Canon
A-200
PERSONAL COMPUTER

A-200 II Owner's Manual

PREFACE

This manual was prepared so that you will get the most out of your A-200II. To learn the correct use of the A-200II, we urge both computer novices and experts alike to read this manual as the need arises.

This manual is divided into five parts and four appendices.

Parts 1 to 5 give you the basic knowledge that you will need, and should therefore be read before you begin using your A-200II. For further information on the operating system, programming languages, and application programs, please read the relevant section in the manual.

A brief description of each section of this manual follows:

PART 1   INTRODUCTION
Gives some basic information about computers in general aimed at the computer novice, and discusses the features of the A-200II software and hardware.

PART 2   INSTALLATION
Explains how to install the A-200II. This part should be read before installing the A-200II.

PART 3   OPERATION
Explains how to operate each individual device of the A-200II, how to prepare the system disk, etc.

PART 4   MAINTENANCE
Explains maintenance procedures of the A-200II, e.g., how to create backup disks, the care of each component, precautions to take when moving it around, etc.

PART 5   OPTIONS
Explains how to connect options to the A-200II and the DIP switch settings. This part should be read before connecting options.

APPENDICES

Consists of diagnostic programs, interface pin assignments, a character code table, and the specifications of the A-200II.

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* MS-DOS is a trademark of the Microsoft Corporation

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PART 1

INTRODUCTION

1. Basic Knowledge About Computers

This section provides some basic knowledge about computers, using the A-200II as an example. Those who feel that they already have enough basic knowledge about computers may skip this section.

1.1 What is the A-200II?

The A-200II is a high-performance general-purpose business microcomputer. Its basic configuration is a keyboard, a display, and the system unit, as shown in Figure 1.1.

Display unit

System unit
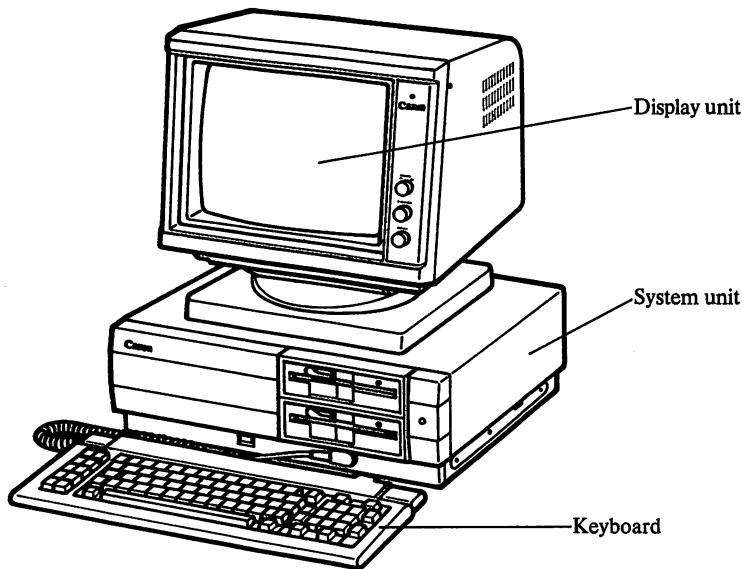
Keyboard

Fig. 1.1

The typewriter-like keyboard is for entering instructions, programs, etc., which are then input into the A-200II.

The display device displays the input characters, program execution results, etc. on its screen.

INTRODUCTION (side tab)

1-1

The system unit, the center of the A-200II, includes integrated circuit chips (called ICs) such as the CPU (Central Processing Unit) and the memory chips, and either one floppy disk drive and one hard disk, or two floppy disk drives. The floppy disk drive is used to read/write data or programs from/to floppy disks.

The hard disk can store a large volume of data or programs, holding approximately 60 times the volume of a floppy disk. Unlike floppy disks, the hard disk is built in and is not interchangeable.

1.2   Programs

A program is a set of instructions given to a computer in order to carry out a job. The computer acts according to instructions in the program. This process is called "program execution".

How is a computer given instructions? Computers do not understand human languages and that is why special programming languages or codes, which the computer understands, are used when instructing a computer to do a job.

The A-200II is compatible with the IBM-PC, which means that the IBM-PC application software commercially available can be used on the A-200II. This eliminates the need for you to program yourself for most of the jobs you want to do.

1.3   Commands

Instructions can also be given to computers in the form of "commands" which are entered in preset formats from the keyboard while interacting with the computer.

1.4   Disks

The contents of the temporary memory (RAM) of a computer are erased when the power is turned off. Data and programs which need to be kept are stored on disks. Like audio tape, a disk has data magnetically recorded on it and its contents remain intact even after the computer power is turned off.

The A-200II system unit incorporates either one or two floppy disk drives. By setting a floppy disk in the drive, data can be read from or written onto the disk. The A-200II hard disk system incorporates a 20 M-byte hard disk. This hard disk can store a large volume of data, which is about 60 times the volume of a floppy disk.

1.5 Operating System

Instructions to computers, like "Display ABC", specify the result required. To get such a result, the computer must refer the data which forms the shape "ABC" and send specific signals to the screen of the display device, etc.

The role of the operating system is to understand the instructions given in program or command form, determine what kind of instructions should actually be given to each part of the computer, and then give such detailed instructions.

Interfacing the software (commands, programs, etc.) and the hardware (computer components), the operating system creates an environment in which the user can effectively use the computer functions with ease.
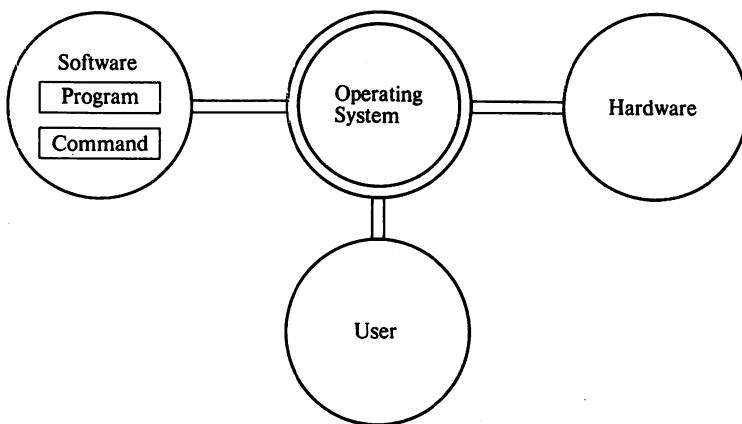
User/Computer Interaction

The operating system of the A-200II is supplied on a disk (system disk), which must be inserted into the disk drive and read into the computer memory before the A-200II can be used.

In the hard disk system, however, the operating system is stored on the hard disk and the system floppy disk need not be inserted into the disk drive.

MS-DOS V2 is used as the operating system of the A-200II. For more ease of use, several utilities of Phoenix Software Associates Ltd. are also included.

1.6   Features

(1)   CPU (Central Processing Unit)
The 8086 microprocessor is used as A-200II's CPU.
The 8086 microprocessor can access 16 bits of data at one time, and its data processing speed is much faster than that of 8-bit microprocessors.

(2)   Memory
The standard A-200II system includes 256 Kbytes of RAM and 16 Kbytes of ROM. As options, another 128 Kbytes or 256 Kbytes of RAM are also available, and thus, RAM can be expanded up to 640 Kbytes.

(3)   8087 Coprocessor
The A-200II was designed so that the numeric calculation 8087 coprocessor can be incorporated, thus speeding up scientific calculation, etc.

(4)   Compatible with IBM-PC
The A-200II can use most IBM-PC software, peripherals, and options. However, there are some which are not compatible. Check at the retail outlet prior to your purchase.

(5)   Clock Alteration
Two clock frequencies, 4.77 MHz and 7.159 MHz, can be set for the A-200II by a switch on the system unit or by the software. (The IBM-PC is 4.77 MHz).
Processing speed is increased when the clock is set at 7.159 MHz, however, if option boards other than Canon's are installed, the clock must be set at 4.77 MHz.

PART 2

INSTALLATION

1. Installation Conditions

Observe the following conditions when installing the A-200II.

1.1 Power Supply Conditions

(1) The operating power supply conditions are:

Power voltage:	Specified voltage ±10%		
Power frequency:	50/60 Hz		
Power requirement:	A-200II FD2:	5 A	(120 V)
		150 W	(230 V)
		150 W	(230 V)
	A-200II HD:	6 A	(120 V)
		180 W	(230 V)
		180 W	(240 V)
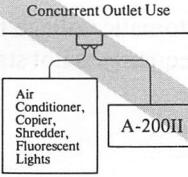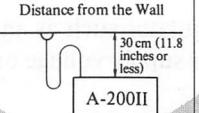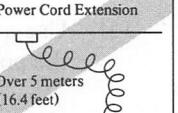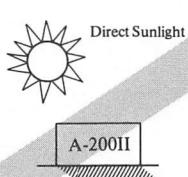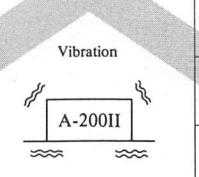
(2) The total cord length (power cord + extension cord) should be less than 5 meters (16.4 feet). Use of a longer cord may result in a voltage drop and cause malfunction.

(3) An individual power receptacle is recommended. Sharing a power receptacle with air conditioners, fluorescent lamps, electrostatic copiers, shredders, etc., may result in electronic noise causing malfunction. If the receptacle must be shared, use a commercially available high frequency noise filter or a transformer.

(4) Use a regulator such as an automatic voltage regulator if the power supply voltage or frequency is not stable.

1.2 Ambient Conditions

(1) Use the A-200II in the operating ambient temperature and humidity ranges as detailed below:
Operating ambient temperature: 10−35°C
Operating ambient humidity: 20−80% RH

(2) Leave at least 30 cm of space between the back of the computer and the wall. Installing the machine too close to the wall may result in overheating.

(3) Avoid direct sunlight; use a blind or curtain if the machine is installed near a window. Exposure to direct sunlight may result in overheating.

(4) Use a humidifier or an antistatic mat if the machine is installed in a place of low humidity. Static electricity may destroy data or cause a malfunction.

(5) Avoid places exposed to:

- Dust
- Sea breeze
- Constant vibration
- Corrosive gas
- Strong electromagnetism

Power source and operating environment

2. Checking the Contents of the Package

Check that the package contains the following:

2.1 System Unit

(1) System unit package
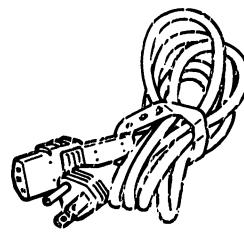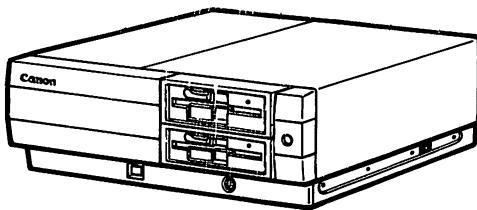
Fig. 2.1

1 System unit
2 Power cord

2.2   Options

A-200II option packages contain the following:

(1)   Manual package
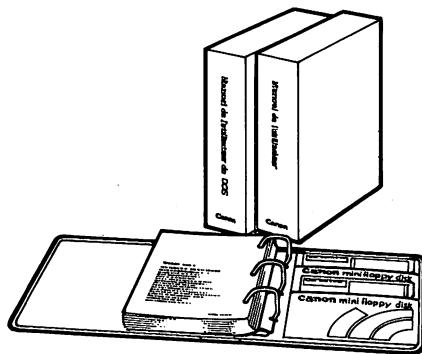
Fig. 2.2

1   Owner's Manual
2   DOS User's Manual
3   BASIC User's Manual
4   Diagnostics program disk
5   System disk
6   Software license agreement

(2)   Keyboard package
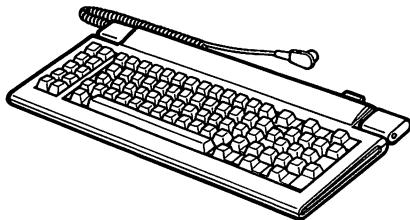
Fig. 2.3

1   Keyboard

(3) Color display package
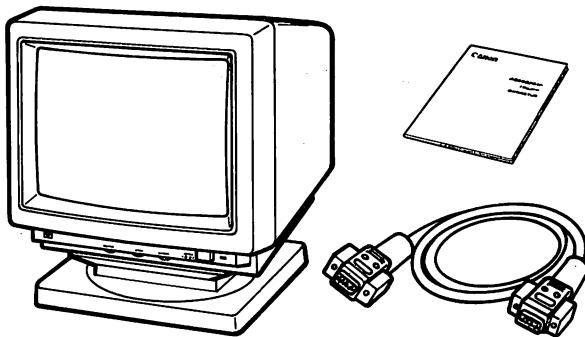
Fig. 2.4

1 Color display device with swivel stand
2 Display signal cable
3 Instructions

(4) Monochrome display package
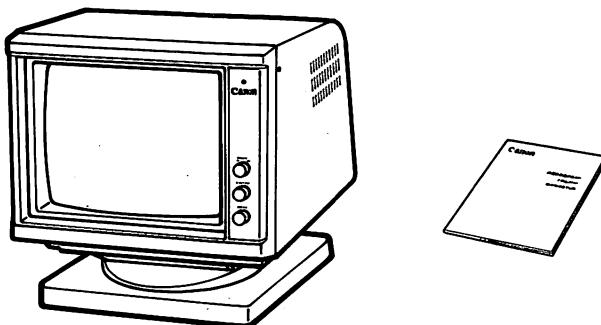
Fig. 2.5

1 Monochrome display device with swivel stand
2 Instructions

The display control board, (monochrome display control board for a monochrome display device, color display control board for a color display device), must be inserted into the system unit, the display control board must be purchased separately to the display unit.

3. Installation

This section explains how to install the A-200II.

3.1 Installation of the Display Control Board

The installation method for the display control board is explained as follows:

(1) Remove the 4 screws from the top cover of the system unit with a Phillips screwdriver.
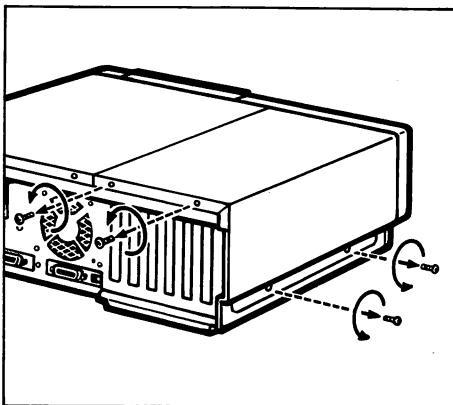
Fig. 2.6

(2) Remove the top cover by lifting it after pulling it slightly toward the rear as shown in the below figure.
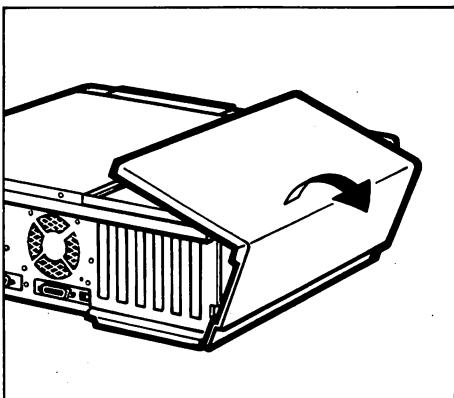
Fig. 2.7

(3) Remove the 8th slot cover screw at the rear of the system unit with a Phillips screwdriver, and lift the slot cover off.
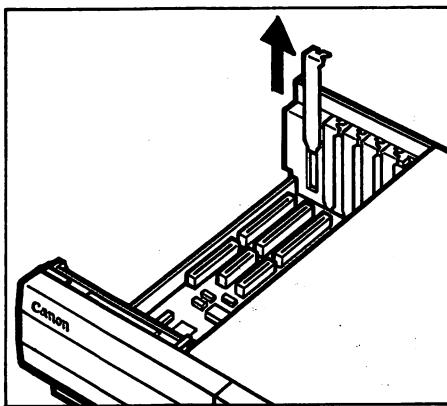
Fig. 2.8

(4) Insert the display control board securely into the two slots where the slot cover has been removed by pressing down firmly on both ends of the control board.
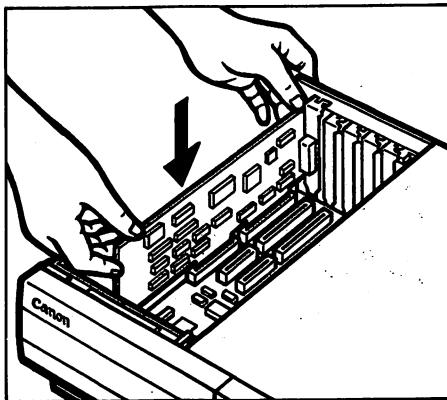
Fig. 2.9

(5) Fix the board with a setscrew using a Phillips screwdriver.
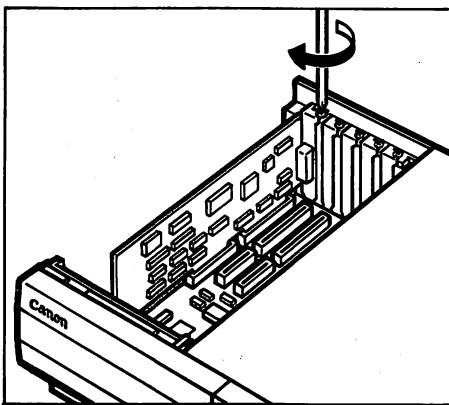
Fig. 2.10

Next you must set the DIP switches. (See 3.2, "Setting DIP switches"). If, however, you have already set the DIP switches, place the system unit top cover back to the original position.

(6) Secure the top cover with four screws. Installation of the display board is now completed.
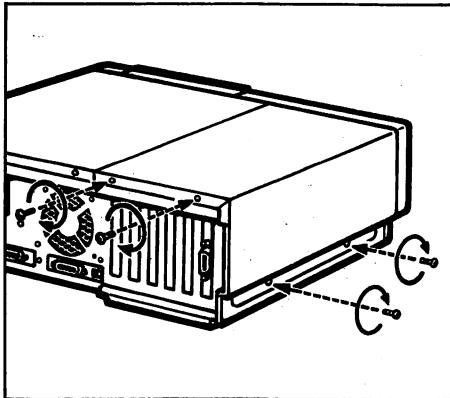
Fig. 2.11

Note: Canon specified option boards may be installed in any combination. However, option boards other than Canon-made may vary in thickness. As the space between slot numbers 7 and 8 is relatively small, a thick and thin board may be installed in neighboring slots whereas two thick boards may not.

INSTALLATION

3.2　Setting DIP Switches

The A-200II has DIP switches in the system unit to set the system for the display unit, floppy disk drive(s) and other peripheral devices now being used. The DIP switch setting must be set to match the system configuration after installing the display control board and before connecting any peripherals.

(1) Once the system unit top cover has been removed in the manner described in 3.1 (1), (2), the DIP switches on the CPU board can be seen in the center of the system unit.
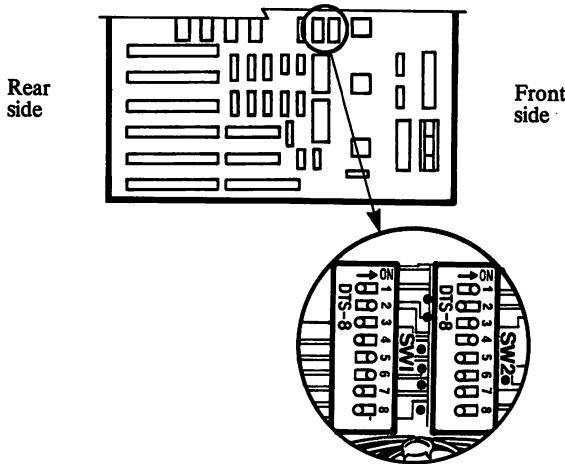
Fig. 2.12

If your system unit is an A-200II HD, you will not be able to find the DIP switches as they are concealed by the hard disk control board inserted at the 3rd slot. When you set the DIP switches, this hard disk control board must be removed.
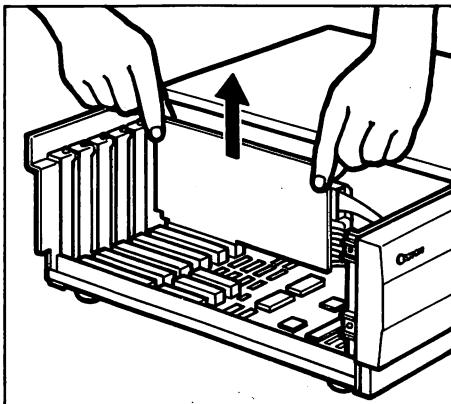
Fig. 2.13

(2) Set the DIP switches to match your display unit with the tip of a ball point pen, as shown in the table below.

Switch Block 1	Monochrome	Color 80 × 25 cha.	Color 40 × 25 cha.
SW.4	OFF	OFF	ON
SW.5	OFF	ON	OFF

When DIP switch setting is complete, Place the hard disk control board back to the original position (3rd slot).

(3) Replace the system unit top cover.
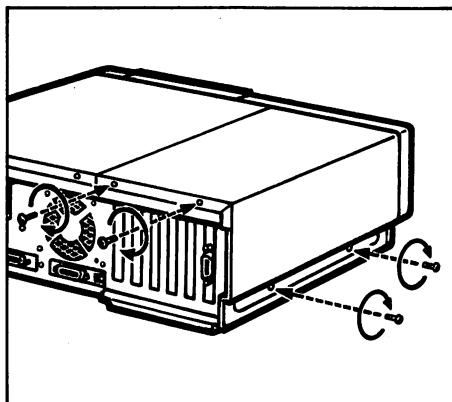
Fig. 2.14

● DIP switch setting must be changed before adding options or changing the display device.
Refer to "DIP switch specifications".

3.3   Connecting a Display Device

(1)   Color display
With the display signal cable supplied with the display device, connect the connector on the rear panel of the color display device and the connector at the slot position where the control board was installed on the rear panel of the system unit. The correct way to connect each connector is explained in 3.3.1 and 3.3.2.
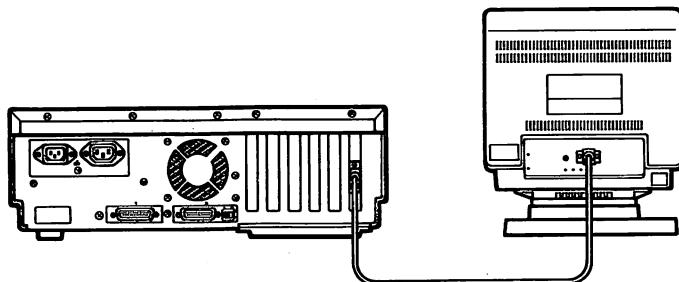
Fig. 2.15 Connecting a color display unit

(2)   Monochrome display
Connect the display signal cable lead out of the rear panel of the display device to the connector at the slot position where the control board was installed on the rear panel of the system unit. This connection is explained in 3.3.2.
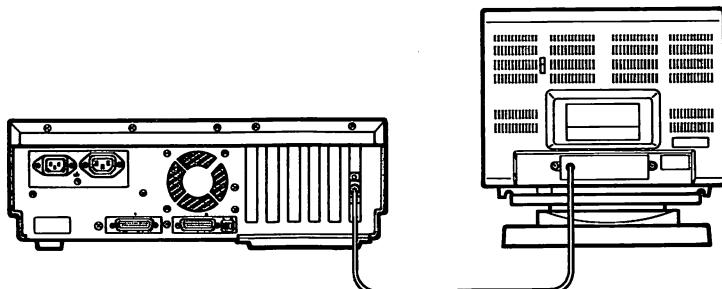
Fig. 2.16 Connecting a monochrome display unit

3.3.1 Connecting a display device and display signal cable

Push the cable connector into the connector at the rear of the display device so that the shapes of these connectors match. If it is a color display device, secure the male and female connectors with two screws.
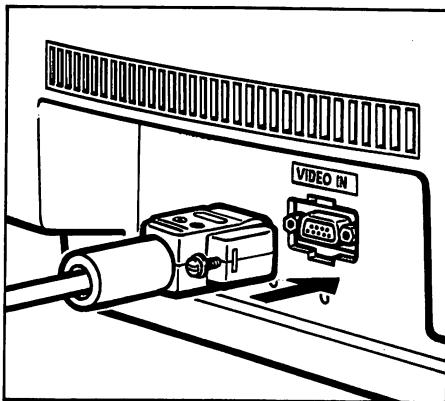
Fig. 2.17

3.3.2 Connecting the system unit and the display signal cable

Push the cable connector into the connector at the slot position where the control board was installed on the rear panel of the system unit. Then, using a screwdriver, tighten the two cable connector screws into the connector at the rear of the system unit.
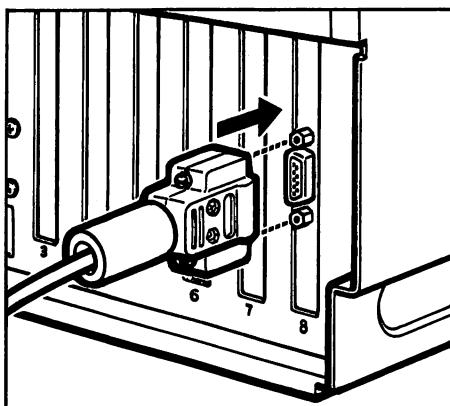
Fig. 2.18

3.4 Connecting the Keyboard

The keyboard is connected to the system as shown in the figure below.
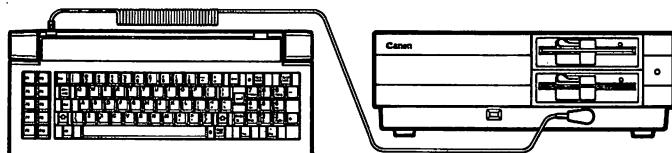
Fig. 2.19

3.4.1 Connector connection

Push the cable lead connector coming out from the keyboard into the connector on the front panel of the system unit as shown below.
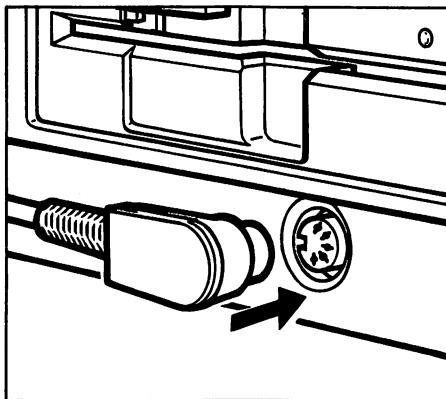
Fig. 2.20

3.4.2 Adjusting the keyboard tilt angle

You can adjust tilt angle of your keyboard as shown in Figure 2.21.

Push out the two legs at on each side of the keyboard to increase the angle of tilt. Pull them in to decrease the angle of tilt.
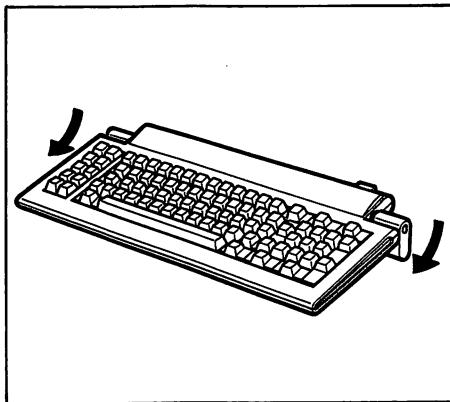
Fig. 2.21

3.5   Connecting the Mouse (Pointing Device)

Connect the mouse to the keyboard as shown in Figure 2.22.
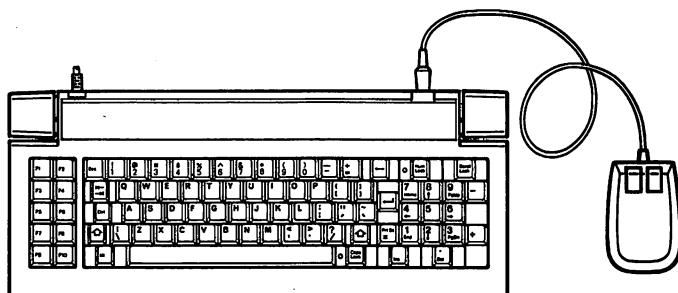
Fig. 2.22

3.5.1 Connector connection

Push the mouse connector into its connector on the key-
board, with the arrow mark on the connector facing the key-
board top surface as shown in the below figure.
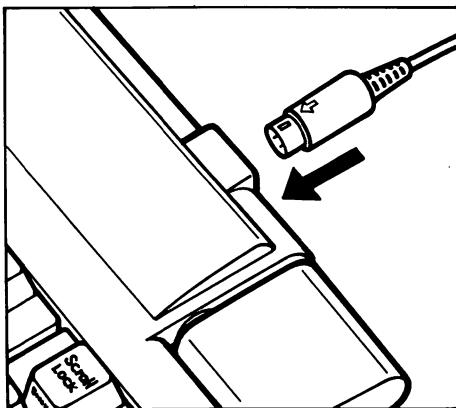
Fig. 2.23

3.6 Connecting Peripherals

On the panel of the system unit you will find one parallel data interface port and one serial data interface port for connecting peripherals. Sections 3.6.1 and 3.6.2 explain how to connect a parallel data interface cable and how to connect a serial data interface cable, respectively.

For the peripheral-to-cable connection, read the manual for the relevent peripheral device.

Parallel data
interface port

Serial data
interface port
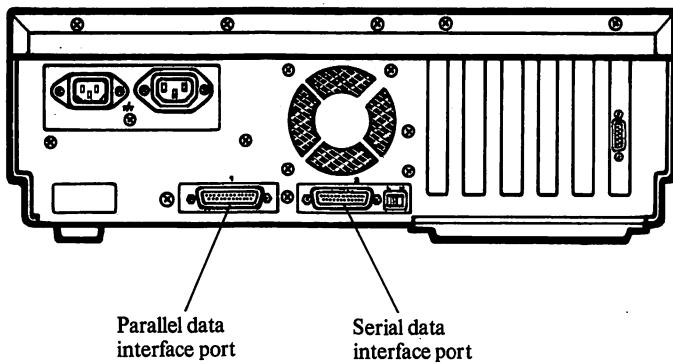
Fig. 2.24

3.6.1 Connecting a parallel data interface cable

Connect the parallel data interface cable as shown in the figure below. Make sure that the connector is secured with screws using a screwdriver.
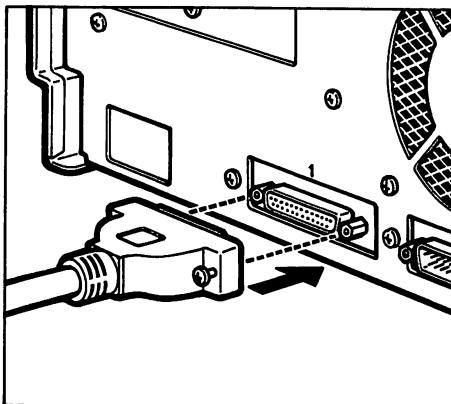
Fig. 2.25

3.6.2 Connecting a serial data interface cable

Connect the serial data interface cable (RS-232C) as shown in the figure below. Make sure that the connector is secured with screws using a screwdriver.
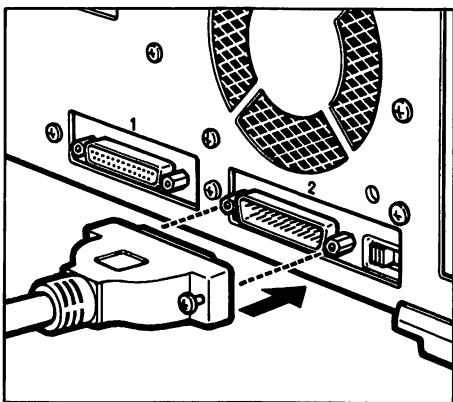
Fig. 2.26

3.7   Connecting the Power Cord

Now that connection between the system unit and the display device, the system unit and the keyboard, and the system unit and peripherals has been completed, connect the power cord for the system unit to the system unit socket.

Push the power plug supplied with the system unit into the power cord socket on the back panel of the system unit.
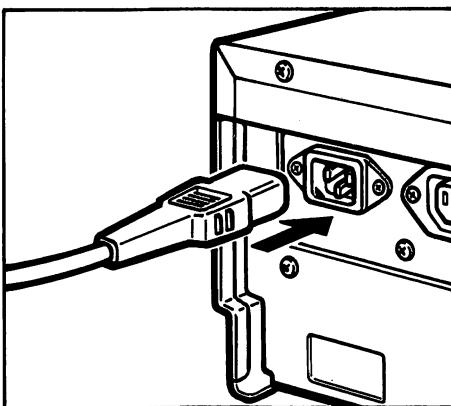
Fig. 2.27

3.8   Plugging into a Wall Outlet

After all the system connections are completed, plug in the display power cord and the system power cord into the wall power outlets. Make sure of the following points before plugging into the wall power outlets:

● Turn the display power off.
● Turn the system power off.
● Make sure that the main power supply satisfies the power conditions given in part 1.1 of this section.
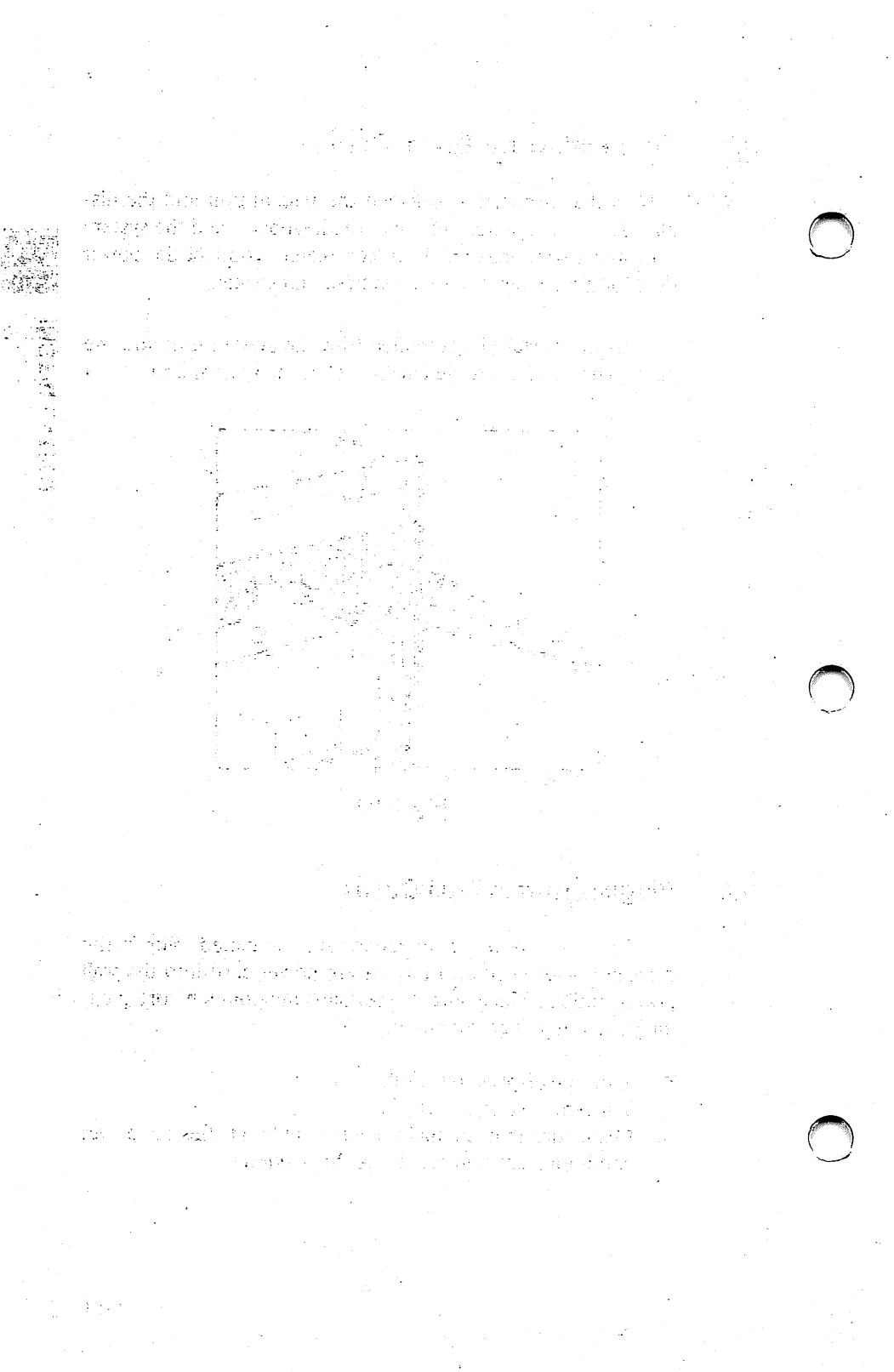
PART 3

OPERATION

1. System Unit

1.1 Components of Systems Unit

(A-200II FD2)

Floppy disk drive

Floppy disk access lamp

Reset button   Keyboard connecter jack   Power lamp   Power switch

(A-200II HD)

Floppy disk drive   Floppy disk access lamp   Power lamp

Reset button   Keyboard connecter jack   Power switch   Hard disk access lamp

Fig. 3.1 Front side

Cooling fan   Clock alteration switch

Parallel data interface port   Serial data interface port   Expansion slots
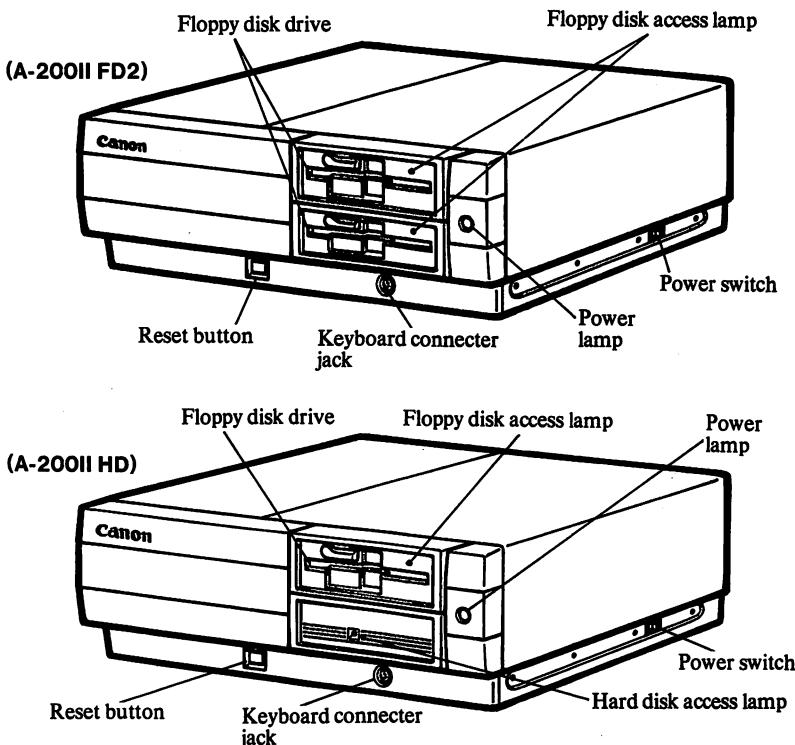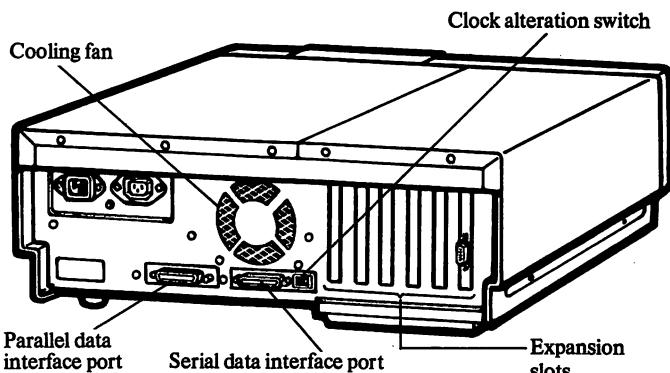
Fig. 3.2 Rear side

The names and functions of the components of the system
unit are:

POWER switch : Set the POWER switch to "I" to turn the
power on, and to "○" to turn the power off.

POWER lamp : Lights up when power is turned on.

Floppy disk : Insert a floppy disk.
drive
In the two-drive configuration (A-200II FD2
model), the top drive acts as drive A and the
bottom drive as drive B.
In the configuration consisting of one floppy
disk drive plus one hard disk (A-200II HD
model), the floppy disk drive acts as drive A
and the hard disk as drive C.

Floppy disk : Lights up while a floppy disk is accessed (data
access lamp is read from or written to a floppy disk).
Taking a disk out while the lamp is on results
in destruction of data recorded on the disk.

Hard disk : Lights up while the hard disk is operating.
access lamp

Reset button : Resets the computer when it is "hung-up"
due to improper owner's programs or ma-
chine language programs.
Whenever this button is pressed, the comput-
er begins execution of self-diagnostic tests
and then reloads the DOS or system disk to
initialize the system.

Keyboard : Connect the coiled keyboard cable plug into
connection jack this jack.

Expansion slots : Install expansion boards.

Parallel data : Connect equipment which has a parallel data
interface port interface.

Serial data : Connect equipment which has a serial data in-
interface port terface.

Cooling fan : Protects the computer against excessive heat
generated during operation. Do not obstruct
this ventilation opening by positioning the
computer too close to the wall, etc.

Clock : Specifies the clock rate at the time of system
alteration start up.
switch

1.2 Floppy Disk Drive
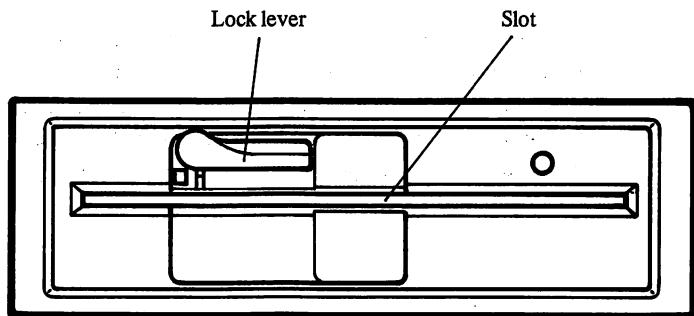
Fig. 3.3

The names and functions of the components of the floppy disk drive are:

Slot: Insert a floppy disk.

Lock lever: Turn the lock lever counterclockwise to a horizontal position to unlock before taking a disk out or inserting a disk, and turn it clockwise to a vertical position to lock after a floppy disk has been inserted.

1.3 Spacer

A piece of cardboard called a spacer is inserted into the floppy disk drive to protect the drive head when the system is delivered to you. After the system installation is completed, turn the lock lever of the floppy disk drive slowly, and take the spacer out. Save the spacer for use when moving your system unit.
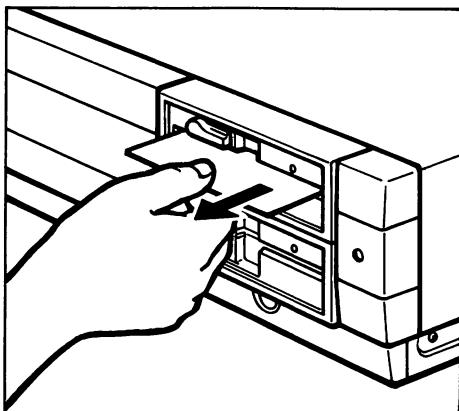
Fig. 3.4

1.4   Floppy Disk

A 5 1/4" floppy disk looks like this:

Write-protect notch

Front   Back
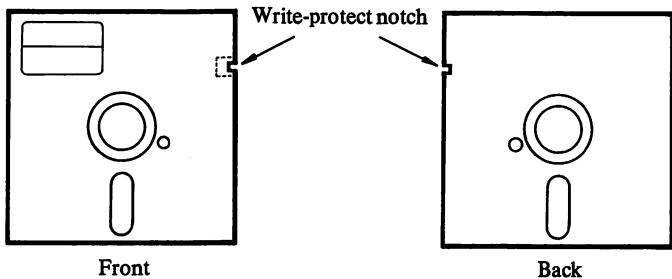
Fig. 3.5

1.4.1   Inserting/removing a floppy disk

Follow these steps when inserting/removing a floppy disk in-to/out of the floppy disk drive:

(1)   Inserting a floppy disk

1.   With the label facing up, insert the floppy disk in the direction indicated by the arrow on the figure below. Push the floppy disk straight into the slot.
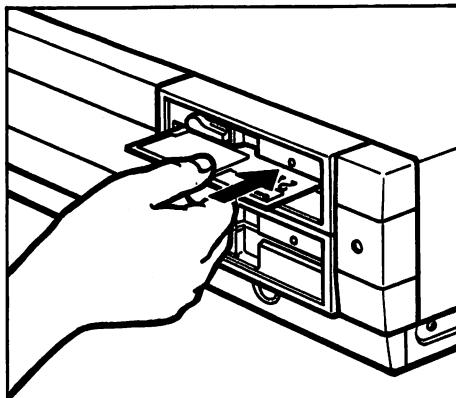
Fig. 3.6

2. Take your hand off the floppy disk, and slowly turn the lock lever down to lock the disk into position.
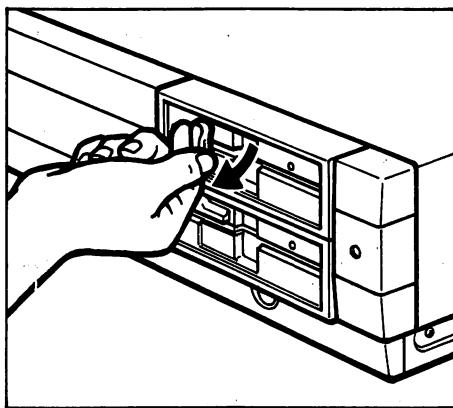
Fig. 3.7

(2) Removing a floppy disk

Turn the lock lever counterclockwise to the horizontal position and you can remove the disk from the drive.
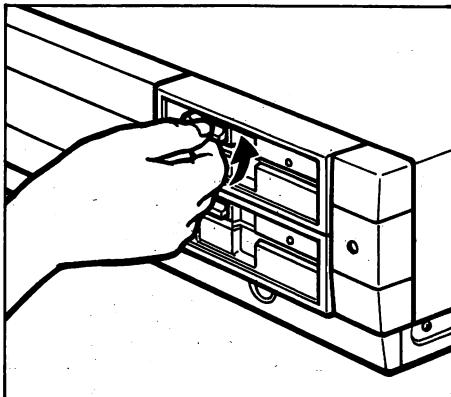
Fig. 3.8

1.4.2 Write-protect notch

A floppy disk have a write-protect notch on their right side for protecting the information written on the disk from being erased by mistake. Stick a silver seal (which is supplied with the disks) over this notch to make the disk read-only and to prevent it from being written. Peel the seal off again to return it to a read/ write disk.
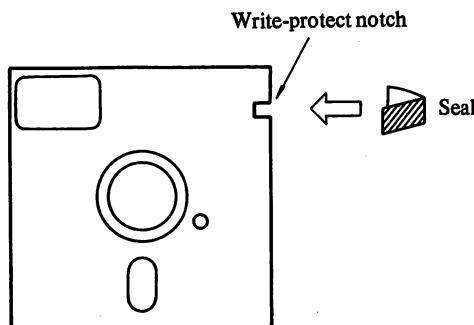
Fig. 3.9

1.4.3 Handling floppy disks

Follow the precautions given below to prolong the life of your disks.

- Do not bend or apply undue force to the disk.

- Do not leave the disk in direct sunlight or near a heat source.
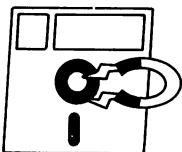
- Make sure that the disk does not come into contact with a magnetic field. Such contact may erase the disk.
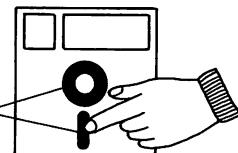
Magnetic surface

- Do not touch the disk's magnetic surface with your fingers or attempt to clean the disk with any kind of solution. Either may erase or otherwise damage the disk.

- Do not clip or staple the disk. Do not write on the disk with a pencil or a ball-point pen. Use a felt tip pen if writing is necessary.

Storage conditions:
Temperature .. 4°C—53°C
(39°F—127°F)
Humidity ..... 8%—80%
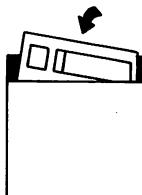
- Store the disk in an upright position in its storage envelope to protect it from dust and to prevent it from bending.

Floppy Disk Life

Mini floppy disks have a service life similar to that of regular magnetic tapes. Service life varies according to the frequency of use, humidity, and other storage conditions. The disks can be used for approximately one year under normal conditions.

1.5   Hard Disk

This paragraph may be skipped if your system does not in-
clude the hard disk, i.e., if it is a two-floppy disk drive system
(A-200II FD2 model).

The A-200II HD model has a 20 Mbyte hard disk. This hard
disk can store about 60 times the capacity of a floppy disk. The
access speed of a hard disk is also several times as fast as that of
a floppy disk.

The hard disk must be set up using the FDISK utility and
then must be formatted with the FORMAT command before
use.

The procedure for setting up the hard disk is explained in 7,
"Setting up the Hard Disk".

OPERATION

1.6   Clock Rate

The A-200II clock rate can be alternated using the switch at the rear of the system unit. This switch specifies the clock rate at the time of system start up.
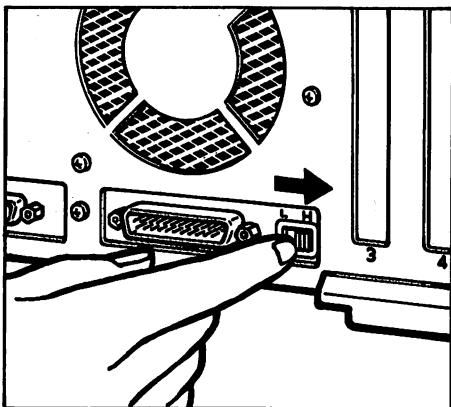
Fig. 3.10

When set to "L", the clock rate is specified as 4.77 MHz, and when set to "H", the clock rate is specified as 7.159 MHz.

2. Display Device

2.1 Components of the Display Device

Color display

OPERATION

POWER switch

Contrast control knob   Brightness control knob   Horizontal adjustment knob

Monochrome display

POWER switch

Contrast control knob

Brightness control knob
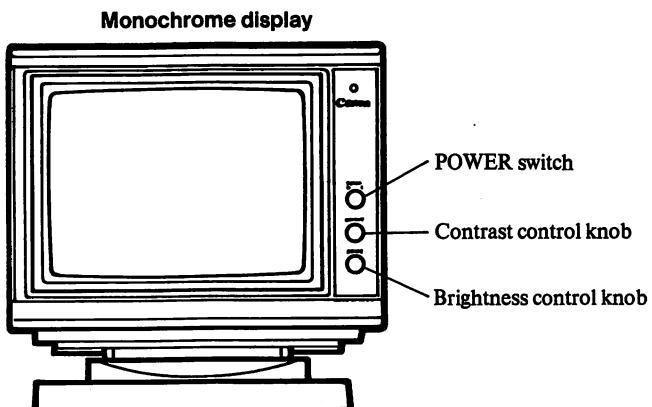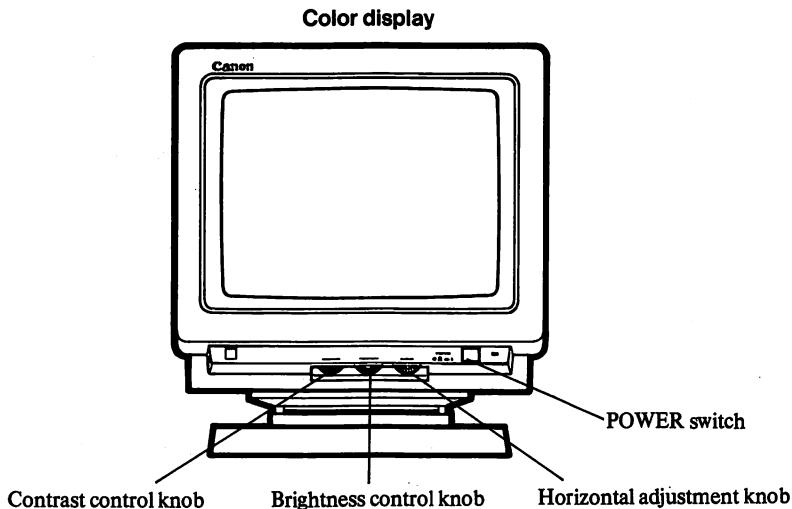
Fig. 3.11

POWER switch: Turn this switch ON/OFF to turn the display power ON/OFF.

Contrast
control knob: Turn this knob to adjust the contrast of the screen.

Brightness
control knob: Turn this knob to adjust the brightness of the screen.

Horizontal
adjustment knob: Turn this knob to move the screen display to the right or left to the position in which it is the easiest to read.

For information about operation of your display device, read the manual supplied.

2.2 Adjusting the Angle of the Display Device

The angle of the display screen can be adjusted up/down, and left/right as shown in Figure 3.12.

Left/right adjustment   Up/down adjustment
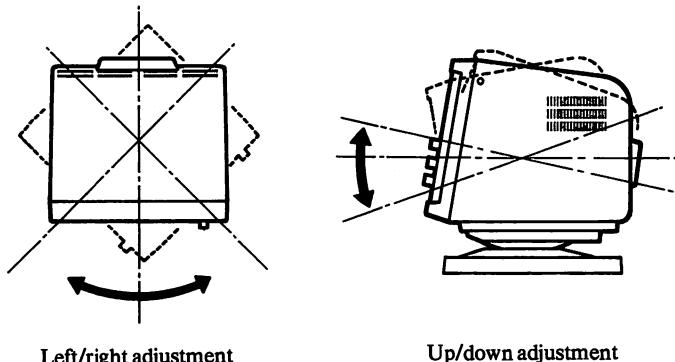
Fig. 3.12 Adjusting the display angle

3. Keyboard

3.1 Components of the Keyboard

Keyboard components

Function keys   Typewriter keyboard   Numeric key pad
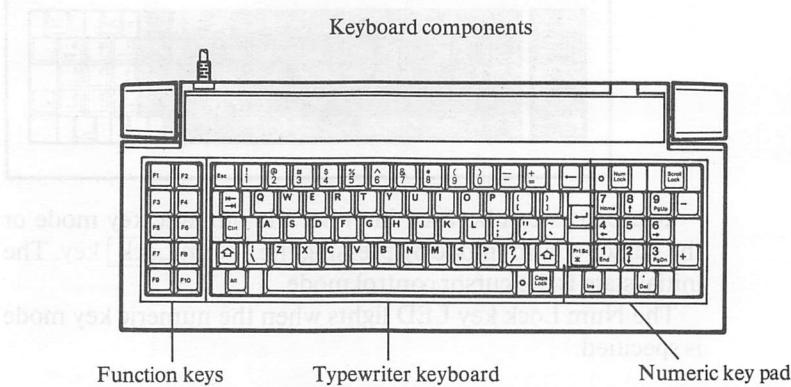
Fig. 3.13
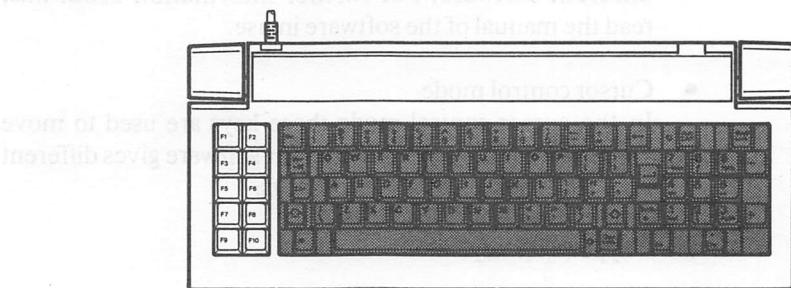
(1) Function keys

These keys can be assigned functions to suit the software in use. For further information, read the manual of the programming language in use, the DOS user's manual, or the manual of the application program in use.

(2) Numeric key pad
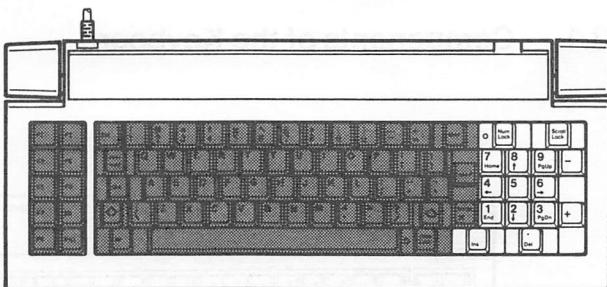
These keys can be used in either the numeric key mode or the cursor control mode by pressing the ⌈Num Lock⌉ key. The initial state is the cursor control mode.

The Num Lock key LED lights when the numeric key mode is specified.

- Numeric key mode
  In the numeric key mode, numbers, decimal point, and the signs (+ and −) can be entered from the numeric key pad. The ⌈Scroll Lock⌉ key has different functions with different software. For further information about this, read the manual of the software in use.

- Cursor control mode
  In the cursor control mode these keys are used to move the cursor on the screen. Different software gives different functions to the cursor control keys.

(3) Typewriter key
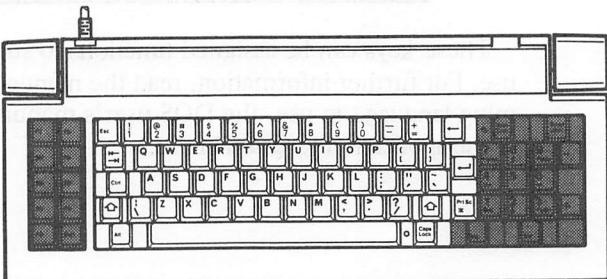
For entering letters, numbers, special characters, etc.

- Typewriter keys.
  For entering the characters shown on the keytops.

- $\boxed{\leftarrow}$ (Backspace)
  Deletes the character on the left side of the cursor and moves the cursor one character position to the left.

- $\boxed{\text{Alt}}$, $\boxed{\text{Ctrl}}$, $\boxed{\text{Esc}}$
  Different software gives different functions to these keys. For further information, read the programming language manual, DOS user's manual, or the manual of the application program in use.

- $\boxed{\hookleftarrow}$ (Carriage return)
  Press this key to terminate an entry. The contents of the entry are then read in and passed to the operating system as an entity.

- $\boxed{\Uparrow}$ (Shift)
  The shift key lets you enter uppercase characters (capitals for letters) by holding it down while pressing the corresponding keys.

- $\boxed{\leftrightarrows}$ (Tab)
  Its function differs according to the software used. MS-DOS moves the cursor 6 character positions each time the tab key is pressed. For further information, read the manual of the software in use.

- $\boxed{\text{Prt Sc}}$
  Its function differs according to the software used. MS-DOS outputs a screen hard copy (print out of the screen display as it is) by pressing this key while holding down the shift key. An asterisk (*) is entered by pressing this key without holding down the shift key.

- $\boxed{\text{Caps Lock}}$
  For setting/resetting the caps mode, in which the capitals are entered. In this mode, lowercase letters are entered by pressing the alphabet keys while holding down the shift key. The Caps Lock key LED lights to indicate specification of the caps mode.

OPERATION

4. Power ON/OFF

This section explains how to turn the power ON/OFF.

If your Master disk is an international version, you should firstly create a system disk. Refer to 5, "Creating a system disk."

4.1 Turning Power ON

Follow these steps to start the A-200II system:

(1) Turn the POWER switch of the display device ON. When peripherals (printer, etc.) are connected, turn their power ON, too.
Turn the POWER switch of the system unit ON as shown in the below figure.
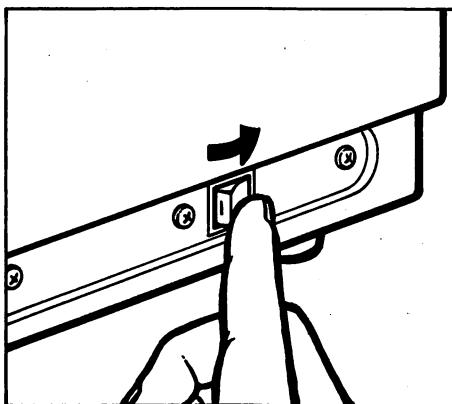
Fig. 3.14

(2) The following message will appear:

Phoenix ROM BIOS Ver. x.xx
Copyright 1984, 1985 Phoenix Software Associate Ltd.
mmm KB GOOD
h.hh MHz

Where x.xx is version number of ROM BIOS, mmm is RAM size, h.hh is clock rate.

(3) Insert the system disk supplied with the A-200II into floppy disk drive A.

Fig. 3.15

OPERATION
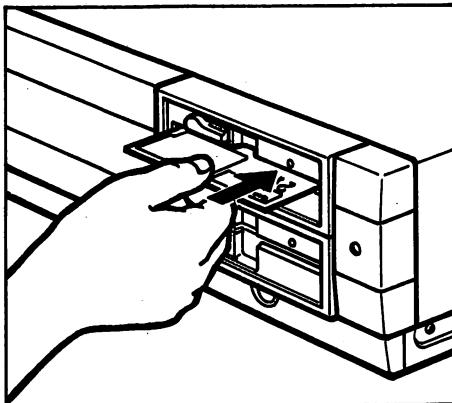
The following message appears on the screen if the system disk is not inserted within 15 seconds after the power is turned ON:

```
Boot disk failure. Type key to retry
```

If this message is displayed, set the system disk into the drive and then press any key.
If the inserted disk is a non-system disk, the following message is displayed:

```
Non-system disk or drive error.
Replace and strike any key when ready.
```

Set the system disk into drive A and press any key.

(4) When the operating system on the system disk is loaded in memory, the following message appears on the screen:

```
Compatibility Software
Copyright (c) 1984 by Phoenix Software Ltd.
MS-DOS version x.xx
Copyright 1981, 82, 83 Microsoft Corp.
Command v.x.xx
Current date is Tue 1-01-1980
Enter new date:
```

Enter today's date from the keyboard.
For example, enter as follows for September 10, 1985:

9-10-1985 <RETURN>

Separate month, day, year with "-".

(5)   Then, the following message is displayed:

   Current time is 0:00:41.38
   Enter new time:

Enter the time from the keyboard.
For example, enter as follows for 8:30 am:

   8:30 <RETURN>

Use the 24-hour system; for 8:30 p.m., for example, enter:

   20:30 <RETURN>

Use " : " to separate hour and minute.

(6)   When the data and time are entered, the system prompt
(A>) is displayed.

The computer is now ready for use.

Steps 4 and 5 are MS-DOS command operations. For further
information, read the DOS User's Manual.

4.2   Turning Power OFF

Turn the power OFF, using the following steps:

(1) Check that the system prompt (for example, A>) is displayed on the screen.

```
A>
```

If the system prompt is not displayed, which means that a program is running, either wait until the program execution ends and the system prompt appears, or terminate the program in the specified way.

(2) Take the floppy disk out of the drive. Do not remove the floppy disk when the floppy disk access lamp is lit.

(3) Turn OFF the system unit POWER switch and then that of the display device. Then, if peripherals are connected, turn OFF their power switches too.
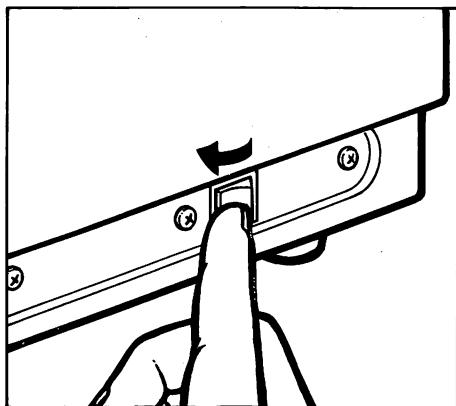
Fig. 3.16

5.   Creating a System Disk

This section explains how to create a system disk for the in-
ternational version. If your keyboard is an ASCII version key-
board, skip this section. Create a system disk using the
DISKCOPY command. (Refer to PART 4, "MAINTENAN-
CE").

Inside the Owner's Manual you will find a master disk from
which you create a system disk for everyday use. Follow these
steps:

(1)   Copy the master disk using DISKCOPY.
(2)   Check that the master disk has been correctly copied.
(3)   Create a system disk to suit your keyboard.
(4)   Reset the system unit.

This section explains each step in detail. First, have a new
floppy disk ready.

5.1   Starting Up System Disk Creation

Turn the display power ON, and the system unit power ON.
Insert the master disk into floppy disk drive A.
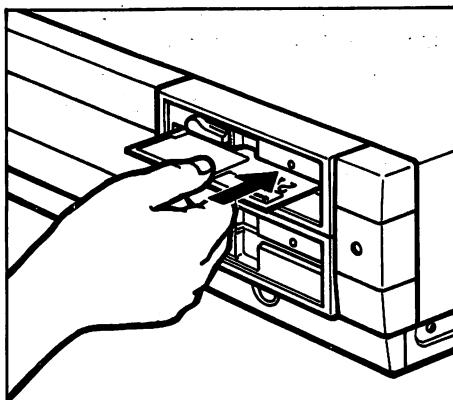
Fig. 3.17.

5.2   Copying the Master Disk

This section explains both the A-200II FD2 and A-200II HD systems.

(a) explains about A-200II FD2, (b) explains about A-200II HD.

When the starting up procedure is complete, the following message is displayed:

(a)   Two floppy disk drive system (A-200II FD Model)

TO CREATE YOUR LANGUAGE COPY OF DOS, FOLLOW THIS PROCEDURE:

(1)   Prepare a blank disk for copying.
       DISKCOPY A: B:
       Insert source diskette in drive A:
       Insert target diskette in drive B:
       Strike any key when ready

Insert a blank disk into drive B, and then press any key. DISKCOPY is run, and the following message is displayed:

Copying 9 sectors per track, 2 sides

When copying is complete (it may take a few minutes), the following message is displayed:

Copy another (Y/N)?

Press the N key.

(b) One floppy disk drive system (A-200II HD Model)

TO CREATE YOUR LANGUAGE COPY OF DOS, FOLLOW THIS PROCEDURE:

(1) Prepare a blank disk for copying.
DISKCOPY A: A:
Insert source diskette in drive A:
Strike any key when ready

Press any key when the master disk is set in drive A.
DISKCOPY is then run and the following message is displayed:

> Copying 9 sectors per track, 2 sides

With the one floppy disk drive system you must change disks several times over. When the following message appears, change disks as instructed by the message:

> Insert target diskette in drive A:
> Strike any key when ready

Insert a blank disk into drive A, and then press any key. After a while the message changes to:

> Insert source diskette in drive A:
> Strike any key when ready

Insert the master disk into drive A, and then press any key. The above process is repeated several times, and when disk copying has been completed, the following message is displayed:

> Copy another (Y/N)?

Press the N key.

5.3   Checking the Copied Disk

The next step is to check to see if the copy operation as described in 5.2 was successful. The following message is displayed:

(a)   Two floppy disk drive system

> New copy will now be verified with Master DOS disk.
> DISKCOMP A: B:
> Insert first diskette in drive A:
> Insert second diskette in drive B:
> Strike any key when ready

Confirm that the master DOS disk is in drive A and the copied disk is in drive B.
Press any key when ready.

A check is done to see if the two floppy disks have the same contents and the following message is displayed:

> Comparing 9 sectors per track, 2 sides

After a while, if no error has been detected during the comparison, the following message is displayed:

> Diskettes compare ok

If errors have been detected during the comparison, the following error message is displayed:

> Comparing error(s) on
> x track x sector

When the comparison is complete, the following message is displayed:

> Compare more diskettes (Y/N)?

Press the N key (whether an error has been detected or not).

(b)   One floppy disk drive system (A-200II HD Model)

```
New copy will be verified with master DOS disk
DISKCOMP A: A:
Insert first diskette in drive A
Strike any key when ready
```

Confirm that the master DOS disk is in drive A.
Press any key when ready.

The following message is displayed:

```
Comparing 9 sectors per track, 2 sides
```

Comparison of the disk contents is performed. The "change disk" messages will appear during the comparison in the same way as during disk copy.

```
Insert second diskette in drive A:
Strike any key when ready
```

When this message is displayed, insert the copied disk in drive A and then press any key.

The above process is repeated several times before disk comparison is completed.

If no error has been detected during the comparison, the following message is displayed:

```
Diskettes compare ok
```

If errors have been detected during the comparison, the following message is displayed:

```
Comparing error(s) on
x track x sector
```

When the comparison is completed, the following message is displayed:

```
Compare more diskettes (Y/N)?
```

Press the N key (whether an error has been detected or not). The comparison is thus complete and the following message appears:

```
(3)  If any errors are found during verification,
     then
     — Confirm that Master disk is in drive A
     — Prepare another blank disk
     — Press and hold ALT, CTRL, then press
       DEL

     Otherwise, if new disk is verified OK, then
     continue.
     Strike any key when ready
```

If any errors have been detected during the comparison, execute the following:

Insert the master DOS disk in drive A, then press the <DEL> key while holding down the <ALT> key and <CTRL> key.
The system is reset and the date and time prompt appear.

Repeat operation again from section 5.1.

If no error has been detected, press any key to continue.

5.4   Creating a System Disk

When disk copy and comparison have been completed, the following message is displayed:

> (4)   Store Master DOS disk, then be sure that
>   new copy is in drive A:
>   Strike any key when ready

If your computer is an A-200II FD2 Model, remove both disks from their respective disk drives. If you have an A-200II HD Model, remove the disk from disk drive A.
Insert the copied disk into drive A and press any key. The following messages will appear consecutively:

> (5)   Then your language will be installed to the
>   copied disk.
>
> | F1 = USA |
> | F2 = Français |
> | F3 = Deutsch |
> | F4 = Italiano |
> | F5 = Español |
> | F6 = English |
> | F7 = Finnish |
> | F8 = Swedish |
> | F9 = EXIT? |
>
> [PRESS THE FUNCTION KEY]
> 1 US 2 FR 3 GR 4 IT 5 SP 6 UK 7 SV 8 SU 9 EXIT 0

When the second message is displayed, press the function key (F1 to F8) that matches your keyboard.
If you press <F9>, "OK" is displayed on the screen. Then, enter the following for the "OK" prompt if you do not want to install local language to the copied disk. By this operation you can make a complete copy of your master disk.

SYSTEM <RETURN>

The system prompt (A >) is then displayed once again.

When a function key <F1> to <F8> is pressed, the following message is displayed in the language of your choice:

```
Confirm that the copy of the DOS disk is in drive A.
Press any key to continue
```

Confirm that the copied disk is in drive A, and then press any key. The system is reset, keyboard installed, and the program is loaded.

The DATIME command is then executed and the following message is displayed in the language of your choice:

```
Current date (DD-MM-YY): 01-10-1980
Enter new date
```

Enter today's date from the keyboard in the order of: day, month, year. For example: if today's date is December 2, 1985, enter:

2-12-85 <RETURN>

When the date is correctly input, the following message is displayed in the language of your choice:

```
Current time: 00:06:46
Enter new time
```

Enter the time from the keyboard in the order of: hour, minutes, seconds.
For example, for 8:30 am, enter:

20:30:00 <RETURN>

Once the date and time have been correctly entered, the system prompt (A >) is displayed.

6. Changing the Keyboard

Changing your keyboard to that of another language requires change of the contents of the system disk and the program disk for consistency of the keytops and the displayed characters. The keyboard handler of the language of interest must be loaded during system initialization.

Follow these steps:

(1)   Turn the system power and the display power ON. Insert the system disk into drive A. System prompt A> is displayed on the screen. (Operating system mode)

(2)   Enter the following from the keyboard:

BASIC CHGKBD <RETURN>

(3)   The followng message appears on the screen:

F1 = USA
F2 = Francais
F3 = Deutsch
F4 = Italiano
F5 = Español
F6 = English
F7 = Finnish
F8 = Swedish
F9 = EXIT

[PRESS THE FUNCTION KEY]

1 US 2 FR 3 GR 4 IT 5 SP 6 UK 7 SV 8 SU 9 EXIT 0

(4) Press the function key (<F1> to <F8>) of the language of your choice, or <F9>. If you press <F9>, the system returns to the operating system mode without changing the keyboard type you specified.

S Y S T E M <RETURN>

The system prompt (A>) then appears on the screen to return to the operating system mode.

When a function key <F1> to <F8> is pressed, the following message is displayed in the language of your choice:

```
Confirm that the copy of the DOS disk with the file
for your language is in drive A
Press any key to continue
```

Check that the system disk is in drive A, and then press any key.
If the correct disk is not set in drive A, the following message is displayed, and control returns to the operating system mode:

```
Keyboard routine not found
```

(5)   When the keyboard handler program is read into the
      memory normally, the following message is displayed:

```
Remove DOS disk and then insert PROGRAM
disk in drive A
Press any key to continue
```

Insert the program disk you want to change for use with
the keyboard of your choice into drive A and then press
any key. If you want to change the system disk, insert the
system disk into drive A, and then press any key.
If the keyboard handler program cannot be written onto
the program disk for some reason, the following message
is displayed and control returns to the operating system
mode:

```
Writing keyboard routine to PROGRAM disk not
possible
```

(6)   When the keyboard handler program is written onto the
      disk normally, the following message is displayed:

```
Keyboard routine and AUTOEXEC are
contained in PROGRAM disk
Press any key to continue
```

Press any key. Control then returns to the operating
system mode.

Thus, changing of the keyboard handler program on the pro-
gram disk of your choice is completed. To change more than
one disk, repeat the above steps as many times as is necessary.

7. Setting Up the Hard Disk

This section explains how to set up the hard disk. If you don't have a hard disk model, skip this section.

The hard disk cannot be used unless correctly set up and formatted.

Set up the following:

(1) Creating the DOS partition
(2) Formatting the hard disk

7.1 Creating the DOS partition

(1) Turn ON the power switch for the display unit and system unit.
(2) Insert the system disk into drive A and the date and time prompt will be displayed. Follow the procedures shown in 4.1, "Turning Power ON".
(3) The system prompt appears when the time and date are entered. Enter the following from the keyboard:

<center>F D I S K <RETURN></center>

The following screen is displayed:

```
Generic FDISK Utility version x.x
Fixed Disk Setup Program

FDISK Options

Choose one of the following:
1.  Create DOS Partition
2.  Change Active Partition
3.  Delete DOS Partition
4.  Display Partition Data

Enter choice: [1]


Press Esc to return to DOS.
```

(4)   Press the <RETURN> key and the following screen
       will be displayed:

```
Generic FDISK Utility version x.x
Fixed Disk Setup Program

Create DOS partition

Do you wish to use the entire fixed disk for DOS (Y/N)? . . . .[Y]

Press Esc to return to FDISK Options
```

Press the <RETURN> key and the following screen is dis-
played:

```
   Partition    Status    Type    Start    End    Size
      1           A       DOS       0      638    639

   Total disk space is 639 cylinders
   The current active partition is 1

   Press Esc to return to FDISK Options
```

Press the <ESC> key and the following screen displayed:

```
Generic FDISK Utility version x.x
Fixed Disk Setup Program

FDISK Options

Choose one of the following:
1.  Create DOS Partition
2.  Change Active Partition
3.  Delete DOS Partition
4.  Display Partition Data

Enter choice = [1]

Press Esc to return to DOS
```

Press the <ESC> key and the following message is displayed:

```
 System will now reboot

 Insert DOS diskette in drive A:
 Press any key when ready. . .
```

Press any key to reboot the system.

7.2   Formatting the Hard Disk

When the FDISK utility is completed, the system is reset
and the date and time prompt is displayed. Enter the date and
time to display the system prompt.

(1)   Enter the following from the keyboard:

FORMAT C: /S <RETURN>

Note: If you don't want to set the OS into the hard disk, the
/S switch should be omitted.

The following message is displayed:

```
        * * * * * * * * * * * * * * * * * * * *
        *                                     *
        *          !!! WARNING !!!            *
        *                                     *
        * * * * * * * * * * * * * * * * * * * *

You are formatting the hard disk.
THIS WILL DESTROY ALL DATA ON THE HARD DISK
Enter Y to continue, any other key will cancel the request to format.
Do you wish to format the hard disk?
```

Enter Y and the following message is displayed:

```
    Press any key to begin formatting C:
```

Press any key and the following message is displayed:

```
    Formatting . . . . .
```

After about 5 minutes, the following message is displayed
and fomatting is completed:

```
Formatting . . . . Format complete
System transferred

22200320 bytes total disk space
   49152 bytes used by the system
22151168 bytes available on disk
```

This message may vary if you didn't specify the /S switch for
FORMAT command.
After the above procedure operation is the same as that for a
floppy disk.

PART 4

MAINTENANCE

1. Creating a Backup Disk

1.1 What is a Backup Disk?

Programs and data which are magnetically recorded onto disks are not erased after the power of the A-200II is turned off, and therefore the information on a disk can be used over and over again. However, the disk contents may be erased by a handling error or by some other mishap. It is a good idea to store such information on two or more disks (backup disks) to back up important data or programs. Follow these steps to make a backup disk:

(1) Initialize a disk.
    By using the FORMAT command, format a new disk so that it can be used with A-200II.

(2) Copy the disk contents.
    To back up a floppy disk, copy the disk contents onto the formatted backup disk using the DISKCOPY command. For a hard disk, use the BACKUP command instead.

(3) Check the contents of the copied disk.
    Check the copied contents using the DIR command.

This section explains only the commands needed for creating backup disks. For explanations of other DOS commands, read the DOS User's Manual.

1.2   FORMAT Command

A new disk must be formatted using the FORMAT command before it can be used with the A-200II. Formatting of a used disk, however, erases what was previously on the disk (programs and/or data).

[Format]

FORMAT < drive name >

↗   ↑

Command name   Drive in which the disk to be formatted is located

[Operation]

Display	Operation
A>_	• Boot the system. • Enter the FORMAT command as shown below (assuming that the disk to be formatted is set in drive A:).
A>FORMAT A:	F O R M A T <SPACE> A : <RETURN>
Insert new diskette for drive A: and strike any key when ready	• When this message appears on the screen, insert the disk to be formatted into drive A:. Then, press any key.
Formatting....	• Formatting message displayed while formatting the disk.
Formatting . . . Format complete 362496 bytes total disk space 362496 bytes available on disk Format another (Y/N)? A>	• Formatting is complete. Enter Y to format another disk, or N to terminate formatting. N

1.3   DISKCOPY Command

The DISKCOPY command copies all the contents of a disk onto another disk. This command is useful when you want to create two or more disks with exactly the same contents.

[Format]

D I S K C O P Y <drive name-1> <drive name-2>

  ↑   ↑   ↑

Command name   Source drive   Destination drive

[Operation]

The explanation here is for a system with two floppy disk drives. A system with only one floppy disk drive requires changing of disks several times during the copy operation.

Display	Operation
A>_	• Enter the DISKCOPY command as shown below (assuming that the source drive is A: and the destination drive is B:). D I S K C O P Y <SPACE> A : <SPACE> B : <RETURN>
A>DISKCOPY A: B: Insert source diskette in drive A: Insert target diskette in B: Strike any key when ready	• Set the source disk in drive A and the destination disk in drive B, and then press any key.
Copying 9 sectors per track, 2 sides Copy another (Y/N)?	• This message is displayed while the disk is being copied. • Indicates that disk copy is completed, and asks if you want to copy another disk. Enter Y to copy another disk, or N to terminate copying.

MAINTENANCE

1.4   BACKUP Command

The BACKUP command copies the data or programs stored on a hard disk onto one or more floppy disks.

[Format]

B A C K U P <drive name-1> [filename] <drive name-2>

| Command name | Drive name of hard disk | Filename on hard disk to be backed up | Destination drive |

[Operation]

Let the hard disk be drive C:, the floppy disk drive be drive A:, and the hard disk file to be backed up be IMP.DAT here. Then,

Display	Operation
A>_ A>BACKUP C:IMP.DAT A: Insert Active Diskette 01 in Drive A: WARNING: All Files Will Be Deleted! Press Any Key To Continue, Control-C To Abort.	• Enter the BACKUP command as follows: B A C K U P <SPACE> C : I M P . D A T <SPACE> A : • Insert formatted disk for backup into drive A. • Press any key.

For further information about the BACKUP command, read the DOS User's Manual.

1.5   DIR Command

The DIR command lists up all the files on the disk in the specified drive. Using this command, list the contents of the source disk and the contents of the destination disk to see if they match, and therefore if copying was successfully performed.

[Format]

D   I   R   <drive name>
Command name   Drive in which the disk for listing is set

[Operation]

Display	Operation
A>_	• Assume that the two disks are set in drive A: and drive B:. • Set these disks in drive A: and drive B:, and enter the DIR command. D I R <SPACE> A :
A>DIR A: Volume in drive A has no label Directory of A:\	• The contents of the disk in drive A: are displayed on the screen. • Enter the following to display the contents of the disk in drive B:. D I R <SPACE> B :
A>DIR B: Volume in drive B has no label Directory of B:\ A>	• Check if the contents of the above lists are the same.

2. Care of System the Unit

 .This section explains how to take care of the system unit, and the care needed when moving it. For further information concerning the display device and printer, read their respective manuals.

2.1 Cleaning the Surface

Clean the surface of the equipment with a dry or damp cloth. Never use an organic solvent such as paint thinner. For persistent stains, consult your supply retailer.

2.2 Care when Moving the System Unit

Disconnect all the cords and cables before moving the system unit, and move the system unit carefully to avoid vibration or shock. Make sure that the supplied spacer is set in the-floppy disk drives.

3.   Before Regarding a Problem as a Fault

This section lists the problems that are caused by handling errors, which may appear to be a fault.

Problem	Checkpoint
No power	• Is the power cord correctly connected? • Is the main power being supplied? • Is the POWER switch ON?
No display	• Is the display correctly connected to the system unit? • Is the brightness setting of the display correct? • Is the POWER switch of the display ON?
No system boot	• Is the system disk correctly set? • Is the system disk correct?
No keyboard entry	• Is the keyboard correctly connected to the system unit?

MAINTENANCE

PART 5

OPTIONS

This part explains how to add options and expand the capability of the A-200II system.

For information concerning the options available for this system, consult the retailer from which you purchased your A-200II.

1. Memory Expansion

The standard 256 Kbyte memory of the A-200II can be expanded to 640 Kbytes by adding a 128 and 256 Kbyte memory board.

1.1 Memory Board Short Plug

The standard memory capacity of A-200II is 256 K-byte and can be expanded to 384, 512 or 640 K-byte by installing optional memory boards. Two types of memory boards are available for the A-200II and they are:

-128 K-byte memory board (A202-MB128)
-256 K-byte memory board (A202-MB256)

Before installing the memory board in the A-200II system unit, set the short plug on the board to specify the total system memory capacity.

The setting patterns of short plug are follows:

1) For 384 K-byte total memory capacity
   (128 K-byte memory board)

   Short Plug Setting

J1	J2
: ▯ : : :	▯ : :

2) For 512 K-byte total memory capacity

   (Two 128 K-byte memory boards)
   Short Plug Setting (First 128 K-byte memory board)

J1	J2
: ▯ : : : :	▯ : :

Short Plug Setting (Second 128 K-byte memory board)

J1	J2
: : : ▯ : :	: ▯ :

   (256 K-byte memory board)
   Short Plug Setting

J1	J2	J3
: : ▯ : : :	▯ : :	▯ : :

3) For 640 K-byte total memory capacity
   (128 and 256 K-byte memory board)

   Short Plug Setting (128 K-byte memory board)

J1	J2
: : : : ▯ :	: : ▯

Short Plug Setting (256 K-byte memory board)

J1	J2	J3
: : ▯ : : :	▯ : :	▯ : :

Notes: Three 128 K-byte memory boards cannot be installed in the A-200II system unit.

Caution: Be careful not to bend the pins when setting the short plug.

1.2   Adding a Memory Board

Turn the POWER switch of the system unit OFF and discon-
nect the power cables before adding a memory board. Then,
follow these steps:

(1) Remove the 4 screws from the top cover of the system
unit with a Phillips screwdriver.
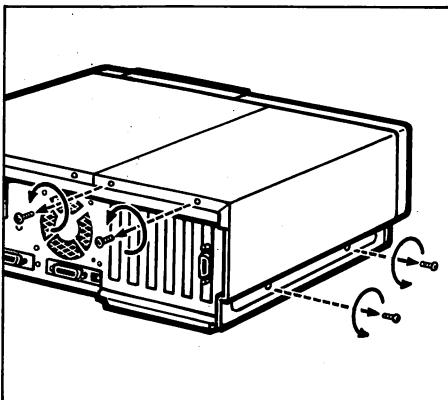
Fig. 5.1

(2) Remove the top cover by lifting it after pulling it toward
the rear, as shown in the figure.
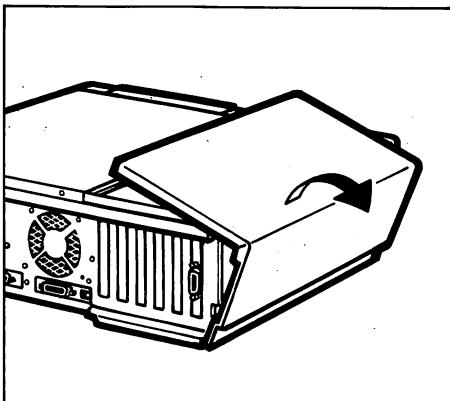
Fig. 5.2

(3) If you are installing a Canon-made memory board, remove either the 6th or 7th slot cover screw at the rear of the system unit using a Phillips screwdriver, and lift the slot cover off (either the 3rd, 4th or 5th slot cover screws for specified memory boards other than Canon-made).
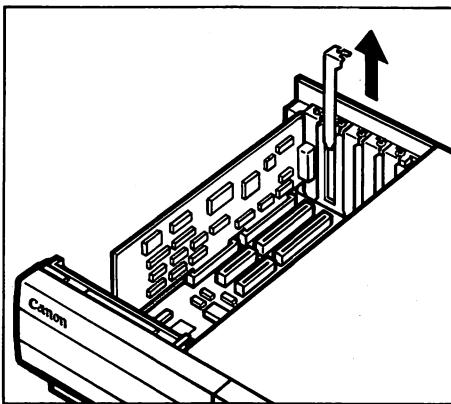
Fig. 5.3

(4) Insert the memory board securely into the slot where the slot cover has been removed by pressing down firmly on both ends of the memory board.
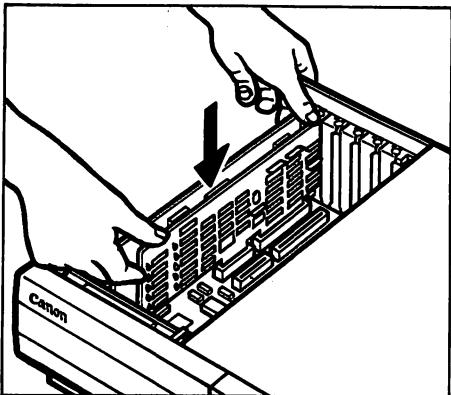
Fig. 5.4

(5) Secure the top cover to the original position by four screws using a Phillips screwdriver. Installation of the memory board now is completed.
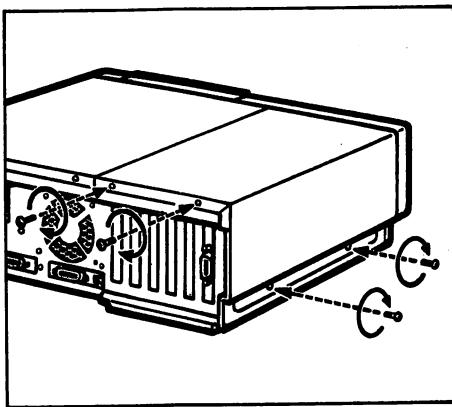
Fig. 5.5

2. 8087 Coprocessor

An 8087 coprocessor, which is meant for numeric calcula-
tion, can be added to the A-200II, thus remarkably enhancing
the processing speed of scientific calculation, etc.

Note: Make sure that an 8087 coprocessor of 8 MHz or more is
used; coprocessors types of less than 8 MHz will not
work with A-200II.

2.1   Installing 8087 Coprocessor

Remove the system unit top cover of the A-200II. (See
steps (1) and (2) in 1.1 "Adding a Memory Board"). Make
sure that the system unit power is OFF and all the cables are
disconnected before removing the cover.
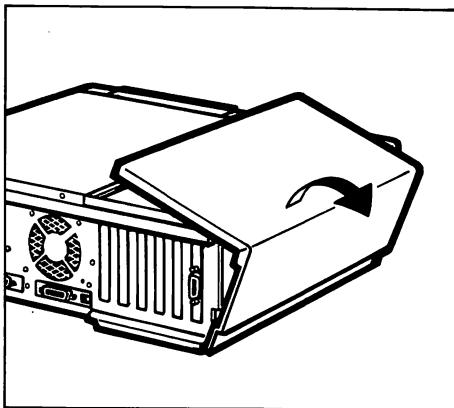
Fig. 5.6

Install the 8087 coprocessor at the position shown in the above figure, matching the notch of the LSI with the notch of the socket. Make sure that all the pins of the LSI fit properly into the socket (be careful not to bend or break pins). Replace the cover of the system unit and installation of the 8087 coprocessor is completed.

Rear side

Front side

Fig. 5.7

OPTIONS
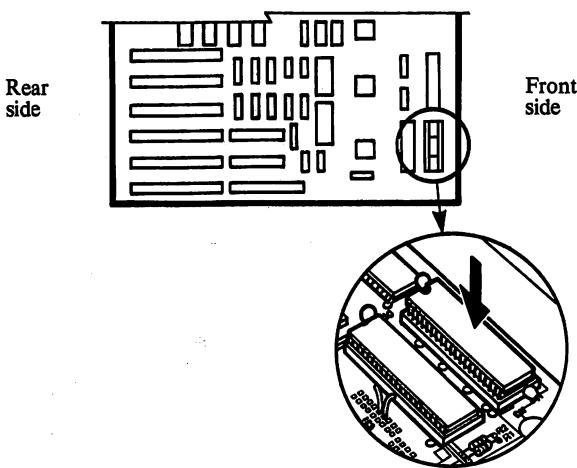
2.2　Setting DIP switch

　When the 8087 coprocessor is installed, the DIP switch setting must be altered as follows.

　Set the 6th switch of the left block (SW1) to OFF and place the top cover back to the original position.

Rear
side

Front
side
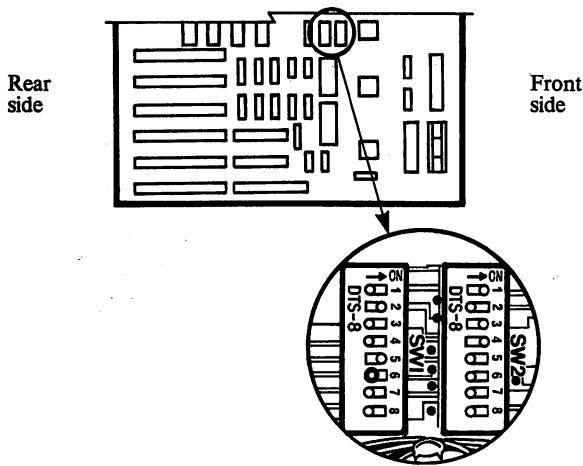
Fig. 5.8

3. DIP Switch Specifications

(1) DIP Switch Block 1

	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7	SW 8
Initial status (A-200II FD)	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
Initial status (A-200II HD)	OFF	ON	ON	OFF	OFF	ON	OFF	OFF
Number of floppy disk drives 　　1 drive 　　2 drives 　　3 drives 　　4 drives		ON ON OFF OFF	ON OFF ON OFF					
Display type 　　Monochrome 　　Color (80 × 25 cha.) 　　Color (40 × 25 cha.)				OFF OFF ON	OFF ON OFF			
8087 Coprocessor 　　Used 　　Not used						OFF ON		
Initial Program Load device 　　Floppy disk drive 　　Other							OFF ON	

(2) DIP Switch Block 2

	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7	SW 8
Initial status	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
Serial Interface slot 　　Internal slot 　　External slot					OFF ON			
Printer slot 　　Internal slot 　　External slot						OFF ON		

OPTIONS

APPENDIX

APPENDIX A

DIAGNOSTICS PROGRAM

The diagnostics program is supplied to check correct operation of your system during its initial run, and also for use whenever a problem arises to help you isolate or identify problems before contacting our sales outlet serviceman.

1.   Overview

The diagnostics program checks the basic operation of each device of the system:

(1)   RAM

(2)   Floppy disk drive(s)

(3)   Hard disk

(4)   CRT

(5)   Keyboard

(6)   Printer port

(7)   RS port

(8)   Mouse

(9)   8087 coprocessor

The display and keyboard must be connected when running this program, and a formatted floppy disk is needed when checking a floppy disk drive.

APPENDIX

The following functions can be checked only when the corresponding options are connected even though the menu to check them are displayed when you instruct to check these devices:

- Hard disk
  The system unit must include a hard disk.
  For example, model A-200II HD.
- RS port
  Peripheral machinery must be connected to the RS port (serial interface port) with the cable.
- Printer port
  A printer must be connected to the printer port with the cable supplied.
- Mouse
  A mouse must be connected to the keyboard.
- 8087 coprocessor
  An 8087 coprocessor must be installed in the system unit.

2. Functions

2.1 Displaying the System Configuration

The diagnostics program displays the system configuration as follows:

```
ROM Version x.xx

Clock rate {4.77/7.15} MHz

yyy KB memory

{Color/Monochrome} CRT

[Keyboard]

[Floppy disk drive: z]

[Hard disk drive: z]

[Printer port: z]

[RS port: z]

[8087 coprocessor]
```

where,   x.xx :ROM version no.
             yyy :RAM size
              z :Number of devices
        { / } :Either of the entries shown
       [   ] :Displayed when connected

2.2   Checking Each Device

(1) RAM
      Writes six different values (05H, 0AH, 14H, 28H, 50H, A0H), one value at a time, in the first 64 Kbytes of RAM, which are read and checked for correctness. Repeats this check for the rest of RAM in 64 Kbyte units.

(2) Floppy disk drive(s)
      Writes data AA55H in the floppy disk of a specified drive, and is read and checked for correctness.

(3) Hard disk
      Checks three points in relation to a specified drive:
      • Determines the maximum, center, and minimum seeks (head movement) of each cylinder, and checks the results.
      • Reads the minimum, center, and maximum sectors of each cylinder, and checks the results.
      • Writes data onto the entire maximum cylinder, which is then read and checked for correctness.

(4) CRT
      Displays 15 check screens on a color display, or 3 check screens on a monochrome display for you to check correctness.

(5) Keyboard
      Displays the key layout on the screen. An asterisk is displayed at the key position of keys hit on the actual keyboard. Check that the correct key is indicated by the asterisk.

(6) Printer port
      Outputs character codes 20H to 7EH to the printer when connected correctly. Check that the output is correct.

(7) RS port
      Writes data into the control register and reads the results into the status register for checking.

(8) Mouse

Move the mouse cursor to the specified location on the screen, click the left or right button, and check the operation.

(9) 8087 coprocessor

Checks the arithmetic operation stack and functions of the 8087 coprocessor. Also reads and checks control, status, and tag words.

2.3   Managing Log Information

Log information means the information concerning errors
found while checking each device. All error information is
stored in the log buffer as log information.

The diagnostics program can store log information in the
buffer (maximum 2 K-byte). You may handle the stored log
information in five ways:

(1)   Store log information in memory into log file

(2)   Write log information in log file into memory

(3)   Display log information in memory onto the screen

(4)   Print out log information in memory

(5)   Delete log information from memory

3. Operation

This section explains how to initiate the diagnostics program and how to check each device.

3.1 Starting Up

(1) Turn ON the power for the system and peripherals.
(2) Set the diagnostics program disk in drive A.
(3) The system configuration is displayed on the screen as shown below.

```
Canon Personal Computer
DIAGNOSTICS Vx.xx
(C) Copyright Canon Inc. 1985

SYSTEM CONFIGURATION

        ROM Version . . . . . . . . x.xx
        Clock rate . . . . . . . . . . x.xx MHz
        Memory . . . . . . . . . . . xxx KB
        Color CRT
        Keyboard

        Floppy disk drive . . . . . x
        Printer port . . . . . . . . . x
        RS port . . . . . . . . . . . . x

OK? (Y/N) =
```
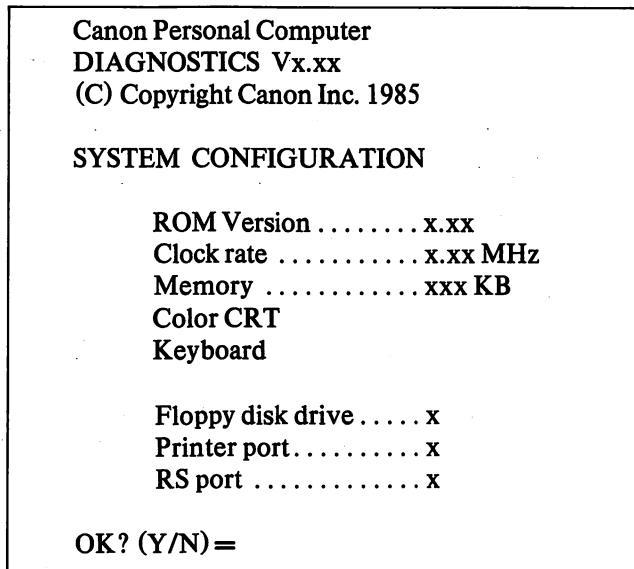
The display includes information concerning the devices connected. If the contents of the display are correct, enter Y <RETURN>; otherwise, enter N <RETURN>.

APPENDIX

(4) Then, the job menu is displayed:

```
JOB MENU
1: SYSTEM CONFIGURATION
2: BASIC DEVICES CHECK
3: LOG MENU
0: END

SELECT JOB No. =
```

Select the items you want to execute on the job menu.

Enter 1 <RETURN> to have the system configuration (3) displayed again.

Enter 2 <RETURN> to proceed to the check menu of each device.

Enter 3 <RETURN> to proceed to the log information management menu.

Enter 0 <RETURN> to end diagnosis, in which case, the following message is displayed:

```
END DIAGNOSTICS
Insert system diskette in drive A:
and strike ENTER key when ready.
```

Insert the system disk in drive A, and press the <RETURN> key. The system is then rese' and can be started up again with the system disk.

The processes which follow the job menu are explained in 3.2 "Checking Devices" and 3.3 "Log Information Management".

3.2   Checking Devices

This paragraph explains the processes taken when BASIC DEVICES CHECK is selected on the job menu.

When 2 is entered on the job menu, the following message appears followed by the basic devices check menu:

```
All devices check? (Y/N) =
```

If you want to check all the component devices, enter Y <RETURN> in response to this message. When you enter Y <RETURN>, you cannot select a device from the menu; all the devices connected are automatically checked one by one in the order of the menu screen shown below. Enter N <RETURN> if you are selecting a particular device to be checked from the menu.
After entering N <RETURN> in response to "All devices check?", the following menu is displayed:

```
BASIC DEVICES CHECK
1: RAM CHECK
2: FLOPPY DISK CHECK
3: HARD DISK CHECK
4: CRT CHECK
5: KEYBOARD CHECK
6: PRINTER PORT CHECK
7: RS PORT CHECK
8: MOUSE CHECK
9: 8087 CHECK
0: Return to JOB MENU
SELECT CHECK No. =
```

If the hard disk and 8087 coprocesor are not included into your system configuration, "3: HARD DISK CHECK" and "9: 8087 CHECK" are not displayed.

If there is an omission in the menu below, the omission is shifted up and the number you have to enter to select the check may be shifted accordingly.

APPENDIX

A-9

Enter 0 <RETURN> when the checking of devices you have selected from this menu is completed and the system returns to the JOB MENU.

(1) RAM CHECK

Enter 1 <RETURN> on the basic devices check menu and the following message is displayed:

```
RAM CHECK
Strike the ENTER key to start the RAM CHECK.
Strike the ESC key to out of CHECK.
```

Press the <RETURN> key to execute RAM check, or press the <ESC> key to return to the check menu without doing the RAM check.

During the RAM check, the following message is displayed:

```
RAM checking. . . . .
```

If an error is found during the RAM check, the following error message is displayed and the RAM check is terminated after the error contents are written into the log buffer:

```
#ERROR!:RAM# addr = xxxx:xxxx W/R = xx:xx
```

where, addr = xxxx:xxxx indicates the address where the error occurred, and W/R = xx:xx indicates the read/write data.

After checking, the following message is displayed:

```
CHECK END!
Strike any key
```

Press any key, and then return to the BASIC DEVICES CHECK menu.

(2) FLOPPY DISK CHECK

Enter 2 <RETURN> on the check menu and the following message is displayed

```
FLOPPY DISK CHECK
CHECK DRIVE (A/B) =
```

If your system has only one floppy disk drive, this message is not displayed.

Enter the name of the drive to be checked. Enter A <RETURN>, for example, and the following message is displayed:

```
Insert scratch diskette for drive A:
and strike ENTER key when ready.
Strike ESC key to out of CHECK.
```

Insert a formatted floppy disk into drive A and press the <RETURN> key. Then, the floppy disk check is done and control returns to the check menu. Press the <ESC> key to return to the check menu without running the floppy disk check.

During the floppy disk check, the following message is displayed:

```
Floppy disk A: checking
```

If an error is found during the floppy disk check, an error message is displayed as shown below, and the error contents will be written into the log buffer.

```
#ERROR!:FD# dr:x hd = x tr = xx sc = x st-x
```

This message is displayed when a read/write error is found, where, dr:x is the drive name, hd=x is the head, tr=xx is the track, sc=x is the sector, st-x is the status code.

The system retries to read/write the error location 3 times and if read/write is still not possible, the check is terminated and control returns to the check menu.

```
#ERROR!:FD W/R# dr:x hd = x tr = xx sc =

x of:xxxx W/R = xx:xx
```

This error message is displayed if the correct value is not read after read/write operation. In the message, of:xxxx means the offset value and W/R=xx:xx means the write/read data.

When checking is completed, the following message is displayed:

```
FLOPPY DISK CHECK
Continue? (Y/N)
```

If your computer is an A-200II HD, this message is not displayed.

Enter Y <RETURN> when you want to check another floppy disk drive such as drive B. In this case, the program returns to the top of FLOPPY DISK CHECK and asks drive to be checked. Or, enter N <RETURN> to return to the check menu.

(3)   HARD DISK CHECK
        Enter   3 <RETURN> on the check menu and the following message is displayed:

```
Strike ENTER key to start HARD DISK CHECK.
Strike ESC key to cancel CHECK MENU.
```

Press the <RETURN> key to run the hard disk check, or press the <ESC> key to return to the check menu without running the hard disk check.

The following messages are displayed during checking to let you know what is being checked:

```
SEEK CHECK
READ CHECK
W/R CHECK
```

When the check is completed, the following message is displayed:

CHECK END!
Strike any key

Press any key to return to the check menu.

If an error occurs during the checking, an error message is displayed as shown below and is stored in the log buffer.

#ERROR!:HD(xxxx)# dr:x cy = xxxx hd = x sc = xx st-xx

This error message is displayed when an error is found during SEEK or READ command execution. In the message, dr:x is the drive name, cy=xxxx the cylinder number, hd=x the head number, sc=xx the sector number, and st-xx the status code.

#ERROR!:HD(COMP)#dr:x cy = xxxx hd = x sc = xx of:xxxx W/R = xx:xx

This error message is displayed when a discrepancy between the write data and the read data is found during the W/R check. In the message, of:xxxx is the offset address and W/R=xx:xx is the write data and the read data.

APPENDIX

(4) CRT CHECK

Enter 4 <RETURN> on the check menu. Then, screens 1 — 8 are displayed in this order:

```
CRT TEST
 ATTRIBUTES TEST
***** REVERSE ****************
***** INTENSIFIED ************
***** NORMAL INTENSIFIED *****
***** BLINKING ***************

WHITE     000000000000000000000
YELLOW    000000000000000000000
MAGENTA   000000000000000000000
RED       000000000000000000000
CYAN      000000000000000000000
GREEN     000000000000000000000
BLUE      000000000000000000000
OK ? (Y/N) =
```

Screen 1

If the display is normal, enter Y <RETURN>.
If the display includes an error, enter N <RETURN>.
Only the upper half of this screen is displayed for a monochrome display.

```
320*200 GRAPHICS
COLOR SET 0




                                          Cyan

         Green
                          Brawn
                 Red
OK ? (Y/N) =
```

Screen 2

If the display is normal, enter Y <RETURN>.
If the display includes an error, enter N <RETURN>.
This screen is not displayed for a monochrome display.

```
320*200 GRAPHICS
COLOR SET 1
```

Red

Cyan

White

Magenta

`OK ? <Y/N> =`

Screen 3
If the display is normal, enter Y <RETURN>.
If the display includes an error, enter N <RETURN>.
This screen is not displayed for a monochrome display.


```
640*200 GRAPHICS
```

Black

Normal
White

White

Intensified
White
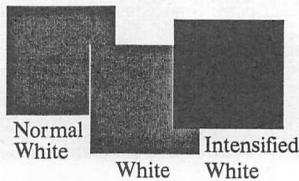
`OK ? (Y/N) =`

Screen 4
If the display is normal, enter Y <RETURN>.
If the display includes an error, enter N <RETURN>.
This screen is not displayed for a monochrome display.

CHARACTER SET

OK ? (Y/N) =

Screen 5

If the display is normal, enter Y <RETURN>.
If the display includes an error, enter N <RETURN>.
This screen is also displayed for a monochrome display.

80*25 DISPLAY

OK ? (Y/N) =

Screen 6

If the display is normal, enter Y <RETURN>.
If the display includes an error, enter N <RETURN>.
This screen is also displayed for a monochrome display. The
monochrome display check ends here, and the screen returns
to the check menu.

```
40*25 DISPLAY

 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFG
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGH
 "#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHI
 #$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJ
 $%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJK
 %&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKL
 &'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLM
 '()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN
 ()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNO
 )*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOP
 *+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQ
 +,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQR
 ,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRS
 -./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRST

OK ? (Y/N) =
```
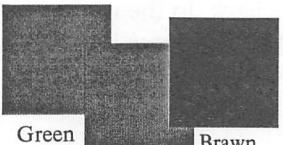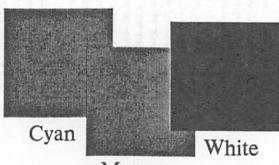
Screen 7

If the display is normal, enter Y <RETURN>.

If the display includes an error, enter N <RETURN>.

This screen is not displayed for a monochrome display.

```
VIDEO PAGE   0

000000000000000000000000000000000000000000
000000000000000000000000000000000000000000
000000000000000000000000000000000000000000
000000000000000000000000000000000000000000
000000000000000000000000000000000000000000
000000000000000000000000000000000000000000
000000000000000000000000000000000000000000
000000000000000000000000000000000000000000
000000000000000000000000000000000000000000
000000000000000000000000000000000000000000
000000000000000000000000000000000000000000
000000000000000000000000000000000000000000
000000000000000000000000000000000000000000

STRIKE ANY KEY FOR NEXT PAGE
```

Screen 8

This step consists of 8 screens, i.e., page 0—7. On each
screen, the corresponding page number is repeatedly displayed
over the entire screen and on the bottom line of page 0—6 the
following message appears:

```
┌─────────────────────────────────────────────────────┐
│        STRIKE ANY KEY FOR NEXT PAGE                   │
└─────────────────────────────────────────────────────┘
```

   Press any key and the next page will be displayed. On page 7,
the following message is displayed instead:

```
┌─────────────────────────────────────────────────────┐
│        8 PAGES OK?(Y/N) =                             │
└─────────────────────────────────────────────────────┘
```

   If the displays on all 8 pages were normal, enter Y
<RETURN>; otherwise, enter N <RETURN>.
The screen then returns to the check menu.

   Whenever N <RETURN> is entered during the CRT
check 1 — 8 , the following message is stored in the log
buffer:

Color display:

```
┌─────────────────────────────────────────────────────┐
│        #ERROR!:Color CRT# screen No. x                │
└─────────────────────────────────────────────────────┘
```

No. x is the check screen number.

Monochrome display:

```
┌─────────────────────────────────────────────────────┐
│        #ERROR!:Monochrome CRT# screen No. x           │
└─────────────────────────────────────────────────────┘
```

(5) KEYBOARD CHECK

Enter 5 <RETURN> on the check menu. The keyboard is displayed as shown below.

```
KEYBOARD CHECK
1: 01 02   03   04 05 06 07 08 09 10 11 12 13 14 15   16    17    18
2: 01 02     03 04 05 06 07 08 09 10 11 12 13 14 15   16  17 18 19  20
3: 01 02       03  04 05 06 07 08 09 10 11 12 13 14 15      16 17 18
4: 01 02   03  04 05 06 07 08 09 10 11 12 13 14  15    16  17 18 19  20
5: 01 02   03                       04              05      06  07

Strike Check key

Y-ENTER : Check OK
N-ENTER : Check NG
```

Screen 9

Press the key you want to check, and see if two asterisks are displayed at the correct keyboard position on the screen. Enter Y <RETURN> if all the key entries are correct; otherwise, enter N <RETURN>. The keyboard check is then terminated and the screen returns to the check menu.

When N <RETURN> is entered during the keyboard check, the following message is stored in the log buffer:

```
#ERROR!:Keyboard#
```

(6) PRINTER PORT CHECK

Enter 6 <RETURN> on the check menu. The following prompt is displayed:

```
PRINTER PORT No. (0—2)=
```

If there is only one printer port in the system unit, the above prompt is not displayed.

Enter the output printer port number (0—2) in response to "PRINTER PORT No. (0—2) =".

APPENDIX

A-19

The following prompt is displayed:

```
LOOP  COUNT  (1-9)=
```

Enter the number of copies to be printed (1-9) in response to "LOOP COUNT (1-9)".

After responding to one or both of the above prompts, the following screen is displayed:

```
Printer ready?
Strike ENTER key when ready.
Strike ESC key to out of CHECK.
```

Set the printer (which is connected to a specified printer port) online, press the <RETURN> key and the printer outputs the following. Press the <ESC> key instead to return to the check menu without running the printer check.

The following characters are printed:

```
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijkl
mnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijkl
mnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijkl
mnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijkl
mnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijkl
mnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijkl
mnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijkl
mnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijkl
mnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijkl
mnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijkl
mnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijkl
mnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijkl
mnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijkl
mnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijkl
mnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijkl
mnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijkl
mnopqrstuvwxyz{|}~
```

When the specified number of copies are printed the following message is displayed:

```
OK? (Y/N) =
```

Check the print-out, and if it is correct, enter Y <RETURN>.

If it is not correct, enter N <RETURN> and the screen will return to the check menu.

When N <RETURN> is entered, the following message is stored in the log buffer:

```
#ERROR!:x Printer port#
```

where, x is the port number.

(7) RS PORT CHECK

Enter 7 <RETURN> on the check menu and the following message is displayed:

```
RS PORT CHECK
   Strike ENTER key to start RS PORT CHECK
   Strike ESC key to return to CHECK MENU.
```

Press the <RETURN> key to run the RS port check and then return to the check menu, or, press the <ESC> key to return to the check menu without running the RS port check.

If an error is found during checking, the following message is displayed and is stored in the log buffer:
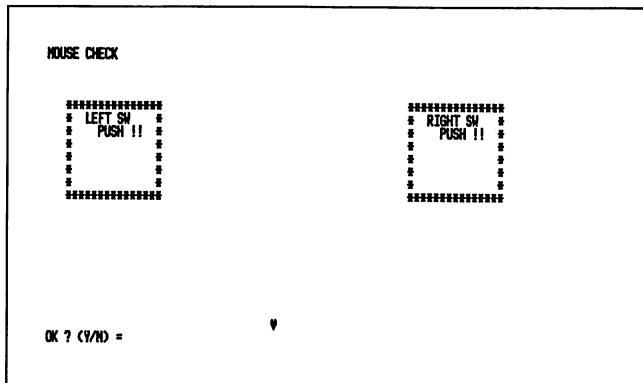
```
#ERROR!:x RS port #
```

where, x is the port number.

(8) MOUSE CHECK
   Enter 8 <RETURN> on the check menu and the
following prompt is displayed:

```
MOUSE ATTACHED? (Y/N)=
```

   If the mouse is attached to your keyboard, enter Y
<RETURN>. If not, enter N <RETURN>. If you
enter N <RETURN>, the system returns to check
menu without running the mouse check. If you enter Y
<RETURN>, the following screen is displayed:

```
MOUSE CHECK


 ***************                      ***************
 *  LEFT SW   *                       *  RIGHT SW   *
 *   PUSH !!  *                       *   PUSH !!   *
 *           *                        *            *
 *           *                        *            *
 *           *                        *            *
 ***************                      ***************




 OK ? (Y/N) =                 ♥
```

Screen 10

The mouse cursor (♥) is displayed at the lower center of the screen. Move the mouse cursor into the left rectangle and press the left button. "LEFT SW ON!" is then displayed at the bottom left corner of the screen and the mouse cursor returns to the lower center of the screen. Move the mouse cursor into the right rectangle and press the right button. "RIGHT SW ON!" is displayed at the bottom right corner of the screen and the mouse cursor returns to the lower center of the screen. Press the left or right button without placing the mouse cursor into the left or right rectangle, "LEFT SW ON!" or "RIGHT SW ON!" is displayed while the button is pressed but the mouse cursor does not return to the lower center of the screen. The display disappears when the button is released.

If the mouse cursor movement and mouse button operation is correct, enter Y <RETURN> in response to "OK? (Y/N) ="; otherwise, enter N <RETURN> and the screen returns to the check menu.

When N <RETURN> is entered, the following message is stored in the log buffer:

```
#ERROR!: Mouse #
```

APPENDIX

(9) 8087 COPROCESSOR CHECK

Enter 9 <RETURN> on the check menu and the following message is displayed:

```
8087 CHECK
    Strike ENTER key to start 8087 check.
    Strike ESC key to return to CHECK  MENU.
```

Press the <RETURN> key to run the 8087 coprocessor check and then return to the check menu. Press the <ESC> key to return to the check menu without running the check.

If an error is found during the check, the following message is displayed and is stored in the log buffer:

```
#ERROR! 8087 coprocessor#
```

3.3　Log Information Management

This paragraph explains log information management when "3: LOG MENU" is selected on the job menu.

When 3 <RETURN> is entered on the job menu, the following menu is displayed:

```
LOG MENU
1: SAVE LOG LIST (Memory to disk)
2: LOAD LOG LIST (Disk to memory)
3: DISPLAY OUT (Memory to CRT)
4: PRINT OUT (Memory to printer)
5: CLEAR LOG LIST (Memory)
0: Return to JOB MENU.
SELECT LOG No. =
```

Each item on the menu means:

1: SAVE LOG LIST　: Save log information in memory onto disk.

2: LOAD LOG LIST　: Load log information on disk into memory.

3: DISPLAY OUT　: Display log information in memory onto screen.

4: PRINT OUT　: Print out log information in memory to printer.

5: CLEAR LOG LIST : Clear log information from memory.

6: Return to JOB MENU　: End log information management and return to job menu.

Operations and functions of these items are explained below.

(1) SAVE LOG LIST

Saves log information in the log buffer onto a floppy disk. Log information in memory is erased when the power is turned off or the system is reset. To avoid losing the information, save it on a floppy disk.

Enter 1 <RETURN> on the log menu and the following message is displayed:

```
SAVE LOG LIST (Memory to disk)
Insert formatted diskette without protection in
drive A: and strike ENTER key when ready.
Strike ESC key to return to LOG MENU.
```

Set a formatted floppy disk which is not write-protected in drive A, and press the <RETURN> key. Log information in memory is then saved onto the floppy disk after which the screen returns to the log menu. Press the <ESC> key to return to the log menu without processing.

(2) LOAD LOG LIST

Loads the log information on a floppy disk into the memory log buffer.

Log information management displays or prints the log information in the log buffer, and therefore the log information must be loaded into the log buffer in memory before it is displayed or printed out.

Enter 2 <RETURN> on the log menu and the following message is displayed:

```
LOAD LOG LIST (Disk to memory)
Insert data diskette for drive A: and strike ENTER
key when ready.
Strike ESC key to return to LOG MENU.
```

Set the floppy disk on which the log information is saved into drive A and press the <RETURN> key. The log information on the floppy disk is then loaded into the log buffer and the screen returns to the log menu.

Press the <ESC> key to return to the log menu without processing.

(3) DISPLAY OUT

Displays the log information in memory onto the screen.

This function is used for examining the results of device checks.

Enter 3 <RETURN> on the log menu and the log information is displayed as shown below:

```
*** LOG LIST ***
# ERROR ! : Monochrom CRT # screen No.1
# ERROR ! : Monochrom CRT # screen No.2
# ERROR ! : Keyboard #
Strike any key to return to LOG MENU.
```

All the log information in the log buffer is listed on the screen. Press any key to return to the log menu.

If there is no log information in log buffer, log information is not displayed on the screen and the display returns to the log menu.

APPENDIX

(4) PRINT OUT

Prints the log information in memory. This function is useful if you want to keep a list of log information. However, the printer must be correctly connected to the printer port for this processing operation.

Enter 4 <RETURN> on the log menu and the following prompt is displayed:

```
PRINT OUT (Memory to printer)
OUTPUT PORT NO. (0—2)=
```

If there is one port in the system unit, the above prompt is not displayed.

In response to "OUTPUT PORT NO. (0—2) =", enter the printer port number to which the log information is output.

After responding to the above prompt, the following screen is displayed:

```
PRINTER READY?
Strike ENTER key when ready.
Strike ESC key to return to LOG MENU.
```

Set paper on the printer connected to a specified printer port, set the printer online, and then press the <RETURN> key. The log information is then printed out as shown below. After printing is complete, the screen returns to the log menu.

Press the <ESC> key instead of the <RETURN> key to return to the log menu without printing out the log list.

(5) CLEAR LOG LIST
     Clears the log information from the log buffer.
     The log buffer can store about 2 K-bytes of log informa-
     tion. The log information in the log buffer should be
     saved onto a floppy disk and the log buffer should be
     cleared before it overflows, otherwise the overflowed log
     information will be lost.

     Enter 5 <RETURN> on the log menu and the fol-
     lowing message is displayed:

     ┌───┐
     │ CLEAR LOG LIST (Memory)   │
     │ Are you sure? (Y/N) =   │
     └───┘

     Enter Y <RETURN> to erase the log information
     in the log buffer, or enter N <RETURN> to return to
     the log menu without clearing the log buffer.

(6) Error messages
     The following error messages can be output by the log
     information management:

     1 ### LOG buffer overflow! ###
        The log buffer (2 K-bytes) overflowed while loading
        log information from a floppy disk into the log buffer.
        Clear the log buffer, and retry.

     2 ### LOG FILE LOAD ERROR! (xxxx) ###
        The floppy disk from which the log information is
        being loaded into the log buffer is not the correct disk.
        Clear the log buffer, and retry with the correct floppy
        disk.

     3 ### LOG FILE SAVE ERROR! (xxxx) ###
        An error occurred while saving the log information
        onto a floppy disk. The disk is defective. Retry with a
        new disk.

APPENDIX

APPENDIX B   INTERFACES

1.   RS-232C Interface
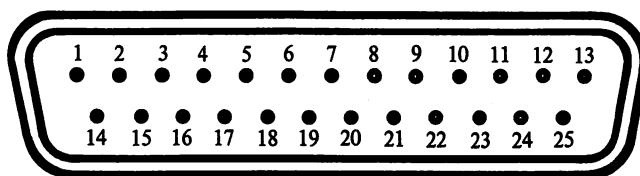
Pin No.	Description	Input/Output
1	Not used	
2	Transmit data	Output
3	Receive data	Input
4	Request to send	Output
5	Clear to send	Input
6	Data set ready	Input
7	Signal ground	
8	Carrier detect	Input
9	Not used	
10	Not used	
11	Not used	
12	Not used	
13	Not used	
14	Not used	
15	Not used	
16	Not used	
17	Not used	
18	Not used	
19	Not used	
20	Data terminal ready	Output
21	Not used	
22	Ring indicate	Input
23	Not used	
24	Not used	
25	Not used	

Note: The DTE (Data Terminal Equipment) mode and the DCE (Data Circuit terminating Equipment) mode are interchangeable with the serial data interface cable.
- Straight cable. . . . . DTE mode
- Cross cable . . . . DCE mode

2. Parallel Data Interface

Printer Interface
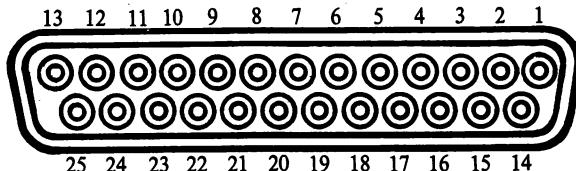
Pin No.	Description	Input/Output
1	Strobe	Output
2	Data bit 0	Output
3	Data bit 1	Output
4	Data bit 2	Output
5	Data bit 3	Output
6	Data bit 4	Output
7	Data bit 5	Output
8	Data bit 6	Output
9	Data bit 7	Output
10	Acknowledge	Input
11	Busy	Input
12	Paper end	Input
13	Select	Input
14	Auto feed	Output
15	Error	Input
16	Initialize printer	Output
17	Select input	Output
18	Ground	
19	Ground	
20	Ground	
21	Ground	
22	Ground	
23	Ground	
24	Ground	
25	Ground	

3. Color Display Interface

Color Monitor Interface
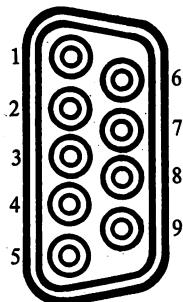
Pin No.	Description	Input/Output
1	Ground	
2	Ground	
3	Red	Output
4	Green	Output
5	Blue	Output
6	Intensity	Output
7	Reserved	Output
8	Horizontal	Output
9	Vertical	Output

4. Monochrome Display Interface

Monochrome Monitor Interface
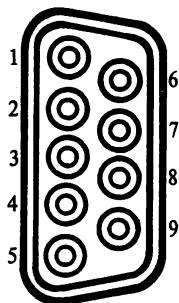
Pin No.	Description	Input/Output
1	Ground	
2	Ground	
3	Not used	
4	Not used	
5	Not used	
6	Intensity	Output
7	Video	Output
8	Horizontal	Output
9	Vertical	Output

5.   Video Composite Interface

Video Composite Interface
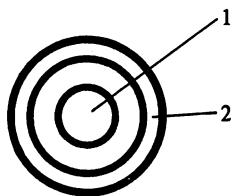
Pin No.	Description	Input/Output
1	Composite signal	Output
2	Ground	

APPENDIX C
CHARACTER CODE TABLE

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p	Ç	É	á	▒	└	╨	α	≡
1	☻	◄	!	1	A	Q	a	q	ü	æ	í	▓	┴	╤	β	±
2	☻	↕	"	2	B	R	b	r	é	Æ	ó	█	┬	╥	Γ	≥
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	♦	¶	$	4	D	T	d	t	ä	ö	ñ			╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┤	╒	σ	⌡
6	♠	▬	&	6	F	V	f	v	å	û	ª	╢		╓	μ	÷
7		↨	'	7	G	W	g	w	ç	ù	º	╖	╫	╫	τ	≈
8		↑	(	8	H	X	h	x	ê	ÿ	¿	╕			Φ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	⌐	╣		╜	θ	●
A		→	*	:	J	Z	j	z	è	Ü	¬	║		┘	Ω	·
B	♂	←	+	;	K	[	k	{	ï	¢	½	╗			δ	√
C	♀	└	,	<	L	\	l	¦	î	£	¼			█	∞	ⁿ
D		↔	–	=	M	]	m	}	ì	¥	¡			█	φ	²
E	♪	▲	.	>	N	^	n	~	Ä	₧	«	╛	╬	█	€	■
F	✳	▼	/	?	O	_	o	Δ	Å	ƒ	»	┐		█	∩	

APPENDIX D

SPECIFICATIONS

Specifications for the major devices are described here for your reference. The contents may be changed for improvement without prior notice.

1. System Unit

- Weight
  - A-200II FD2   : 11.3 kg
  - A-200II HD   : 11.6 kg
- Size   : 440 mm (W) × 396 mm (D)
                    × 140 mm (H)
                    (17.32 × 15.59″ × 5.51″)
- Power supply   : A-200II FD2
                    5 A (120 V)
                    150 W (230 V)
                    150 W (240 V)
                    : A-200II HD
                    6 A (120 V)
                    180 W (230 V)
                    180 W (230 V)
- CPU
  - Processor   : 16 bit microprocessor 8086
  - Control method : Microprogram method
  - Clock   : 7.159/4.77 MHz (switchable by switch setting or software)
- Memory
  - ROM   : 16 K-bytes
  - RAM   : 256 K-bytes standard (with parity), can be expanded by 128/256 K-bytes to a maximum of 640 K-bytes

- Interface
  Serial data interface   : Supplied with one serial data
  interface as standard
  RS-232C asynchronous type, 25
  pins
  Parallel data interface   : Supplied with one parallel data
  interface as standard
  Centronics type, 25 pins

- Expansion slots
  16 bit bus   : 6th slot (62 pins + 36 pins)
  7th slot (62 pins + 36 pins)
  8th slot (62 pins + 50 pins)
  8 bit bus   : 3rd slot (62 pins)
  4th slot (62 pins)
  5th slot (62 pins)

- Floppy Disk drive
  Drive   : 5-1/4″ floppy disk drive
  A-200II FD2 has two drives.
  A-200II HD has one drive.
  Media   : Double-sided, double-density
  5-1/4″ floppy disk specified by
  Canon
  Capacity
      total   : 368 K-bytes/disk (formatted)
      track   : 4608 bytes
      sector   : 512 bytes
  Number of tracks   : 80 tracks·
  Number of sectors   : 9 sectors/track
  Recording density   : 5876 BPI/48 TPI
  Recording method   : MFM
  Transfer rate   : 250 K bps
  Step rate   : 4 ms
  Head settling time   : 15 ms
  Revolution waiting
      time   : 100 ms (AVR)
  Start up time   : 1 sec

- Hard disk (A-200II HD)

Drive	: 5-1/4″ Winchester type
Capacity	
total	: 22 M-bytes (formatted)
track	: 8704 bytes/track
sector	: 512 bytes/sector
Number of cylinders	: 640 cylinders
Number of sectors	: 17 sectors/track
Total number of	
tracks	: 2560 tracks (640×4)
Number of heads	: 4 heads
Recording density	: 10200 BPI/596 TPI
Recording method	: MFM
Transfer rate	: 635 K-bytes/s
Access time	
min.	: $18 + (8-25)$ ms
avr.	: $95 + (8-25)$ ms
max.	: $235 + (8-25)$ ms
Revolution waiting time	
avr.	: 8.46 ms
max.	: 16.973 ms
Number of disk	
revolutions	: 3535 rpm
Start up time	: 12 sec

2. Display Unit

Color display

CRT	: 12″ deflection
	RGB in line
Dot pitch	: 0.015″ (0.38 mm)
Character area	: 8.46″ (H) × 5.43″ (V)
	(215 × 138 mm)
Character format	: 80 × 25 = 2000 characters
Connector	: 9 pin D-subminiature
Dimensions (with swivel stand)	
width	: 12.40″ (315 mm)
height	: 13.74″ (349 mm)
depth	: 14.78″ (375.5 mm)
Net weight	: 23.37 lbs (10.6 kg)
Power source	: 0.7 A (120 V)
	55 W (230 V)
	55 W (240 V)
Accessories	: Signal cable

Monochrome display

CRT	: 12″ deflection
Phosphor color	: Green
Character area	: 8.46″ (H) × 5.43″ (V)
	(215 × 138 mm)
Character format	: 80 × 25 = 2000 characters
Connector	: 9 pin D-subminiature
Dimensions (with swivel stand)	
width	: 13.78″ (350 mm)
height	: 14.02″ (356 mm)
depth	: 13.82″ (351 mm)
Net weight	: 20.28 lbs (9.2 kg)
Power source	: 0.4 A (120 V)
	40 W (230 V)
	40 W (240 V)

3. Keyboard

Face angle	: 2 stages (5 degree, 9 degree)
Size	: 440 mm (W) × 180 mm (H) × 30 mm (D) (17.32″ × 7″ × 1.17″)
Weight	: 1.4 kg

4. Pointing Device

Type	: Mechanical
Buttons	: Two
Size	: 63.5 mm (W) × 101.6 mm (H) × 35 mm (T) (2.5″ × 4″ × 3.38″)
Weight	: 155 g

APPENDIX

ASCII

A-42

UK
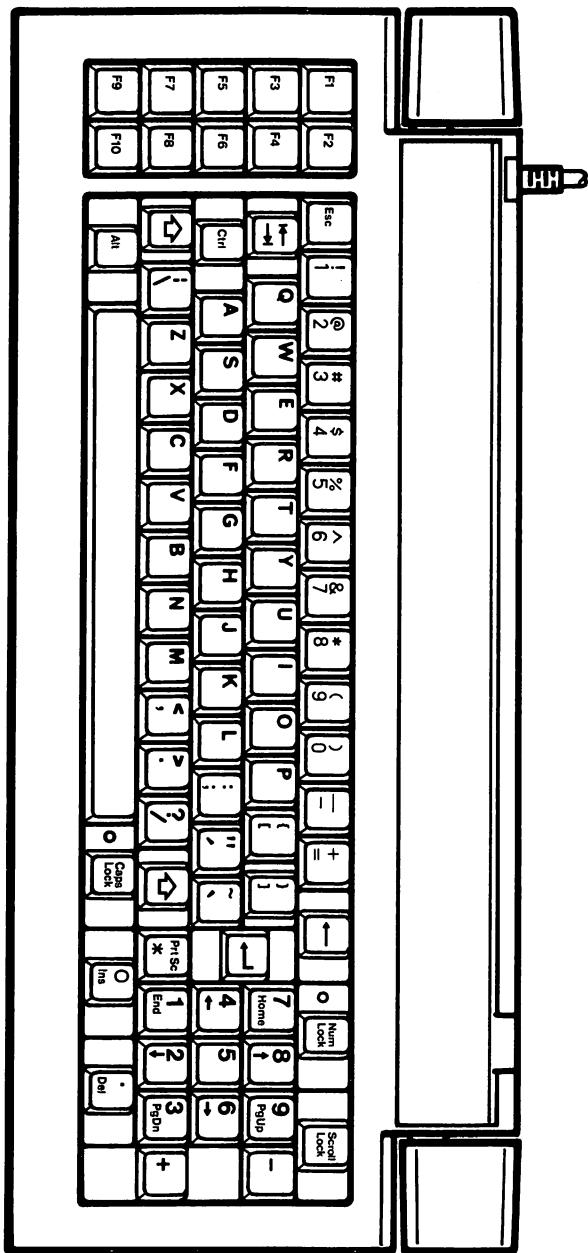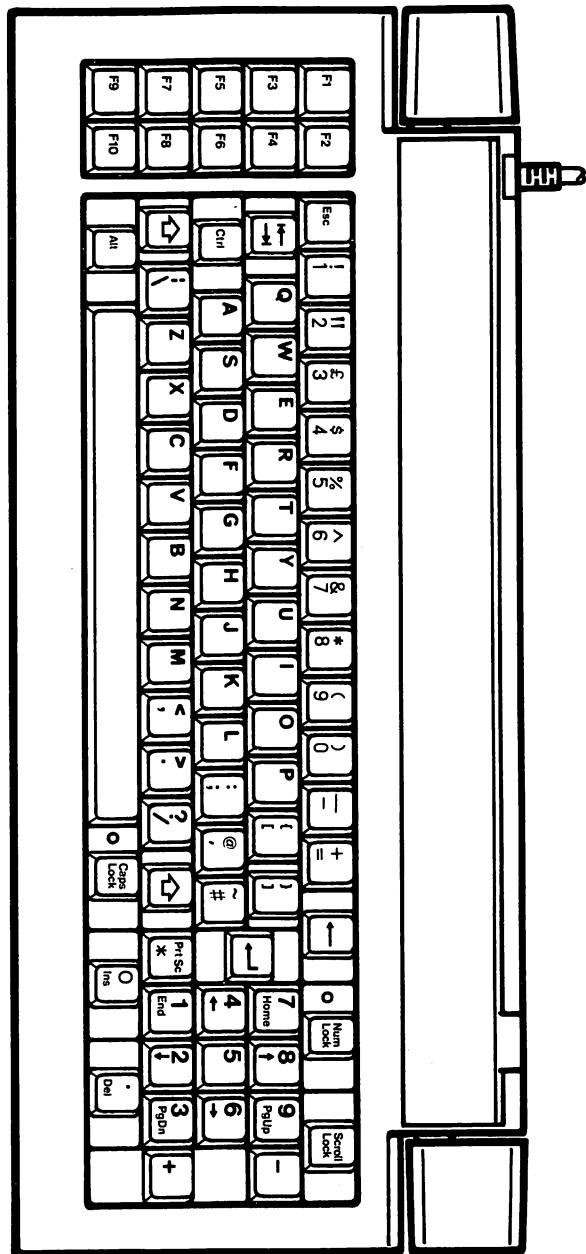
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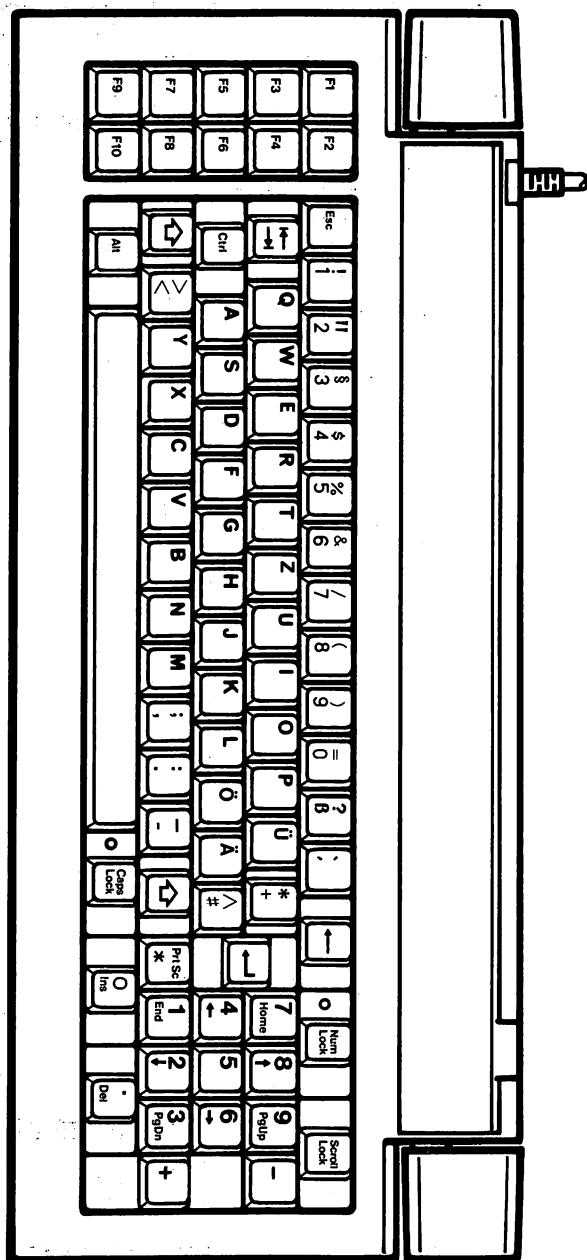
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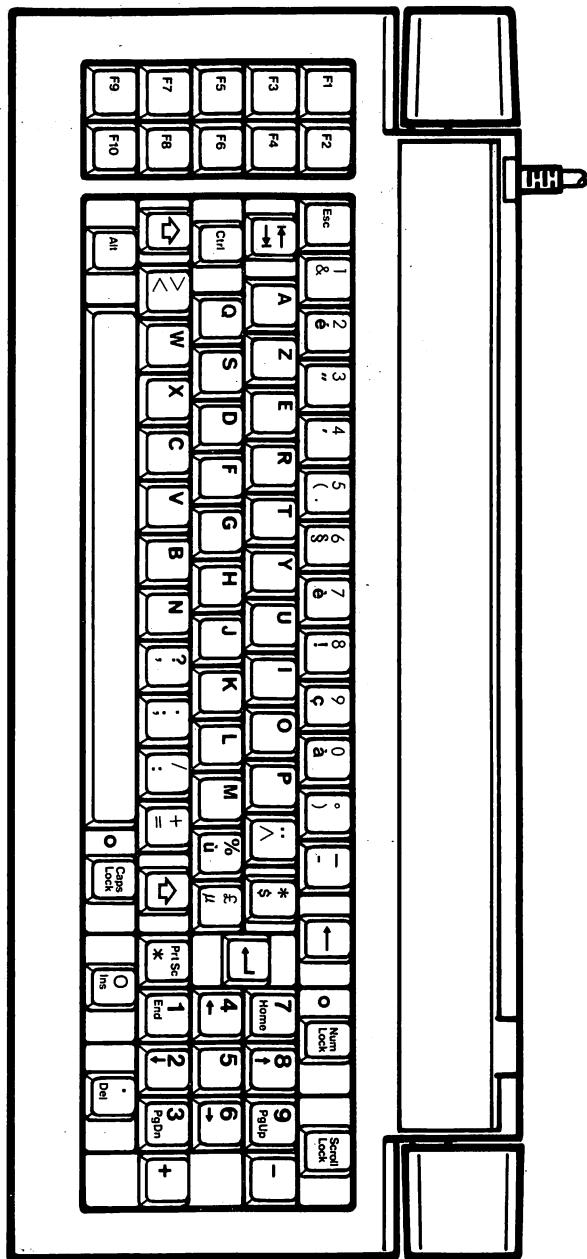
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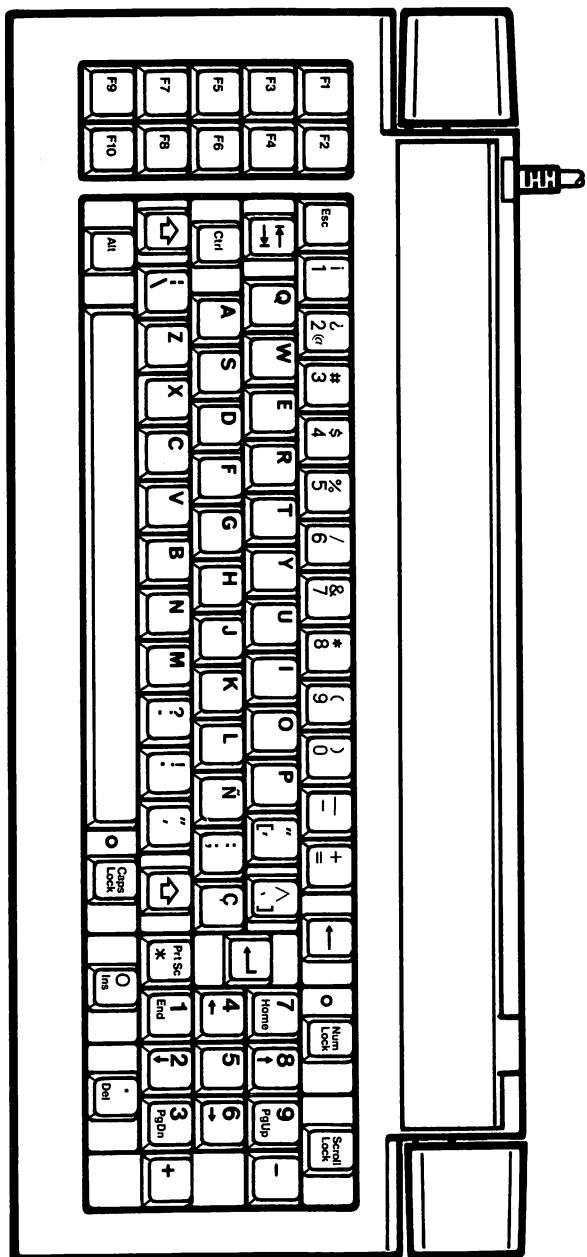
Italian

Sweden / Finland

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<V>

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