POS-460

All-in-One Single Board 486
Computer with SVGA, Ethernet,
and SSD

User's Manual for POS-460

Copyright Notice

Acknowledgements

Packing List

Before installing your board, insure that the following materials have been received:

- 1 POS-460 All-in-One Single Board Computer
- 1 utility disk with system BIOS, VGA BIOS, and Ethernet utility programs
- 1 utility disk with SVGA utility programs and drivers for Windows 3.1
- 1 utility disk with SVGA utility programs and drivers for Windows 95 and OS/2
- 1 warranty certificate
- 2 FDD/HDD cables

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

Contents

General Information

This chapter gives background information on the POS-460.

Sections include:

• Board specifications

• Board layout and dimensions

Introduction

The POS-460 All-in-One control board was designed for POS applications and to simplify POS system integration with on-board Super I/O, LCD controller, VGA, solid state disk and Ethernet.

The POS-460 uses a standard layout based on Western Digital's LPM/LPX format. It is 100% PC compatible, ready to adapt to any existing PC hardware and software. Special POS provisions, such as digital I/Os and four on-board serial ports, each with +5 V/+12 V power output capability, are available to accommodate a wide array of POS peripherals.

The POS-460's industrial grade construction permits continuous operation in a harsh POS environment where reliability is crucial. Other on-board industrial features not typically found on other motherboards include a watchdog timer for dependability during unmanned operations, and CMOS backup. An on-board SSD, capable of adapting SRAM, Flash or EPROM, is perfect for POS data backup or emulating a floppy disk drive. The POS-460 can upgraded to any CPU from the 486SX to the 5x86 simply by rearranging jumpers.

In addition to a 72-pin SIMM socket for up to 32 MB of DRAM, an optional 1 MB or 4 MB DRAM can be installed to the board to reduce the overall DRAM cost and increase system stability.

Specifications

- **CPU:** 486SX/DX/DX2/DX4/5x86 CPU

- **2nd Level Cache:** Up to 512 KB cache memory

- **Watchdog Timer:** Timer generates system reset at 1.6 sec interval. Software enabled.

- **CMOS Backup:** CMOS data backed up in Flash BIOS to avoid system configuration data loss

- **Expansion Slot:** One ISA-bus expansion slot. Supports ISA-bus expansion riser card.

- **Dimensions:** 220 mm x 250 mm, WD/LPM/LPX format

- **Operating Temperature:** 0~60°C

- **Power Consumption:** +5V @ 3A, +12 V @ 0.15 A, -12V @ 0.15 A (Nominal)

Standard I/O

- **Serial Ports:** 3 RS-232, 1 RS-232/RS-422/RS-485, 16550 UARTS, all with +5V and +12V power output capability on Pin 1 and Pin 9, selectable via 1A fuse placement

- **Parallel Ports:** 2 EPP/ECP/Bidirectional

- **Floppy Disk Drive Interface:** 1

- **EIDE Hard Disk Drive Interface:** 1

- **3-way Keyboard:**   2 external PS/2 keyboard connectors
                          1 internal PS/2 keyboard connector

Control I/O

- **Digital Outputs:** 2 open-collector outputs to drive relay or cash drawer solenoid (on-board pin header)

- **Digital Inputs:** 4 TTL-compatible inputs to sense cash drawer closure (on-board pin header)

Solid State Disk

- Supports DiskOnChip (DOC) 2000

- Three 32-pin sockets support 1.5 MB SRAM/Flash/ROM devices

System Memory

- **SIMM DRAM:** One 72-pin socket, up to 32 MB

- **On-board DRAM:** 1 MB or 4 MB (optional)

PCI Flat Panel/VGA Interface

- **Display memory:** 512 KB DRAM (standard); 1 MB DRAM (optional)

- **Display type:** Supports CRT and flat panel LCD (EL, DSTN, MONO and TFT) display. Can display both CRT and flat panel simultaneously.

- **CRT/flat panel display modes:** Supports resolutions up to 1024 x 768. Non-interlaced CRT monitor resolutions up to 1024 x 768 @ 256 colors. True color and Hi-color display capability with flat panels and CRT monitors at 640 x 480 resolution.

Ethernet Interface

- **Ethernet interface:** Software compatible with Novell NE 2000 driver. On-board 10-Base-T, software drivers optional. Supports boot ROM function

Note: Specifications subject to change without notice.

Board Layout and Dimensions

POS-460 Board Configuration
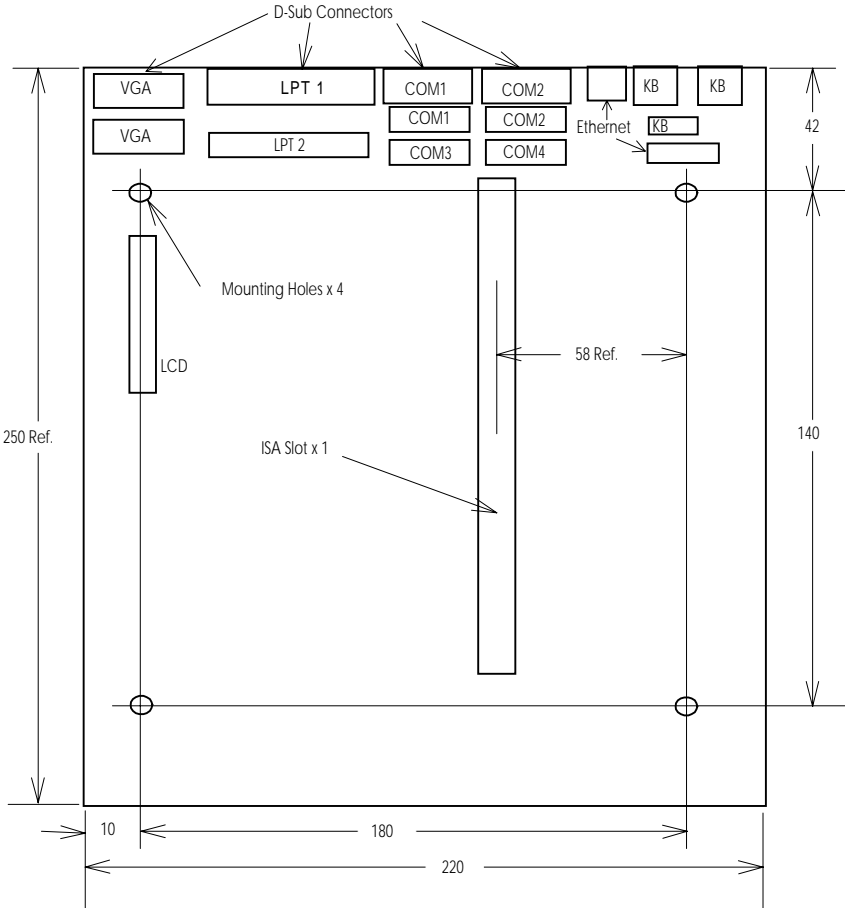
WD/LPM/LPX Format
Overal Size: 220 mm x 250 mm
All units in mm

Installation

This chapter explains how to set up the POS-460 hardware, including instructions on setting jumpers and connecting peripherals, switches and indicators. Be sure to read all the safety precautions before you begin the installation procedure.

Jumpers and Connectors

Connectors on the board link the POS-460 to external devices such as hard disk drives, a keyboard or floppy drives. The board has a number of jumpers that allow you to configure your system to suit your application. The tables below lists the function of each of the board's jumpers and connectors:

Peripheral Connections

Label	Connection type	Peripheral type
CN1	Mini DIN	PS/2 keyboard
CN2	Mini DIN	PS/2 keyboard
CN2A	5-pin header	Internal PS/2 keyboard
CN3	RJ-45A	Ethernet connection
CN4	DB-9	RS-232 COM2
CN5	DB-9	RS-232 COM1
CN6	DB-25	Parallel port LPT1
CN7	DB-15	CRT VGA
CN8	10-pin header	RS-232 COM2 (internal)
CN9	10-pin header	RS-232 COM1 (internal)
CN10	26-pin header	Parallel port LPT2
CN11	10-pin header	RS-232 COM4 (secondary I/O)
CN12	10-pin header	RS-232 COM3 (secondary I/O)
CN13	44-pin header	LCD port
CN14	12-pin connector	Power supply input
CN15	40-pin header	HDD (IDE)
CN16	34-pin header	FDD
CN17	5 x 2 pin header	Digital I/O
Slot1	SLT-98	ISA expansion slot
CN18	10 pin header	CRT VGA (internal)
CN19	14 pin header	Ethernet (internal)

NOTE: Do not confuse J19 with JP19, or J31 with JP31.

Jumpers and Switches

Label	Function
JP19	CPU clock speed
JP31	Flash ROM voltage select
SW1	SSD function
J3	On-board VGA enable/disable
J8, J9	LPT1 DMA select
J12	Secondary I/O IRQ select
J16	CMOS discharge
J17	Cache size selection
J18,J20,J21	SSD function
J22~J31	CPU select
JP33	CPU voltage select
J34	Power LED
J35	Reset switch
J36	HDD LED
J37	Turbo LED
J38	Turbo switch
J39	Speaker
J40	Power LED and keylock
J41	CPU clock speed
J42	COM3 RS-232/RS-422/RS-485 select for COM3
J43	SSD function
J46	COM3 RS-232/RS-422/RS-485 select for COM3
J47	COM3/COM4/LPT2 enable/disable

Locating Jumpers and Connectors
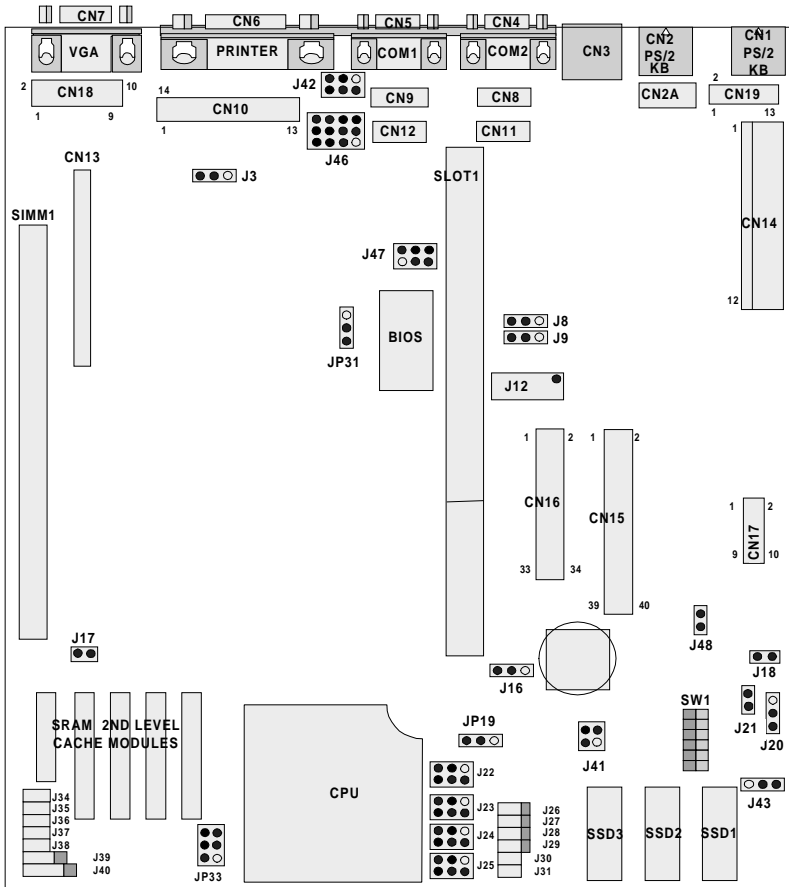
Safety Precautions

Warning!   *Always disconnect the power cord from your chassis before you begin working on it. Do not make connections while the power is on because sensitive electronic components can be damaged by the sudden rush of power. Only experienced electronics personnel should open the PC chassis.*

Caution!   *Always ground yourself to remove any static charge before touching the CPU board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.*

Installing the CPU

The POS-460 All-in-one CPU module supports most 486 CPUs. The system's performance depends upon the installed CPU. You can install or upgrade the CPU in the board's PGA socket by following the procedures outlined below.

Removing a CPU

1. Disconnect power from the chassis, and unplug all connections to the CPU board. Consult your chassis' user's manual for instructions on removing the CPU board.

2. Unclip and lift the side lever of the CPU socket. Once the lever is up, the CPU should be easy to remove.

Installing a CPU

Follow the installation instructions that came with your CPU. The general procedures for installing a CPU are as follows:

1. Unclip and lift the side lever of the CPU socket to an upright position.

2. Carefully align the CPU so that it is parallel to the socket. Make sure that the notch on the corner of the CPU matches the notch on the inside of the socket.

3. Gently insert the CPU into the socket. There will probably be a small gap between the CPU and the socket even when it is fully seated. Lower the side lever to lock the CPU in place. Make sure that the lever is clipped securely.

When you install a new CPU, you may have to adjust other settings on the board, including CPU type, CPU clock, and PCI speed. Make sure that the settings are correct for your CPU. **Improper settings may damage the CPU.**

Setting Jumpers

You configure your board to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper you connect the pins with the clip. To "open" a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case you would connect either pins 1 and 2 or 2 and 3.

| Open | Closed | Closed 2-3 |
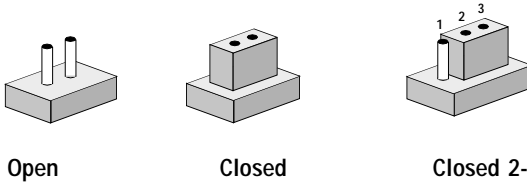
The jumper settings are schematically depicted in this manual as follows:

| Open | Closed | Closed 2-3 |
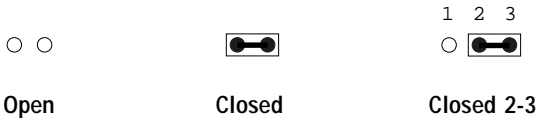
A pair of needle-nose pliers may be helpful when working with jumpers.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

Generally, you simply need a standard cable to make most connections.

CPU type select (J22-J31)

The following diagrams show the correct jumper settings for different CPUs.

CPU type select

Intel 486SX

CPU Voltage = 5V

Intel/SGS DX4-S

CPU Voltage = 3.45V

Intel 486DX/DX2

CPU Voltage = 5V

Intel P24D, Cyrix 5x86 (M1-SC)

CPU Voltage =3.45V

Intel 486SX2-S

CPU Voltage = 5V

Pentium ODP (P24T)

CPU Voltage = 5V
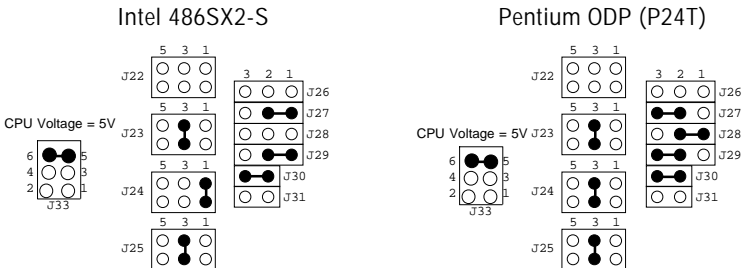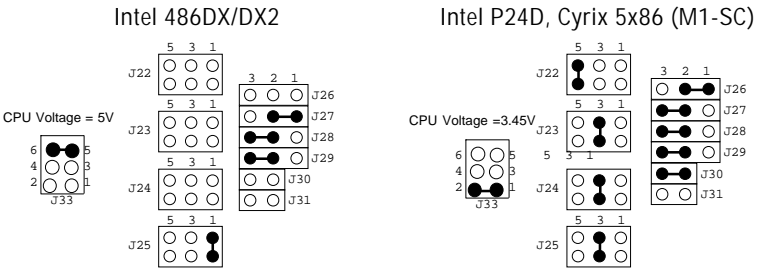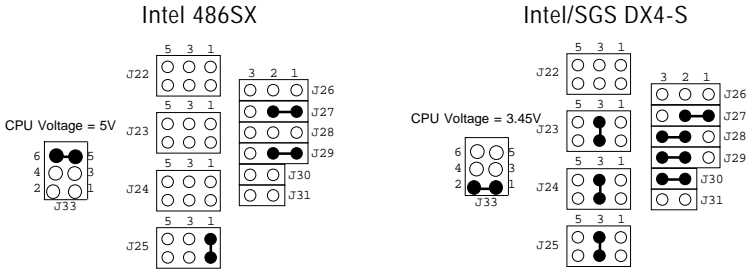
Intel 486DX-S/DX2-S
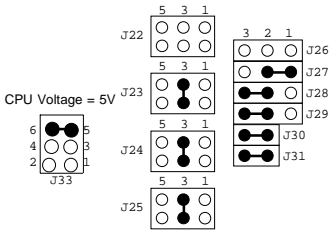
IBM BL486DX2,
Cyrix 486DX2, and TI486DX/DX2

J22

5 3 1

3 2 1
J26
J27
J28
J29
J30
J31

CPU Voltage = 5V J23

5 3 1

5 3 1

J24

5 3 1

6
4
2
5
3
1
J33

J25

5 3 1

J22

5 3 1

3 2 1
J26
J27
J28
J29
J30
J31

CPU Voltage = 3.45V J23

5 3 1

6
4
2
5
3
1
J33

J24

5 3 1

J25

5 3 1
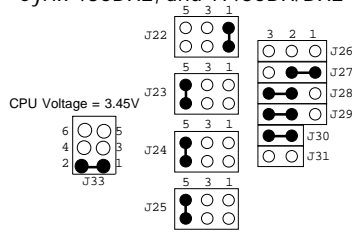
AMD 486DX/DX2 (none green)
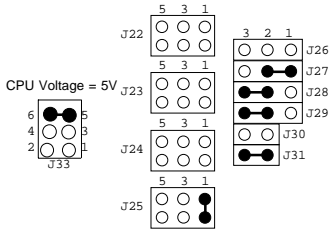
AMD 486DX4 <nv8t>
(none green)

J22

5 3 1

3 2 1
J26
J27
J28
J29
J30
J31

CPU Voltage = 5V J23

5 3 1

6
4
2
5
3
1
J33

J24

5 3 1

J25

5 3 1

J22

5 3 1

3 2 1
J26
J27
J28
J29
J30
J31

CPU Voltage = 3.45V J23

5 3 1

6
4
2
5
3
1
J33

J24

5 3 1

J25

5 3 1
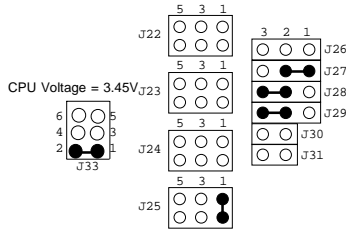
AMD 486 DX4 <sv8b>

AMD 486DX2<sv8b>,
AMD 5x86

J22

5 3 1

3 2 1
J26
J27
J28
J29
J30
J31

CPU Voltage = 3.45V J23

5 3 1

6
4
2
5
3
1
J33

J24

5 3 1

J25

5 3 1

J22

5 3 1

3 2 1
J26
J27
J28
J29
J30
J31

CPU Voltage = 3.45V J23

5 3 1

6
4
2
5
3
1
J33

J24

5 3 1

J25

5 3 1
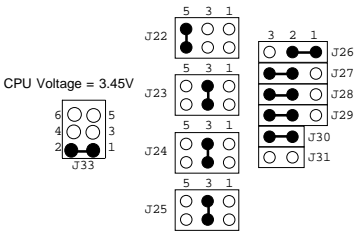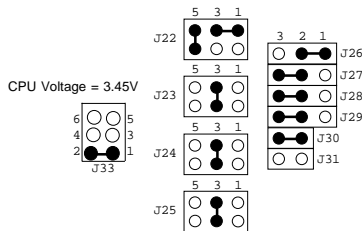
CPU power supply select (J33)

J33 must be set to match the CPU type. The chart below shows the proper jumper settings for their respective V_{CC}.

CPU voltage select (J33)		
CPU voltage	**3.45 V**	**3.5 V**	**5 V**

CPU clock speed select (J41, JP19)

J41 and JP19 are used to synchronize the CPU clock with the CPU type. Set the CPU clock according to the base CPU speed.

CPU clock speed select (J41)			
	CPU clock	**1 - 2**	**3 - 4**
	25 MHz	○ ○	○ ○
	33 MHz	●━━●	○ ○
	40 MHz	○ ○	●━━●

CPU clock speed select (JP19)	
CPU	**> 33 MHz**	**≤ 33 MHz**
	3 2 1	3 2 1
	○ ●━━●	●━━● ○

CMOS discharge jumper (J16)

CMOS discharge jumper (J16)	
Normal (default)	**Discharge**
3 2 1	3 2 1
●━━● ○	○ ●━━●

Note: To discharge CMOS, first make sure the power is off. Move jumper J16 from 2-3 to 1-2 for a few seconds so the CMOS can discharge. Move the jumper back to 2-3.

AInstalling SIMM DRAM

You can install between 1 MB to 32 MB of DRAM using a 1, 2, 4, 8, 16 or 32 MB 72-pin SIMM (Single In-Line Memory Module). Access time should be 70 nsec. or less.

The SIMM can operate in conjunction with the optional 1 MB or 4 MB of on-board DRAM. Refer to the following page for details.

Installing a SIMM

NOTE: The module can only fit into a socket one way. The gold pins must be pointing down into the SIMM socket.

The procedure for installing a SIMM is outlined below.

1. Ensure that all power supplies to the system are switched Off.

2. Locate the board's memory bank, shown in the figure on page 7.

3. Install the SIMM module.

4. Slip the SIMM into a socket at a 45 degree angle and carefully fit the bottom of the board against the connectors.

5. Gently push the SIMM into a perpendicular position until the clips on the ends of the SIMM sockets snap into place.

6. Check to ensure that each SIMM is correctly seated and all connector contacts touch. The SIMM should not move around in its socket.

Optional On-board DRAM

With a volume order, the POS-460 can be affixed with 1 MB or 4 MB on-board DRAM. The on-board DRAM and the SIMM type DRAM can work together.

Cache Installation and Jumpers Set-up (J17)

The cache memory system consists of two parts, one is TAG SRAM, the other is DATA SRAM. The TAG SRAM used in this mainboard is 32Kx8 -15 ns and the DATA SRAM is 64Kx8 -15/20 ns or 128Kx8 -15/20 ns. The mainboard can be installed with 256 or 512 KB cache memory when using 64Kx8 or 128Kx8 type DATA SRAM respectively.

Cache Memory Size Setting

	256K	512K
J17	open	close
Data SRAM	64K8 x 4 pc.	128K8 x 4 pc.
TAG SRAM	32K8	32K8

Note: Make sure notch end on the chip matches notch end of the socket when installing.

IDE Hard Drive Connector (CN15)

The built-in Enhanced IDE (Integrated Device Electronics) controller supports up to two IDE devices, including CD-ROM drives, tape backup drives, a large hard disk drive and other IDE devices. It also supports faster data transfer rates and allows IDE hard disk drives with capacities in excess of 528 MB.

Connecting the hard drive

Connecting drives is done in a daisy-chain fashion. Wire number 1 on the cable is red or blue, while the other wires are gray.

1. Connect one end of the cable to CN15. Make sure that the red (or blue) wire corresponds to pin 1 on the connector, which is labeled on the board (on the right side).

2. Plug the other end of the cable into the Enhanced IDE hard drive with pin 1 on the cable corresponding to pin 1 on the hard drive. (See your hard drive's documentation for the location of the connector.)

Connect a second drive as described above.

Unlike floppy drives, IDE hard drives can connect to either end of the cable. If you install two drives, you will need to set one as the master and one as the slave by using jumpers on the drives. If you install just one drive, set it as the master.

Floppy Drive Connector (CN16)

You can attach up to two floppy disks to the POS-460's on-board controller. You can use any combination of 5¼" (360 KB and 1.2 MB) and/or 3½" (720 KB, 1.44 MB, and 2.88 MB) drives.

A 34-pin daisy-chain drive connector cable is required for a dual-drive system. On one end of the cable is a 34-pin flat-cable connector. On the other end are two sets of floppy disk drive connectors. Each set consists of a 34-pin flat-cable connector (usually used for 3½" drives) and a printed-circuit board connector (usually used for 5¼" drives).

Connecting the floppy drive

1. Plug the 34-pin flat-cable connector into CN16. Make sure that the red wire corresponds to pin one on the connector.

2. Attach the appropriate connector on the other end of the cable to the floppy drive(s). You can use only one connector in the set. The set on the end (after the twist in the cable) connects to the A: drive. The set in the middle connects to the B: drive.

3. If you are connecting a 5¼" floppy drive, line up the slot in the printed circuit board with the blocked-off part of the cable connector.
   If you are connecting a 3½" floppy drive, you may have trouble determining which pin is pin number one. Look for a number printed on the circuit board indicating pin number one. Also, the connector on the floppy drive connector may have a slot. When the slot is up, pin number one should be on the right. Check the documentation that came with the drive for more information.

   The B: drive can be attached to the connectors in the middle of the cable as described above.

Primary Parallel Port Connector (LPT1: CN6)

The primary parallel printer port is located at the rear edge of the board with the DB-25 connector. The printer port is typically used to connect a printer via an adapter cable. LPT1's IRQ is defined as IRQ7. You can select the LPT1 SPP/EPP/ECP selection mode from BIOS (see Chapter 4).

You can select the DMA channel by setting J8 and J9.

DMA channel (J8, J9)		
	DMA1(default)	DMA3
J8	3 2 1	3 2 1
J9	3 2 1	3 2 1

Secondary Parallel Port (LPT2: CN10)

The secondary parallel port is internally located next to the primary parallel port with a 26-pin box header. The IRQ setting is selectable. (See Secondary IRQ Selection, page 20.)

Keyboard Connector (CN1, CN2, CN2A)

The POS-460 provides 3-way parallel keyboard input via 2 external mini DIN jacks (CN1 and CN2) and one internal 5-pin keyboard jack (CN2A). The two external keyboard jacks are intended to accommodate several chassis arrangements. Only one external keyboard port (CN1 or CN2) can be used at a given time - they cannot be used simultaneously. The interior keyboard jack (CN2A) is a 5 pin DIN for users to connect to the keyboard internally, for example, as an all-in-one POS system. Pin assignment is shown in this manual's appendix.

Front Panel Connectors

You may want to install external switches to monitor and control the POS-460. These features are completely optional — install them only if necessary.

Front panel connection jumpers	
J34	Power LED
J35	Reset switch
J36	HDD active LED
J37	Turbo LED
J38	Turbo switch
J39	Speaker
J40	Power LED and keyboard
LED1	Ethernet LED

Speaker
The POS-460 can drive an 8 Ω speaker at 0.5 watts. Ensure that alternatives to this specification do not overload the board.

LED interface
The front panel LED indicator for hard disk access is an active low signal (24 mA sink rate).

Reset switch
If you install a reset switch, it should be an open single pole switch. Momentarily pressing the switch will activate a reset. The switch should be rated for 10 mA, 5 V.

Power Connector (CN14)

The power connection is a 12-pin connector requiring ±5 V and ±12 V power. Remember to keep the ground wires (black color) toward the middle when connecting the power wire from the power supply.

Serial Ports (COM1-4)

The POS-460 has a total of four on-board RS-232 serial ports, COM1-4. They are differentiated by COM1 and COM2 as primary serial ports and COM3 (RS-232/422/485) and COM4 as secondary ports. All four serial ports have +5 V and +12 V power capabilities on both pin #1 and pin #9, depending on the fuse placement.
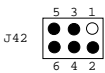
Primary serial ports (COM1: CN5/CN9, COM2: CN4/CN8)

Each primary serial port has two connections, one external DB-9 and one internal 10-pin header giving the user the flexibility to adapt the board to many different systems. IRQ for COM1 and COM2 is fixed with COM1 on IRQ4 and COM2 on IRQ3. COM1 and COM2 can be enabled or disabled via BIOS (see Chapter 4).
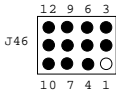
Secondary serial ports (COM3: CN11, COM4: CN6)

The secondary serial ports each have one 10-pin, internally positioned header connection. The IRQ for both COM3 and COM4 is selectable (see below).

COM3 RS-232/422/485 setting (J42)

	COM3	Pin
J42	RS-232	1-2
	RS-422	3-4
	RS-485	5-6

COM3 RS-232/422/485 setting (J46)

	COM3	Pin	COM3	Pin
J46	RS-422/485	1-2	RS-232	2-3
	RS-422/485	4-5	RS-232	5-6
	RS-422/485	7-8	RS-232	8-9
	RS-422/485	10-11	RS-232	11-12

COM3, COM4, LPT2 enable/disable select (J47)				
	Port	Pin	Close	Open
	COM3	1-2	Enable	Disable
	COM4	3-4	Enable	Disable
	LPT2	5-6	Enable	Disable

J47
```
2 4 6
● ● ●
○ ● ●
1 3 5
```

Secondary I/O (COM3, COM4, LPT2) IRQ selection (J12)

COM3, COM4 and LPT2 do not have defined IRQ settings. By setting J12, users may choose from the IRQ selection choices below:

Secondary I/O (COM3, COM4, LPT2) IRQ selection (J12)		
Ports	Close jumpers…	IRQ selected
COM3	1-3	IRQ 11
	3-5	IRQ 10
	3-4	IRQ 12
COM4	5-7	IRQ 10
	7-9	IRQ 9
	7-8	IRQ 15
LPT2	4-6	IRQ 12
	5-6	IRQ 10
	6-8	IRQ 15

Jumper configuration

J12
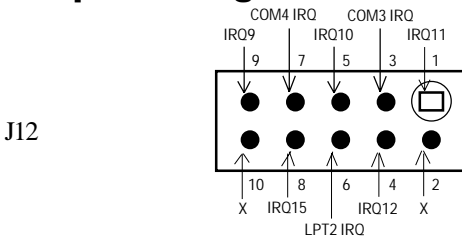
Note: *The above jumper arrangement will avoid secondary I/O's IRQ conflicts and mistakes.*

RS-232 serial ports (COM1-4) +5 V and +12 V power selection

All COM ports on the POS-460 have +5 V or +12 V capability on Pin 1 and Pin 9, depending on where you solder your fuse (fuse not included). We recommend using a 1 Amp fuse. To conserve board space, the fuse mounts are positioned next to each other. To ensure proper fuse placement, please observe the following example.

Typical fuse placement for the POS-460:

ALWAYS do this...   **NEVER do this !!!**
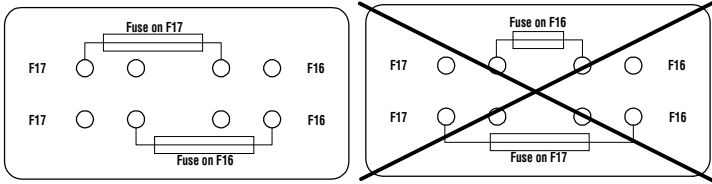
Fuse installation chart for +5 V or +12 V power in COM ports

Port	Pin	+5 V	+12 V
COM1	Pin 1	F8	F9
	Pin 9	F6	F7
COM2	Pin 1	F5	F4
	Pin 9	F3	F2
COM3	Pin 1	F17	F16
	Pin 9	F14	F15
COM4	Pin 1	F13	F11
	Pin 9	F10	F12

Note: *Only install the fuse if your peripheral requires it. Unnecessary power in the serial port will damage peripherals that do not require it.*

VGA Interface Connections

The POS-460's SVGA interface can drive conventional CRT displays and is capable of driving a wide range of flat panel displays, including electroluminescent (EL), gas plasma, passive LCD and active LCD displays. The board has two connectors to support these displays, one for standard CRT VGA monitors and one for flat panel displays.

On-board VGA hardware enable/disable		
	Enable	**Disable**
J3	3 2 1 ○ ●━●	3 2 1 ●━● ○

CRT display connector (CN7 and CN18)

CN7 is a standard 15-pin D-SUB connector commonly used for the CRT VGA monitor. CN18 is a 10 pin header connector allowing user to extend VGA connector elesewhere via customized cable. Pin assignment appears in the appendix.

Flat panel display connector (CN13)

CN13 consists of a 44-pin, dual-in-line header. Power supplies (+12 V, -12 V) present on CN13 depend upon the supply connected to the board. (For more information on the proper connection between CN13 and LCD, refer to chapter 3).

Configuration of the VGA interface is done completely via the software utility. You don't have to set any jumpers. (Refer to Chapter 3 for software setup details.)

Digital I/O (CN17: 2 outputs, 4 inputs)

The POS-460 uses digital I/O to customize its configuration to your control needs. For example, you may configure the digital I/O to

control the opening and closing of the cash drawer or to sense the warning signal from a tripped UPS. The following is a detailed description of how the digital I/O is controlled via software programming:
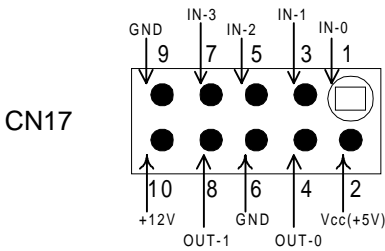
Digital I/O programming (lattice installed PLSI 1016)

Digital output is Open Collector type, meant to drive relays or solenoids (50 V_{DC}, 500 mA max.).

Output	Address	Bit
OUT-1	220	0
OUT-2	220	1

EXAMPLE:
  DATA 00 = OUT-0 & -1 = "0"
       DARLINTON OUT-0 & -1 TURN OFF
  DATA 01 = OUT-0 = "1"
       DARLINTON OUT-0 TURN ON
  DATA 02 = OUT-1 = "1"
       DARLINTON OUT-1 TURN ON
  DATA 03 = OUT-0 & -1 = "1"
       DARLINTON OUT-0 & -1 TURN ON

Input	Address	Bit
IN-0	220	0
IN-1	220	1
IN-2	220	2
IN-3	220	3

EXAMPLE: If INPUT 220 is [0111], then INPUT 3 is "0"
          If INPUT 220 is [0011], then INPUT 3 & 4 are "0"

Note: *The INPUT signal must be TTL compatible.*

Ethernet Configuration

The POS-460 is equipped with a high performance 16-bit Ethernet interface which is fully compliant with IEEE 802.3 10Mbps CSMA/CD standards. It is supported by all major network operating systems and is 100% Novell NE-2000 compatible.

Configuration of the Ethernet is very easy and can be done via the DIAG9008.EXE program included on the utility disk. This program enables you to view the current Ethernet configuration, to reconfigure the Ethernet interface (IRQ, I/O address, etc.), and to execute useful diagnostic functions. (See Chapter 3 for detailed information)

The DIAG9008.EXE program provides ways to configure the Ethernet interface without using jumpers. The following IRQ and I/O address settings are available.

POS-460 Ethernet settings

	IRQ option	I/O address range
Jumperless Configuration	3, 4, 5, 7, 9, 10, 11, 12	300H, 240H, 280H, 2C0H, 320H, 340H, 360H

Default Settings: IRQ = 5 ; I/O Address = 300H

Note: *1. You can select an IRQ from the options shown above, but make sure your selection does not conflict with other I/O devices.*

10BASE-T connector (CN3)

10BASE-T connects to the POS-460 via an adapter cable to the RJ-45 standard jack (CN3) located at the rear of the board.

Network boot

The Network Boot feature is built into the BIOS. It can be enabled/
disabled in the chipset setup of the CMOS configuration. Please
refer to the BIOS setting in Chapter 4 for more information.

Watchdog Timer Configuration

An on-board watchdog timer reduces the chance of disruptions
which EMP (electro-magnetic pulse) interference can cause. This is
an invaluable protective device for standalone or unmanned
applications. Setup involves writing and running the control
software (refer to Appendix A).

Watchdog timer enable/disable

You can enable the watchdog timer by using your program to write
to the SSD's base address + 400h. (i.e. If the SSD address is 2D0h,
then read/write to address 6D0h.) Writing to the address enables
the watchdog, and reading from the address refreshes the watch-
dog. For information on programming the watchdog timer see
Appendix A.

Solid State Disk Configuration

The POS-460 features an internal Flash/ROM disk drive and
DiskOnChip 2000. This drive emulates a floppy disk drive by using
solid-state memory chips (Flash or EPROM) to store programs and
data instead of the magnetic particles on the mechanical drive's
disk. The Flash/ROM disk and DOC 2000 offer much faster access
times than a floppy or hard disk and greatly increased reliability in
harsh environments.

The Flash/ROM disk/DOC 2000 works by modifying the BIOS
INT-13 disk I/O routine on boot-up. The routine then translates
read and write commands to the disk so that they will correctly

access the memory chips. You don't need any special drivers. You simply set the drive to act as a DOS drive (e.g. A: or C:) and use standard DOS commands (COPY, DIR,etc) to manipulate your data.

Before you use the Flash/ROM disk, you will need to enable it with SW1 and the BIOS Chipset Features Setup Program as detailed in Chapter 4.

Memory devices

The Flash/ROM disk supports the following memory devices, DiskOnChip 2000 series, or their equivalents:

• 27C010 128 Kb x 8 EPROM

• 27C040 512 Kb x 8 EPROM

• 28F010 128 Kb x 8 +12 V Flash Memory (AMD/INTEL)

• 29C010 128 Kb x 8 +5 V Flash Memory (ATMEL only)

• 29C040 512 Kb x 8 +5 V Flash Memory (ATMEL only)

• 29C040A 512 Kb x 8 +5 V Flash Memory (ATMEL only)

• MD-2200-DXX (DOC 2000 series)

If you use EPROM, files on the disk are read only. You will need an external programmer to load your program and data files on the EPROMs.

If you use +5 V Flash memories (29C010) for the solid state disk, you can read or write data just like a floppy disk; you need not use an external programmer. If you use +12 V Flash memories (28F010) you will still need an external programmer to write data.

Before you activate the Flash/ROM drive (using the BIOS Chipset Features Setup program), you will need to set the drive's I/O and memory addresses to avoid conflicts with other plug-in cards. You will also need to set the DOS drive designation to be used by the Flash/ROM drive.

Note: If you use the DiskOnChip 2000 series, you must put it in the SSD1 socket only.

Drive capacity

The size of the emulated drive depends on the size and number of the chips you install. For example, if you install three 512 KB chips, you will have 3 x 512 KB = 1.536 MB, equivalent to a 1.44 MB floppy. The following table shows the memory chips you will need to emulate 360 KB, 720 KB, 1.2 MB and 1.44 MB floppy drives.

You will need to set jumpers JP18, JP20, J43, JP21 and J48 to match the type (Flash, SRAM, ROM, or DOC 2000) and size (128 KB, 512 KB, or 2~12 MB for DOC 2000) of the devices you use. All the devices must be the same type and size.

The following tables shows the size and number of devices you will need for each size emulated disk. It also shows the corresponding settings of jumpers JP18, JP20, J43, J21 and J48.

	J20	J18	J21	J43	J48
SRAM 128K	-	Short	Open	2-3	Open
SRAM 512K	-	Open	Open	2-3	Open
FLASH 128K	2-3	Short	Short	1-2	Open
FLASH 512K	2-3	Open	Short	1-2	Open
EPROM 128K	1-2	Short	Short	1-2	Open
EPROM 512K	1-2	Open	Short	1-2	Open
DiskOnChip	2-3	Open	Short	1-2	Close

Drive configuration

Before you activate the Flash/ROM drive (using the BIOS Chipset Features Setup program), you will need to set the drive's I/O and memory addresses to avoid conflicts with other plug-in cards. You will also need to set the DOS drive designation to be used by the Flash/ROM drive. DIP switch SW1 controls each of these settings, as described in the following sections:

I/O address selection (SW1)
Positions 1 and 2 on DIP switch SW1 control the disk's I/O address.

Position 1	Position 2	I/O Address (hex)
Off	Off	2D0
Off	On	290
On	Off	250
On	On	210

Memory address selection (SW1)
The SSD occupies a window in the memory address range of D000: 0000-1FFF. Positions 3 and 4 on SW1 enable/disable the Flash/ROM disk's memory address. If you select "Disabled", the disk will not function.

Position 3	Position 4	SSD Function
Off	Off	Disabled
Off	On	Enabled
On	Off	Enabled
On	On	Enabled

Drive emulated (SW1)
Positions 5 and 6 of SW1 control the DOS drive emulated by the Flash/ROM disk: 1st, 2nd, 3rd or 4th.

Position 5	Position 6	Drive
Off	Off	4th
Off	On	3rd
On	Off	2nd
On	On	1st

The actual drive letter assigned by DOS to the Flash/ROM disk depends on the floppy or hard disks installed in the system. If you are using a DOS version prior to DOS 5.0, the drive designation may also differ.

DOS 5.0 (and later)

Floppy disks

The Flash/ROM disk will replace the corresponding floppy disk. For example, if you have a single floppy disk (drive A) and assign the Flash/ROM disk to be the first drive (both switches 5 and 6 are on), any drive operations directed at drive A will go to the Flash/ROM disk. This floppy drive will then be assigned the next free drive designation. The example below illustrates this.

Hard disks

The Flash/ROM disk will not replace corresponding hard disks. Instead, DOS will assign the Flash/ROM disk to the next free drive designation. For example, if you have a single hard disk (drive C) and assign the Flash/ROM disk to be the 3rd drive (switch 5 off, switch 6 on), the Flash/ROM drive will become drive D. If you have two hard disks, the Flash/ROM drive will become drive E.

Example 1

Installing the Flash/ROM disk as drive A (switches 5 and 6 are on).

Drive	A	B	C	D
Before	FDD	FDD	HDD	
After	Flash/ROM	FDD	HDD	FDD

Example 2

You (try to) install the Flash/ROM disk as drive C.

Drive	A	B	C	D
Before	FDD	FDD	HDD	
After	FDD	FDD	HDD	Flash/ROM

Booting from the Flash/ROM disk

If you wish to have the system boot from the Flash/ROM disk, simply set positions 5 and 6 on SW1 for the first FDD. Copy your application files to the disk along with the standard system files required to boot (command.com, io.sys, autoexec.bat, etc). The next time you start the system, it will boot from the solid state disk.

Inserting memory devices

After you have set all the jumpers and switches on the POS-460, insert the appropriate memory devices into the card's sockets. Remember that you will need to program EPROMs before you insert them.

NOTE: The first SSD you install must be inserted into DIP socket SSD1 (as shown in the diagram on page 8), leaving SSD2 and SSD3 empty. Likewise, the second SSD must go into SSD2, leaving SSD3 empty.

1. Make sure that the pins of the memory chips are perpendicular to the case and both rows are parallel to each other. Many times the chips come with the pins spread out slightly. Place the chip on a table top and carefully bend each line of pins together until they point directly down.

2. Insert each chip. Align the chips so their pins are perpendicular to the connector and the semicircular notch on the end of the chip matches the notch on the end of the socket. There will probably be a gap between the chip body and the socket when it is fully seated – Do not push too hard!

Formatting the Solid State disk

If you use Flash memory or SRAM, it is advisable to format the Flash/SRAM disk before copying files to it. The DOS command is as follows:

```
FORMAT drv: /U ...
```

where drv = solid state disk drive A, B, C etc.

File copy utility

The utility program COOKROM.EXE, included on the card's utility disk, splits the files on a diskette into a series of binary files. You can then use an external programmer to copy the files to EPROM or +12 V Flash memory chips. It produces up to three files, depending on the size of the source files.

Using a memory manager (EMM386.EXE)

If you are using an extended or expanded memory manager (such as EMM386 or QEMM386), you will need to configure it to avoid the addresses used by the Flash/ROM disk (set by positions 3 and 4 of SW1). Otherwise, the memory manager will attempt to use these addresses, causing unreliable operation.

For example, the line in your CONFIG.SYS file that invokes EMM386, the DOS memory manager, might be the following:

```
DEVICE=EMM386.SYS X=D600-D7FF
```

This excludes an 8 KB range for the card from D6000 to D7FFF (the default addresses).

If you are using expanded memory, you will need to make sure that the memory manager is not putting the page frame in the disk's addresses. For example,

```
DEVICE=EMM386.EXE X=D600-D7FF FRAME = D800
```

You should also make sure that the disk's memory address is not shadowed in the BIOS.

VGA Display & Ethernet Software Configuration

This chapter details the software configuration information. It shows you how to configure the board to match your application requirements. AWARD System BIOS is covered in Chapter 4.

Sections include:

• LCD display configuration

• Connections for two standard LCDs

• Ethernet interface configuration

Introduction

The POS-460 system BIOS and custom drivers are located in a 128 Kbyte, 32-pin (JEDEC spec.) Flash ROM device, designated U33. A single Flash chip holds the system BIOS, VGA BIOS, and network Boot ROM image. The display can be configured via software. This method minimizes the number of chips and eases configuration. You can change the display BIOS simply by reprogramming the Flash chip.

POS-460 Utility Disk

The POS-460 is supplied with a software utility disk that holds the necessary file for setting up the VGA display and Ethernet controller. The disk's directory and file structure is as follows:

```
ROOT
    |
    |   README.DOC
    |
    |------ NET
    |           DIAG9008.EXE
    |
    |------ SSD
    |           COOKROM.EXE
    |
    |------ BIOS
                460_SYS.BIN
                AWDFLASH.EXE
```
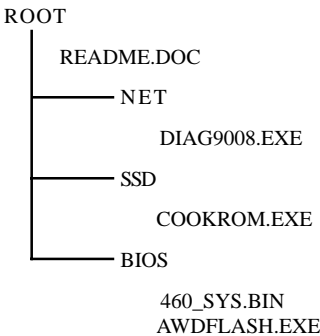
DIAG9008.EXE
This program is the UMC9008 Ethernet controller AUTO-Scan/ Setup/Diagnostic function.

COOKROM.EXE
A program that converts application files into binary files (files with a .BIN extension). These are then written into the SSD Flash ROM devices.

460_SYS.BIN
This binary file contains the system BIOS.

AWDFLASH.EXE

This program allows you to write the Factory-Bundled System BIOS/ VGA BIOS files to the BIOS Flash ROM. The VGA files are already formatted for the POS-460 with .BIN extensions. See README.DOC. These files support various CRT and flat panel displays. They are custom written and are available upon request.

VGA BIOS Software Configuration

The POS-460's on-board VGA BIOS is bundled at the factory with the System BIOS and are together written into the BIOS Flash ROM via the AWDFLASH.EXE utility software. The VGA BIOS supports a wide range of popular LCD, EL, gas plasma flat panel displays and traditional analog CRT monitors. The VGA BIOS can drive CRT displays with resolutions up to 1024 x 768 in 256 colors. It is also capable of driving color panel displays with resolutions of 640 x 480 in 64K colors. If the VGA BIOS needs to be re-configured for a special LCD, the system BIOS and the VGA BIOS need to be re-configured together via the AWDFLASH.EXE utility. Most LCD panels can be lit with the POS-460's standard VGA BIOS when the LCD interface is connected. (See appendix for CN13 pin assignment).

In case the customer's LCD panel cannot work correctly with standard VGA BIOS and we have the modified BIOS to support their particular LCD, we can provide the file to the customer free of charge. The customer can then use AWDFLASH.exe utility program to update the VGA BIOS. If we do not have the modified BIOS and the customer needs us to modify the BIOS for them, we need the specific LCD to adjust BIOS parameters and to verify the BIOS. The customer must ship their LCD to us, and a service charge will apply for this custom modification.

Use AWDFLASH.exe to configure the VGA display as follows:

1. Apply power to the POS-460 with a color TFT display attached. This is the default setting for the POS-460. Ensure that the AWDFLASH.EXE and *.BIN files are located in the working drive.

NOTE: *Ensure that you do not run AWDFLASH.EXE while your system is operating in EMM386 mode.*

2. At the prompt, type AWDFLASH.EXE and press <Enter>. The
   VGA configuration program will then display the following:

```
        FLASH  MEMORY  WRITER v1.2
   Copyright (C) 1993, Award Software, Inc.,

        For VIA486A-310L200        08/23/1994
        Flash Type -

File Name to Program : ▮

Error Message:
```
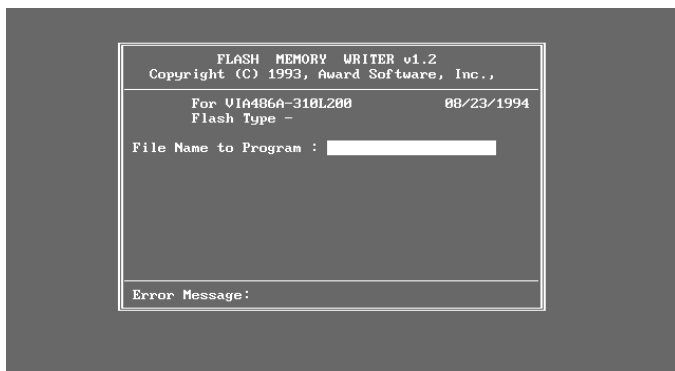
VGA Setup screen

3. At the prompt, type in the BIN file which supports your display.
   When you are sure that you have entered the file name correct-
   ly press <Enter>. The screen will ask "Do you want to save?" If
   you wish to continue press Y. If you change your mind or have
   made a mistake press N to abort and end the setup procedure.

4. If you decide to continue, the program will create a BIOS.OLD
   file which contains the existing BIOS configuration. The prompt
   will then ask "Are you sure you want to save new configura-
   tion?" Press Y if you want the new file to be written into the
   BIOS. Press N to exit the program.

The new VGA configuration will then write to the ROM BIOS chip.
This configuration will remain the same until you run the
AWDFLASH.EXE program and change the settings.

Sample Connections for LCD

Note: Please consult your sales representative to see if Advantech has the connection chart for your particular LCD.

Connections to Toshiba LTM09C016 (640 x 480 TFT Color LCD)

LTM09C016		POS-460 CN13	
Pin	Pin name	Pin	Pin name
CN1-1	NCLK	35	SHFCLK
CN1-2	GND	3	GND
CN1-3	R0	22	P13
CN1-4	GND	3	GND
CN1-5	R1	23	P14
CN1-6	GND	4	GND
CN1-7	R2	24	P15
CN1-8	GND	4	GND
CN1-9	G0	17	P8
CN1-10	GND	8	GND
CN1-11	G1	18	P9
CN1-12	GND	8	GND
CN1-13	G2	19	P10
CN1-14	GND	33	GND
CN1-15	NC	—	—
CN2-1	B0	11	P2
CN2-2	GND	33	GND
CN2-3	B1	12	P3
CN2-4	GND	34	GND
CN2-5	B2	13	P4
CN2-6	GND	34	GND
CN2-7	ENAB	37	M
CN2-8	GND	39	GND
CN2-9	VDD	5	+5 V
CN2-10	VDD	6	+5 V

Ethernet Software Configuration

The POS-460's on-board Ethernet interface supports all major network operating systems. I/O addresses and interrupts are easily configured via the DIAG9008.EXE program. To execute the configuration, to view the current configuration, or to run diagnostics, do the following:

1. Power the POS-460 on. Ensure that the DIAG9008.EXE file is located in the working drive.

2. At the prompt type DIAG9008.EXE and press <Enter>. The Ethernet configuration program will then be displayed.

3. This simple screen shows all the available options for the Ethernet interface. Just highlight the option you wish to change by using the Up and Down keys. To change a selected item, press <Enter>, and a screen will appear with the available options. Highlight your option and press <Enter>. Each highlighted option has a helpful message guide displayed at the bottom of the screen for additional information.

4. After you have made your selections and are certain it is the configuration that you want, press ESC. A prompt will appear asking if you want to save the configuration. Press Y if you want to save.

The Ethernet Setup Menu also offers three very useful diagnostic functions. These are:

1. Run EEPROM test

2. Run Diagnostics on Board

3. Run Diagnostics on Network

Each option has its own display screen which shows the format and result of any diagnostic tests undertaken.

Award BIOS Setup

This chapter describes how to set BIOS configuration data.

Getting Help

Press F1 to open a help window that describes the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the help window.

Main Menu

When you enter the Award BIOS CMOS Setup Utility, the main menu will appear, allowing you to select from 10 setup functions and two exit choices. Use the arrow keys to move among the items, and press <Enter> to accept or enter a sub-menu.

```
ROM PCI/ISA BIOS (2A4KDAK9)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP            SETTING PASSWORD

BIOS FEATURES SETUP            IDE HDD AUTO DETECTION

CHIPSET FEATURES SETUP         SAVE & EXIT SETUP

POWER MANAGEMENT SETUP         EXIT WITHOUT SAVING

PCI CONFIGURATION SETUP

LOAD BIOS DEFAULTS

LOAD SETUP DEFAULTS

ESC: QUIT                      ←→↑↓: SELECT ITEM

F10: Save & Exit Setup         (Shift)F2: Change Color

Time, Date, Hard Disk Type....
```

Main Menu

Standard CMOS Setup Menu

Use the arrows to highlight an item, and use <PgUp> and
<PgDn> to select the value for each item.

```
        R O M   P C I / I S A   B I O S (2A4KDAK9)
            S T A N D A R D   C M O S   S E T U P
            A W A R D   S O F T W A R E ,   I N C .


Date (mm:dd:yy) :  Wed, Jan 17 1996
Time (hh:mm:ss) :  12 : 19 : 58
HARD DISKS    TYPE  SIZE  CYLS.  HEADS  PRECOMP  LANDZONE  SECTORS  MODE

Primary  Masternone  0    0      0      0        0         0        N/A
Primary  Slave none  0    0      0      0        0         0        N/A



Drive A : None                        Base Memory :      640K
Drive B : None                    Extended Memory :     3072K
                                      Other Memory :      384K
Video   : EGA/VGA                 ─────────────────────────────
Halt On : All Errors                  Total Memory :     4096K

  ESC : Quit          ←→↑↓ : Select Item      PU / PD / + / - : Modify
  F1  : Help          (Shift)F2 : Change Color
```

Standard CMOS Setup

Time

The time format is <hour> <minute> <second>. The time is based
on the 24-hour military clock. For example, 1 P.M. is 13:00:00.

Hard Drive Type

Press <PgUp> or <PgDn> to select a numbered hard disk type, or
type the number and press <Enter>. If no hard disk has been
installed, select "NONE".

If your hard disk type is not listed, set the type as "User" to define
your own drive manually. Use the keyboard to enter the drive
information (CYLS, HEAD, etc.), which should be found in the
documentation from your hard disk vendor or manufacturer.

Video

This setting must match your display card and monitor type. It is used for the primary system monitor. Although secondary monitors are supported, you do not have to select the type in setup.

Halt on

The computer can be set to halt if an error is detected during setup.

No Errors	When BIOS detects a non-fatal error, the system boot will not stop.
All Errors	The system boot will stop for any error that is detected.
All But Keyboard	The system boot will not stop for a keyboard error. It will stop for all other errors
All But Diskette	The system boot will not stop for a disk error. It will stop for all other errors
All But Disk/Key	The system boot will not stop for a keyboard or disk error. It will stop for all other errors

BIOS Features Setup

```
           ROM  PCI/ISA  BIOS (2A4KDAK9)
              BIOS  FEATURES  SETUP
           AWARD  SOFTWARE,  INC.

  Virus  Warning           : Disabled    Video  BIOS Shadow       : Enabled
  CPU  Internal Cache       : Enabled     C8000-CFFFF  Shadow      : Disabled
  External  Cache          : Enabled     D0000-D7FFF  Shadow       : Disabled
  Quick Power On Self Test  : Enabled     D8000-DFFFF  Shadow       : Disabled
  Boot  Sequence           : A, C
  Swap  Floppy  Drive       : Disabled
  Boot Up  Floppy  Seek     : Disabled
  Boot Up  NumLock  Status  : On
  Boot Up  System  Speed    : High
  Gate A20  Option          : Fast
  Memory  Parity  Check     : Enabled
  Typematic  Rate  Setting  : Disabled
  Typematic  Rate  (Chars/sec):6         Esc: Quit            ←→↑↓Select Item
  Typematic  Delay  (Msec))  : 250       F1 : Help           PU/PD/+/-:Modify
  Security  Option          : Setup      F5 : Old  Values     (Shift)F2 : Color
  PCI/VGA  Palette  Snoop    : Disabled   F6 : Load  BIOS  Defaults
  OS  Select  For  DRAM>64MB:Non-OS2     F7 : Load  Setup  Defaults
```

BIOS Features Setup

Virus Warning

When enabled, any attempt to write to the hard drive's boot sector or partition table will cause the system to halt and display an error message.

CPU Internal Cache / External Cache

Enabling caches can speed memory access, depending on your CPU/chipset design.

Quick Power On Self Test

Enabling this setting speeds the POST by causing BIOS to shorten or skip some check items.

Boot Sequence

This determines which drive the computer searches first for the disk operatong system.

Boot Up Floppy Seek

When enabled, BIOS will determine if the installed floppy drive is 40 tracks (360 KB) or 80 tracks (720 KB or more).

Boot Up System Speed

"Low" fixes the CPU clock at 33 MHz. "High" causes BIOS to refer to the CPU clock jumper settings to find the correct clock speed.

Security Option

If you select "System", you will be prompted for a password every time the system is booted or any time you try to enter CMOS Setup. If you select "Setup", you will be prompted only when you try to enter CMOS Setup.

Chipset Features Setup

```
          ROM PCI/ISA BIOS (2A4KDAK9)
              CHIPSET  FEATURES  SETUP
          CHIPSET  FEATURES  SETUP

Auto Configuration      : Enabled      LAN Card Boot ROM        : Disabled
                                       Solid State Disk         : Disabled
AT-BUS Clock            : 7.19 MHz
DRAM Read Timing        : Slow         On-board FDD Controller  : Enabled
DRAM Write Timing       : Fast         On-board Serial Port 1   : COM1/3F8
SRAM Read Timing        : 3-1-1-1      On-board Serial Port 2   : COM2/2F8
SRAM Write Timing       : 1 Wait       On-board Parallel Port   : 378H
                                       On-board Parallel Mode   : SPP
Hidden Refresh          : Disabled
ISA I/O Recovery        : Enabled
Fast-Back-To-Back       : Enabled      IR Function              : UnUsed
On-Chip Local Bus IDE   : Enabled
IDE Buffer for DOS & Win: Disabled
The 2nd Channel IDE     : Enabled
IDE HDD Block Mode      : Enabled      Esc  : Quit          ←→↑↓: Select Item
IDE Primary Master PIO  : Auto         F1   : Help          PU/PD/+/- : Modify
IDE Primary Slave PIO   : Auto         F5   : Old Values    (Shift)F2 : Color
IDE Secondary Master PIO: Auto         F6   : Load BIOS Defaults
IDE Secondary Slave PIO : Auto         F7   : Load Setup Defaults
```

Chipset Features Setup

AT-bus Clock

7.19 MHz	Normal setting
PCICLK/3	For 25 MHz systems (DX-25, DX2-50, DX4-75)
PCICLK/4	For 33 MHz systems (DX-33, DX2-66, DX4-100, 5x86-100/133)
PCICLK/5	For 40 MHz systems (DX-40, DX2-80, DX4-120)
PCICLK/6	Low AT-bus clock
PCICLK/8	Lowest AT-bus clock

IDE Primary/Secondary - Master/Slave PIO

BIOS can automatically detect IDE HDD accessing mode, or the mode (0~4) can be set manually.

LAN Card Boot ROM
Enabled/disabled LAN BOOT ROM for on-board LAN function

Solid State Disk
Enabled/disabled on-board SSD funtions

Power Management Setup

```
                ROM PCI/ISA BIOS (2A4KDAK9)
                   POWER MANAGEMENT SETUP
                     AWARD SOFTWARE, INC.

Power Management      : Disable      IRQ6   (Floppy Disk)    : ON
PM Control by APM     : Yes          IRQ7   (LPT1)           : ON
Video Off Option      : Susp,Stby-->Off  IRQ8   (RTC Alarm)      : OFF
Video Off Method      : V/H SYNC+Blank   IRQ9   (IRQ2 Redirect) : ON
                                      IRQ10  (Reserved)       : OFF
          **PM TIMERS**               IRQ11  (Reserved)       : OFF
HDD Power Down        : Disable      IRQ12  (PS/2 Mouse)     : ON
Doze Mode             : Disable      IRQ13  (Coprocessor)    : OFF
Standby Mode          : Disable      IRQ14  (Hard Disk)      : ON
Suspend Mode          : Disable      IRQ15  (Reserved)       : ON


          **PM EVENTS**
VGA                   : OFF
FDD    (3FXh)         : ON
LPT & COM             : LPT/COM
HDD    (1FXh)         : ON          Esc  : Quit      ←→↑↓      : Select Item
NMI                   : OFF         F1   : Help      PU/PD/+/-  : Modify
IRQ3   (COM2)         : ON          F5   : Old Values  (Shift)F2  : Color
IRQ4   (COM1)         : ON          F6   : Load BIOS Defaults
IRQ5   (LPT2)         : ON          F7   : Load Setup Defaults
```

Power Management Setup

Video Off Method

V/H SYNC + Blank	BIOS will turn off V/H SYNC when in Green mode.
Blank Screen	The screen will go blank when in Green mode.
DPMS Support	If your VGA card supports DPMS (Display Power Management Signaling), you may select this to reduce the monitor power consumption.

HDD Power Down
This function may be set from 1 to 15 minutes or disabled.

Suspend Mode

This function may be set from 10 seconds to 1 hour or disabled.

VGA, HDD, IRQ3 - 15

You can choose whether or not power management will monitor activity at each of these locations.

PCI Configuration Setup

```
                ROM PCI/ISA BIOS  (2A4KDAK9)
                  PCI CONFIGURATION SETUP
                    AWARD SOFTWARE, INC
────────────────────────────────────────────────────────────────
PnP BIOS Auto-Config    :Disabled   │  CPU to PCI Write Buffer   :Enabled
Slot 1  Using INT#      : AUTO      │  PCI to DRAM Buffer        :Enabled
Slot 2 Using INT #      : AUTO      │  CPU to PCI Byte Merge     :Disabled
Slot 3 Using INT #      :AUTO       │
1st Available IRQ       :10         │
2nd Available IRQ       :11         │
3rd Available IRQ       :12         │
4th Available IRQ       :9          │  ESC: Quit ↑↓→←      :Select Item
PCI IRQ Actived By      :Level      │  F1: Help      PU/PD/+/- :Modify
PCI IDE 2nd Channel     :Enabled    │  F5: Old Values (Shift) F2   :Color
PCI IDE IRQ Map To      :PCI-Auto   │  F6: Load BIOS Defaults
  Primary   IDE INT#    : A         │
  Secondary IDE INT #   : B         │  F7: Load Setup Defaults
```

PnP BIOS Auto Config:

Enable/Disabled PnP BIOS Auto-Config
The default value is Disable

Slot 1-3 using INT #:

Auto-detects the PCI device's IRQ or let user set IRQ manually.
The default value is AUTO

Available IRQ

The default value is shown on the above table.
These available IRQs are mapped to be PCI INT # by BIOS for PCI device automatically. If on IRQ device is used by ISA device then the user must keep the IRQ out of the available table.

Load BIOS defaults

LOAD BIOS DEFAULTS loads the default system values directly from ROM. If the stored record created by the Setup program becomes corrupted (and therefore unusable), these defaults will load automatically when you turn the POS-460 on.

Setting Password

If you enabled security in the BIOS features Setup Menu, you will need to set a password. At the prompt, enter a password of up to eight characters. You will then be asked to retype the password for confirmation. To disable the password, press <Enter> when you are prompted for a password.

IDE HDD Auto-Detect

BIOS can detect the type of hard drive you have. If you don't use this option, you must manually set up the hard drive in the Standard CMOS Setup.

SVGA Setup

The POS-460 features an on-board flat panel/VGA interface. This chapter provides instructions for installing and operating the software drivers on the included display driver diskette.

Simultaneous Display Mode

The 65545 VGA BIOS supports monochrome LCD, EL, color TFT and STN LCD flat panel displays. It also supports interlaced and non-interlaced analog monitors (VGA color and VGA monochrome) in high-resolution modes while maintaining complete IBM VGA compatibility. Digital monitors (i.e. MDA, CGA, and EGA) are NOT supported. Multiple frequency (multi-sync) monitors are supported as analog monitors.

Both CRT and panel displays can be used simultaneously. The POS-460 can be set in one of three configurations: on a CRT, on a flat panel display, or on both simultaneously. The system is initially set to simultaneous display mode. In the utility diskette, there are three .COM files which can be used to select the display. Simply type the filename at the DOS prompt:

CT.COM Enables CRT display only

FP.COM Enables panel display only

SM.COM Enables both displays at the same time.

Sleep Mode

The display driver diskette contains two files that support sleep mode. Simply type the filename at the DOS prompt:

ON.COM switches to normal display mode.

OFF.COM switches to sleep mode.

Software Support

The drivers support the following applications using the filenames and resolutions listed:

Application	Filename	Resolution	Colors
Windows 3.1	LINEAR4.DRV	640x480	16
		800x600	16
		1024x768	16
	LINEAR8.DRV	640x480	256
		800x600	256
		1024x768	256
	LINEAR16.DRV	640x480	64K
	LINEAR24.DRV	640x480	16M
AutoCAD R12	RCTURBOC.EXP	640x480	16
		800x600	16
		1024x768	16
		640x480	256
		800x600	256
		1024x768	256
		640x480	32K
		640x480	64K
		640x480	16M
Lotus 1-2-3 2.0 and Lotus Symphony 1.0,1.1			
	V132X25.DRV	132x25 (Text)	16
	V132X50.DRV	132x50 (Text)	16
VESA 1.2	VESA.COM	800x600	16
		1024x768	16
		640x400	256
		640x480	256
		800x600	256
		1024x768	256
		640x480	32K
		640x480	64K

Word 5.0	VGA600.VID	800x600	16
	VGA768.VID	1024x768	16
Word 5.5	VGA55600.VID	800x600	16
	VGA55768.VID	1024x768	16
WordPerfect 5.0	CHIPS600.WPD	800x600	16
	CHIPS768.WPD	1024x768	16
WordPerfect 5.1	VGA600.VRS	800x600	16
	VGA768.VRS	1024x768	16

Driver Installation

Necessary prerequisites

The instructions in this manual assume that you understand elementary concepts of MS-DOS and the IBM Personal Computer. Before you attempt to install any driver or utility you should: know how to copy files from a floppy disk to a directory on the hard disk, understand the MS-DOS directory structure, and know how to format a floppy disk. If you are uncertain about any of these concepts, please refer to the DOS or Windows user reference guides for more information before you proceed with the installation.

Before you begin

Before you begin installing software drivers, you should make a backup copy of the display driver diskette and store the original in a safe place. The display driver diskette contains drivers for several versions of certain applications. You must install the correct version in order for the driver to work properly so make sure you know which version of the application you have.

Windows setup

These drivers are designed to work with Microsoft Windows 3.1. You may install these drivers through Windows or in DOS.

Step 1: Install Windows as you normally would for a VGA display. Run Windows to make sure that it is working correctly.

Step 2: Place the display driver diskette in drive A. In Windows Program Manager, choose *File* from the Options Menu. Then from the pull-down menu, choose *Run . . . .* At the command line prompt, type **A:\WINSETUP**. Press the <ENTER> key or click *OK* to begin the installation. At this point the setup program locates the directory where Windows is installed. For proper operation, the drivers must be installed in the Windows subdirectory. Press <ENTER> to complete the installation. Once completed, the Display Driver Control Panel appears on the screen. This Control Panel allows you to select and load the installed drivers.

Another method of installing these drivers is through the File Manager. Click on *Drive A:*. Then double-click on *WINSETUP.EXE* to begin installation.

Changing Display Drivers in Windows

To change display drivers in Windows, select the *Windows Setup* icon from the Main window. You will be shown the current setup configuration. Select *Change System Settings* from the Option menu. Click on the arrow at the end of the Display line. You will be shown a list of display drivers. Click on the driver you want. Then click on the *OK* button. Follow the directions to complete the setup.

Changing Color Schemes

After you change display drivers, you may notice that the color scheme used by Windows looks strange. This is because different drivers have different default colors. To change the color scheme, select the *Control Panel* from the Main window. Select the *Color* icon. You will be shown the current color scheme. Choose a new color scheme and click the *OK* button.

DOS Setup

Step 1: Install Windows as you normally would for a VGA display. Run Windows to make sure that it is working correctly. Then exit Windows.

Step 2: Place the display driver diskette in drive A. Type **A:** <ENTER> to make this the default drive. Type **SETUP** <ENTER> to run the driver SETUP program. Press any key to get to the applications list. Using the arrow keys, select *Windows Version 3.1* and press the <ENTER> key. Press the <ENTER> key to select *All Resolutions*, and then press <END> to begin the installation. At this point you will be asked for the path to your Windows System directory (default C:\WINDOWS). When the installation is complete, press any key to continue. Press <ESC> followed by Y to exit to DOS.

Step 3: Change to the directory where you installed Windows (usually C:\WINDOWS).

Step 4: Type **SETUP** <ENTER> to run the Windows Setup program. It will show the current Windows configuration. Use the up arrow key to move to the Display line and press <ENTER>. A list of display drivers will be shown. Use the arrow keys to select one of the drivers starting with an asterisk (*) and press <ENTER>.

Step 5: Follow the directions on the screen to complete the setup. In most cases, you may press <ENTER> to accept the suggested option. When Setup is done, it will return to DOS. Type **WIN** <ENTER> to start Windows with the new display driver.

Changing Display Drivers in DOS

To change display drivers from DOS, change to the Windows directory and run Setup, repeating steps 4 and 5 from the previous page. Besides the special display drivers marked by an asterisk (*), you should be able to use the following standard drivers:

VGA   640x480, 16 colors

Super VGA   800x600, 16 colors

Panning Drivers

Special panning drivers are provided to allow high-resolution modes to be displayed on a flat panel or CRT. These drivers will show a section of a larger screen and will automatically pan, or scroll, the screen horizontally and vertically when the mouse reaches the edge of the display.

Linear Acceleration Drivers

A special high-performance linear acceleration driver is provided for 256-color modes. This driver may require special hardware and may not be supported on all systems. It is only available for Windows3.1.

AutoCAD R12

These drivers are designed to work with Autodesk AutoCAD R12. They conform to the Autodesk Device Interface (ADI) for Rendering drivers and Display drivers. These display list drivers accelerate redraw, pan, and zoom functions.

Driver installation

Step 1: Place the display driver diskette in drive A. Type **A:** <ENTER> to make this the default drive. Type **SETUP** <ENTER> to run the SETUP program. Press any key to get to the applications list. Using the arrow keys, select *AutoCAD Release 12* and press <ENTER>. This will display a list of supported driver resolutions. Using the arrow keys and the <ENTER> key, select the resolutions that are appropriate for your monitor. When all of the desired resolutions have been selected, press <END> to begin the installation. At this point you will be asked for a drive and directory to copy the driver files. Enter the drive and directory that contains the installed AutoCAD R12. If the destination directory does not exist you will be asked for confirmation. When the installation is complete, press any key to continue. Press <ESC> followed by Y to exit to DOS.

Step 2: Go to the AutoCAD directory where the new drivers were installed and run the driver installation program by typing **ACAD12 -r** <ENTER>. This program will configure your AutoCAD R12 to use the new display drivers. Select *TurboDLD Classic*.

Configuring TurboDLD

Select *Configure Video Display*. In Display Device Configuration choose *Select Graphics Board/Resolution*. Then choose *Select Display Graphics Board*. After choosing a graphics board, go to *Select Display Resolution*. After selecting the display resolution, save the new configuration, and return to the main menu.

Basic Configuration Menu

This menu allows you to modify:

Number of AutoCAD Command Lines

Font Size	6x8/8x8/8x14/8x16/12x20/12x24
Dual Screen	Enable/Disable

User Interface Configuration

Double Click Interval Time

BP Button

BP Highlight	Patt Line/Xor Rect/Both
BP Refresh	Enable/Disable
BP Cache	Enable/Disable

Expert Configuration Menu

This menu allows you to modify:

Display List	Enable/Disable
Drawing Cache	Enable/Disable
Use Acad 31 bit space?	Yes/No
Internal Command Echo	Enable/Disable
BP Zoom Mode	Freeze/Float
Regen Mode	Incremental/Fast

If your previously installed driver is not TurboDLD, you will have to reconfigure the RENDER command the first time you use it.

Lotus 1-2-3 and Lotus Symphony

These drivers are designed to work with Lotus 1-2-3 versions 2.0, 2.01 and 2.2, and with Lotus Symphony versions 1.0 and 1.1.

Driver installation

Step 1: Place the display driver diskette into drive A. Make A the default drive by typing **A:** <ENTER>. Run the SETUP program by typing **SETUP** <ENTER>. Press any key to display a list of supported applications. Use the arrow keys to select *Lotus/ Symphony,* and press <ENTER>. A list of supported screen resolutions will be displayed. Use the arrow keys to select the desired screen resolution and press <ENTER>. (Make sure your monitor is able to display the resolution desired) Press <END> to begin the driver installation process. A default drive and directory path will be displayed. Use the backspace key to erase this default and type in the 123 directory. At this point you may be asked to create the target directory if it does not already exist. After the files have been installed, press any key to return to the list of supported applications. Press <ESC> followed by Y to exit to DOS. Copy all the files that were just created in the temporary directory onto a formatted floppy diskette.

Step 2: Go to your 123 directory, and start the installation program. Type the following commands:

  C: <ENTER>

  INSTALL <ENTER>

Step 3: The Lotus installation program will load and present the installation menu. From this menu, select *Advanced Options*. From the Advanced Options menu, select *Add New Drivers To Library*. From the Add New Drivers Menu, select *Modify Current Driver Set*. From the Modify Driver Set Menu, select *Text Display*. From the Text Display menu, select one of drivers.

Step 4: After the selection of the appropriate VGA display driver, you will need to exit this menu and return to the Main Lotus Installation Menu. Do this by selecting *Return To Menu*.

Step 5: At the Main Lotus Installation Menu, select *Save Changes*.

Step 6: At this point the Installation Menu will prompt you for the name of your new Lotus configuration file. The Lotus system will prompt you with the default value — 123.SET, but you may want to use a filename that indicates the resolution of its driver. For example, if you installed the 132 column by 25 line driver, you could name this driver 132X25.SET, or if you installed the 80 by 50 driver, you may want to call the file 80X50.SET.

Step 7: The installation of your Lotus 1-2-3 driver is now complete. You will need to exit the Lotus installation program at this point. At the main Lotus Installation Menu, select *Exit*.

NOTE: If your driver set is not 123.SET, you have to type the filename of your driver set in the command line when you start Lotus 1-2-3. For example, if you named your driver set 132X25.SET, type the following to start Lotus 1-2-3:

   123 132X25.SET <ENTER>

VESA

The Video Electronics Standards Association (VESA) has created a standard for a Super VGA BIOS Extension (VBE). This defines a standard software interface to allow application programs to set and control extended video modes, such as 800x600 graphics, on video adapters from different manufacturers.

The VESA driver adds this Super VGA BIOS Extension to the VGA BIOS. Any application program which supports the VESA standard driver interface can be used with this driver. This VESA driver conforms to the VESA Super VGA Standard #VS891001.

Driver installation

Step 1: Place the display driver diskette into drive A. Make A the default drive by typing **A:** <ENTER>. Run the SETUP program by typing **SETUP** <ENTER>. Press any key to display a list of supported applications. Use the arrow keys to select VESA Driver *Version 1.2* and press <ENTER>. Press the <ENTER> key to select *All Resolutions*, and press <END> to begin the installation. A default drive and directory path will be displayed. Use the backspace key to erase this and type in a directory that is in the directory path (such as C:\BIN or C:\UTILS). After the files have been installed, press any key to return to the list of supported applications. Press <ESC> followed by Y to exit to DOS.

Step 2: To install the VESA driver, type either **VESA** <ENTER> or **VESA** + <ENTER> at the DOS prompt. The optional + command line parameter enables all of the available modes. Make sure that your monitor is capable of displaying these high resolution modes before enabling them.

NOTE: If the video BIOS already supports VBE extended video modes, DO NOT use this driver. Run the VTEST.EXE program to see if the video BIOS supports the VBE modes.

Word

These drivers are designed to work with Microsoft Word 5.0 and 5.5.

Driver installation

If you have already installed Word on your computer, go to Step 2 to install the new video driver.

Step 1: Install Word as normal.

Step 2: After you complete the Word installation, place the display driver diskette into drive A. Make A the default drive by typing **A:** <ENTER>. Run the SETUP program by typing **SETUP** <ENTER>. Press any key to display a list of supported applications. Use the arrow keys to select *Word* and press <ENTER>. Use the arrow keys to select the desired screen resolution and press <ENTER> (make sure your monitor is able to display the resolution desired). Press <END> to begin the driver installation process. A default drive and directory path will be displayed. Use the backspace key to erase this and type in your Word directory. After the files have been installed, press any key to return to the list of supported applications. Press <ESC> followed by Y to exit to DOS.

Step 3: Copy the driver file for the desired resolution that was just installed to SCREEN.VID.

WordPerfect

These drivers are designed to work with WordPerfect 5.0 or 5.1. They support 132-column display in editing mode, and high-resolution graphics display in PreView mode.

Driver installation

Step 1: Place the display driver diskette into drive A. Make A the default drive by typing **A:** <ENTER>. Run the SETUP program by typing **SETUP** <ENTER>. Press any key to display a list of supported applications. Use the arrow keys to select *WordPerfect* and press <ENTER>. A list of supported screen resolutions will be displayed. Use the arrow keys to select the desired screen resolution and press <ENTER> (make sure your monitor is able to display the resolution desired). Press <END> to begin the driver installation process. A default drive and directory path will be displayed. Use the backspace key to erase this default and type in the WordPerfect directory. At this point you may be asked to create the target directory if it does not already exist. After the files have been installed, press any key to return to the list of supported applications. Press <ESC> followed by Y to exit to DOS.

Step 2: Start WordPerfect, and press <SHIFT>+<F1> to enter the setup menu. Select *D* for Display and *G* for Graphics Screen Type, and then choose the desired Chips VGA resolution.

Configuring WordPerfect 5.0 for 132 columns

Follow these instructions to configure WordPerfect 5.0 for 132 column text mode:

Step 1: To use the SETCOL program to set 132 columns and 25 rows, type the following command:

SETCOL 132, 25 <ENTER>

Step 2: Start WordPerfect. The program will detect the number of rows and columns automatically. If for some reason WordPerfect is unable to adapt to 132 columns by 25 rows, start WordPerfect with the following command:

WP /SS=25,132 <ENTER>

Configuring WordPerfect 5.1 for 132 columns

Start WordPerfect and press <SHIFT>+<F1> to enter the setup menu. Select *D* for Display and *T* for Text Screen Type and then select *Chips 132 Column Text*.

A

Programming the Watchdog Timer

The POS-460 is equipped with a watchdog timer that resets the CPU if processing comes to a standstill for whatever reason. This feature ensures system reliability in industrial standalone, or unmanned, environments.

To enable the watchdog timer, you must write a program which first writes to the SSD's address + 400(hex) and then reads from that address at regular intervals. The first time your program writes to the port, it enables the watchdog timer. After that, your program must read the port during a time interval of less than 1.6 seconds, otherwise the watchdog timer will activate and reset the CPU.

If CPU processing comes to a standstill because of EMI or a software bug, the program will signal to SSD address + 400(hex) and the timer will be interrupted. The timer will then automatically reset the CPU and data processing will continue normally.

You must write your program so that it reads the SSD's address + 400(hex) at an interval shorter than the timer's preset interval. The timer's intervals have a tolerance of ±30%, so you should program an instruction that will refresh the timer about every second.

The following program shows how you might program the watchdog timer in BASIC. If the SSD's base address is 2D0 (hex), then the watchdog timer's address is 6D0 (hex):

```
10    REM   Watchdog timer example program
20    X=IN (&H6D0) REM   Enable the watchdog
30    GOSUB 1000 REM   Task #1, takes 1.6 seconds to
      complete
40    X=OUT (&H6D0) REM   Disable the watchdog
50    GOSUB 2000 REM   Task #2, takes 1.6 second to
      complete
60    END
1000  REM   Subroutine #1, takes 1.6 second to complete
      .
      .
      .
1070  RETURN
2000  REM   Subroutine #2, takes 1.6 second to complete
      .
      .
      .
2090  RETURN
```

B

Pin Assignments

This appendix contains information of a detailed or specialized nature. It includes:

- Flat panel display connector
- Internal CRT connector
- Ethernet 10BASE-T connector
- IDE hard drive connector
- RS-232 connections
- Keyboard connectors
- ISA-slots
- Floppy drive connector
- Parallel port connector
- Digital input/output
- Main power connector
- Power LED and keylock
- Speaker
- IRQ Mapping

Flat panel display connector (CN13)

POS-460 Flat panel display connector

Pin	Function	Pin	Function
1	+12 V	2	+12 V
3	GND	4	GND
5	V_{cc}	6	V_{cc}
7	ENAVEE	8	GND
9	P0	10	P1
11	P2	12	P3
13	P4	14	P5
15	P6	16	P7
17	P8	18	P9
19	P10	20	P11
21	P12	22	P13
23	P14	24	P15
25	P16	26	P17
27	P18	28	P19
29	P20	30	P21
31	P22	32	P23
33	GND	34	GND
35	SHFCLK	36	FLM
37	M/DE	38	LP
39	GND	40	ENABKL
41	NC	42	NC
43	NC	44	NC

VGA Internal Connector (CN18)

POS-460 Internal VGA connector

Pin	Signal	Pin	Signal
1	RED	2	VGND
3	GREEN	4	VGND
5	BLUE	6	VGND
7	HSYNC	8	VGND
9	VSYNC	10	VGND

Ethernet AUI-BNC connector (CN19)

POS-460 Ethernet AUI-BNC connector

Pin	Signal	Pin	Signal
1	TD+	11	TX-
2	TD-	12	BNC EN
3	RD+	13	GND
4	RD-	14	V_{cc}
5	NC		
6	CD+		
7	CD-		
8	RX+		
9	RX-		
10	TX+		

IDE hard drive connector (CN15)

POS-460 IDE hard drive connector

Pin	Signal	Pin	Signal
1	IDE RESET	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	SIGNAL GND	20	N/C
21	N/C	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	IO CHANNEL READY	28	BALE
29	N/C	30	GND
31	IRQ14	32	IOCS16
33	ADDR 1	34	N/C
35	ADDR 0	36	ADDR 2
37	HARD DISK SELECT 0	38	HARD DISK SELECT 1
39	IDE ACTIVE	40	GND

RS-232 connections (COM1: CN5/CN9, COM2: CN4/CN8, COM3: CN12, COM4: CN11)

Different devices implement the RS-232 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector. The following table shows the pin assignments for the board's RS-232 port.

POS-460 COM1-4 RS-232 serial ports		COM3: CN12 RS-422/485	
Pin	Signal	Pin	Signal
1	DCD/+5 V/+12 V	1	TX-
2	RX	2	TX+
3	TX	3	RX+
4	DTR	4	RX-
5	GND	5	GND
6	DSR	6	DSR
7	RTS	7	RTS
8	CTS	8	CTS
9	RI/+5 V/+12 V	9	RI/+5/+12V
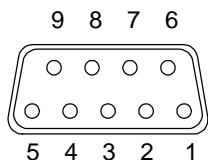
COM1 - 2
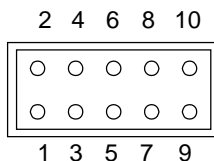
Internal COM1-4

Keyboard connectors (CN2A, CN1, CN2)

POS-460 internal keyboard connector 5-pin header (CN2A)	
Pin	Function
1	K/B clock
2	K/B data
3	N/C
4	GND
5	+5 V$_{DC}$

External keyboard connectors (6-pin mini DIN) (CN1, CN2)

Pin	Function
1	K/B data
2	N/C
3	GND
4	+5 V_{DC}
5	K/B clock
6	N/C

ISA slots (slot 1)

Board connector pin assignments - Side A

I/O pin	Signal name	Input/output
A1	-I/O CH CK	Input
A2	SD7	Input/output
A3	SD6	Input/output
A4	SD5	Input/output
A5	SD4	Input/output
A6	SD3	Input/output
A7	SD2	Input/output
A8	SD1	Input/output
A9	SD0	Input/output
A10	I/O CHRDY	Input
A11	AEN	Output
A12	SA19	Input/output
A13	SA18	Input/output
A14	SA17	Input/output
A15	SA16	Input/output
A16	SA15	Input/output
A17	SA14	Input/output
A18	SA13	Input/output
A19	SA12	Input/output
A20	SA11	Input/output
A21	SA10	Input/output
A22	SA9	Input/output
A23	SA8	Input/output
A24	SA7	Input/output

Board connector pin assignments - Side A, cont.

I/O pin	Signal name	Input/output
A25	SA6	Input/output
A26	SA5	Input/output
A27	SA4	Input/output
A28	SA3	Input/output
A29	SA2	Input/output
A30	SA1	Input/output
A31	SA0	Input/output

Board connector pin assignments - Side B

I/O pin	Signal name	Input/output
B1	GND	Ground
B2	RESET DRV	Output
B3	+5 V_{DC}	Power
B4	IRQ9	Input
B5	-5 V_{DC}	Power
B6	DRQ2	Input
B7	-12 V_{DC}	Power
B8	OWS	Input
B9	+12 V_{DC}	Power
B10	GND	Ground
B11	-SMEMW	Output
B12	-SMSMR	Output
B13	-10 W	Input/output
B14	-10 R	Input/output
B15	-DRACK3	Output
B16	DRQ3	Input
B17	-DRACK1	Output
B18	DRQ1	Input
B19	-REFRESH	Input/output
B20	CLK	Output
B21	IRQ7	Input
B22	IRQ6	Input
B23	IRQ5	Input
B24	IRQ4	Input
B25	IRQ3	Input

Board connector pin assignments - Side B, cont.

I/O pin	Signal name	Input/output
B26	-DACK2	Output
B27	T/C	Output
B28	BALE	Output
B29	+5 V$_{DC}$	Power
B30	OSC	Output
B31	GND	Ground

Board connector pin assignments - Side C

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

Board connector pin assignments - Side D

| I/O pin	Signal name	Input/output
D1	-MEM CSI6	Input
D2	-I/O CS16	Input
D3	IRQ10	Input
D4	IRQ11	Input

I/O pin	Signal name	Input/output
D5	IRQ12	Input
D6	IRQ15	Input
D7	IRQ14	Input
D8	-DACK0	Output
D9	DRQ0	Input
D10	-DACK5	Output
D11	DRQ5	Input
D12	-DACK6	Output
D13	DRQ6	Input
D14	-DACK7	Output
D15	DRQ7	Input
D16	+5 V_{DC}	Power
D17	-MASTER	Input
D18	GND	Ground

Floppy drive connector (CN16)

POS-460 Floppy drive connector

Pin	Signal	Pin	Signal
1	GND	2	DENSITY SELECT
3	GND	4	N/C
5	GND	6	DRIVE TYPE
7	GND	8	INDEX
9	GND	10	MOTOR 0
11	GND	12	DRIVE SELECT 1
13	GND	14	DRIVE SELECT 2
15	GND	16	MOTOR 1
17	GND	18	DIRECTION
19	GND	20	STEP
21	GND	22	WRITE DATA
23	GND	24	WRITE GATE
25	GND	26	TRACK 0
27	GND	28	WRITE PROTECT
29	GND	30	READ DATA
31	GND	32	HEAD SELECT
33	GND	34	DISK CHANGE

Parallel port connector
(CN6: LPT1, CN10: LPT2)

POS-460 Parallel port connector

Pin	Signal
1	\STROBE
2	D0
3	D1
4	D2
5	D3
6	D4
7	D5
8	D6
9	D7
10	\ACK
11	BUSY
12	PE
13	SLCT
14	AUTOFD
15	ERR
16	INIT
17	SLIN
18	GND
19	GND
20	GND
21	GND
22	GND
23	GND
24	GND
25	GND
26	NC

LPT1

```
     25                            14
   ┌─────────────────────────────────┐
    o o o o o o o o o o o o o o
     o o o o o o o o o o o o o
   └─────────────────────────────────┘
     13                             1
```

LPT2

```
     14                            26
   ┌─────────────────────────────────┐
    o o o o o o o o o o o o o o
     o o o o o o o o o o o o o
   └─────────────────────────────────┘
     1                             13
```
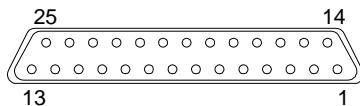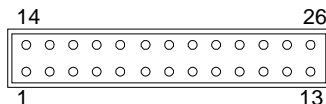
Digital input/output (CN17)

POS-460 digital I/O (CN17)

Pin	Signal
1	I/O IN 0
2	V_{CC}
3	I/O IN 1
4	I/O OUT 0
5	I/O IN 2
6	GND
7	I/O IN 3
8	I/O OUT 1
9	GND
10	+12 V

Main power connector (CN14)

POS-460 main power connector (CN14)

Pin	Signal
1	Power good
2	V_{CC}
3	+12 V
4	-12 V
5	GND
6	GND
7	GND
8	GND
9	-5 V
11	V_{CC}
12	V_{CC}

Power
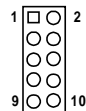
Digital I/O

Power LED and keylock (J40)

POS-460 power LED & keylock (J40)

Pin	Signal
1	V_{CC}
2	N/C
3	GND
4	Keylock
5	GND

Speaker (J39)

POS-460 speaker (J39)

Pin	Signal
1	V_{CC}
2	GND
3	GND
4	Speaker

IRQ Mapping Chart

IRQ	Function
0	Interval timer
1	Keyboard
2	Interrupt from Controller 2
3	COM2
4	COM1
5	Ethernet
6	FDD
7	LPT1
8	RTC
9	Reserved for COM4
10	Reserved for COM3, COM4, or LPT2
11	Reserved for COM3
12	Reserved for COM3 or LPT2
13	INT from co-processor
14	IDE
15	Reserved for COM4 or LPT2