AWS-8420T

Industrial Workstation with 12.1"
Flat Panel Display

User's Manual

Copyright Notice

Acknowledgments

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FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy. If not installed and used in accordance with this user's manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

警告使用者

這是甲類的資訊產品，在居住的環境中使用時，
可能會造成射頻干擾，在這種情況下，使用者會
被要求採取某些適當的對策。

Packing List

Before you set up the AWS-8420 workstation, make sure that the following materials have been included with the package, and that this manual is in good condition. If anything is missing or damaged, contact your dealer immediately:

• One AWS-8420 industrial workstation with 12.1" flat panel display

• A PCA-6654LB VGA card is installed in the AWS-8420TP and AWS-8420TP-T models

• One accessory box, including:
  - One power cord
  - One HMI products drivers and utilities CD-ROM
  - One utility diskette for function key programming
  - AWS-8420T User's Manual
  - PCA-6654 User's Manual (TP and TP-T only)
  - Cable to link front PS/2 connector to CPU card
  - Flat gray cable for 3.5" HDD and slim CD-ROM
  - A Y-cable for PS/2 keyboard and mouse
  - RS-232 cable to link touchscreen to CPU card (only -T models)
  - Screw bag with screws

• CDR-842-0024 (optional)

  The CD-ROM drive for the AWS-8420T is packed in a separate carton, to ensure that it is shipped safely and does not deteriorate.
  - One application notes
  - Screw bag with screws

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

Additional Information And Assistance

1. Visit the Advantech web sites at **www.advantech.com** or **www.advantech.com.tw** where you can find the latest information about the product.

2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:

   • Product name and serial number

   • Description of your peripheral attachments

   • Description of your software (operating system, version, application software, etc.)

   • A complete description of the problem

   • The exact wording of any error messages

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User's Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
    a. The power cord or plug is damaged.
    b. Liquid has penetrated into the equipment.
    c. The equipment has been exposed to moisture.
    d. The equipment does not work well, or you cannot get it to work according to the user's manual.
    e. The equipment has been dropped and damaged.
    f. The equipment has obvious signs of breakage.
15. DO NOT LEAVE THIS EQUIPMENT IN AN UNCONTROLLED ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS MAY DAMAGE THE EQUIPMENT.

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70dB(A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Wichtige Sicherheishinweise

1. Bitte lesen sie Sich diese Hinweise sorgfältig durch.

2. Heben Sie diese Anleitung für den späteren Gebrauch auf.

3. Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Verwenden Sie Keine Flüssig-oder Aerosolreiniger. Am besten dient ein angefeuchtetes Tuch zur Reinigung.

4. Die NetzanschluBsteckdose soll nahe dem Gerät angebracht und leicht zugänglich sein.

5. Das Gerät ist vor Feuchtigkeit zu schützen.

6. Bei der Aufstellung des Gerätes ist auf sicheren Stand zu achten. Ein Kippen oder Fallen könnte Verletzungen hervorrufen.

7. Die Belüftungsöffnungen dienen zur Luftzirkulation die das Gerät vor überhitzung schützt. Sorgen Sie dafür, daB diese Öffnungen nicht abgedeckt werden.

8. Beachten Sie beim. AnschluB an das Stromnetz die AnschluBwerte.

9. Verlegen Sie die NetzanschluBleitung so, daB niemand darüber fallen kann. Es sollte auch nichts auf der Leitung abgestellt werden.

10. Alle Hinweise und Warnungen die sich am Geräten befinden sind zu beachten.

11. Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden.

12. Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw. elektrischen Schlag auslösen.

13. Öffnen Sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von authorisiertem Servicepersonal geöffnet werden.

14. Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen:

    a - Netzkabel oder Netzstecker sind beschädigt.

    b - Flüssigkeit ist in das Gerät eingedrungen.

    c - Das Gerät war Feuchtigkeit ausgesetzt.

    d - Wenn das Gerät nicht der Bedienungsanleitung entsprechend funktioni ert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.

    e - Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.

    f - Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.

Der arbeitsplatzbezogene Schalldruckpegel nach DIN 45 635 Teil 1000 beträgt 70dB(A) oder weiger.

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Introduction

- Description
- Specifications
- Dimensions
- Complete functionality
- Front accessible CD-ROM
- Front control panel

1.1 Description

The AWS-8420 series workstations take advantage of modern flat-panel displays for minimum size. The AWS-8420 offers two types of passive backplane, 3 PCI / 4 ISA / 1 CPU (AWS-8420TP/TP-T) and 8 ISA (AWS-8420T/T-T) slots, 250 watt power supply, data-entry/function-key keypads, a slim floppy drive, and two spaces for a hard drive and a slim CD-ROM. A high-quality steel frame gives security and environmental protection that meets the toughest industrial standards.

Versatile backplane supply

The backplanes were formed by four-layer PCBs with ground and power planes for reduced noise and lower power-supply impedence. They have LED power indicators for +5 V, +12 V, -5 V and -12 V. The AWS-8420TP/-T contains three PCI-compatible slots, four PC/AT-compatible (ISA-bus) slots and one dedicated slot for the CPU card.

Sealed-membrane tactile-response keypad

You can enter data with the workstation's two convenient sealed-membrane keypads, one with 60 data keys, the other with 20 function keys. An external keyboard can be attached through a connector on the front panel. A built-in keyboard interface module merges keyboard and keypad signals into a single output signal that acts like a standard IBM AT keyboard. No special software or I/O ports are needed. (Refer to section 4.4 for a detailed description.)

Note: *To use the keyboard and keypad simultaneously, you must first connect the keyboard connector on the backplane to the keyboard connector on the CPU card, and then connect the external keyboard jack to another keyboard jack located next to the power supply. If you connect the keyboard to the 5-pin DIN connector on the CPU card, neither the keyboard nor the keypad will work. The keyboard must be connected to the jack behind the front door.*

Accessible and secure control panel

We have put all the workstation's controls at the front of the unit for easy access. A door protects the controls from damage. External controls are: power ON/OFF and reset switches, slim floppy disk drive, slim CD-ROM drive and PS/2 port. Two LEDs indicate power ON and HDD status. There is a control to adjust the brightness or contrast of the LCD display.

1.2 Specifications

General

- **Front panel**: Aluminum, meets NEMA 4 or IP 65

- **Disk drive housing**: Supports one slim 3.5" FDD, one 3.5" HDD and one slim CD-ROM

- **VGA card:** CHIPS 65550 PCI-bus card (PCA-6654LB) with 2 MB DRAM on board, supports simultaneous CRT/LCD display, AWS-8420T and AWS-8420T-T without VGA card

Note: For AWS-8420T and AWS-8420T-T, we recommend PCA-6751, 6752 and 6770 series CPU card, whose signals are 3.3 V.

- **Cooling system**: One 49 CFM fan on rear panel

- **Membrane keypads**: One with 60 data entry keys, one with 10 function keys and 10 programmable macro function keys

- **Keyboard connector**: 6-pin PS/2 connector with dust-proof door on front panel

- **Indicators**: LEDs for Power On/Off and HDD activity

- **Linear VR adjustment:** Brightness and on/off control

- **Operating temperature**: 0 ~ 50° C (32 ~ 122° F)

- **Relative humidity**: 5 ~ 85% @ 50° C, non-condensing

- **CE compliant**

- **Dimensions (W x H x D)**: 482 x 266 x 307 mm
                                      (19.0" x 10.5" x 12.1")

- **Weight**: 15 kg (33 lb)

Touchscreen (optional)

- **Type**: Analog resistive

- **Resolution**: Continuous

- **Light transmission:** 75%
- **Controller**: RS-232 interface
- **Power consumption**: +5 V @ 200 mA
- **Software driver**: Supports MS-DOS, Windows 3.1/95/98/ 2000/NT

Passive backplane

- **PCA-6108P3 (AWS-8420TP/-T):** 4 ISA, 3 PCI, 1 CPU slot
- **PCA-6108C (AWS-8420T/-T):** 8 ISA slot

Power supply options

AC input 250 W (standard offer)

- **Input**: 85 ~ 130 V_{AC} or 180 ~ 260 V_{AC}, switchable
- **Output**:
  +5 V @ 25 A; +12 V @ 9 A; -5 V @ 0.5 A; -12 V @ 2.0 A
- **MTBF**: 100,000 hours
- **Safety**: UL/CSA/TUV

-48 V_{DC} input 310 W (ODM option)

- **Input**: -38 ~ -58 V_{DC}
- **Output**:
  +5 V @ 25 A; +12 V @ 10 A; -5 V @ 1 A; -12 V @ 5 A
- **MTBF**: 100,000 hours

24 V_{DC} input 250 W (ODM option)

- **Input:** 19 ~ 32 V_{DC}
- **Output**:
  +5 V @ 25 A; +12 V @ 10 A; -5 V @ 1 A; -12 V @ 1 A
- **MTBF**: 100,000 hours

1.3 LCD display

Model	AWS-8420T
Display type	12.1" TFT color
Max. resolution	800 x 600
Max. colors	256 K colors
Dot size (mm)	0.3075 x 0.3075
Luminance (cd/m^2)	200
Viewing angle	90°
Temperature	0 ~ 50° C
VR controller	Brightness & on/off
LCD MTBF	50,000 hours
Backlight MTBF	20,000 hours

Table 1-1: LCD Display

1.4 Dimensions

Before you rackmount or panelmount the AWS-8420T worksta-
tion, use the following diagram to verify that the mounting
screws correspond with the holes in your panel/rack.
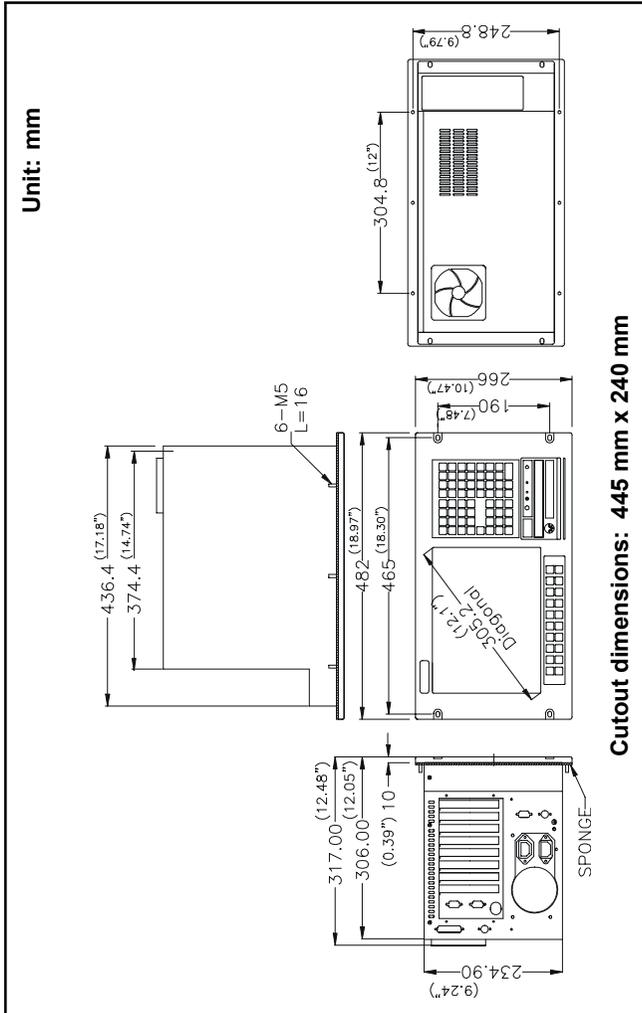
Figure 1-1: Dimensions

1.5 Complete Functionality

VGA card (TP & TP-T models)
8 slots passive backplane
Keyboard translator
Shielded 12.1" TFT LCD
Touch-screen RS-232 connector

Cooling fan with removable filter
Heavy-duty steel frame

Rear chassis keyboard connectors
Front PS/2 mouse connector
AC 250 W power supply
Power supply cooling fan
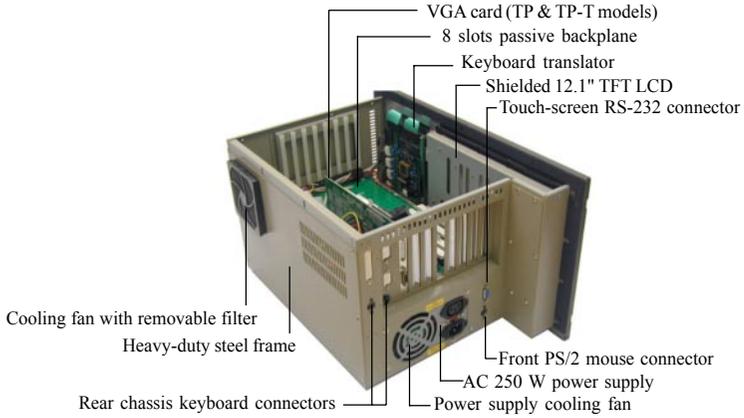
Figure 1-2: Complete functionality

1.6   Front Accessible CD-ROM
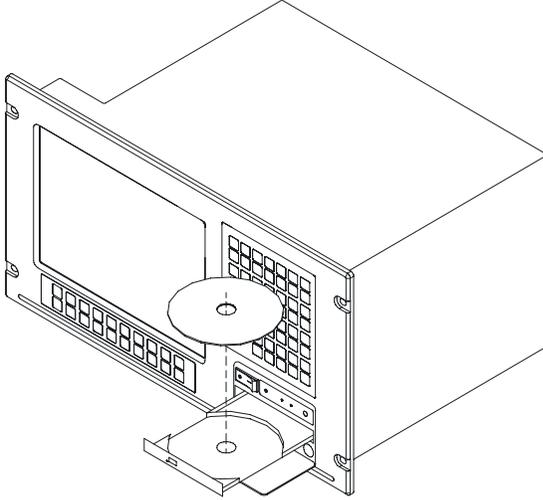
Figure 1-3: Front accessible CD-ROM

1.7 Front Control Panel

VR FOR BRIGHTNESS/CONTRAST ADJUSTMENT
POWER INDICATOR
HDD INDICATOR
RESET
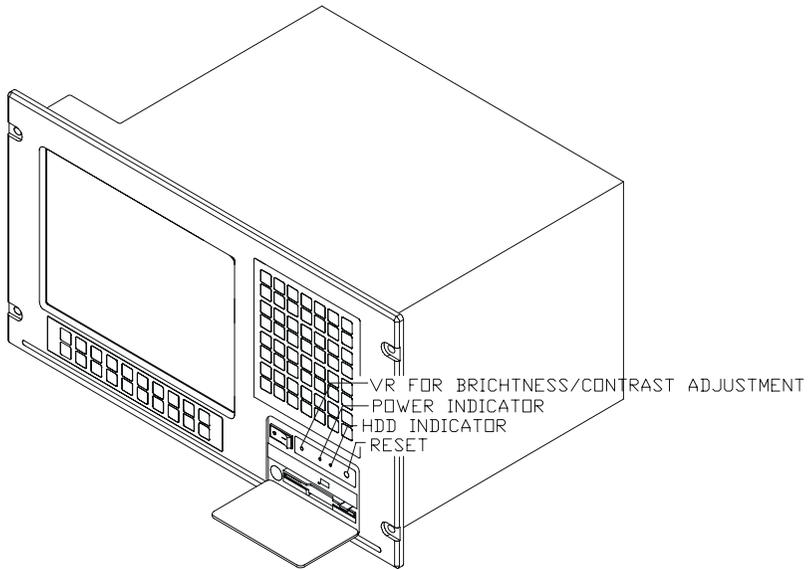
Figure 1-4: Front control panel

System Setup

- General
- Opening the top panel and rear panel
- Adding cards
- Installing optional drives
- Connecting cables
- Connecting external keyboard and mouse
- Panel mounting
- Rack mounting

2.1 General

Your AWS-8420T is easy to use. All you have to do is remove its cover, install your CPU card, display adapter card, an optional hard disk drive, and whatever additional I/O cards that your application requires, and you are ready to mount your workstation into a 19-inch rack or panel.

Warning! *Do not begin your installation until you are sure there is no power flowing within the AWS-8420T. It must be switched off and unplugged. Every time you access the inside of the AWS-8420T, you should switch it off and unplug it.*

2.2 Opening The Top Panel And Rear Panel

Remove the eight screws from the top panel and then open the top cover. (See Fig. 2-1.) After removing the top cover, you can detach the six screws from the rear panel and open the rear panel. (See Fig. 2-2.)
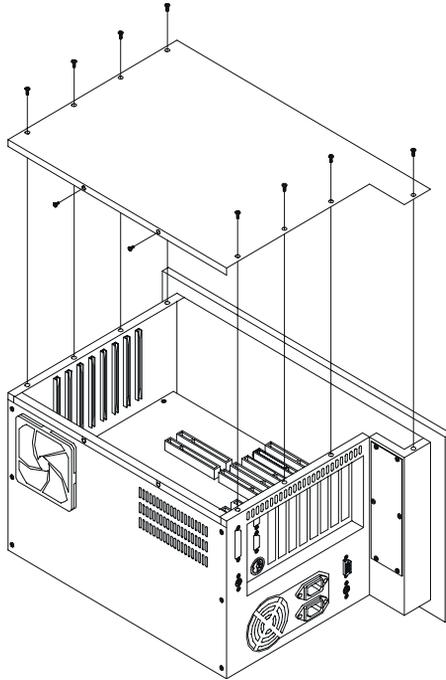
Figure 2-1: Opening the top panel
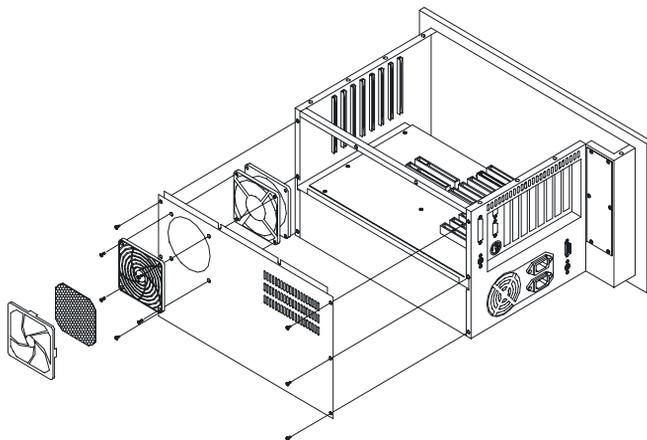
Figure 2-2: Opening the rear panel

2.3 Adding Cards

The PCI passive backplane accepts both PCI-bus and ISA-bus CPU and I/O cards. We recommend all-in-one cards. They are durable, and save valuable slot space by bundling a CPU card with hard disk and floppy disk controllers, as well as serial and parallel ports.

Open the top panel (see Section 2.2) and then slowly slide the card in and carefully press it into the backplane socket. Secure it with a screw to the top mounting bar. (See Fig. 2-3). Connect the wires. Install additional cards as needed. When you have finished, reattach the cover.
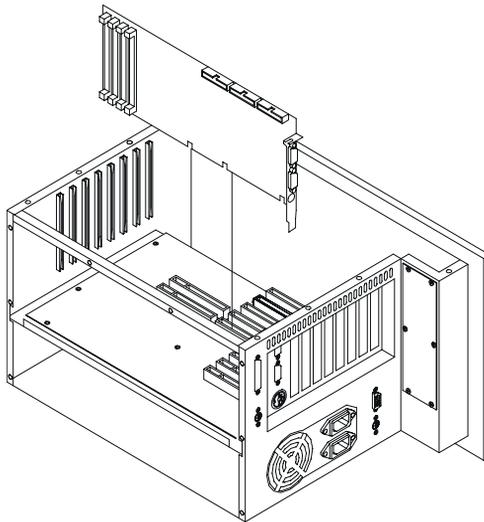
Figure 2-3: Installing add-on cards

2.4 Installing Optional Drives

The AWS-8420T provides space for three drives (one slim floppy disk drive, one hard disk drive and one slim CD-ROM drive) underneath the case. A front-facing floppy drive has already been installed. You can access it from the FDD dust-resistant door panel.

If you wish, you can add a 3.5" hard disk drive or a slim CD-ROM drive above the front-facing floppy drive. Unscrew the drivemount assembly from the body of the case, attach the drive with the screws, and attach the ribbon connector. (See Figs. 2-4, 2-5, 2-6 and 2-7.) When you have added the drives, set the ribbon cables in place and mount the drivemount assembly.
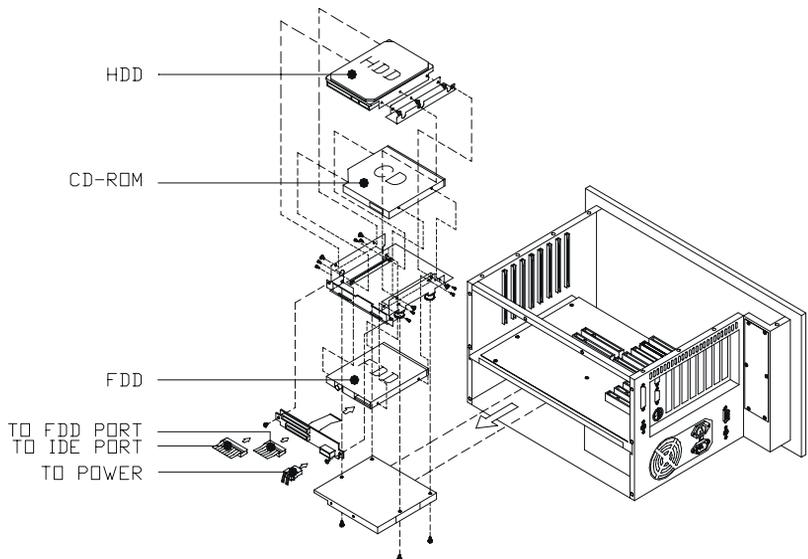
Figure 2-4: Installing optional disk drives - overall view
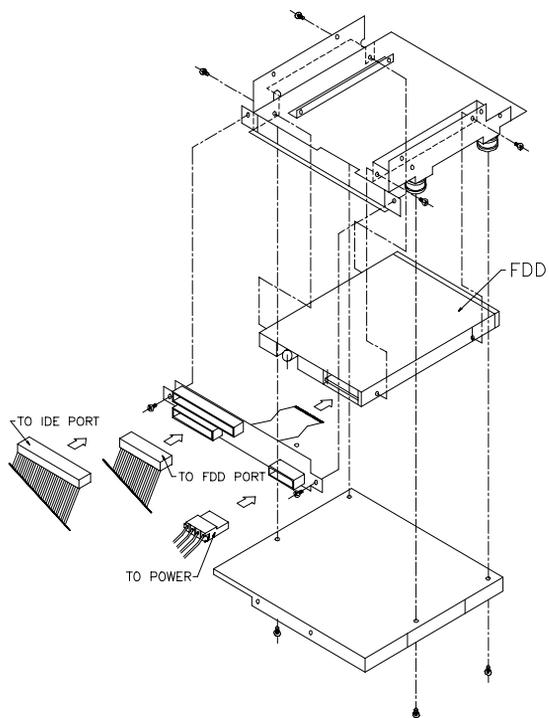
Figure 2-5: Installing an FDD

HDD

TO IDE PORT

TO POWER
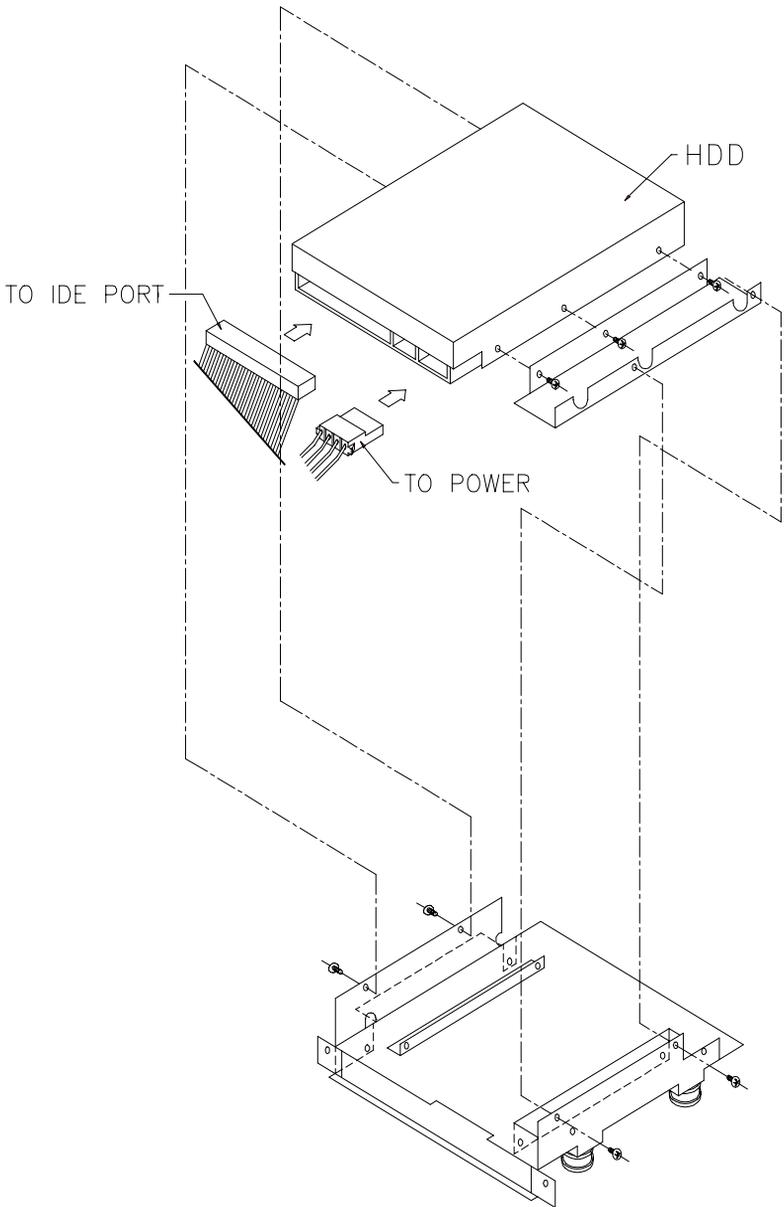
Figure 2-6: Installing an HDD
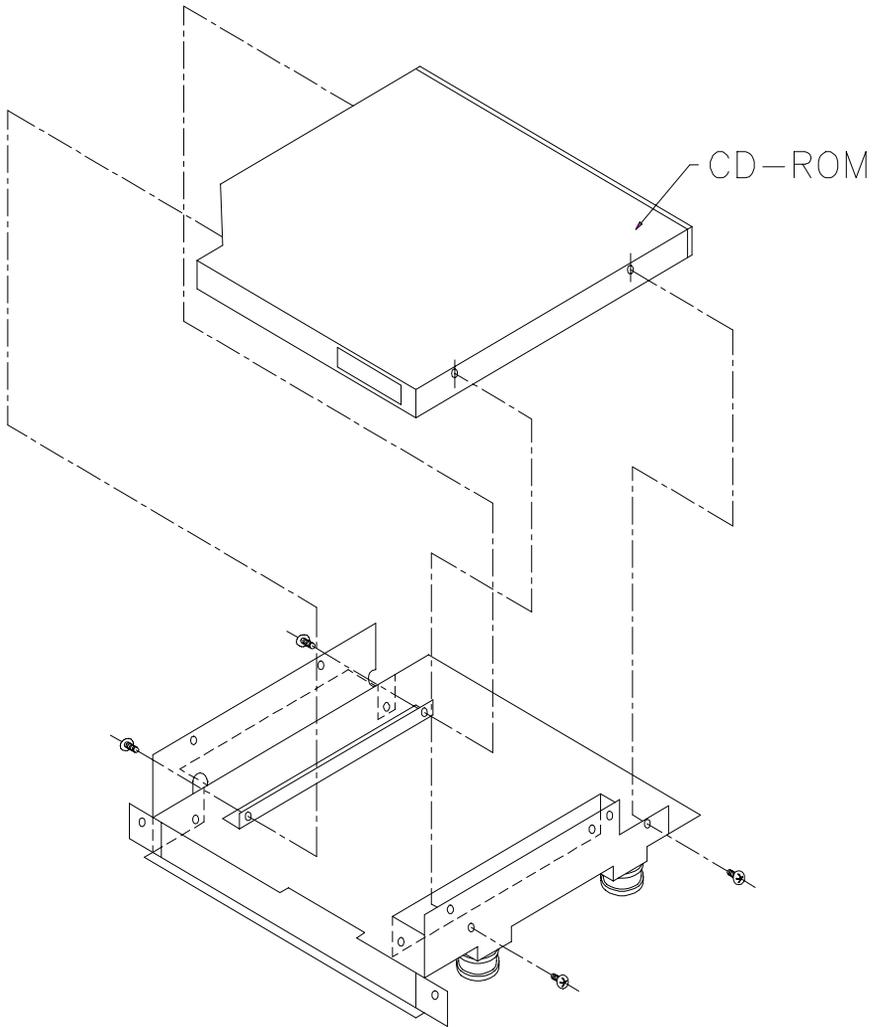
CD−ROM

Figure 2-7: Installing a CD-ROM

2.5 Connecting Cables

After inserting the CPU card into the chassis, connect the FDD, CD-ROM and HDD cables to the CPU card. In addition to the storage devices, three other cables need to be connected: the PS/2 mouse cable, keyboard cable and RS-232 cable for the touch screen. The PS/2 mouse cable is used to connect the mouse signal from the pfront panel PS/2 keyboard/mouse to the CPU card, as shown below. There is a keyboard control board in the system which integrates the keyboard signals. An internal keyboard cable needs to be connected to the CPU card as shown below. If your workstation is equipped with a touch screen, connect the touch screen controller and CPU card through the RS-232 cable as shown belows.

Keyboard cable

Touch-screen RS-232 cable

PS/2 mouse cable
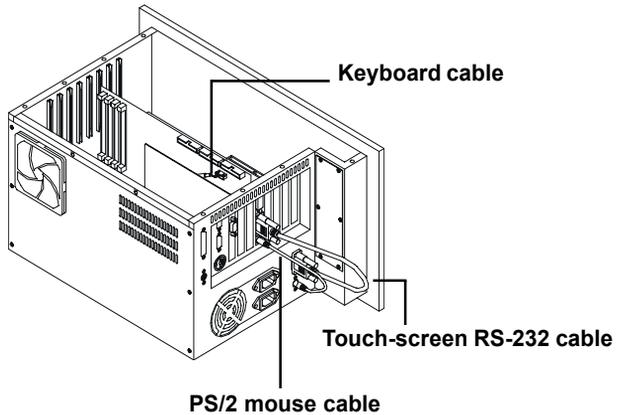
Figure 2-8 Connecting cables

2.6 Connecting External Keyboard and Mouse

You can connect an external keyboard and mouse to the workstation. The first place to the keyboard and mouse is the PS/2 connector on the front panel, under the dust-protection door. You can connect a PS/2 keyboard to the connector if you do not need a mouse. Or use the Y-cable provided in the accessory box to connect simultaneously a keyboard and a mouse. There are two additional keyboard connectors in the back of the chassis as shown in figure 2-10. You cannot connect two keyboards to the two connectors in the back at the same time. You could connect a keyboard to the front panel PS/2 connector and another to one of the keyboard connectos at the back of the chassis at the same time.
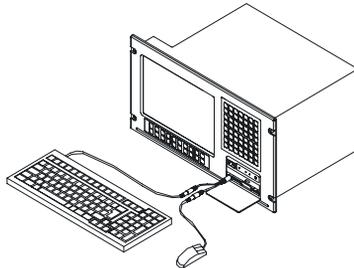
Figure 2-9 Connecting keyboard/mouse from front panel

Rear keyboard connector
Can't work simultaneously
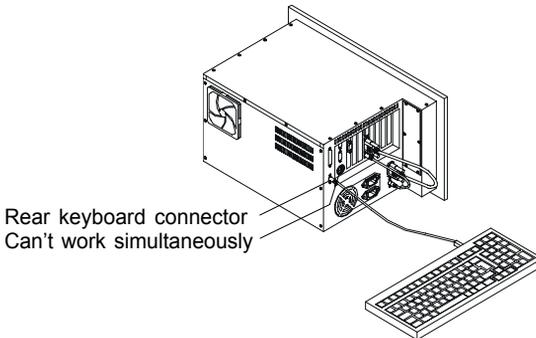
Figure 2-10 Connecting keyboard from back chassis

2.7 Panel Mounting

The AWS-8420T will stand on a shelf or a table, and it may be mounted within a panel. Dimensions for the case, the mounting flange, and the mounting bolts are shown in Fig. 1-1.

Once you have added your cards, drives, and other equipment, you should switch on the AWS-8420T to confirm that it works. Then set the case within your panel aperture so that your screw holes line up with the mounting bolts on the flange of the AWS-8420T. Secure the bolts to the panel.
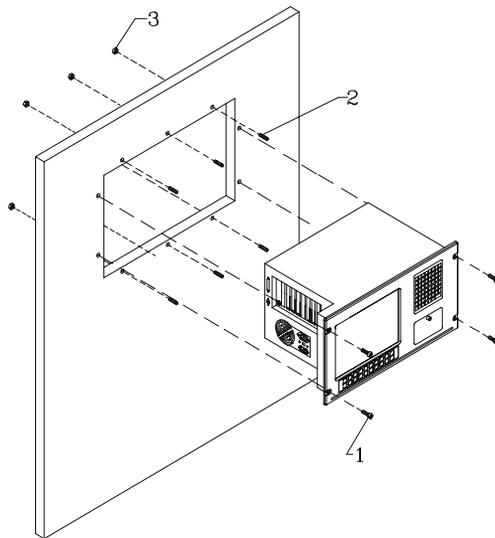
Figure 2-11: Panel mounting

2.8 Rack Mounting

The AWS-8420T can also be mounted in a 19" rack. Make sure that all additional equipment has been installed correctly. Also make sure that all cabling (such as the monitor signal cable, the keyboard cable and the monitor power cable) has been reattached. Attach the rack to the case using screws on both sides of the case.
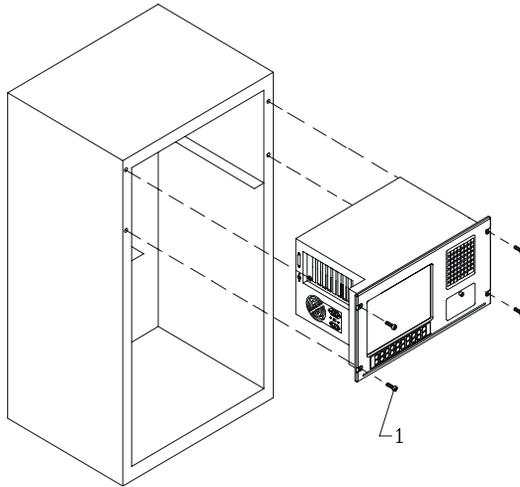
Figure 2-12: Rack mounting

Macro Key Programming

- Introduction

- Macro components

- Syntax

- How to use SFED842.COM

- Examples

3.1   Introduction

Our workstations are equipped with programmable function keys
(macro keys) that greatly enhance the operator interface. Macros,
far more powerful than batch files, automate the most commonly
used input sequences. They extended their functional reach to
within application programs.

3.2   Macro Components

The following article explains how to use and program the
function keys. The complete macro function consists of the
following elements:

Macro keys

Ten programmable macro keys that are located under the monitor
screen of your workstation.

Macro EEPROM

Holds the key sequences that are activated when the corresponding
macro key is pushed.

Macro programming utility

Locate the program SFED842.COM in the Function Key Utility
diskette for function key programming. The SFED software
provides an edit function to produce an ASCII file that contains
keystroke sequences for every macro key. After you have finished
editing the file, the program will ask you whether you want to save
the macro script and/or transmit it to the EEPROM. Macros
consist of keystroke sequences to automate the most common
procedures in your application. The way they function is much like
batch files (.BAT) under DOS, but there are some differences. In a
Macro you have to specify the ENTER key explicitly. Macros give
you the possibility to enter key sequences in an application that was
executed by the macro itself.

3.3 Syntax

Macro definitions consist of ASCII characters or character codes for special characters such as ALT, ENTER, SHIFT, F1, SF2, and so on. These codes are predefined, and SFED842.COM will display them on the screen for you. They are easily recognizable, appearing between the square brackets '[' and ']'.

For example :

ALT represents [26]
ENTER represents [33]

In your macro script, you can enter ordinary text (ASCII characters) or the code(s) of the required special character(s).

For example :

CD\TOOLKIT[33] means CD\TOOLKIT [ENTER]

For combination keystrokes (ALT/SHIFT/CTRL + another key) enter the codes of the special characters, followed by [90] (RELEASE).

For example:

ALT-F1 represents [26][44][90]

CRTL-C represents [28]C[90]

SHIFT-B represents [27]B[90]

Please refer to the following examples:

ALT-X represents [26]X[90] or [26]x[90].

ALT-F1 represents [26][44][90]

SHIFT-X represents [27]X[90]

SHIFT-F1 represents [27][44][90]

CTRL-X represents [28]X[90]

CTRL-F represents [28][44][90]

CTRL-ALT-DEL represents [28][26][41][90] (reboot)

CTRL-ALT-A represents [28][26]A[90]

CTRL-SHIFT-1 represents [28][27]1[90]

Another useful function is the DELAY instruction. You can instruct the macro program to wait before executing the next keystroke. SFED842.COM displays the codes that you can use for various delays.

For example:

[86] - Wait for 10 seconds before executing next keystroke

[88] - Wait for 1 minute before executing next keystroke.

[26]A[90][86][26]B[90] means ALT-A, wait 10 seconds, ALT-B

3.4 How To Use SFED842.COM

First, boot your system under pure DOS mode (not DOS shell in windows) and copy all the files to your hard disk and/or make a backup disk. Then start the macro editor. You will have to specify either an existing macro script file or a new macro script file. Here we will create a new file by typing SFED842 NEWKEY.TXT [ENTER].

The following screen will appear:

```
Advantech Workstation Special Function Key Edit Program      Rev. 11/16/1995
Table of Control Codes :                          Example : SF5  =CD\WINDOWS[33]WIN[33]

 TAB    [24]       HOME [3C]       [  [30]      ]  [31]      BS [35]      ESC [36]
 ALT    [26]       END   [3D]      ↑ [38]       ↓ [39]      ← [3A]       → [3B]
 SHIFT  [27]       PGUP [3E]       F1 [44]      F2  [45]     F3 [46]      F4  [47]
 CTRL   [28]       PGDN [3F]       F5 [48]      F6  [49]     F7 [4A]      F8  [4B]
 ENTER[33]         INS   [40]      F9 [4C]      F10 [4D]     F11 [4E]     F12 [4F]
 PRTSC[7E]         DEL   [41]      RELEASE [90]
 PAUSE[7F]         SF1 to SF10 = [70] to [79]

Key delay Mode :

 0.1 Sec [80]      0.5 Sec [81]     1 Sec  [82]      2 Sec   [83]      3 Sec  [84]
  5 Sec [85]       10 Sec [86]      30 Sec [87]      1 Min   [88]      1 Hour [89]
─────────────────────────────────────────────────────────────────────────────
 SF1  =
 SF2  =
 SF3  =
 SF4  =
 SF5  =
 SF6  =
 SF7  =
 SF8  =
 SF9  =
 SF10 =
─────────────────────────────────────────────────────────────────────────────
                            KBT ID:AD111695      ESC:Quit/Save/Transmit
```

Figure 3-1: The Macro Editor screen

When you have finished editing, press the ESC key. At the bottom line of the screen you will be prompted to choose if you want to save the file and/or if you want to transmit it to the EEPROM.

After confirmation with the ENTER key, the tasks are carried out and you return to DOS.

3.5 Examples

We will explain all macro functions that you can find in the EX842.TXT macro script file. After typing SFED842 EX842.TXT [ENTER], the following editor screen will appear:

```
Advantech Workstation Special Function Key Edit Program      Rev. 11/16/1995
Table of Control Codes :                    Example : SF5  =CD\WINDOWS[33]WIN[33]

TAB     [24]      HOME [3C]       [   [30]      ]   [31]    BS  [35]    ESC[36]
ALT     [26]      END    [3D]     ↑ [38]        ↓ [39]      ← [3A]      → [3B]
SHIFT [27]        PGUP [3E]       F1 [44]       F2 [45]     F3 [46]     F4  [47]
CTRL  [28]        PGDN [3F]       F5 [48]       F6 [49]     F7 [4A]     F8  [4B]
ENTER[33]         INS    [40]     F9 [4C]       F10 [4D]    F11 [4E]    F12 [4F]
PRTSC[7E]         DEL    [41]     RELEASE [90]
PAUSE[7F]         SF1 to SF10 = [70] to [79]

Key delay Mode :

0.1 Sec [80]      0.5 Sec [81]    1  Sec [82]    2 Sec [83]    3 Sec  [84]
  5 Sec [85]      10 Sec [86]     30 Sec [87]    1 Min [88]    1 Hour [89]
_____
SF1  = CD\TOOL[33]SFED842 EXAMPLE.TXT[33]
SF2  = COPY C:\CONFIG.EMM C:\CONFIG.SYS[33]Y[33][85][79]
SF3  =
SF4  = C:\WP51\WP[33][86][27][4D][90]REPORT.WP5[33]
SF5  =
SF6  =
SF7  =
SF8  =
SF9  =
SF10 = [28][26][41][90]
_____
Save(Y/N)?      Transmit(Y/N)?              KBT ID:AD111695      ESC:Quit/Save/Transmit
```

Figure 3-2: Macro examples

SF1 = CD\TOOL[33] SFED842 EXAMPLE.TXT[33]

This macro changes to the TOOL directory, then starts up
SFED842.COM with EXAMPLE.TXT.

SF2 = COPY C:\CONFIG.EMM C:\CONFIG.SYS[33]Y[33][85][79]

The configuration information is changed by copying
CONFIG.EMM to CONFIG.SYS. After a delay of 5 seconds,
[85], the macro, invokes macro function key SF10, [79], which was
defined to reset the system.

SF4 = C:\WP51\WP[33][86][27][4D][90]REPORT.WP5[33]

This example shows that after a macro executes, it is able to direct
the program to accomplish several tasks. WordPerfect is started.
After a delay of 10 seconds (time to load the program), the com-
mand Shift-F10, [27][4D], is issued to import a text file. The name
of the text file (REPORT.WP5) is inserted and finally ENTER,
[33], causes the text file to be loaded and appear on the screen.

SF10 = [28][26][41][90]

Restarts the computer (CTRL-ALT-DEL).

Maintenance

- Detaching the backplane and bracket
- Power supply
- LCD maintenance
- Keyboard translator
- LED board
- Touchscreen controller

4.1 Detaching The Backplane And Bracket

Before detaching the bracket, you must open the top and rear covers
(see Figure 2-1). Remove the card from the backplane and detach
the backplane. If you want to repair and upgrade your peripherals
(for example, the membrane keypad controller or the backlight of the
LCD), you must first pull out the bracket.
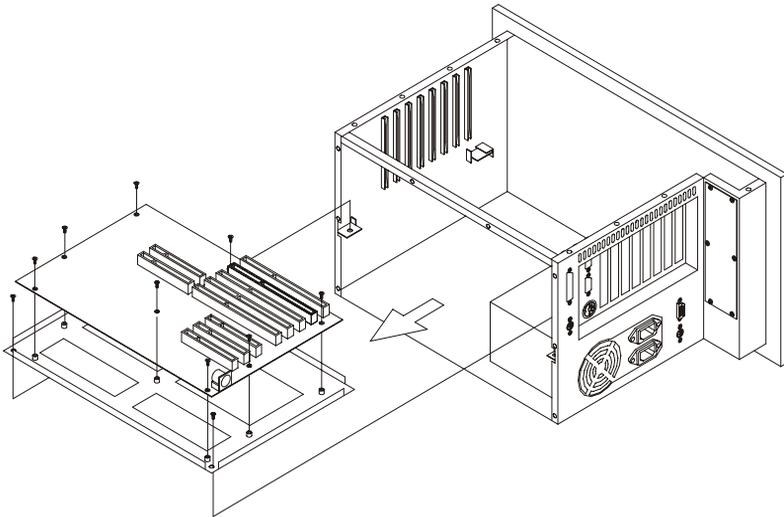
Figure 4-1: Detaching the backplane and bracket

4.2 Power Supply

To repair or upgrade your power supply, first detach and remove the top and rear covers. Unscrew the four screws on the side panel (see Fig. 4-2), and disconnect all DC output connectors and the AC line.

Warning: Shut off all power to the AWS-8420T before you commence to repair the power supply. Switch off the power and unplug the unit.

For detailed power supply specifications, refer to Appendix A.
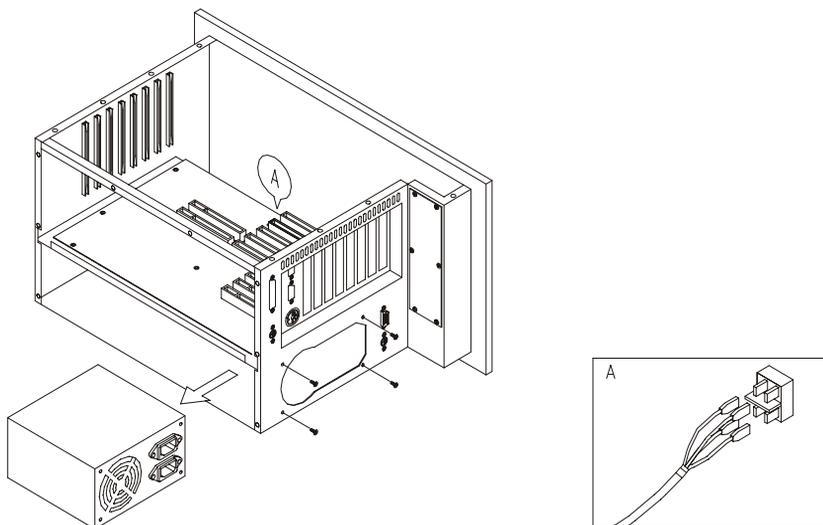
Figure 4-2: Installing the power supply

4.3 LCD Maintenance

In the normal working life of the AWS-8420T, you may have to replace the inverter, LCD or LCD backlight. Follow these instructions:

1. Open the top and rear cover. (See Fig. 2-1.)

2. Disconnect the cable from the LCD controller and LCD.

3. Pull out the bracket which is located below the backplane.

4. Detach the bracket behind the front panel.

5. Disconnect the cables of the inverter, and the cables of the touchscreen controller (if applicable). Pull out the LCD bracket to change the inverter.

6. Unscrew the four screws, and pull out the LCD very carefully.

7. Unscrew the screws on the LCD (see Fig. 4-3), and then change the backlight.

Warning: The backlight is small and fragile. Use caution when handling or replacing it.
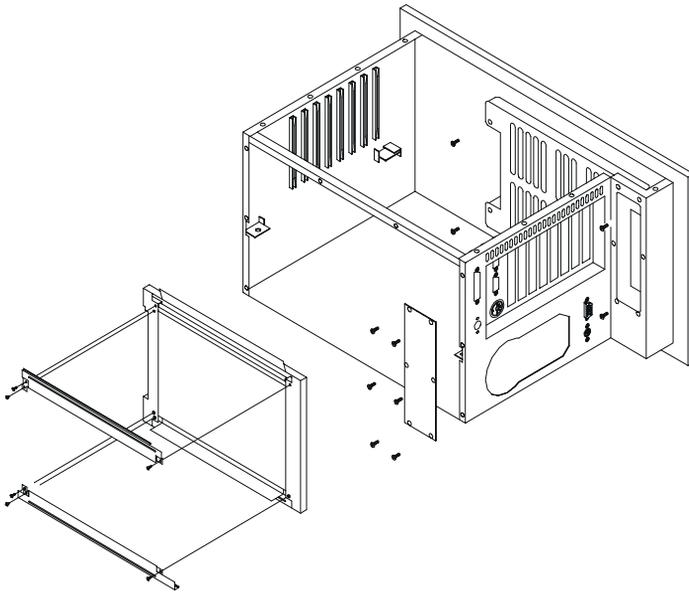
Figure 4-3: Installing the LCD backlight

4.4 Keyboard Translator

The keyboard translator is an interface which switches the signal from the membrane keypad to the standard AT keyboard. There are six connectors on the board. On top of the board, there are two connectors linking two flat cables with the larger membrane keypad (as shown in Fig. 4-5). On the side of the board, there are four connectors. For connection details, refer to Fig. 4-5.

When servicing the keyboard translator:

1. Switch off the power, and detach the main power cord.

2. Detach the work drawer and cover from the AWS-8420T unit. (See Fig. 2-1.)

3. Pull out the work drawer out as far as it will go.

4. Remove the keypad connector protective bracket.

5. Carefully detach all cables connected to the keyboard translator. (See Fig. 4-5.)

6. Unscrew the four screws on the corners, pull out the keyboard translator, and replace it.
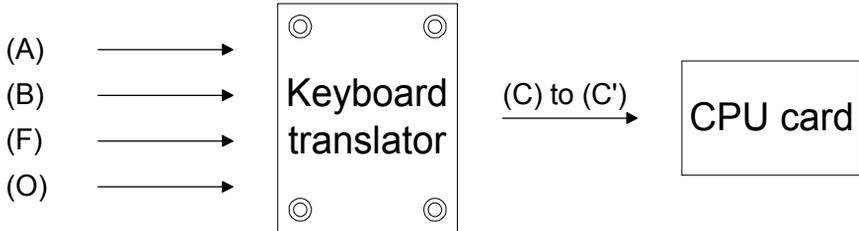
(A)	Input from external keyboard (A)
(B)	Input from external keyboard (B)
(F)	Input from function keypad (F1, F2, ...)
(O)	Input from operation keypad (1, 2, 3, ...)
(C) to (C')	Output to CPU card's keyboard connector

Figure 4-4: Keyboard translator input/output (basic schematic)
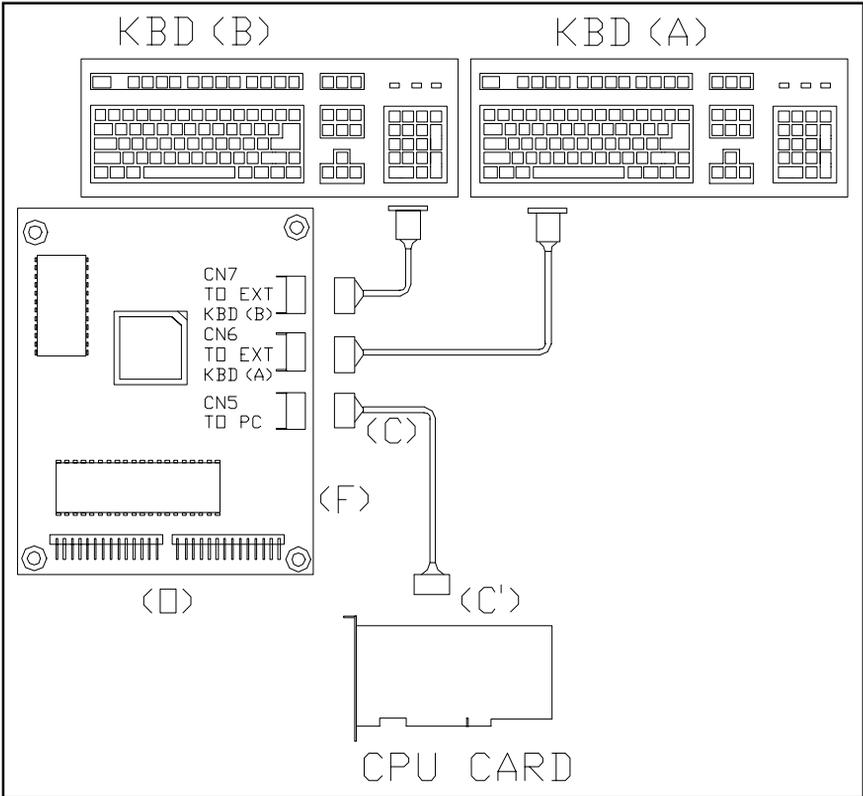
Figure 4-5: Keyboard translator input/output (detailed schematic)

4.5   LED Board

It is very unlikely that the LED board will have to be replaced. There are two indicators in the LED board: HDD and power. You do not need to remove the backplane and bracket to replace the LED board. Simply detach the bays for the FDD, HDD and slim CD-ROM drive, and then unscrew the three screws fixed into the panel. Before removing the LED board, carefully detach the cables by pulling them down.

4.6   Touchscreen Controller

To service or replace the touchscreen controller:

1. Open the top and rear cover. (See Fig. 2-1.)

2. Disconnect the cable from the LCD controller and LCD.

3. Pull out the bracket which is located below the backplane.

4. Detach the bracket behind the front panel.

5. Disconnect the cables of the inverter, and the cables of the touchscreen controller.

6. Replace the touchscreen controller.

Caution: Do not bend the touchscreen tail which is attached to the touchscreen sensor.

A

Power Supply Specifications

- 250 watt power supply
- -48 V_{DC} power supply
- 24 V_{DC} power supply

A.1 250 Watt Power Supply

The AWS-8420T off-line switching power supply is ideal for use in workstations. It has been designed to meet UL, CSA and TUV safety standards. It has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

Specifications

Input

- **Input range:** $90{\sim}135/180{\sim}265\ V_{AC}$

- **Input frequency:** $47 \sim 63$ Hz

- **Input current:**   6 A @ 115 V_{AC}; 3 A @ 230 V_{AC}

- **Efficiency:**   >65% @ full load, nominal line

- **EMI/RFI:**   FCC Part 15 Class B; VDE 243 Calss B & CISPR 22 Class B

Output load range:

Output	Voltage	Regulations	Minimum load	Maximum load	Peak load	Ripple & Noise P/P
V1	+3.3 V	+/-5 %	0 A	14 A	-	50 mV
V2	+5 V	+/-5 %	1 A	25 A	-	50 mV
V3	+12 V	+/-5 %	0.2 A	8 A	16 A	120 mV
V4	-12 V	+/-10 %	0 A	0.8 A	-	120 mV
V5	-5 V	+/-5 %	0 A	0.5 A	-	100 mV
V6	+5 VSB	+/-5 %	0 A	1 A	-	50 mV

1. Maximum continuous DC output power shall not exceed 250 W
2. +3.3 V and +5 V total O/P power should not exceed 145 W
3. -12 V and -5 V max. total combined current is 0.8 A
4. M.T.B.F: 100K hours min. at max. load and 25° C ambient conditions

A.2 -48 V$_{DC}$ Power Supply

The following specifications describe the physical and electrical characteristics of a 310 W, four output, DC to DC switching power supply housed in a standard size PS/2 casing.

Specifications

Input voltage:	-38 ~ -58 V$_{DC}$ (continuous operation)
	-48 V$_{DC}$ (normal operation)
Input current:	10 A max. @ -48 V$_{DC}$ input
Inrush current:	5 A max. @ -48 V$_{DC}$ input
Efficiency:	70% min. @ full load and normal line voltage

Output characteristics:

Table A-3: -48 V_{DC} power supply output characteristics

Output voltage	Loading current			Total regulation tolerance		Noise plus ripple
	Min.	Max.	Surge	Max.	Min.	Max.
+5 V_{DC}	2 A	25 A	30 A	+3%	-3%	50 mV p-p
+12 V_{DC}	0 A	10 A	12 A	+3%	-3%	120 mV p-p
-5 V_{DC}	0.0 A	1.0 A	-	+5%	-5%	50 mV p-p
-12 V_{DC}	0.0 A	5 A	-	+3%	-3%	120 mV p-p

Note 1: *Total regulation tolerance includes temperature change, warmup drift and dynamic load.*

Note 2: *Ripple and noise were measured differentially at the power supply using loads that were each shunted by at least a 0.1 μF ceramic disc capacitor and a 10 μF electrolytic capacitor, each capacitor having a bandwidth up to 20 MHz.*

Overshoot (resistive load):

Any output overshoot when the power is turned on does not exceed 10% of the nominal output voltage.

Output power: Maximum continuous: 310 W

Power good and power fail signals (optional):

When the power is turned on, the power good signal will activate 100 to 500 ms after all output DC voltages are operating within their respective regulation limits.

The power fail signal will activate at least 1 ms before the +5 V output voltage falls below its regulation limit.

Short circuit protection:

A short circuit placed on any output to ground is shut down. When the short circuit conditions have ceased to exist, power will then be recycled to restart the power supply.

Over-current protection:

The power supply will shut down all the DC outputs when any output is overloaded beyond its current limit or beyond its nominal line voltage limit. When the over-current conditions have ceased to exist, power will then be recycled to restart the power supply.

Current limit ranges:
5 V:	32 ~ 45 A
12 V:	13 ~ 20 A
-12 V:	6 ~ 12 A
-5 V:	1.5 ~ 3 A

Over-voltage protection:

The power supply will shut down all the DC outputs when any output maximum voltage limit is exceeded. When the over-voltage conditions have ceased to exist, power will then be recycled to restart the power supply.

Voltage limit ranges:
5 V:	6.25 ±0.75 V
12 V:	14 ±1 V
-5 V:	-6.25 ±0.75 V
-12 V:	-14 ±1 V

Reset time:

When the power supply has automatically shut down, and the short circuit, over-current and/or over-voltage conditions have ceased to exist, power will be automatically recycled to restart the power supply within 3 seconds of such return to normal conditions.

No load start:

When the power supply is switched on but with no load connected, the power supply does not get damaged, and it is still completely safe for users.

Transient response:

Dynamic load change: ±50% of maximum rating load

Recovery time: 500 µs max.

Reliability

Mean time between failures (MTBF): 100,000 hours minimum

Environmental specifications

Operating temperature: $0 \sim 50°$ C

Storage temperature: $-40 \sim 60°$ C

Operating and storage humidity: $10 \sim 95\%$ RH

Operating altitude: sea level $\sim 15,000$ ft

Storage altitude: sea level $\sim 50,000$ ft

International standards compliance

Safety: UL 1950
CSA 22.2 No. 234
TUV EN 60950

EMI: FCC Part 15 Subpart J Class B

DC output wire list:

All DC output cables use UL 1007 type wires.

Table A-4: -48 V_{DC} power supply DC output wire list

Connector	Output	Color	Wire #AWG	Length (mm)	Housing	Terminal
P8-1	PG	Orange	18	300 +30/-10	BURNDY GTC 6P-1 or equivalent	BURNDY DCK 18-2TR9 or equivalent
P8-2	+5 V	Red	18			
P8-3	+12 V	Yellow	18			
P8-4	-12 V	Blue	18			
P8-5	COM	Black	18			
P8-6	COM	Black	18			
P9-1	COM	Black	18	300 +30/-10	BURNDY GTC 6P-1 or equivalent	BURNDY DCK 18-2TR9 or equivalent
P9-2	COM	Black	18			
P9-3	-5 V	White	18			
P9-4	+5 V	Red	18			
P9-5	+5 V	Red	18			
P9-6	+5 V	Red	18			
PE-1	+12 V	Yellow	18	300 +30/-10	AMP 480424-0 or equivalent	AMP 61314 or equivalent
PE-2	COM	Black	18			
PE-3	COM	Black	18			
PE-4	+5 V	Red	18			
PF-1	+5 V	Red	20	150 +30/-10	AMP 171822-4 or equivalent	AMP 170262-1 or equivalent
PF-2	COM	Black	20			
PF-3	COM	Black	20			
PF-4	+12 V	Yellow	20			
PA-1	+12 V	Yellow	18	300 +30/-10	AMP 480424-0 or equivalent	AMP 61314 or equivalent
PA-2	COM	Black	18			
PA-3	COM	Black	18			
PA-4	+5 V	Red	18			
PB-1	+12 V	Yellow	18	150 +30/-10	AMP 480424-0 or equivalent	AMP 61314 or equivalent
PB-2	COM	Black	18			
PB-3	COM	Black	18			
PB-4	+5 V	Red	18			

A.3 24 V$_{DC}$ Power Supply

This is a DC to DC switching mode power supply with a 24 V$_{DC}$ input.

Specifications

Input voltage: +19 ~ +32 V$_{DC}$ (normal operation)

Input current: 16 A max. @ +24 V$_{DC}$ input

Inrush current: 10 A max. @ +24 V$_{DC}$ input

Output load range:

Table A-5: 24 V$_{DC}$ power supply output load range

Output No.	Output	Min. load	Rated load	Peak load	Voltage accuracy
1	+5 V	1.0 A	25 A	30 A	4.90 ~ 5.10 V
2	+12 V	0 A	10 A	12 A	11.28 ~ 12.72 V
3	-12 V	0 A	1 A	2 A	-11.40 ~ -12.60 V
4	-5 V	0 A	1 A	2 A	-4.75 ~ -5.25 V

At the factory, the +5 V output was set between 5.00 and 5.10 V, while other outputs were simultaneously set at 60% of their respective rated loads.

The -5 V and -12 V outputs can be used at their respective rated loads. The +5 V output should carry a load of at least 4 A.

Output power:

Total DC continuous power does not exceed 250 W. Each output should be able to operate continuously under its maximum load.

Ripple and noise:

Peak to peak ripple and noise for each output is less than 1% of each output's respective voltage. Measurements were performed with a 15 MHz bandwidth limited oscilloscope, and each output was terminated with a 0.47 µF capacitor.

Line regulation:

The output line regulation for each output is less than ±1%, when measured at each output's respective rated load and under ±10% changing input voltage conditions.

Load regulation:

The values for each of the following output numbers were obtained by changing each output load ±40% from the 60% rated load, whilst simultaneously keeping all other outputs at 60% of their respective rated loads.

Table A-6: 24 V_{DC} power supply load regulation

Output No.	Load regulation
1	±4%
2	±5%
3	±3%
4	±3%

Power good signal:

When the power is turned on, the power good signal will activate 100 to 500 ms after all output DC voltages are operating within their respective regulation limits.

Power fail signal:

This will activate at least 0.5 ms before any of the output voltages fall below their respective regulation limits.

General features

Efficiency:

65% typical when measured at nominal input and rated load.

Input protection:

Protection against wrong polarity if the +24 V input voltage is mistakenly reversed.

Output protection:

If for some reason the power supply fails to control itself, the built-in over-voltage protection circuit will shut down the outputs to prevent damage to external circuits. The trip point of the crowbar circuit is approximately 5.7 ~ 7.0 V. The power supply will go into hiccup mode under short circuit or overload conditions, and will recover automatically when such conditions cease to exist.

Environmental specifications

Operating temperature: 0 ~ 45° C

Storage temperature: -40 ~ 75° C

International standards compliance

Safety: UL 1950 D3
        CSA 234
        TUV EN 60950

Touchscreen Driver Installation

- Introduction
- Windows 95/98
- Windows NT
- Windows 2000
- Windows 3.1 and DOS

B.1 Introduction

The AWS-8420T's touch screen drivers for different operating systems are included in the "HMI Products Drivers Utilities" CD-ROM. You could install the touch screen drivers from the utility CD-ROM; the AWS-8420T has an optional CD-ROM drive, or a floppy disk drive, which is a standard device of the AWS-8420T series of products. If you want to install the drivers from a floppy disk, you need to copy the drivers from the utility CD-ROM first.

Touch screen drivers for DOS, Windows 3.1/95/98/2000 and Windows NT are now supported. The touch screen drivers for the supported OS are under the following path:

Windows 3.1 and DOS:
\AWS-825&842&8120\TouchDrv\PenMount\Win31&DOS\

Windows 95 and 98:
\AWS-825&842&8120\TouchDrv\PenMount\Win9Xv3.3\

Windows 2000:
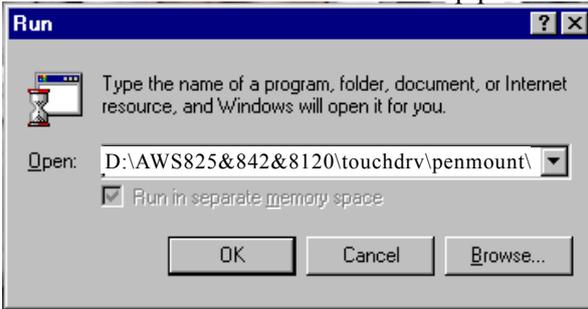\AWS-825&842&8120\TouchDrv\PenMount\Win2000v1.0\

Windows NT:
\AWS-825&842&8120\TouchDrv\PenMount\Winnt-ver3.11\

Note: Following the installation procedures, "D" represents the CD-ROM or floppy disk drive.
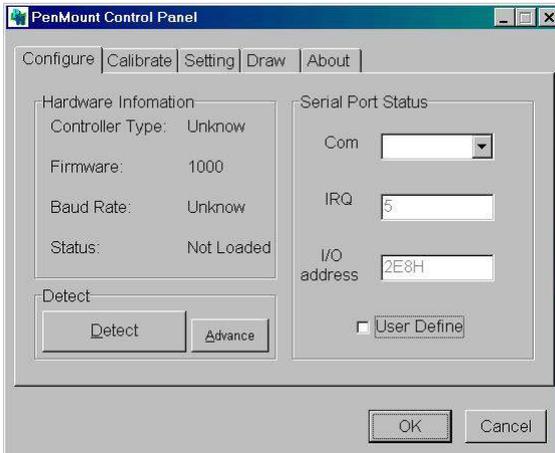
B.1.1   Installation for Windows 95/98

1. A. Select Start menu and then click Run
   B. Type D:\AWS825&842&8120\
         touchdrv\penmount\win9xv3.3\setup.exe
   C. Press OK
   D. Follow the instructions for the setup process

2. A. Click the Detect button
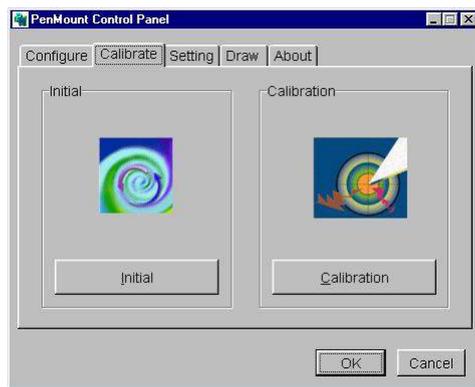   B. Press OK and the system will reboot

3. A. After the system reboots, click Start, Programs, Pen
Mount Utilities, PenMount Control Panel
B. Select the Calibrate tab
C. Click the Calibrations button on the right

4. A. Use a soft stylus to press the little red dot located above
the finger icon
B. Repeat the process according to the sequence: top, right,
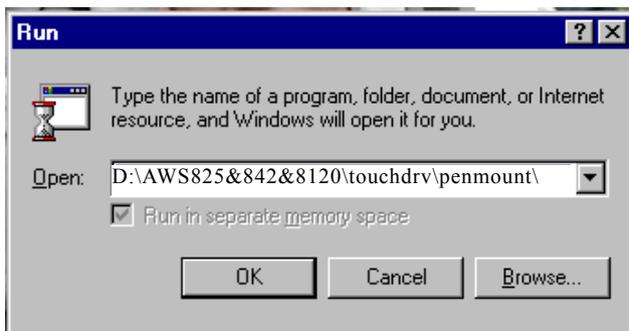bottom, and left

5. Press OK

B.1.2 Installation for Windows NT

1. A. Select Start menu and then click Run
   B. Type D:\AWS825&842&8120\
      touchdrv\penmount\winnt-ver3.11\setup.exe
   C. Press OK
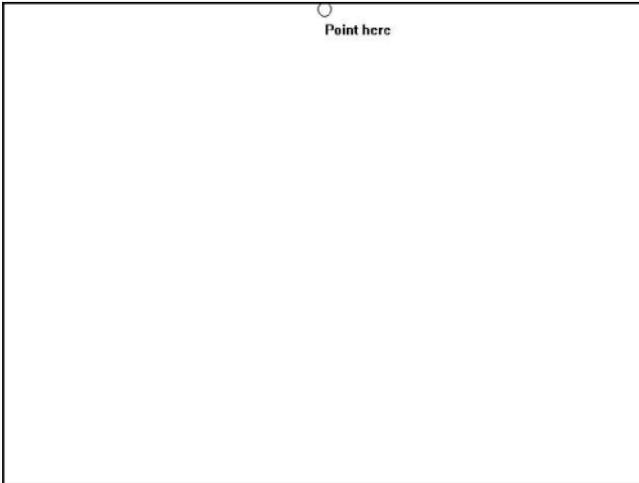   D. Follow the instructions for the setup process

2. A. Click the Detect button
   B. Press OK and the system will reboot

3. A. After the system reboots, click Start, Programs, Pen
   Mount Utilities, PenMount Control Panel
   B. Select the Calibrate tab
   C. Click the Calibrations button on the right

4. A. Use a soft stylus to press the little red dot located above the finger icon
   B. Repeat the process according to the sequence: top, right, bottom, and left

Point here

5. Press OK

B.1.3 Installation for Windows 2000

1. A. Select Start menu and then click Run
    B. Type D:\AWS825&842&8120\
       touchdrv\penmount\win2000v1.0\setup.exe
    C. Press OK
    D. Follow the instructions for the setup process

2. A. Click the Detect button
    B. Press OK and the system will reboot

3. A. After the system reboots, click Start, Programs, Pen
      Mount Utilities, PenMount Control Panel
      B. Select the Calibrate tab
      C. Click the Calibrations button on the right

4. A. Use a soft stylus to press the little red dot located above
      the finger icon
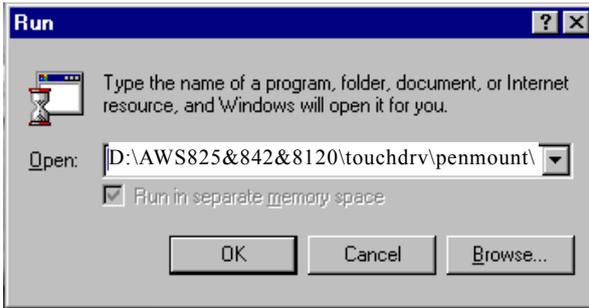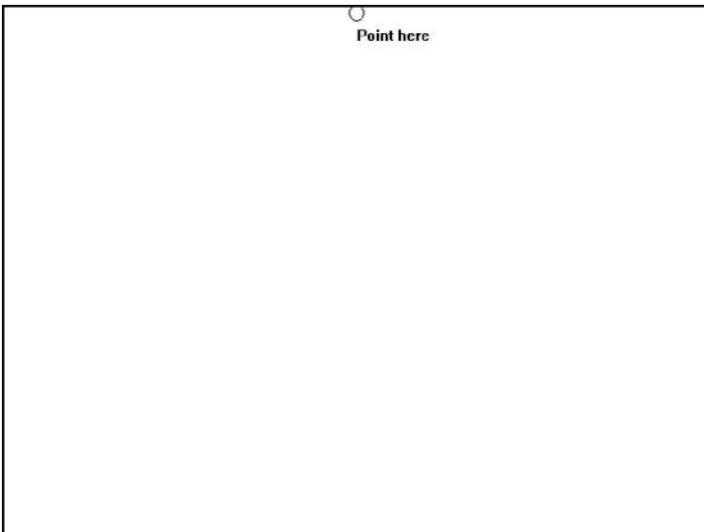   B. Repeat the process according to the sequence: top, right,
      bottom, and left

5. Press OK

B.1.4 Installation for DOS

B.1.4.1 Using HMI CD Driver to install PenMount software driver.

A. Insert the driver CD toCD-ROM drive.

B. Type
"D:\AWS825&842&8120\touchdrv\penmount\win31&dos\install"

C. A pop-up window will display "Salt International Corp. PenMount Install Utilities. Press ENTER key to allow Pen-Mount install the drivers to drive C or use keyboard to key-in the hard disk drive that you plan to install the driver." Press ENTER.

D. The pop-up window will ask "Do you want to modify your Autoexec.bat to initilaize PenMount? (Y/N)" Choose "Y" to generate the initializing instruction in the autoexec.bat files.

B.1.4.2 Identify the communication port and IRQ number

A. For first time installation, or to change PenMount Touch Screen's COM port, use PMDETECT (e.g. C:\PENMOUNT\PMDETECT) to check the COM port and IRQ number automatically. The screen will then show:

PenMount is initialized successfully!

Create file "pmouse.cfg". Success.

PenMount internal settings:

Comm. Port: COM<n> IRQ<n>

....

B. PMDETECT program is able to skip IRQ detecting if you do not need to detect a specified IRQ number. For example, if you do not need to detect IRQ5, the command is :

C:\PENMOUNT\PMDETECT -N5

If you do not need to detect IRQ5 and IRQ9, the command is:

  C:\PENMOUNT\PMDETECT -N5 -N9

B.1.4.3 Do Calibration

A. To adjust touch screen mapping properly for the display, use PM.BAT (C:\PENMOUNT\PM) tocalibration.

B. Choose "1" DO CALIBRATION (adjust screen mapping).

C. The message on the pop up window asks you to select video mode number. Select by keyboard to start the calibration, touch the upper-center point, then right-center point, bottom-center point and left-center point in sequence. After calibration, the data will show in the screen. Press any key to continue the progress.

D. After the calibration, suggest you to test touch screen and display mapped results by choose "3" DRAWING TEST under PM.BAT

B.1.4.4 Initializing the PenMount driver

A. If you don't have the initialization commands in AUTOEXEC.BAT, initialize the PenMount controller before you use the PenMount Touch Screen.

  C:\PENMOUNT\PMINIT

The display will show the initialization message :

PenMount V7.06 Copyright(c) SALT International Corp.

Test:COM<n> IRQ<n> (<n> is the number after PMDETECT done)

PenMount communication settings: COM<N> IRQ<n> Baud Rate: <xxxx>

... ...

B.1.4.5 Demonstration

To demonstrate or test touch screen operation, select "3" DRAWING TEST in PM.BAT file of Utility Directory. Drawing on screen.

The other demonstration program called "ICECREAM.EXE" in the "PENMOUNT" directory can also be applied.

Now, the PenMount DOS driver is installed.

B.1.4.6 PenMount DOS driver functions

There are several functions in the PenMount DOS driver. The user is able to change the settings of the following utilities:

  ??Show Current Setting

A. The current setting data could be found from PM.BAT file.

B. The procedure to get the status is C:\PENMOUNT\PM

C. Choose "2" SHOW CURRENT SETTINGS

  ??Beep Sound On or Off

A. Beep sound is able to set ON or OFF with parameter.

B. Enable Beep Sound command is

  C:\PENMOUNT\PMOUSE /S.

C. Disable Beep Sound (Default) command is

  C:\PENMOUNT\PMOUSE.

  ??Getting current touch's data

A. To get the touching data, use "PMGET.EXE" utility. This utility is only available for COM 1 or COM 2 port.

  C:\PENMOUNT\PMGET <COM port> <baud rate>

B. User will see the touching point address in the pop-up window.