name	I/O	I/O PIN	Signal Name	I/O
A1	IOCHK*	I	B1	GND	-
A2	SD7	I/O	B2	RESET DRV	O
A3	SD6	I/O	B3	VCC (+5V)	-
A4	SD5	I/O	B4	IRQ9	I
A5	SD4	I/O	B5	Not Connected	-
A6	SD3	I/O	B6	DRQ2	I
A7	SD2	I/O	B7	-12V	-
A8	SD1	I/O	B8	OWS*	I
A9	SD0	I/O	B9	+12V	-
A10	IOCHRDY	I	B10	GND	-
A11	AEN	O	B11	SMEMW*	O
A12	SA19	I/O	B12	SMEMR*	O
A13	SA18	I/O	B13	IOW*	I/O
A14	SA17	I/O	B14	IOR*	I/O
A15	SA16	I/O	B15	DACK3*	O
A16	SA15	I/O	B16	DRQ3	I
A17	SA14	I/O	B17	DACK1*	O
A18	SA13	I/O	B18	DRQ1	I
A19	SA12	I/O	B19	REFRESH*	I/O
A20	SA11	I/O	B20	SYSCLK	O
A21	SA10	I/O	B21	IRQ7	I
A22	SA9	I/O	B22	IRQ6	I
A23	SA8	I/O	B23	IRQ5	I
A24	SA7	I/O	B24	IRQ4	I
A25	SA6	I/O	B25	IRQ3	I
A26	SA5	I/O	B26	DACK2*	O
A27	SA4	I/O	B27	TC	O
A28	SA3	I/O	B28	BALE	O
A29	SA2	I/O	B29	VCC (+5V)	-
A30	SA1	I/O	B30	OSC	O
A31	SA0	I/O	B31	GND	-

* Active low signal

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:

TABLE E-3: BEEP CODE :

Post code	BeepCode	Description
41	**_*	Entering 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 indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

DISK BOOT FAILURE, INSERT SYSTEM DISK AND PRESS ENTER

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

DISKETTE DRIVES OR TYPES MISMATCH ERROR - RUN SETUP

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

DISPLAY SWITCH IS SET INCORRECTLY

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

DISPLAY TYPE HAS CHANGED SINCE LAST BOOT

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

ERROR ENCOUNTERED INITIALIZING HARD DRIVE

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

ERROR INITIALIZING HARD DRIVE DISK CONTROLLER

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

FLOPPY DISK CNTRLR ERROR OR NO CNTRLR PRESENT

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

KEYBOARD ERROR OR NO KEYBOARD PRESENT

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

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

MEMORY ADDRESS ERROR AT ...

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

MEMORY PARITY ERROR AT ...

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

MEMORY SIZE HAS CHANGED SINCE LAST BOOT

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

MEMORY VERIFY ERROR AT ...

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

OFFENDING SEGMENT

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

PRESS A KEY TO REBOOT

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

PRESS F1 TO DISABLE NMI, F2 TO REBOOT

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

RAM PARITY ERROR - CHECKING FOR SEGMENT ...

Indicates a parity error in Random Access Memory.

E.4 POST Codes



Note:

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

TABLE E-1: POST Codes

POST (hex)	Name	Description
CO	Turn Off Chipset Cache	OEM Specific-Cache control
1	Processor Test 1	Processor Status (1FLAGS) Verification. Tests the following processor status flags: Carry, zero, sign, overflow. The BIOS will set each of these flags, verify they are set, then turn each flag off and verify it is off.
2	Processor Test 2	Read/Write/Verify all CPU registers except SS, SP, and BP with data pattern FF and 00.
3	Initialize Chips	Disable NMI, PIE, AIE, UEI, SQWV. Disable video, parity checking, DMA. Reset math coprocessor. Clear all page registers, CMOS shutdown byte. Initialize timer 0, 1, and 2, including set EISA timer to a known state. Initialize DMA controllers 0 and 1. Initialize interrupt controllers 0 and 1. Initialize EISA extended registers.
4	Test Memory Refresh Toggle	RAM must be periodically refreshed in order to keep the memory from decaying. This function assures that the memory refresh function is working properly.
5	Blank video, Initialize keyboard	Keyboard controller initialization.
6	Reserved	
7	Test CMOS Interface and Battery Status	Verifies CMOS is working correctly, detects bad battery.
BE	Chipset Default Initialization	Program chipset registers with power on BIOS defaults.
C1	Memory presence test	OEM Specific-Test to size on-board memory.
C5	Early Shadow	OEM Specific-Early Shadow enable for fast boot.
C6	Cache presence test	External cache size detection.
8	Setup low memory	Early chip set initialization. Memory presence test. OEM chip set routines. Clear low 64K of memory. Test first 64K memory.
9	Early Cache Initialization	Cyrix CPU initialization. Cache initialization.
A	Setup Interrupt Vector Table	Initialize first 120 interrupt vectors with SPURIOUS_INT_HDLR and initialize INT 00h-1Fh according to INT_TBL.
B	Test CMOS RAM Checksum	Test CMOS RAM Checksum, if bad, or insert key pressed, load defaults.
C	Initialize keyboard	Detect type of keyboard controller (optional). Set NUM LOCK status.
D	Initialize Video Interface	Detect CPU clock. Read CMOS location 14h to find out type of video in use.

		Detect and Initialize Video Adapter.
E	Test Video Memory	Test video memory, write sign-on message to screen. Setup shadow RAM - Enable shadow according to Setup.
F	Test DMA Controller 0	BIOS checksum test. Keyboard detect and initialization.
10	Test DMA Controller 1	
11	Test DMA Page Registers	Test DMA Page Registers.
12-13	Reserved	
14	Test Timer Counter 2	Test 8254 Timer 0 Counter 2.
15	Test 8259-1 Mask Bits	Verify 8259 Channel 1 masked interrupts by alternately turning off and on the interrupt lines.
16	Test 8259-2 Mask Bits	Verify 8259 Channel 2 masked interrupts by alternately turning off and on the interrupt lines.
17	Test Stuck 8259's Interrupts Bits	Turn off interrupts then verify no interrupt mask register is on.
18	Test 8259 Interrupt Functionality	Force an interrupt and verify the interrupt occurred.
19	Test Stuck NMI Bits (Parity/IO Check)	Verify NMI can be cleared.
1A		Display CPU clock
1B-1E	Reserved	
1F	Set EISA Mode	If EISA non-volatile memory checksum is good, execute EISA initialization. If not, execute ISA tests and clear EISA mode flag. Test EISA Configuration Memory Integrity (checksum & communication interface).
20	Enable Slot 0	Initialize slot 0 (System Board).
21-2F	Enable Slots 1-15	Initialize slots 1 through 15.
30	Size Base and Extended Memory	Size base memory from 256KB to 640KB and extended memory above 1 MB.
31	Test Base and Extended Memory	Test base memory from 256KB to 640KB and extended memory above 1 MB using various patterns. NOTE: This will be skipped in ISA mode and can be « skipped » with ESC key in EISA mode.
32	Test EISA Extended Memory	If EISA Mode flag is set then test EISA memory found in slots initialization. NOTE: This will be skipped in ISA mode and can be « skipped » with ESC key in EISA mode.
33-3B	Reserved	
3C	Setup Enabled	
3D	Initialize & Install Mouse	Detect if mouse is present, initialize mouse, install interrupt vectors.
3E	Setup Cache Controller	Initialize Cache controller.
3F	Reserved	
BF	Chipset Initialization	Program chipset registers with Setup values.
40		Display virus protect disable or enable
41	Initialize Floppy Drive & Controller	Initialize floppy disk drive controller and any drives.
42	Initialize Hard Drive & Controller	Initialize hard drive controller and any drives.
43	Detect & Initialize Serial/Parallel Ports	Initialize any serial and parallel ports (also game port).
44	Reserved	
45	Detect & Initialize Math Coprocessor	Initialize math coprocessor
46	Reserved	
47	Reserved	
48-4D	Reserved	

4E	Manufacturing POST Loop or Display Messages	Reboot if Manufacturing POST Loop pin is set. Otherwise display any messages (i.e., any non-fatal errors that were detected during POST) and enter Setup.
4F	Security Check	Ask password security (optional).
50	Write CMOS	Write all CMOS values back to RAM and clear screen.
51	Pre-boot Enable	Enable parity checker. Enable NMI, Enable Cache before boot.
52	Initialize Option ROMs	Initialize any option ROMs present from C8000h to EFFFFh. Note: When FSCAN option is enabled, will initialize from C8000h to F7FFFh.
53	Initialize 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:

F.1 Symptoms

- No POST code on a power up (when using a POST card).
- No TEKNOR BIOS extensions present even if jumper W22 (5-6) is not installed.
- System stops at post 41(when using a POST card) and associated beep code is generated (indicated in Table E-1).
- Board does not boot, even after following all the steps indicated in the Read Me First section.

F.2 Emergency Procedure

Running an EMERGENCY PROCEDURE.

- 1) Remove battery jumper (W14,W15) even if it is set to internal or external.
- 2) Be sure that your Supervisor I/O base address is set to 190h (jumper W19).
- 3) Install the EMERGENCY jumper (J13).
- 4) Install the EMERGENCY diskette in the floppy drive A (1.44 Mb) connected to the PCI-936 board.
- 5) Power on the board. (Note that no VGA is present during this procedure.)
- 6) Boot block flash update will be completed when you will see the post code 55 (when using a POST card) or hear the associated beep code (indicated in Table E-2).
- 7) After the procedure is successfully completed, power down the board, remove EMERGENCY jumper (J13), set your battery jumper and Supervisor I/O base address as it was previously and power up the board. Your PCI-936 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.3 Generate an Emergency Floppy Diskette.

F.3 Generate an Emergency Floppy Diskette

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

- 1) Insert the KONTRON 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 KONTRON diskette package).
- 3) Remove the KONTRON 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 PCI-936. Many other modes are available and function equally well. Users are encouraged to check with their local distributors for comparable substitutes.

G.1 DRAM (Four 72-pin Sockets Located at U22, U27, U31 and U36)

DRAM devices with parity bit and page mode at 70ns maximum access time are recommended. Consult the following list to see examples of recommended DRAM devices on the PCI-936.

DRAM	Vendor	Part Number	DRAM	Vendor	Part Number
1M*36	MICRON	MT9D136M-7	4M*36	HYUNDAI	HYM536410AM-70
	NEC	MC-4210000A36B-70		MITSUBISHI	MH4M36ANXJ-7
	SAMSUNG	70		NEC	MC-424000A36BH-70
	TI	KMM5361000B-7		NEC	MC-424000A36BJ-70
	TOSHIBA	TM124MBK36R-70		SAMSUNG	KMM5364100-7
		THM361020AS-70	TOSHIBA	THM3640205-70	
2M*36	HITACHI	HB56D236B2-7C	8M*36	HITACHI	HB56D836BR-70A
	HITACHI	HB56D236BS-7BC		TOSHIBA	THM368020S-70
	HITACHI	HB56D236BW-7B		TOSHIBA	THM368020SG-70
	HITACHI	HB56D236BW-7C			
	HYUNDAI	HYM536220W-70			
	MICRON	MT18D236M-7			
	NEC	MC422000A36B-70			
	SAMSUNG	KMM5362000B-7			
	TOSHIBA	THM362040AS-60			
	TOSHIBA	THM362040AS-70			

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.

<u>Connector</u>	<u>Recommended Mating Part</u>
Fan Connector (J17)	Leoco 2530 S020013 (housing), Leoco 2533 TCB00A0 (crimp); Molex 22-01-3027 (housing), Molex 08-50-0114 (crimp).
SCSI (J1)	Amp 1-746285-0 [499252-4*], Robinson Nugent IDS-C50PK-TG, Thomas & Betts 622-5030 [622-55041*]. (50-pin flat cable connector).
Hard Disks (J2 & J8)	Amp 746285-9 [499252-1*], Robinson Nugent IDS-C40PK-TG, Thomas & Betts 622-4030 [622-4041*]. (40-pin flat cable connector).
Floppy Disk (J3)	Amp 746285-8 [499252-6*], Robinson Nugent IDS-C34PK-TG, Thomas & Betts 622-3430 [622-3441*]. (34-pin flat cable connector).
Multi-Function (J4)	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 (J5 & J6)	Amp 746285-1 [499252-5*], Robinson Nugent IDS-C10PK-TG, Thomas & Betts 622-1030 [622-1041*]. (10-pin flat cable connector).

* optional strain relief part number shown in square brackets

Connector

Recommended Mating Part

Parallel Port (J10)

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

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

CANADIAN HEADQUARTERS

Tel.: (514) 437-5682

Fax: (514) 437-8053

EUROPEAN REGIONAL OFFICE

Tel.: +49 811 / 600 15-0

Fax: +49 811 / 600 15-33

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

**Kontron Inc.
616 Cure Boivin
Boisbriand, Quebec
J7G 2A7 CANADA**

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

LIMITED WARRANTY

Kontron Inc. ("the seller") warrants its products to be free from defects in material and workmanship for a period of two (2) years commencing on the date of shipment. The liability of the seller shall be limited to replacing or repairing, at the seller's option, any defective units. Equipment or parts that 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 Kontron Inc product malfunctions, please do the following before returning any merchandise:

- 1) Call our Technical Support department in Canada at (514) 437-5682 or in Germany at +49 811 / 600 15-0. Make sure you have the following at hand: the Kontron Invoice #, your Purchase Order #, and the Serial Number of the defective unit.
- 2) Give the serial number found on the back of the card and explain the nature of your problem to a service technician.
- 3) If the problem cannot be solved over the telephone, the technician will further instruct you on the return procedure.
- 4) Prior to returning any merchandise, make sure you receive an RMA # from Kontron'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 Kontron card:
 - i) Make sure that the card is properly packed: Place it in an antistatic plastic bag and pack it in a rigid cardboard box.
 - ii) Ship prepaid to (but not insured, since incoming units are insured by Kontron):

**Kontron Inc.
616 Cure Boivin
Boisbriand, Quebec
J7G 2A7 CANADA**

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



**RETURN TO MANUFACTURER
AUTHORISATION REQUEST**

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

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

**Fax this form to Kontron's Technical Support department
in Canada at (514) 437-8053 or in Germany at +49 811 / 600 15-33**