Canon

CX-1

Instruction Manual

The Canon CX-1 Desktop Computer has been manufactured with the latest state-of-the-art technology to meet your most pressing office needs.

Please read this manual carefully before using your CX-1 to insure proper operation and continued product reliability.

For general and detailed explanations of the CX-1 BASIC language functions, please refer to the "BASIC Language Manual".

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V. PROGRAMMING OPERATION

VI. PROGRAM EXECUTION

VII. SPECIFICATIONS

I. BEFORE USING

When installing your CX-1 be sure that you follow the guidelines listed below. If you have any questions, contact our sales agent from whom you purchased the CX-1.

1. Installation Conditions

(1) Use the CX-1 only within the specified power range.

AC Power:	Rated supply voltage ±10 — 15%
	(measured at the power supply cord socket)
Supply Frequency:	50 Hz or 60 Hz
Working Range:	49 — 61 Hz

(2) The power supply cord should not be more than 5 meters long.

When extending the power supply cord, use a single-wire cable and be sure that the overall length (CX-1 power supply code + extension cable) does not exceed 5 meters. Use of a longer cord may cause voltage drop.

(3) Avoid common use of an electrical outlet with a unit that may become a noise source.

Do not use the same electrical outlet on a circuit supplying power to an air conditioner, elevator, electrostatic copier, or a machine with a large-capacity motor using brushes (like a shredder). Noise pick-up may cause the CX-1 to malfunction. If it is necessary to use a common outlet for the power supply, install a high-frequency noise eliminating filter or an exclusive-use transformer.

(4) Install a voltage regulator if the power supply is not stable.

When the CX-1 is used in a location where the supply voltage and frequency tend to fluctuate, be sure to install an automatic voltage regulator or similar device to maintain the power supply within the specified work range.

(5) Avoid dusty places.

Avoid locations where the air is dusty or salty, or where corrosive gases are generated, to protect the unit.

(6) Avoid vibration.

Avoid a location where constant vibration occurs.

(7) Use within the prescribed work ranges of temperature and humidity.

Be sure to maintain proper ambient temperature and humidity to insure proper operation. If the temperature or humidity is outside the normal work range, heating or air-conditioning is required.

Working ambient temperature: 10°C — 40°C (50°F — 104°F)
Working ambient humidity: 20% — 80%

(8) Allow 30 cm or more between the wall and the CX-1.

When used next to a wall, be sure to allow 30 cm or more at the back of the CX-1 to prevent a temperature rise inside the machine.
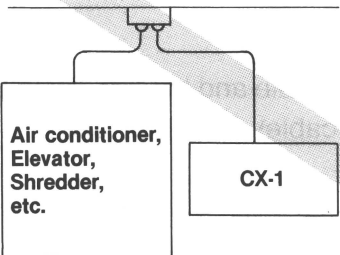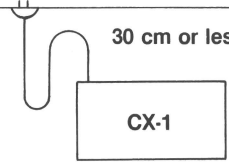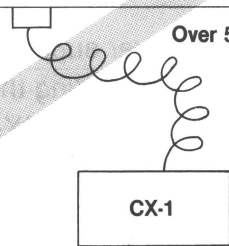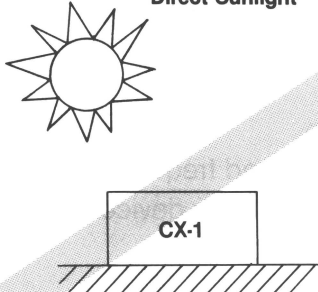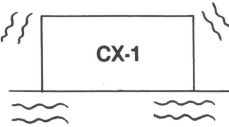
(9) Avoid use in direct sunlight.

To protect expendable materials and to avoid a temperature rise inside the CX-1, do not use in direct sunlight.

(10) Warm the CX-1 up before use in cold climates.

    When the CX-1 is used in cold climates or early in the morning, turn the power ON and allow the unit to warm-up for 15 — 20 minutes before use.

(11) Be careful of static electricity build-up during seasonal temperature drops. Due to static electricity built-up during dry seasons, sparking may occur. This sparking causes data irregularities in the CX-1 and humidity should be modified.

Common Use of Outlet	Distance from the Wall	Power Cord Extension
Air conditioner, Elevator, Shredder, etc. — CX-1	30 cm or less — CX-1	Over 5 m — CX-1
Direct Sunlight — CX-1	Vibration — CX-1	Dust, Salt air, Corrosive gas, etc.
		Ambient Temperature Below 10°C (50°F) Above 40°C (104°F)
		Ambient Humidity Below 20% Above 80%

2. Checking Components

When you open the package, be sure that all the following components have been included and have not been damaged in transit.
1) Power supply cord
2) Dust cover
3) System disk
4) Instruction Manual
5) BASIC Language Manual

――――――――――――――――― **CAUTION** ―――――――――――――――――

The CX-1 Mini-Floppy Disk Drives are packed with cardboard spacers to prevent damage during transit. Be sure to remove all spacers before installation. Keep the spacers, and when you move the CX-1 later, re-pack the spacers in the drive units to avoid damage.

II. DESCRIPTION OF COMPONENTS

This chapter provides a detailed description of CX-1 components.

1. General View

CRT Display

Mini-Floppy
Disk Drives

Keyboard
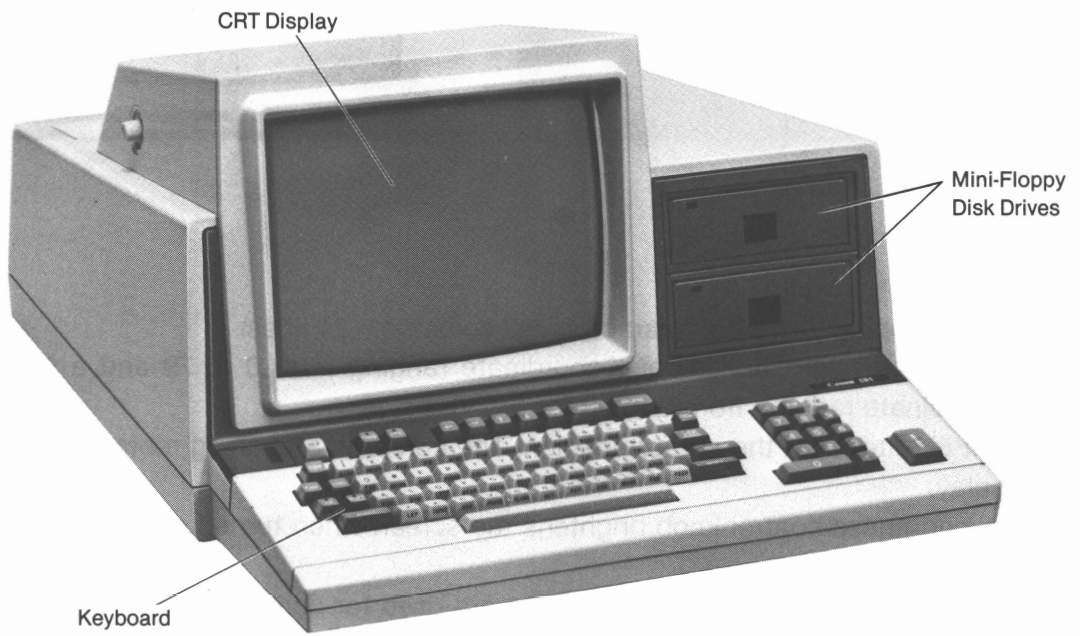
2. CRT Display
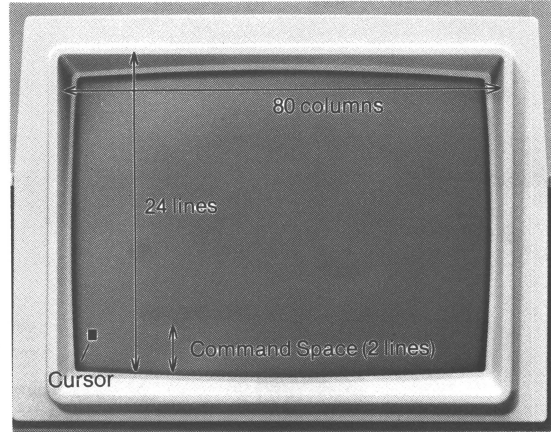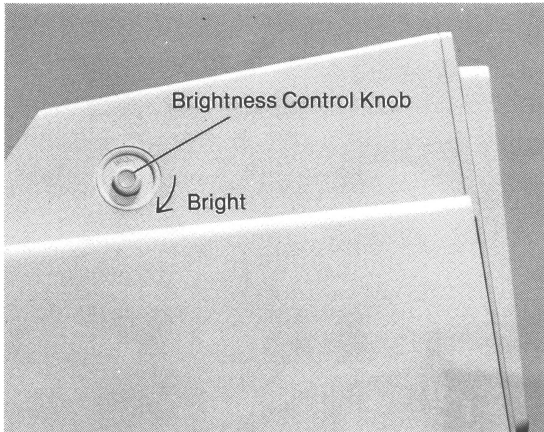
○ Display capacity is 1,920 characters (80 columns × 24 lines).
○ The display has a horizontal X-coordinate ranging from 0 to 79 and a vertical Y-coordinate ranging from 0 to 23 for programs.
○ Input is entered at the cursor position. The cursor is a flashing rectangle on the display.
○ The brightness control knob brightens the screen when turned clockwise.

NOTE: The last two lines on the screen are used for command entries.
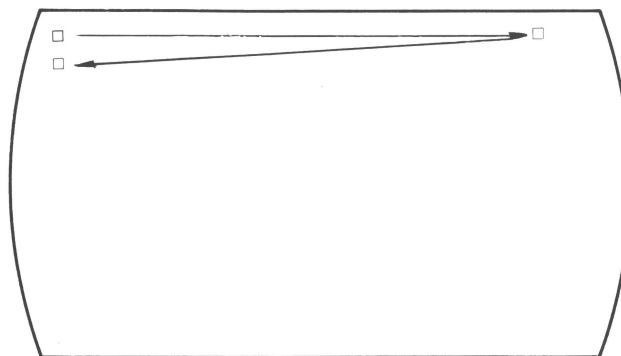
Cursor Movement

3. Mini-Floppy Disk Drive
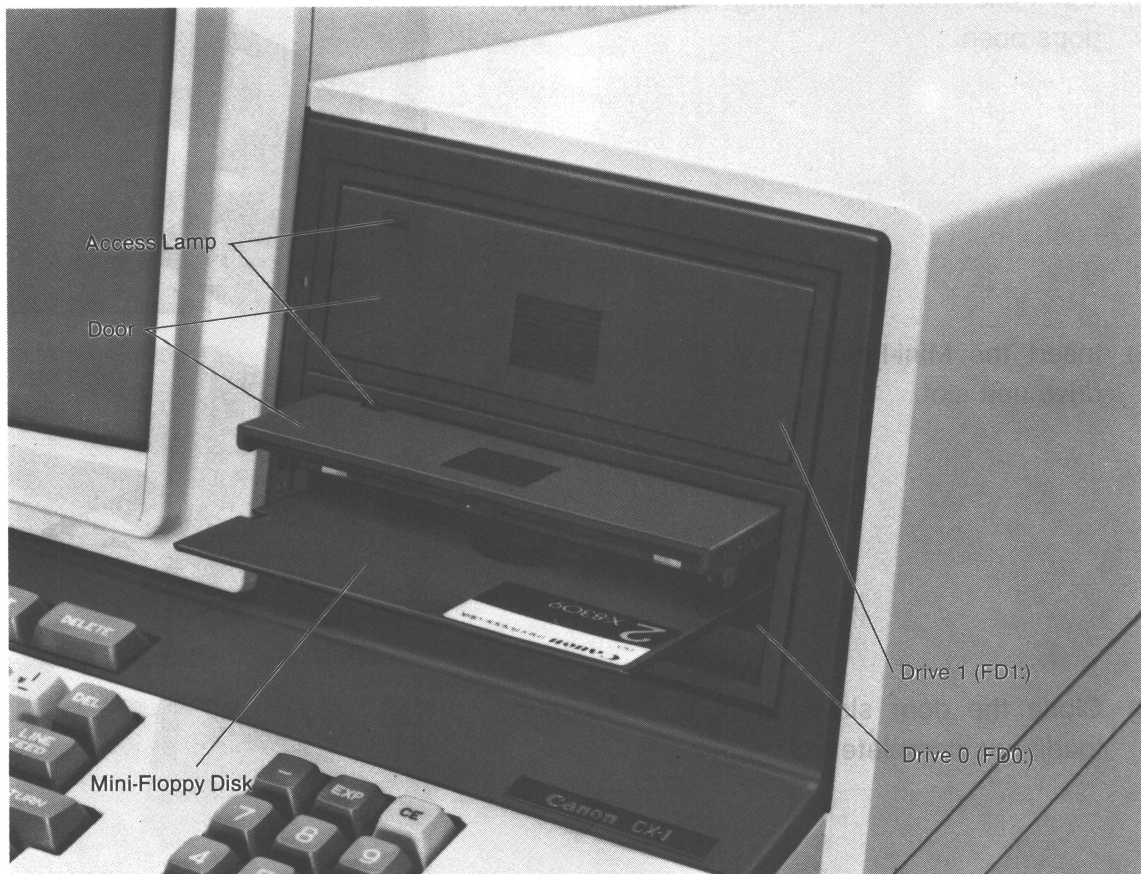
- Drive 0 (lower deck) is defined as FD0:, and Drive 1 (upper deck) as FD1:.
- Set the system disk into Drive 0 (see Chapter III "SYSTEM OUTLINE").
- When the disk is accessed during Read or Write, the access lamp lights.
- The drive doors lock during disk access. If the drive door does not open easily, it is locked and should not be forced.

———————————————— CAUTION ————————————————

New disks must be formatted before using them with the CX-1. The system disk included in the CX-1 package has already been formatted and is ready to use. For formatting details and procedure, see Chapter IV Section 5 "Disk Formatting."

[Setting the Disk]

1) Open the door by pushing it firmly until it pops open.
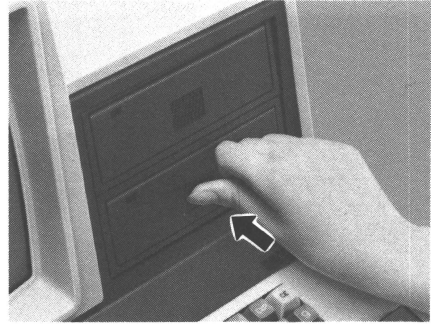
2) Insert the Mini-Floppy Disk firmly into the drive unit slot.

3) Close the door slowly until it clicks, and loading is complete.

[Caution in Handling Mini-Floppy Disks]

- Do not bend or apply undue force to the Mini-Floppy Disk.

- Make sure that the Mini-Floppy Disk does not come into contact with a magnetic field. Such contact may erase the disk.

- Do not use paper clips or staples on the Mini-Floppy Disk. Do not write on the disk with a pencil or ballpoint pen; use a felt-tip pen if writing is necessary.

  Storage Conditions
  Temperature: $+4°C — +53°C$
  $(+39°F — +127°F)$
  Humidity: 8 — 80%

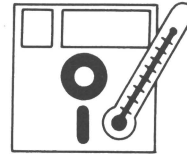- Do not leave the Mini-Floppy Disk in direct sunlight or near a heat source.
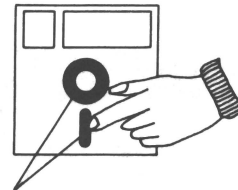
magnetized surface

- Do not touch the magnetic surface with your hand or clean the surface with any kind of solution. Either may erase the Mini-Floppy Disk.
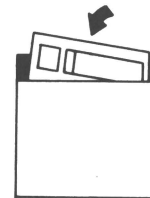
- When not in use, keep the Mini-Floppy Disk in the storage envelope. Store it in an upright position to protect it from dust and dirt and to keep it from bending.

NOTES:
1) Insert the Mini-Floppy Disk into the drive. Push it in gently until it stops, and then close the door. Do not try to insert the disk at an angle or try to force it into the drive unit; either may damage the disk.
2) The Mini-Floppy Disk has a service life similar to that of a regular audio cassette. Service life varies depending on the frequency of use and the storage and handling conditions. The disk has a reading and writing life of 3×10^6 times, and with ordinary use, has a useable life of about one year.
3) Use media Canon Mini-Floppy Disk X-8309.

4. Keyboard

Halt Key   Cursor Control Keys   Editing Keys

Mode Select Keys   Cursor Home Key

Typewriter and Command Keys   Return Key Ten-Key Pad Start Key
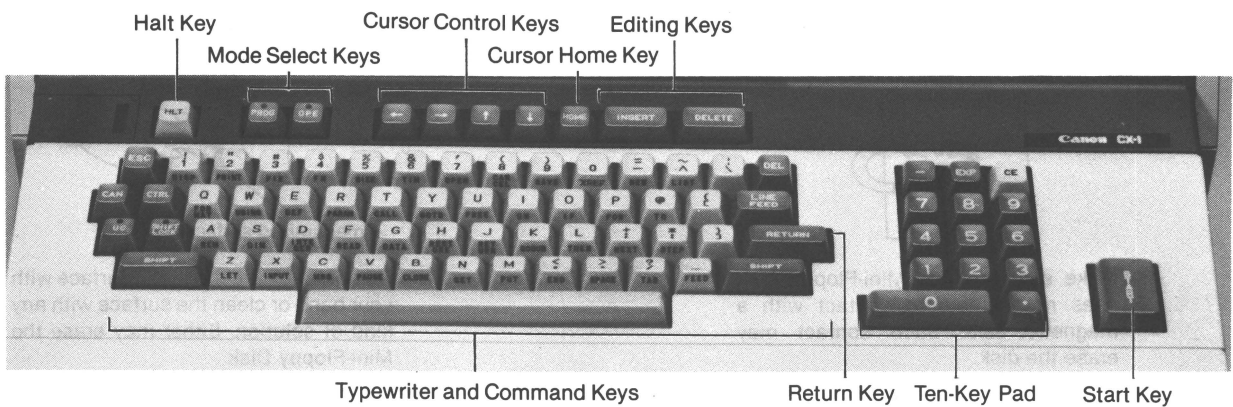
○ The two keys located on the top left of the keyboard inside the cover are System Check Keys and should never be touched.

○ The keys with lamps are lock keys. As long as the lamp on one of these keys is on, functions are maintained.

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Entry through Typewriter Keys

Several kinds of characters can be entered using the same key. When entering data and programs through the typewriter keyboard, the following auxiliary keys are used.

ESC Enters commands and edits or corrects programs when used with another key to activate "one key, one instruction entry system".

PRINT ⟶ PRINT

SHIFT Used to obtain capital letters or upper-case symbols. The shift function is effective only when the key is held down.

Simultaneously   Simultaneously
    A $ ⟶ A$
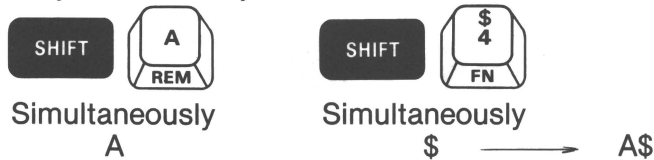
SHIFT LOCK Locks the keyboard in the "shift" state. When depressed, the lamp lights. Depress the Shift Lock Key again to release the function.
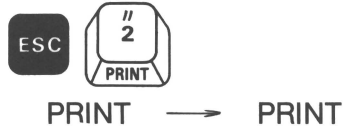
OFF   ON   A $ ⟶ A$
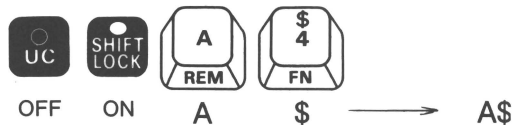
UC Used to obtain capital letters or numbers and locks the keyboard in the upper case state. When depressed, the lamp lights. Depress the uppercase lock key again to release the function.

ON   OFF   A   4 ⟶ A4
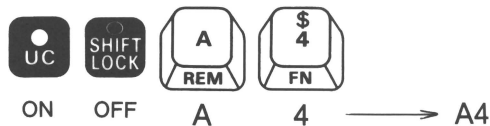
○ RETURN and START Keys

RETURN and **START** Used to delimit entries. The functions of both keys are identical. The keys are used to end a line during program editing, to indicate the end of data entry, and to indicate the direction of program execution at the beginning of a program.

○ HLT Key

HLT Temporarily halts program execution. This is same as executing the PAUSE statement in the program. (Refer to Chapter V, Section 3 "Pause State".)

• Table of Keyed-In Characters

Character	Key Operation
Capital letters A ⟨ Z	(UC OFF) (SHIFT LOCK ON) [A/REM] ⟨ [Z/LET] or (UC ON) (SHIFT LOCK OFF) [A/REM] ⟨ [Z/LET]
Small letters a ⟨ z	(UC OFF) (SHIFT LOCK OFF) [A/REM] ⟨ [Z/LET]
Numbers 1 ⟨ 0	(UC OFF) (SHIFT LOCK OFF) [!/1/DISP] ⟨ [0/XREF] or (UC ON) (SHIFT LOCK OFF) [!/1/DISP] ⟨ [0/XREF] or Ten-Key pad

*As long as the lamp on one of the lock keys is on, the respective key functions are maintained.

Character	Key Operation
Upper-case symbols ! ⟨ others	(UC OFF) SHIFT LOCK ON [!/1/DISP] ⟨ others
Lower-case symbols ; ⟨ others	(UC OFF SHIFT LOCK OFF) [+/;/NEXT] ⟨ others or UC ON (SHIFT LOCK OFF) [+/;/NEXT] ⟨ others
Statements and Commands DISP ⟨ others	ESC [!/1/DISP] ⟨ others

- The function of [UC] : ON, [SHIFT LOCK] : ON is the same as that of [UC] : OFF, [SHIFT LOCK] : ON.

- The [SHIFT LOCK] key performs the same function as the [SHIFT] key.

• In the examples that follow, the key-in operation is expressed as follows:

([UC OFF]) [SHIFT LOCK ON] [A / REM]

or

[UC ON] ([SHIFT LOCK OFF]) [A / REM]

⟶ [A]

[ESC] [S / DIM]

or

([UC OFF]) [SHIFT LOCK ON] [D / INTGER] [I / ON] [M / PUT]

or

[UC ON] ([SHIFT LOCK OFF]) [D / INTGER] [I / ON] [M / PUT]

⟶ [D] [I] [M]

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5. Rear View

AC Power
Source
Connector

Floppy
Disk Drive Power
Supply
Connector

Fuse

Light-Pen Connector

Connector for
Mini/Standard
Floppy Disk Drive

Connectors for
Serial Data I/F

Connectors for
Parallel Data I/F
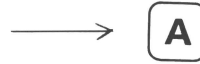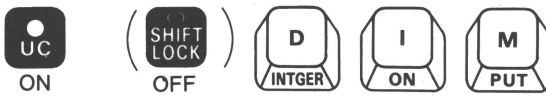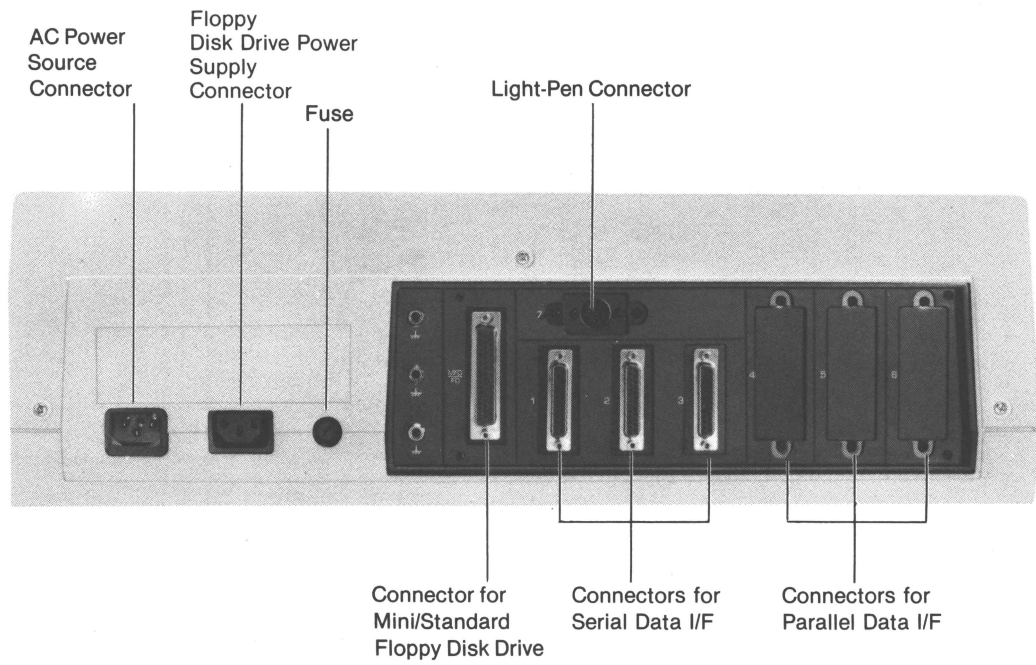
III. SYSTEM OUTLINE

The CX-1 employs the Floppy Disk Operating System making it possible to perform various functions with simple operations. This chapter outlines the CX-1 System and the fundamental rules for operating the CX-1 properly.

1. Operating System

The operating system is a monitoring program that connects the user with the CX-1 for simple and effective use so that the user can take advantage of its various functions. The system stores this monitoring program on the mini-floppy disk and loads the program into the memory of the CX-1 when necessary.

The CX-1's operating system is called the "Monitor Program for the Canon X-Series (abbreviated MCX)." The disk that stores this MCX is called the "System Disk". Unless this System Disk is set into Drive 0 (lower deck), the CX-1 cannot perform its functions.

USER — Operating System — Hardware / Software
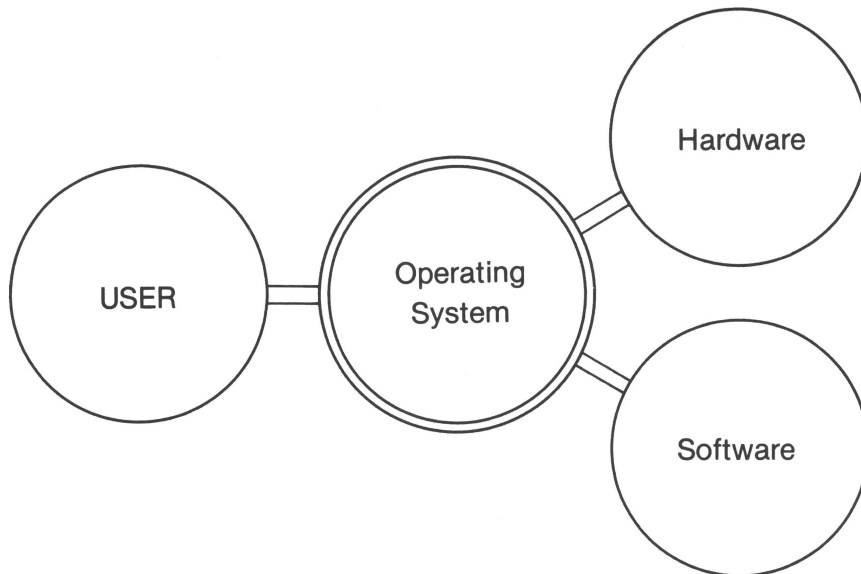
2. Starting the System

It is necessary to set the system disk into Drive 0 before the power is turned ON. After the power is turned ON, the CX-1 automatically loads the part of the MCX necessary for operation (called the "resident portion") from the disk to the main memory. After performing self-diagnosis of its respective functions, if no malfunction is found, the CX-1 is ready for normal use.

Set the System disk into Drive 0.

→
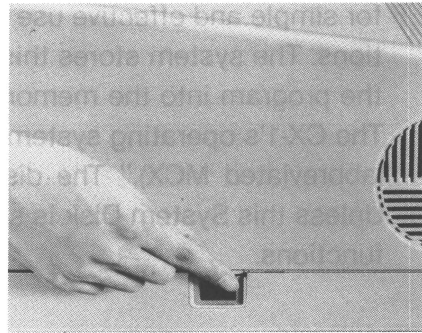
Turn the power ON.

3. System Control

The instructions for controlling the CX-1 consist of statements in BASIC programs and commands which are entered independently through the keyboard.

The statements in the BASIC program are automatically executed one by one. Commands are independently executed through the keyboard and are used to start program execution, edit programs, and perform other functions.

These instructions control the CX-1 through the MCX and are divided into keywords which indicate functions, and operands which indicate the elements necessary to execute the function. Each statement must include a keyword and an operand as shown below.

[Ex.]   [R] [U] [N] [SPACE] ([Drive]) ([Program name])

         Keyword   Operand

The syntax of BASIC statements used in programs is described in the "BASIC Language Manual" and the syntax of commands is described in Chapter IV "BASIC OPERATIONS 2. Command Operation" of this manual.

4. Modes

The CX-1 functions in two modes, the Operating mode for program execution and the Programming mode for program editing and correction.

○ **Operating Mode**

In the Operating mode, the program is executed or the CX-1 is operated by commands. Depress the [OPE] key, the lamp lights, and $□ (cursor) appears on the CRT screen as shown below. This is called the "command-awaiting state" and it is now possible to start program execution or operate the CX-1 by entering commands. When the program is being executed, the entire screen is used for data output.

$□
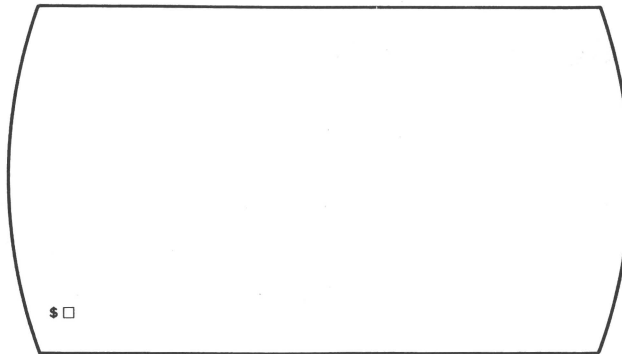
* If the CX-1 is set in the Programming mode, simply depress the [OPE] key to release the Programming mode and change it to the Operating mode.

○ Programming Mode

The Programming mode is used for the following:

[Program Editing]

When editing a program, the Line Number is displayed as shown below.

```
         BASIC  PROGRAM  EDIT  AAA




 10 □
```
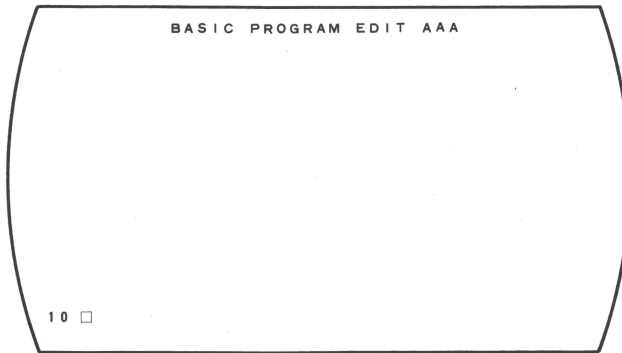
[Program Correction]

When correcting the existing program, %□ is displayed as shown below.

```
         BASIC  PROGRAM  EDIT  AAA
 10 · · · ·





 180  · · ·
 %□
```
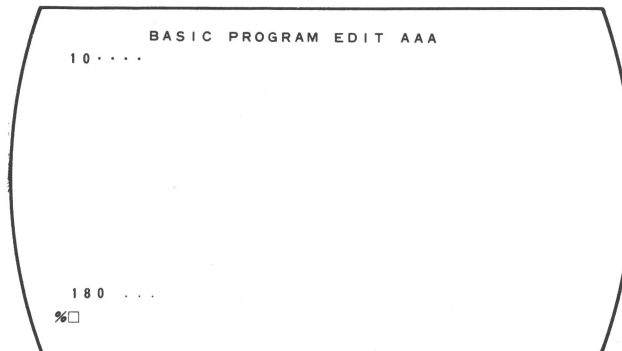
In both program editing and correction, the 🔲 lamp lights. To change from the Operating mode to the Programming mode, use the 🔲 key.

5. Files

The file is used as a unit of data and programs recorded on the disk. It can consist of a program or a group of data items and has its own name.

A file consisting of a single program is called a "program file", and a file consisting of a single group of data items is called the "data file".

This unit is used when loading a program on the disk into the memory or when saving the program onto the disk from the memory.

Capital alphabetic letters numbers can be used as file names, expressed in maximum of 6 characters starting with a capital letter.

○ **Program File**

The program file consists of a program written in BASIC Language, and the file name has the same meaning as that of the program name.

The program file name (program name) is written as follows:

FD1 : AAAAAA . BAS

— On the disk in Drive 1
(When using Drive 0, FD0: can be omitted.)

— BASIC Language

— Program "AAAAAA"
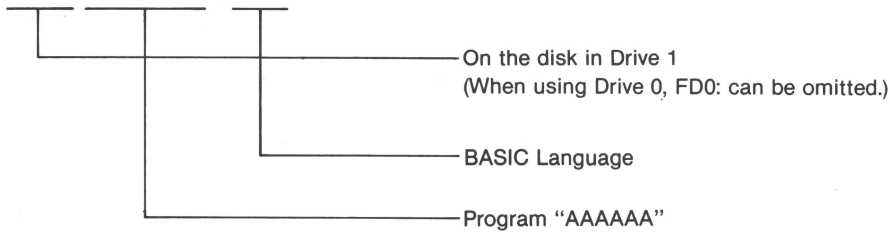
○ **Data File**

The data file consists of a series of data items used in BASIC programming. The data file name is written as follows:

FD0 : XXXXXX . DAT

— On the disk in Drive 0

— File name "XXXXXX"

— Data group
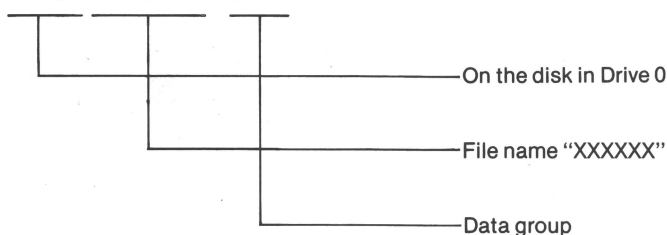
* FD0: is a code for controlling Drive 0 by the MCX; the code for Drive 1 (upper deck) is FD1:.

○ **File Specification**

When the program file is specified by the operand of a command, FD0: and BAS in the program name can be omitted.

When specifying the disk in Drive 1, use the name FD1: [Program name].

6. Priority Program

When program name specification is required during various command operations, omission of the program name will automatically specify the priority program stored in the memory.

The priority program usually means the leading program in the memory, but the priority shifts in the following cases:

1) Immediately after program execution, the program just executed becomes the priority program.
2) Immediately after program editing or correction, the program just edited or corrected becomes the priority program.

In the above cases, the priority remains the same until the next program is executed, edited, or corrected.

7. Test-Run Program

A test-run program is stored on the system disk to check the function of the CX-1 and its peripheral devices.

This test program is different from the self-diagnosis function which operates when the power is turned ON.

Run this test program before using your CX-1 to check for malfunctions that may have developed during transit. Use this program periodically to make sure that your CX-1 is operating correctly.

[How to Use the Test-Run Program]
1. Make sure the CX-1 is set in the Operating mode.
2. ⟨x⟩⟨T⟩⟨E⟩⟨S⟩⟨T⟩ [RETURN] or [START]
3. The test menu is displayed.

```
XTEST  MENU

1  KEY=CX—1/BX-3

2  KEY=X—8300/X—8330  FD2

3  KEY=X—8300/X—8330  FD3

4  KEY=PW—80

5  KEY=PT—80


SELECT  TEST  NO.?□
```

4. Select Test Number

(1) For the CX-1

  1) **[1]** **[RETURN]** or **[START]**

  2) The Character Table will be displayed as shown below.

  3) The time will be displayed at one second intervals for 10 seconds and the buzzer will sound each second.

  4) The buzzer will sound at the end of 10 seconds, "END" is displayed, and the CX-1 returns to the normal condition. When the test is complete, the CX-1 returns to the command-awaiting state.

(2) For X-8300 and X-8330 Disk Drive Units

  1) Set a disk with more than one empty track into the drive to be tested.

  2) FD2 ... **[2]** **[RETURN]** or **[START]**

  FD3 ... **[3]** **[RETURN]** or **[START]**

  3) The following will be displayed:

  X-8300/8330 FD2 (or FD3)

  4) When "END" is displayed, the drive unit is in the normal condition, and the CX-1 returns to the command-awaiting state.

(3) For PW-80 and PT-80 Printers

  1) PW-80 ... **[4]** **[RETURN]** or **[START]**

  PT-80 ... **[5]** **[RETURN]** or **[START]**

  2) The Character Table will be printed.

  3) When the PW-80 or PT-80 test is complete, the CX-1 returns to the command-awaiting state.

Character Table
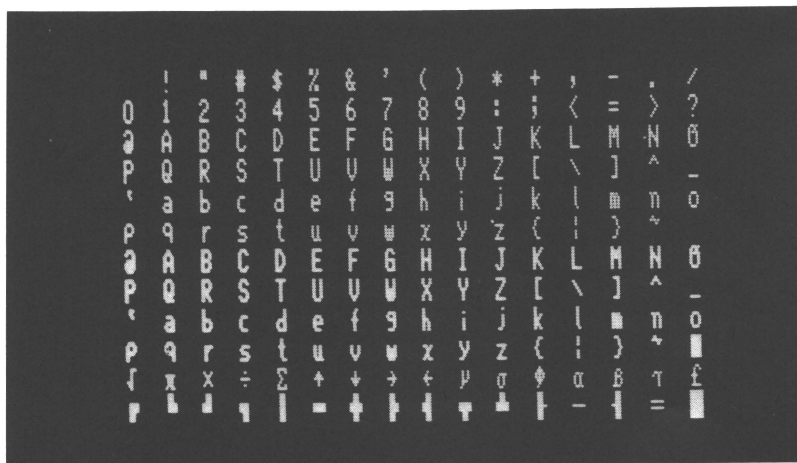
IV.   BASIC OPERATIONS

1. Initial Operation

CX-1 operations are outlined in the flowchart below:

```
                              ┌──────────────────┐
                              │ Set system disk  │  ❶
                              │  into Drive 0    │
                              └──────────────────┘
                                      │
                                      ▼
                              ┌──────────────────┐
                              │   Turn power     │  ❷
                              │   switch ON      │
                              └──────────────────┘
                                      │
                                      ▼
                              ┌──────────────────┐
                              │  Self diagnosis  │  ❸
                              └──────────────────┘
                                      │                ┌──────────────────┐
                                      │                │   Turn power     │
                                      │                │   switch OFF     │
                                      │                └──────────────────┘
   ❻                                  ▼
┌──────────────┐            ┌──────────────────┐
│ Programming  │ ◄──────────│  Operating mode  │◄──────────┐
│    mode      │            └──────────────────┘           │
└──────────────┘              │      ▲    ▲                 │
     │                        │      │    │        ┌──────────────────┐
  ┌──┴──┐                     ▼      │    │        │    Command       │  ❹
  ▼     ▼                            │    │        │    operation     │
┌────────┐ ┌────────────┐            │    │        └──────────────────┘
│Program │ │  Program   │            │    │
│editing │ │ correction │            │    │
└────────┘ └────────────┘            │    │
                          ┌──────────────────┐
                        ❺ │ Program execution│
                          └──────────────────┘
```
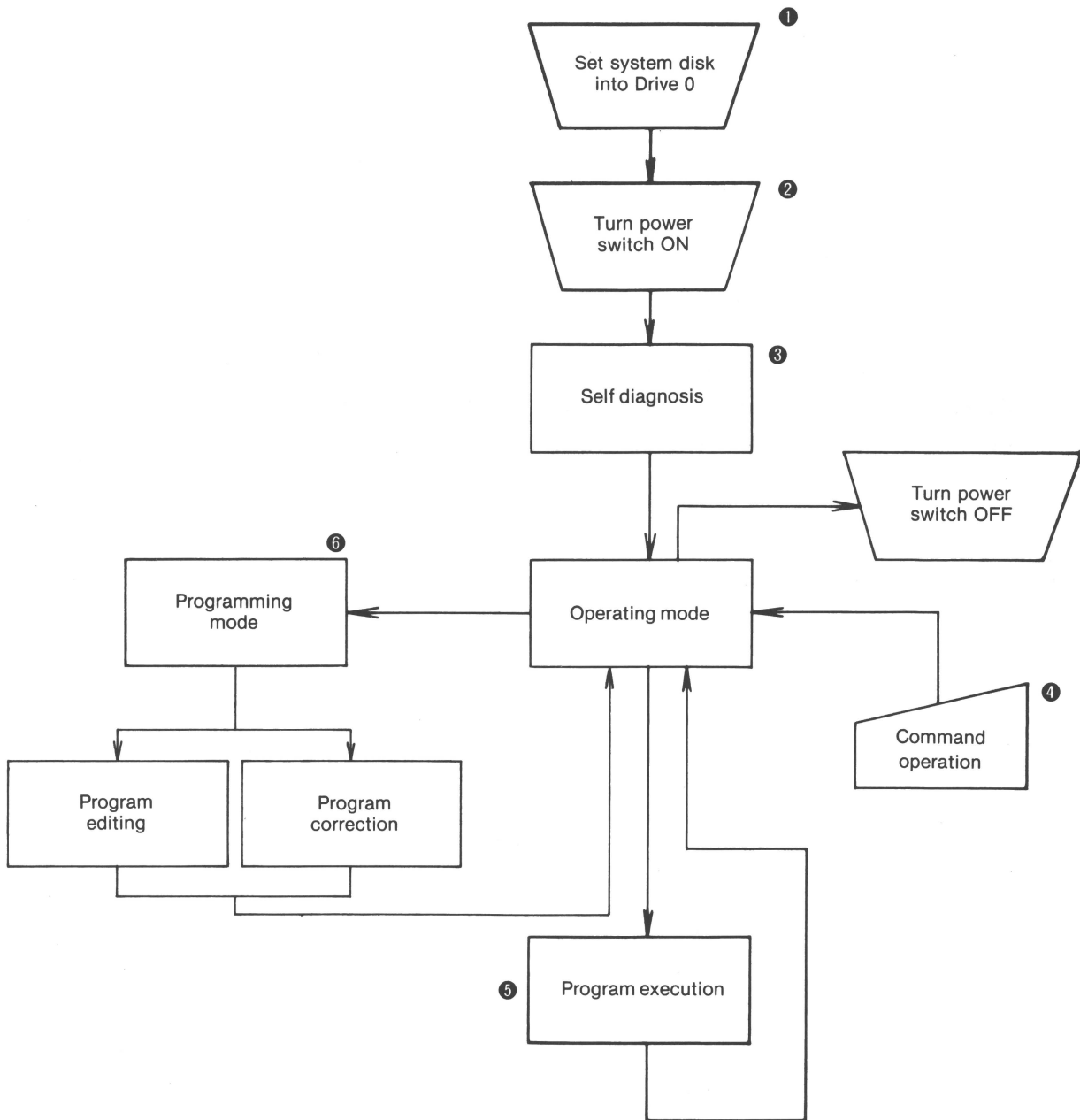
❶ Be sure to set the system disk into Drive 0 before turning the power switch ON.

❷ Turn the power switch ON.

❸ The self-diagnostic function of the CX-1 automatically checks for malfunctions.

If no malfunction is found after checking, the display will change as shown below, and the CX-1 enters the command-awaiting state.

```
MCX  BASIC  VCI . 0C




$□
```
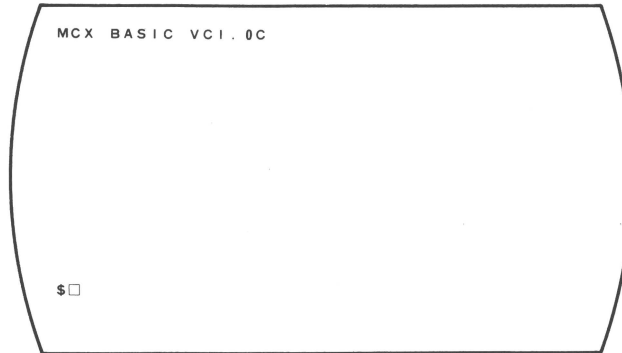
❹ Refer to the Chapter IV "Command Operation".

❺ Refer to the Chapter V "PROGRAMMING OPERATION".

❻ Refer to the Chapter VI "PROGRAM EXECUTION".

2. Command Operation

A "command" is an instruction which is entered directly through the keyboard and separate from program execution statement, that causes the CX-1 to perform various functions. Like the program statement, the command has grammar and performs various operations by changing its parameter (all elements following the keyword).

Commands are divided into three broad groups. The first group of commands is related to program execution, the second is related to program editing and correction, and the third is related to the disk. Command operations are explained later in this chapter.

(1) Command-Awaiting State

Command entry is possible when the cursor is at the "$" display located at the left end of the second line from the bottom of the CRT screen.

23rd line ⟶ $□
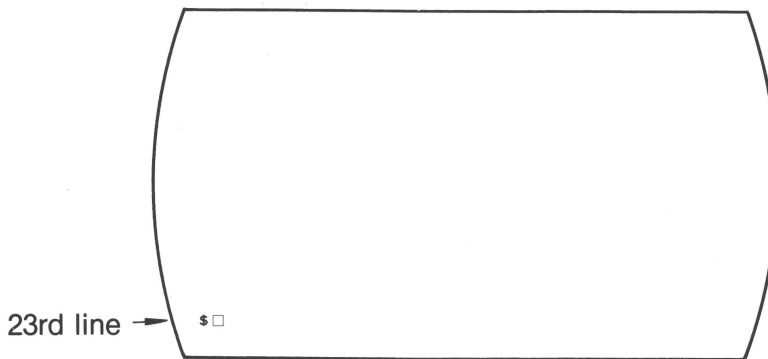
(2) Basic Grammar

Each command has its own grammar and entry rules, which are shown below with the command description and basic grammar common to all commands.

[Command name] SPACE ([Drive]) ([Program name]) ([Add. parameter])

[Ex.]

S A V E SPACE ([Drive]) ([Program name]) RETURN or START

ESC SAVE

• The part in parentheses may be omitted.

• Finally, depress the RETURN or START key.
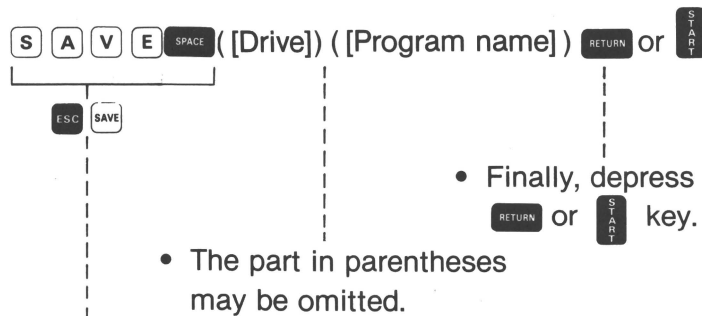
• This indicates that the same result is obtained by the ESC SAVE key operation ("one key, one instruction" function).

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(3) Omission of Program and Drive Names

Some commands require program and drive name specification but these names may be omitted as indicated in Chapter III, "System Outline".

- Omission of Program Name

  This has the same effect as specifying the priority program in the memory.

- Omission of Drive Name

  This has the same effect as specifying Drive 0 (FD0:).

2-1 Program Execution-Related Commands

This command group is required for program execution and its configuration is shown below:

Disk

MEMORY

Program

• LOAD
  ... Loads program from disk to memory.
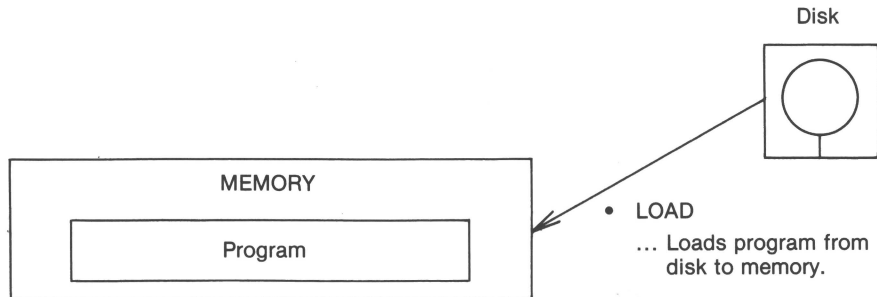
- • OPE ... Sets the CX-1 in the Operating mode.
- • RUN ... Starts program execution.
- • NEW ... Deletes data and programs in the memory.

❶ **OPE Command (Operation)**

  ○ Sets the CX-1 in the Operating mode.
  ○ At the time of power ON, the CX-1 is automatically set in the Programming mode. This command releases the Programming mode and places the CX-1 in the Operating mode.

OPE

  ○ The OPE key is effective only in the Programming mode with the %■ display.
  ○ In the Operating mode, the OPE lamp lights and $■ is displayed.

[Ex.]

<Key Operation>   <CRT Display>

```
 ┌─────────────────────────────────────┐
 │        BASIC  PROGRAM  EDIT  AAA     │
 │  1 0 · · ·                          │
 │       ·                             │
 │       ·                             │
 │       ·                             │
 │       ·                             │
 │                                     │
 │                                     │
 │  1 0 0  □                           │
 └─────────────────────────────────────┘
```

[RETURN] or [START]

```
 ┌─────────────────────────────────────┐
 │        BASIC  PROGRAM  EDIT  AAA     │
 │  1 0 · · ·                          │
 │                                     │
 │                                     │
 │                                     │
 │                                     │
 │                                     │
 │  % □                                │
 └─────────────────────────────────────┘
```

[OPE]

```
 ┌─────────────────────────────────────┐
 │        BASIC  PROGRAM  EDIT  AAA     │
 │  1 0 · · ·                          │
 │                                     │
 │                                     │
 │                                     │
 │                                     │
 │                                     │
 │  $ □                                │
 └─────────────────────────────────────┘
```

$\left(\begin{array}{c} \text{[OPE]} \\ \text{lamp on} \end{array} \right)$
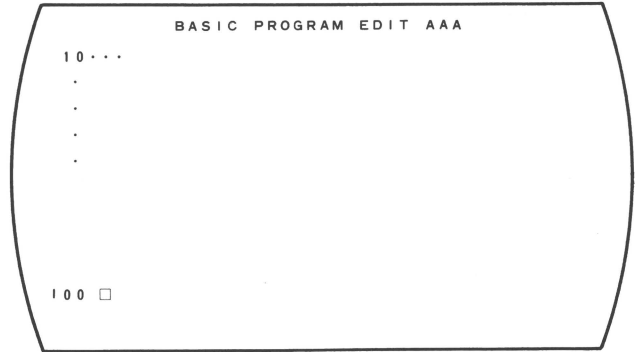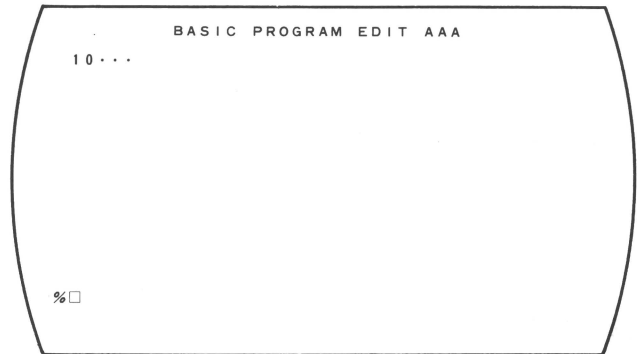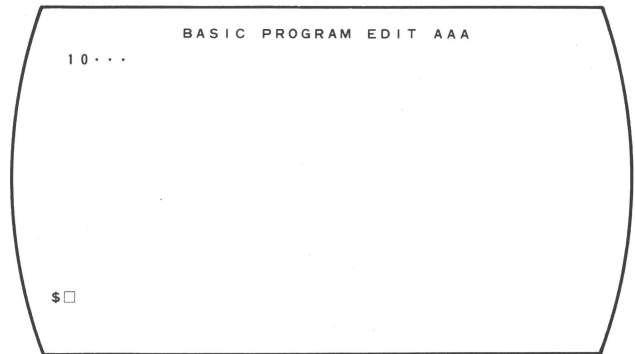
❷ LOAD Command (Load)

○ Loads the program from the disk into the memory.

○ Used for loading when no program execution is required, for example when LIST and XREF (explained later) are used.

○ The LOAD command cannot be executed when the memory is full.

[L] [O] [A] [D] [SPACE]([Drive]) [Program name] [RETURN] or [START]

○ A specified program is loaded from the disk in the specified drive into the memory.

○ When [Drive] is omitted, Drive 0 is automatically specified.

[Ex.]

                \<Key Operation\>   \<CRT Display\>

• Load program "AAA" from the disk in Drive 0.

[L] [O] [A] [D] [SPACE] [A] [A] [A]

[RETURN] or [START]

```
$LOAD AAA




$□
```

[Ex.]

                \<Key Operation\>   \<CRT Display\>

• Load program "AAA" from the disk in Drive 1.

[L] [O] [A] [D] [SPACE] [F] [D] [1] [:]

[A] [A] [A] [RETURN] or [START]

```
$LOAD FD1:AAA




$□
```

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❸ RUN Command (Run)

○ Starts program execution.

○ If the memory does not contain the program specified, the program is automatically loaded from the disk into the memory.

○ This command cannot be executed unless there is a vacant area in memory for loading the program.

R U N SPACE ([Drive]) ([Program name]) LINE FEED or START

○ If the program name is omitted, the priority program in the memory is executed.

○ If [Drive] is omitted during automatic loading from the disk sheet, Drive 0 is automatically specified.

[Ex.]

<Key Operation>

• Execute the priority program.

R U N RETURN or START

[Ex.]

<Key Operation>

• When program "AAA" is not in the memory.

R U N SPACE A A A

RETURN or START

The program is loaded from the disk in Drive 0 and executed.

[Ex.]
<Key Operation>

• When program "BBB" on the disk in Drive 1 is to be executed.

[R] [U] [N] [SPACE] [F] [D] [1] [:]
[B] [B] [B] [RETURN] or [START]

The program "BBB" is loaded from the disk in Drive 1 and executed.

❹ NEW Command (New)
○ Deletes all the contents of the program and data memory and returns the memory to its original state after power ON.
○ This command is used to delete an unnecessary program from the memory when a new, larger program is to be executed. (It may be used for instance, when the memory is full and the LOAD command cannot be executed.)

[N] [E] [W] [RETURN] or [START]
[ESC] [NEW]

[Ex.]

<Key Operation>

[N] [E] [W] [RETURN] or [START]

<CRT Display>

$□
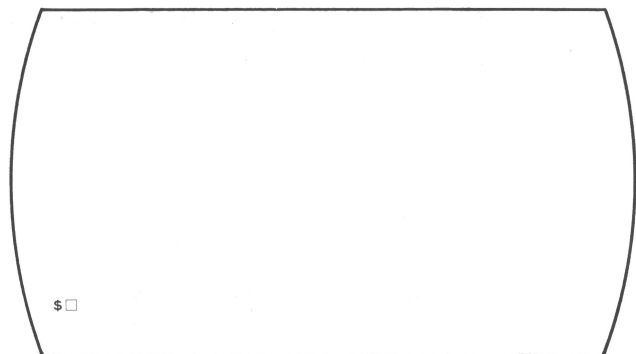
2-2 Programming-Related Commands

This command group is used for operations necessary for editing and correcting programs and its entire configuration is shown below:

Disk

CRT

Memory

Program

- LIST
  ... Outputs the program contents.

- SAVE
  ... Saves the program to the disk.

- SECURE
  ... Secures-sets the program.

- NONSEC
  ... Secures-resets the program.

- XREF
  ... Outputs the name of the variables which are used in the program.

- PROG
  ... Sets the CX-1 in the Programming mode.

---
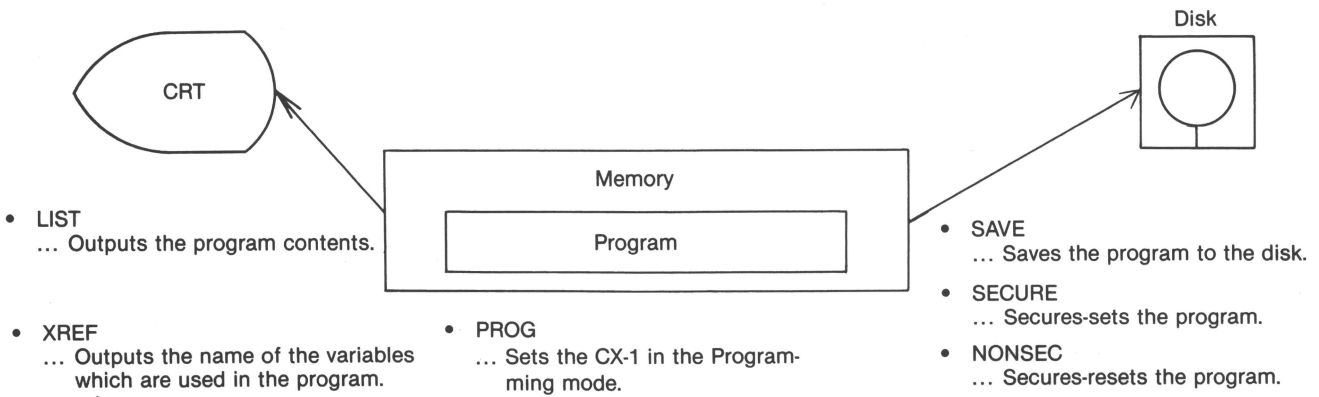
⑤ PROG Command (Program)

○ Sets the CX-1 in the Programming mode.

○ Use the exclusive-use [PROG] key.

[PROG] ([Drive]) ([Program name]) [RETURN] or [START]

○ The [PROG] lamp lights, and "BASIC PROGRAM EDIT" is displayed on the screen.

○ For further details see Chapter V "PROGRAMMING OPERATION".

[Ex.]

        <Key Operation>   <CRT Display>

[PROG] [A] [A] [A] [RETURN] or [START]

```
BASIC PROGRAM EDIT AAA




10 □
```

⑥ SECURE Command (Secure)

○ The SECURE command provides system security and protects the program soft ware. After the program is secured, the Programming mode, DCOPY Command, LIST command XREF command, and SAVE command cannot be used with the program on the disk. The SECURE command prevents the following:

- Re-writing the program
- Outputting the contents of the program
- Saving the program on the disk

○ For secure-set, a password (secret code) of 6 characters or less must be specified. Without this password, secure-reset (to release the secure function) is impossible.

[S][E][C][U][R][E][SPACE] ([Drive]) [Program name]

[RETURN] or [START]

☆ The following message is displayed.
PASSWORD?

[Password]   [RETURN]   or   [START]

○ When [Drive] is omitted, the program on the disk in Drive 0 (FD0:) automatically becomes the object of the SECURE command.

[Ex.]

<Key Operation>   <CRT Display>

- Secure-set program "AAA" on the disk in Drive 0.

[S][E][C][U][R][E][SPACE][A][A][A]

[RETURN] or [START]

```
$SECURE AAA
  PASSWORD ? □
```

- Enter the password.

[C][A][N][O][N][RETURN] or [START]

```
$SECURE AAA
  PASSWORD ? CANON
  SECURE COMPLETED




$□
```

- Secure-set is complete.

* When PROG, SAVE, DCOPY, XREF, and LIST commands are used with the program that has been secure-set by the SECURE command, they cannot be executed and "SECURED PROGRAM" is displayed.
* When a SECURE command is used on a program which has been secure-set, the following message is displayed: "ALREADY SECURED".

❼ NONSEC Command (No Secure)
   ○ Secure-reset releases the program from the SECURE function.
   ○ Secure-reset is impossible without using the password which was specified at the time of secure-set.

[N][O][N][S][E][C][SPACE] ([Drive][:]) [Program name]
                         [RETURN] or [START]

☆ The following message is displayed.
   OLD PASSWORD?
   [Password]   [RETURN]   or [START]

   ○ When [Drive] is omitted, the program on the disk in Drive 0 (FD0:) is the object of the NONSEC command.

[Ex.]

<Key Operation>

[N][O][N][S][E][C][SPACE][A][A][A]
         [RETURN] or [START]

* Enter the password specified at the time of secure-set.

[C][A][N][O][N] [RETURN] or [START]

<CRT Display>

```
$NONSEC AAA
  OLD  PASSWORD ? □
```

```
$NONSEC AAA
  OLD  PASSWORD ? CANON
  NONSEC  COMPLETED




$□
```

* Secure-reset is complete.

* If the wrong password is used, the following message is displayed: "PASSWORD NOT RIGHT".

❽ SAVE Command (Save)

      ○ Saves the program in the memory to the disk.

      ○ If there is no program in the memory, this command cannot be executed.

[S] [A] [V] [E] [SPACE] ([Drive] [:]) ([Program name])
   [ESC] [SAVE]   [RETURN] or [START]

☆ The following confirmation message is displayed:

    SAVE TO FD0: AAA   BAS (Y/N)?
    (Y is "Yes": Saves, N is "No": Does not save)

[Y] [RETURN] or [START] ([N] [RETURN] or [START])

      ○ The specified program (having [Program name]) is saved on the disk in the drive ([Drive]).

      ○ If the [Program name] is omitted, the priority program in the memory will automatically be the object of the SAVE command.

      ○ When [Drive] is omitted, the program is saved on the disk in Drive 0 (FD0:).

      ○ The SAVE command cannot be used with the secured program.

    [Ex.]

                <Key Operation>   <CRT Display>

        [S] [A] [V] [E] [SPACE] [A] [B] [C]
              [RETURN] or [START]

```
$SAVE ABC
 SAVE TO FD0:AAA    .BAS (Y/N) ?□
```

        • Yes

          [Y] [RETURN] or [START]

```
$SAVE ABC
 SAVE TO FD0:AAA    BAS (Y/N) ?Y




$□
```

       * If [N] is chosen, the CX-1 returns to the command-awaiting state without execution.

○ When the original program is still on the disk after the program has been corrected, the machine asks if the old program should be deleted and if the new program should be saved.

[Ex.]

<Key Operation>

[S] [A] [V] [E] [SPACE] [A] [B] [C]
[RETURN] or [START]

<CRT Display>

```
$SAVE ABC
  SAVE TO FD0:ABC    .BAS(Y/N)?□
```

• Yes

[Y] [RETURN] or [START]

```
$SAVE ABC
  SAVE TO FD0:ABC    .BAS(Y/N)?Y
  CANCEL OLD FD0:ABC    .BAS(Y/N)?□
```

• May the old file be deleted? → Yes

[Y] [RETURN] or [START]

* If [N] is chosen, the CX-1 returns to the command-awaiting state without execution.

```
$SAVE ABC
  SAVE TO FD0:ABC    .BAS(Y/N)?Y
  CANCEL OLD FD0:ABC    .BAS(Y/N)?Y



$□
```

❾ LIST Command (List)

○ Outputs the size and contents of the specified program.

○ Can specify the range of lines to be outputted.

○ If the program is not in the memory, load programs from the disk into the memory using the LOAD command. Unless programs are loaded in the memory, the LIST command cannot be executed.

○ The LIST command cannot be used with the secured program.

[L] [I] [S] [T] [SPACE] ([Program name]) ([SPACE] ([Starting Line No.]) ([,] [Ending Line No.]))

[ESC] [LIST]   [RETURN] or [START]

○ If [Program name] is omitted, the priority program in the memory is the object of the LIST command.

○ If the program exceeds 19 lines, only the last 21 lines will be displayed by the scroll function.

Line Specification

Line specification is as shown below. (In the example below, the program name is omitted)

○ LIST 10 ....Only Line 100 is listed

○ LIST 10, 100 ....Lines 10 to Line 100 are listed.

○ LIST 10, 300 ....The 21 lines above Line 300 are listed.

○ LIST ,,150...............The first line to Line 150 are listed.

○ LIST 100, ...Line 100 to the last line are listed.

When over 21 lines are specified, the 21 lines above the last specified line are listed.

[Ex.]   \<Key Operation>   \<CRT Display>

• List all the program lines from start to end.

[L] [I] [S] [T] [SPACE] [A] [A] [A]

[RETURN] or [START]

```
$LIST AAA
AAA  .140
10
 .              ───────── Program size
 .
 .
 .

180 END
$□
```
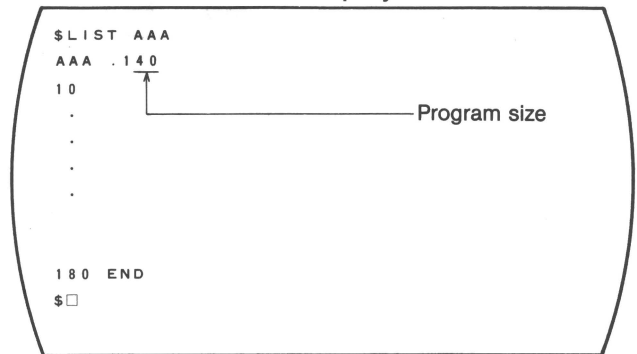
When the program lines exceed 19 lines, the list is displayed as below by scroll.

```
220···
 .
 .
 .
 .

420 END
$□
```
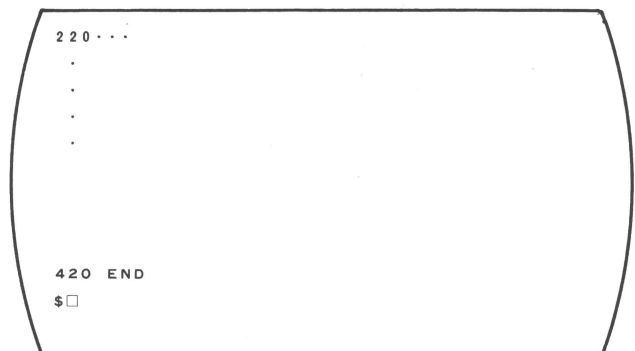
[Ex.] Line Specification

• List from the Line 140.

[L] [I] [S] [T] [SPACE] [A] [A] [A] [SPACE]

[1] [4] [0] [,] [3] [2] [0] [RETURN] or [START]

```
$LIST AAA 140.320
AAA···
140···
 .
 .
 .
 .
320···
$□
```

49
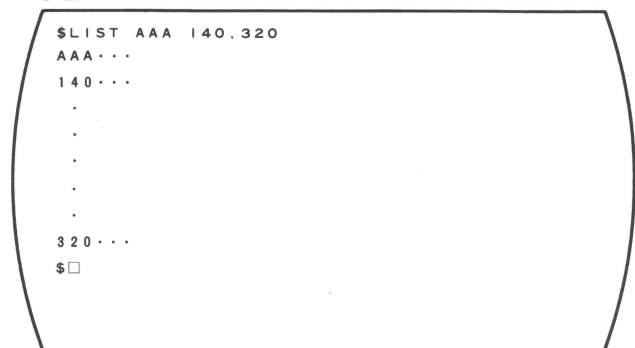
⑩ XREF Command (Cross Reference)

- ○ Lists the names of variables used in the specified program and the line numbers where they are used. Load the program from the disk into the memory using the LOAD command.
- ○ The XREF command cannot be executed unless the program is loaded in the memory.
- ○ The XREF command cannot be used with the secured program.

```
X R E F SPACE ( [Program name] ) RETURN or START
         ESC XREF
```
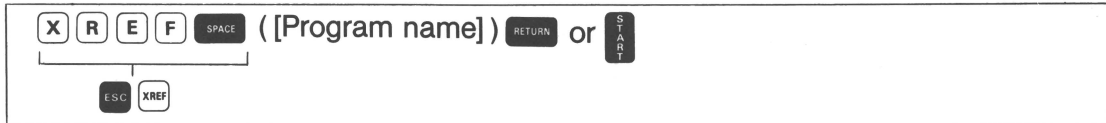
- ○ When the [Program name] is omitted, the priority program in the memory is the object of the XREF command.

[Ex.]

<Key Operation>

```
X R E F SPACE A A A
        RETURN or START
```

<CRT Display>

```
$XREF AAA
X    40 60 60 70 200
Y    40 70 70 70 200
Z    50 100




$□
```
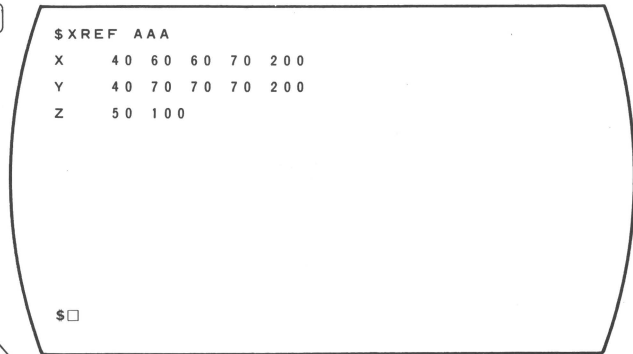
```
$XREF AAA
  X     40  60  60  70  200  ← Variable X is used
  Y     40  70  70  70  200     on Lines 40, 60, 70
  Z     50  100                  and 200.
```

Variable X is used twice on Line 60.

In program AAA, variables X, Y, and Z are used.

2-3   Disk-Related Commands

This command group includes commands to the disk in the drive. The entire configuration of this command group is shown below.

°DLIST
...Lists file names and the portion of the disk that has been used.

°CANCEL
...Deletes the file on the disk.

°DCOPY
...Copies the contents of the disk onto another disk.
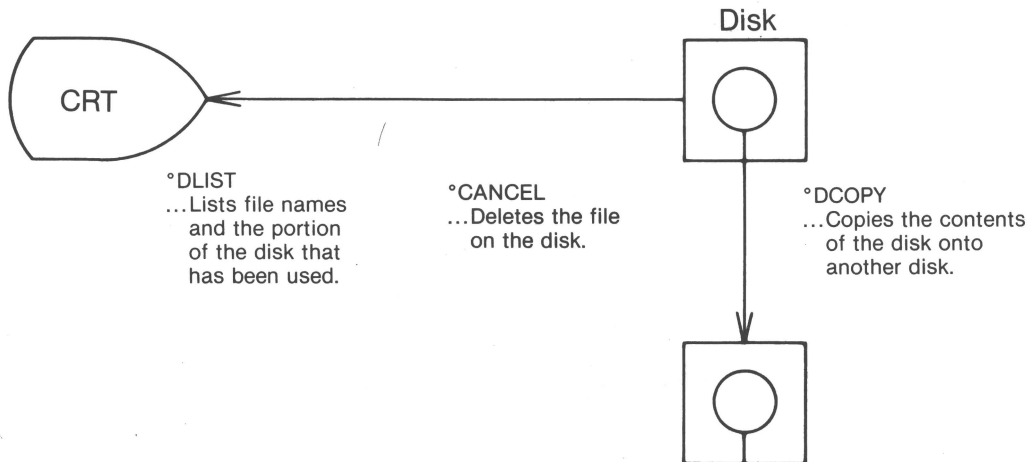
⓫ DLIST Command (Disk List)

○ Lists the name and size (in bytes) of the specified file.

D L I S T RETURN or START

☆ "FILE   ?" is displayed.

([Drive]) [File name] RETURN or START

How to specify the file name

[Ex.]

1 AAA.BAS ....Lists the name and size of program AAA on the disk in Drive 0.
2 *.BAS ....Lists the name and size of all program files on the disk in Drive 0.
3 *.SYS ....Lists the name and size of all system programs on the disk in Drive 0.
4 *.DAT ....Lists the name and size of all data files on the disk in Drive 0.
5 *.* ....Lists the name and size of all files on the disk in Drive 0.
6 FD1: ABC.BAS ...Lists the name and size of program ABC on the disk in Drive 1.

○ When [Drive] name is omitted, Drive 0 (FD0:) is specified.
○ "*" means "All".

[Ex.] <Key Operation>   <CRT Display>

`D` `L` `I` `S` `T` `RETURN` or `START`

```
FILE ?  □
```

`*` `.` `B` `A` `S` `RETURN` or `START`

```
FILE ?  *.BAS
         FILE  NAME              SIZE

FD0 : ABC      . BAS      1250
FD0 : XXX      . BAS       780      SECURE
.........................................
     TOTAL              5430



$□
```

Total of all files   Indicates
on the disk.   program secured.

---
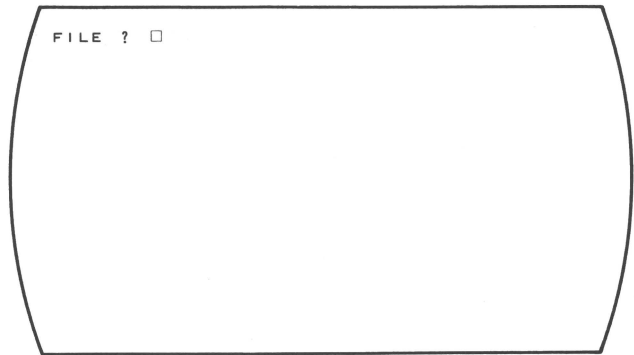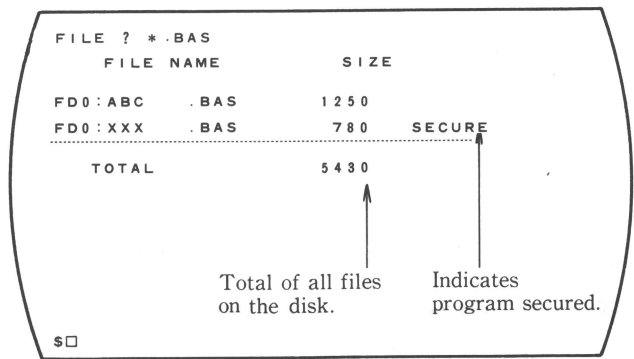
⑫ CANCEL Command (Cancel File)

○ Deletes the specified program file or data file from the disk.

`C` `A` `N` `C` `E` `L` `SPACE` ([Drive]) [File name] (`.` `D` `A` `T`) `RETURN` or `START`

`ESC` `CANCEL`

☆ The following confirmation message is displayed:

FD0: <u>AAA. BAS</u> CANCEL (Y/N)?
   └ File name
(Y is "Yes": Deletes; N is "No": Does not delete.)

`Y` `RETURN` or `START`   (`N` `RETURN` or `START`)

○ To delete the data file, enter `.` `D` `A` `T` after the [File name].
○ When the [Drive] is omitted, the file on the disk in Drive 0 (FD0:) is automatically specified.

[Ex.] Deletion of program file

<Key Operation>

<Display>

• Program file AAA

[C] [A] [N] [C] [E] [L] [SPACE] [A] [A] [A]

[RETURN] or [START]
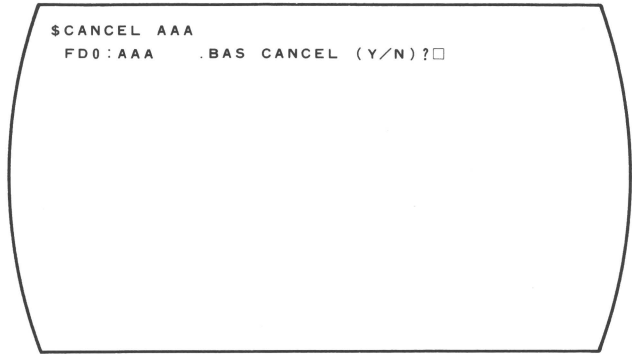
```
$CANCEL AAA
 FD0:AAA    .BAS CANCEL (Y/N)?□
```

• Yes

[Y] [RETURN] or [START]

```
$CANCEL AAA
 FD0:AAA    .BAS CANCEL (Y/N)?Y
 FD0:AAA    .BAS CANCELED




$□
```
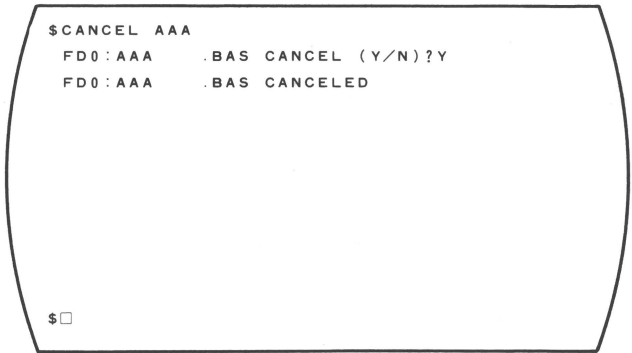
*If [N] is chosen, the CX-1 automatically returns to the command-awaiting state.

[Ex.] Deletion of data file

<Key Operation>

<CRT Display>

•Data File AAA

[C] [A] [N] [C] [E] [L] [SPACE] [A] [A] [A] [•] [D] [A] [T]

[RETURN] or [START]
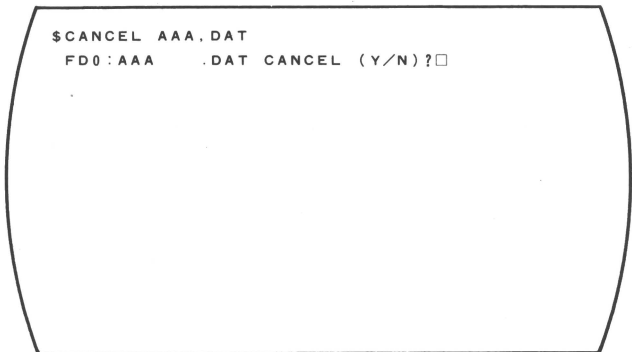
```
$CANCEL AAA.DAT
 FD0:AAA    .DAT CANCEL (Y/N)?□
```

○ Yes

[Y] [RETURN] or [START]

```
$CANCEL AAA.DAT
  FD0:AAA     .DAT CANCEL  (Y/N) ?Y
  FD0:AAA     .DAT CANCELED


$□
```

*If [N] is chosen, the CX-1
automatically returns to
the command-awaiting state.

* [File name]. BAS indicates the program file; [File name]. DAT indicates the data file.

⓭ DCOPY Command (Disk Copy)

○ Copies the program file and the data file onto the other disk.
○ The DCOPY command cannot be used with the secured program.

[D][C][O][P][Y] [RETURN] or [START]

☆ "FILE   ?" is displayed.

[File name][,][Drive] ([,][U][P][D])[RETURN] or [START]

How to specify the file name
[Ex.]

1 FD0: ABC.BAS, FD1: …Copies the program ABC on the disk in Drive 0 onto the disk
                in Drive 1 remaining the same name.
2 FD0:*.BAS,FD1: ………Copies all of the program files on the disk in Drive 0 onto
                the disk in Drive 1 retaining the same name.
3 FD0: *.* FD1: …………Copies all of the system program files on the disk in Drive 0
  (FD0: , FD1:)   onto the disk in Drive 1.
   ○ Drive is specified by FD0: or FD1:.
   ○ "*" means or "All".
   ○ When the file has the same name as that of the specified file, ",UPD" is used as
     described below.
     1) When ",UPD" is specified, the old file is deleted and the new file is copied.
     2) The new file cannot be copied unless ",UPD" is specified.

Note: When it is necessary to copy only the system programs from a disk that includes other programs, use the DCOPY command with specification as shown below.

FD0: START. COM, FD1:
FD0: *. SYS, FD1:
FD0: *. CX-1, FD1:
FD0: BASINT. STD, FD1:
FD0: DLIST. BAS, FD1:
FD0: DCOPY. BAS, FD1:
FD0: XTEST. BAS, FD1:
FD0: XTEST1. BAS, FD1:
FD0: XTEST2. BAS, FD1:

<Key Operation>

[D] [C] [O] [P] [Y] [RETURN] or [START]

<CRT Display>

```
FILE? □
```
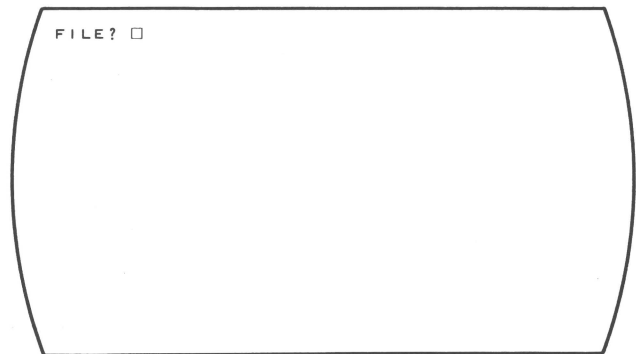
[F] [D] [0] [:] [X] [X] [X] [.] [B] [A] [S] [,]
[F] [D] [1] [:] [RETURN] or [START]

```
FILE ? FD0:XXX.BAS, FD1:
COPY   FD0:XXX   .BAS TO FD1:XXX   .BAS 1256
COPY COMPLETED                              ↑
                                        File size




$□
```

<Key Operation>   <CRT Display>
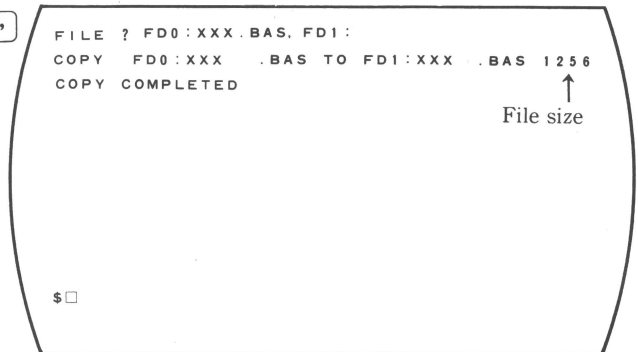
[D][C][O][P][Y][RETURN] or [START]

```
FILE ?  □
```

[F][D][0][:][,][F][D][1][:][RETURN] or [START]

```
FILE ?  FD0:,FDI:
COPY FD0:XXX    ·SYS TO  FDI:XXX    ·SYS    270
      .
      .
      .
      .
      .
COPY  COMPLETED


$□
```

2-4 Other Commands

The OPEN command is used when an external peripheral device is connected and the PRINT command is used for output of the value of variables or the result of manual calculation. The END command ends the program execution.

○ PRINT
  ... Outputs the value of the variable during program execution or the result of manual calculation.

CRT

MEMORY

Program

External Printer

○ OPEN
  ... Defines the Logical Device No. to the external peripheral device.
○ END
  ... Ends program execution.
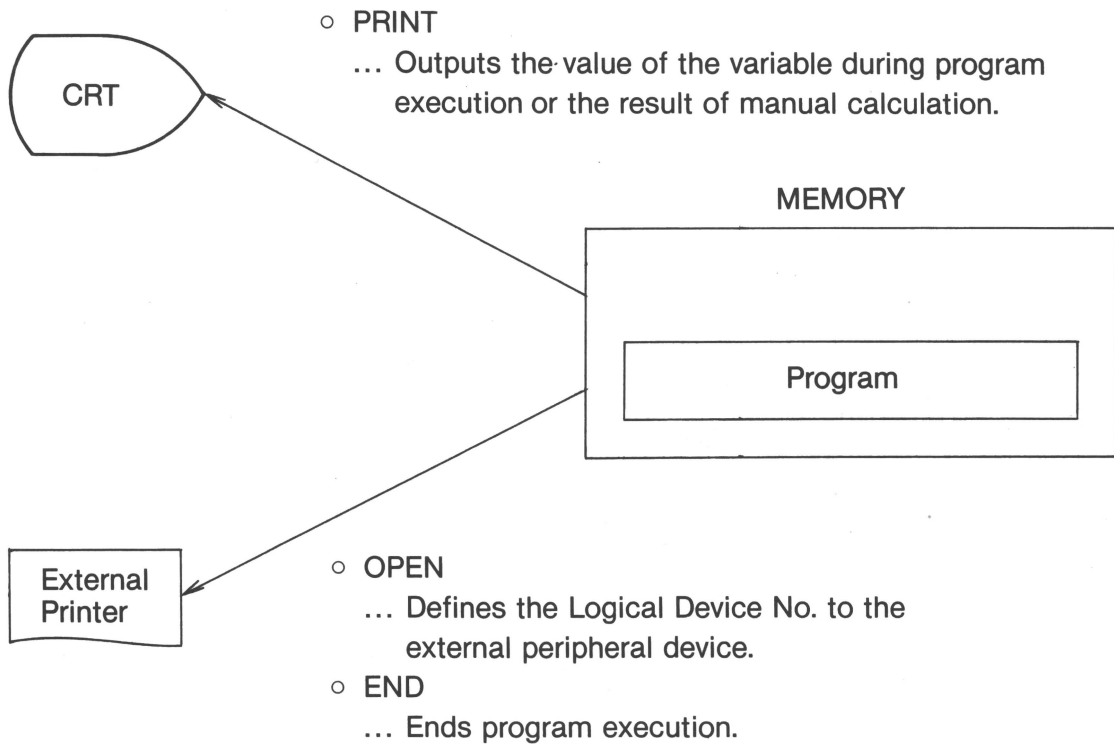
⑭ OPEN Command (Open)

○ When external peripheral devices (like printers) are connected to the CX-1 for output with the LIST or PRINT command, the Logical Device No. must be defined. The Logical Device No. is indicated by #1 — #9. With this, the system of the CX-1 manages the peripheral device. The Logical Device No. is defined by the OPEN command.

O P E N SPACE [Logical Device No.] , " [I/O Connector Name] " RETURN or START

ESC OPEN

○ I/O Connector Names follow.

No.	I/O Connector Name	I/F Type	240V, 230V, 115V Models Standard	120V Model Standard
1	US2:	Serial Data I/F (RS232C/V-24)	○	
2	US1:		○	
3	US0:		○	
4	UP0:	Parallel Data I/F		○

[Ex.]   Outputs the list using the LIST command to the printer defined as US0:

• Defines the US0 as #1.

[O] [P] [E] [N] [SPACE] [#] [1] [,] ["] [U] [S] [0]
[:] ["]
                              [RETURN] or [START]

```
$OPEN #1,"US0:"




$□
```
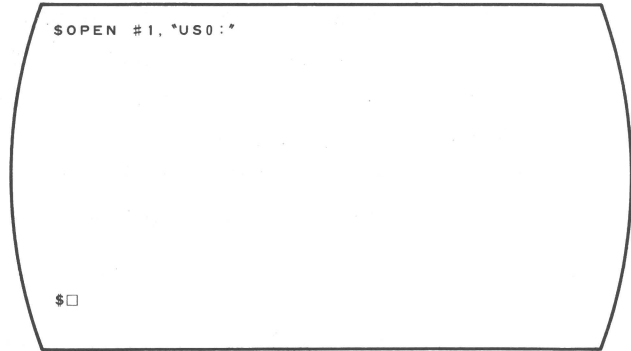
• Specify #1 in the LIST command.
(Program AAA)

[L] [I] [S] [T] [SPACE] [#] [1] [,] [A] [A] [A]

```
$LIST #1, AAA




$□
```
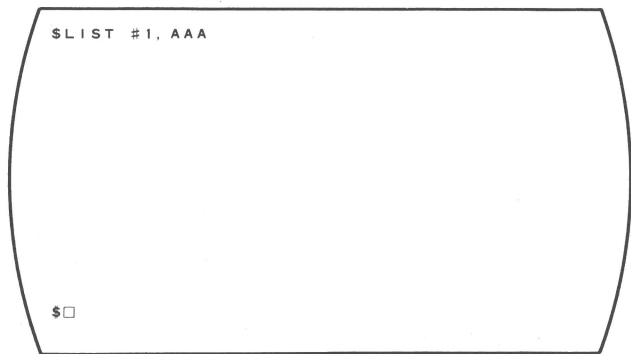
• The list is printed on the
printer connected at US0:.

```
AAA······
10
20
  ⋮
```
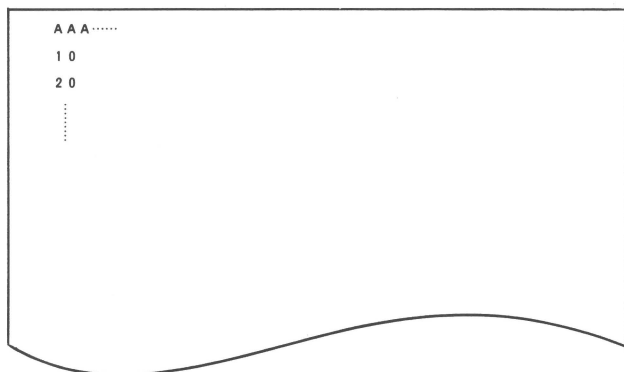
⑮ PRINT Command (Print)

° Outputs the value of the variable at the the time the PAUSE statement is executed or ⎡HLT⎤ key is depressed.
° Outputs the result of manual calculation in the command-swaiting state.
° When the output device is specified by a Logical Device No., this Logical Device No. can be specified in the PRINT command. (Refer to Logical Device No., in the "BASIC Language Manual".)
° The detail of this function is the same as for the PRINT statement in BASIC language. (Refer to PRINT statement in the "BASIC Language Manual".)

| P | R | I | N | T | SPACE | (# [Logical Device No.] ⊙) [Variable] ({ ⊙ / ⊙ }) RETURN or START |

ESC PRINT
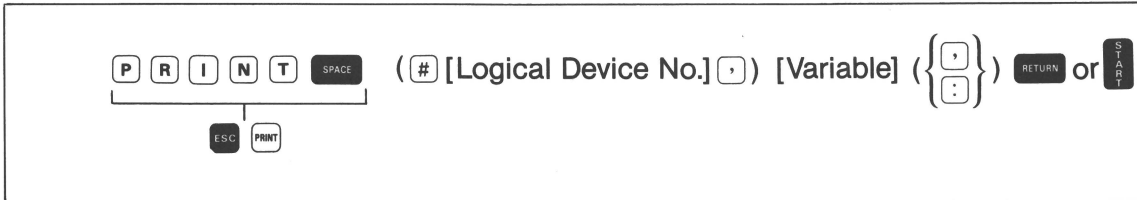
[Ex.] Prints the value of variable A, B, C at the time the PAUSE statement is executed. (A = 150, B = 418, C = 670)

○ The pause state is indicated by using the PAUSE statement or depressing the ⎡HLT⎤ key.

@□
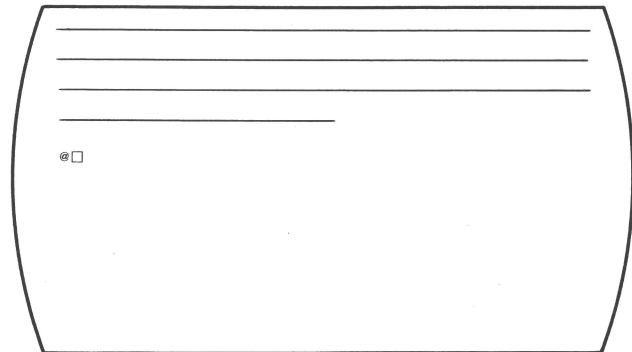
PRINT `SPACE` A `,` B `,` C
`RETURN` or `START`

```
@ P R I N T   A ,  B ,  C
1 5 0   4 1 8   6 7 0
@ □
```
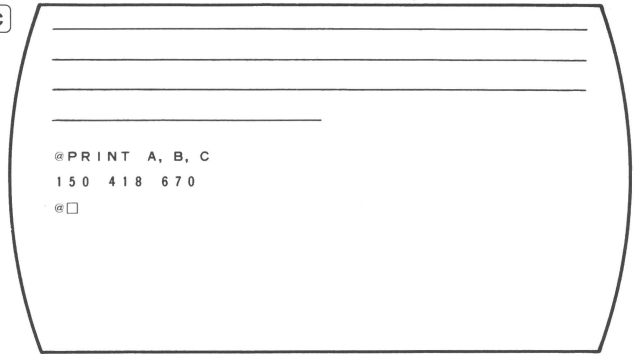
○ The program execution is
restarted.

`RETURN` or `START`

```
@ P R I N T   A ,  B ,  C
1 5 0   4 1 8   6 7 0
@
```
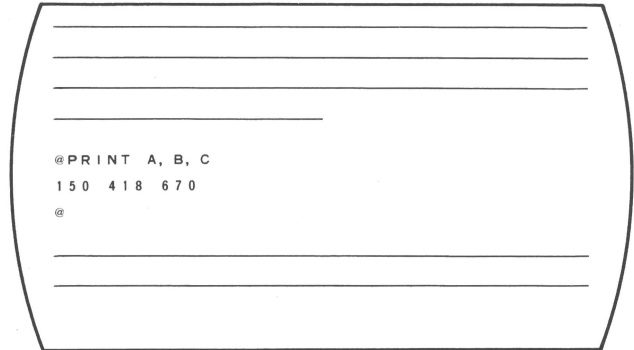
[Ex.]   Prints the result of manual calculation in the command-awaiting
            state.

<Key Operation>   <CRT display>

PRINT `SPACE`
1 3 `.` 5 `*` 3 `.` 1 4

```
$ P R I N T  1 3 .  5 * 3 .  1 4 □
```

`RETURN` or `START`

```
$ P R I N T  1 3 .  5 * 3 .  1 4
4 2 .  3 9



$ □
```

⑯ END Command (End)

○ The END command can be used in the pause state.

○ The program is ended without restarting execution.
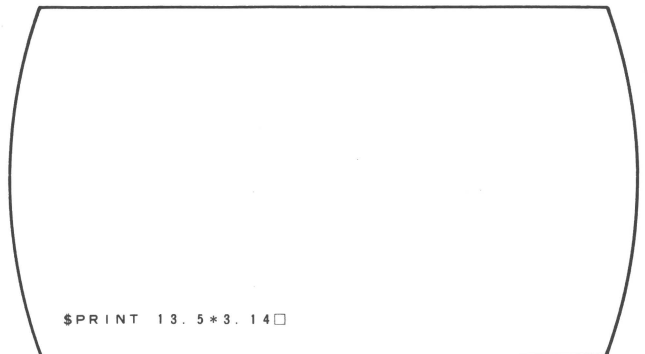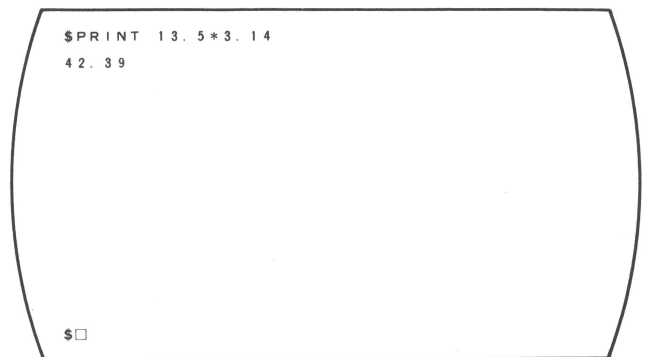
Table of Commands

Category	No.	Command	Name	Syntax	Contents
Program Execution-Related Commands	1	OPE	Operation	—	Sets the Operating mode
	2	LOAD	Load	LOAD ([Drive]) [Program Name]	Loads program
	3	RUN	Run	RUN ([Drive]) ([Program Name])	Executes program
	4	NEW	New	NEW	Clears memory
Programming-Related Commands	5	PROG	Program	PROG ([Drive]) ([Program Name])	Sets the Programming mode
	6	SECURE	Secure	SECURE ([Drive]) [Program Name] [Password]	Secure-sets program
	7	NONSEC	No Secure	NONSEC ([Drive]) [Program Name] [Password]	Secure-resets program
	8	SAVE	Save	SAVE ([Drive]) ([Program Name])	Saves to disk
	9	LIST	List	LIST ([Program Name]) (([Starting Line No.]) ([Ending Line No.]))	Lists programs
	10	XREF	Cross-reference	XREF ([Program Name])	Lists variable names
Disk-Related Commands	11	DLIST	Disk List	DLIST [File Specification]	Lists the file name on disk
	12	CANCEL	Cancel	CANCEL ([Drive]) [File Name] (.DAT)	Deletes file
	13	DCOPY	Disk Copy	DCOPY [File Name], [Drive] (,UPD)	Copies file
Other Commands	14	OPEN	Open	OPEN [Logical Device No.], "[I/O Connector Name]"	Defines the Logical Device No.
	15	PRINT	Print	PRINT ([Logical Device No.]) [Variable] { ; }	Outputs the value of variables during program execution or the result of manual calculation
	16	END	End	END	Ends program execution

3. Stop Code

The stop code is used in both the Operating and Programming modes to temporarily stop output to the CRT screen. Program execution continues even though the CRT screen is frozen. Use the following key operation to stop CRT screen movement:

CTRL S

Depress simultaneously

Repeat above operation to restart output to CRT screen.

4. Errors

The CX-1 detects program errors and entry mistakes and displays error messages so that the operator can correct the errors. This section describes the various types of error messages and the way to correct the errors.

The displayed error message has the following format:

[Ex.]

SYNTAX ERROR! ABCDEF. 100

Error type

Name of the program in which
the error is detected.

Line No. in which
the error is detected.

No.	Message	Contents	Example

1	SYNTAX ERROR	Grammatical error	1. SIN (X, Y) ....Format of function argument is wrong.
			2. PI (X) ....Function which shouldn't have an argument has an argument.
			3. DEF FNA (X, Y)
			   A = FNA (B) ....The form of the defined function is wrong.
			4. DIM A$256 (10, 10) ...The length of the character string exceeds 256.
			5. DIM A (10, 10)
			   INPUT A (5) ....Error in subscript.
			6. INPUT A (2, 3) ....No definition by the DIM command has been given.

2	TYPE ERROR	Error in type	1. 3 + A$ 2. A$∗B$
3	CONVERSION ERROR	Error in conversion type	1. X = A$ + "ABC" ......Character → Numeric value 2. A$ = 123 ....Numeric value → Character 3. DIM A$ (10, "ABC") ...Characters are used to denote array size. 4. SIN (A$) 5. LEN (X)
4	ILLEGAL ARGUMENT	Error in the range of numeric value	1. ASN (-2), SQR (-5) ......Outside the range of the function argument. 2. OPEN #10 "FD0: ..." Logical Device No. is within the 1-9 range.
5	BRANCH ERROR	Branching error in program control	1. These is no Line 100 in "GOTO 100". 2. RETURN without execution of GOSUB. 3. NEXT without FOR 4. USING [ABC] without the line of [ABC]
6.	ADDRESS ERROR	Error in the value of subscript	1. DIM A (10, 10) LET X = A (10, 20) ......The subscript range has been exceeded. 2. Y = B (-2) ....The value of the subscript is a negative number.

7	XXXX I/O ERROR. nn
	   XXXX: File name
	   nn: Error code
		Error concerning file	1. The data cannot be written to the disk because the disk is broken.

8	ILLEGAL FILE NAME	Error in specifying data file name	1. OPEN #1, "abc" ......Small letters of alphabet are used. 2. OPEN #1, "1XYZ" ...Data file name starts with a number.
9	CONVERSION OVERFLOW	Overflow in conversion of integer	1. INTEGER I INPUT I.................Number 123456 is entered for I.
10	MEMORY OVERFLOW	Overflow in memory	1. Overflow in stack memory. 2. Overflow in program/data memory.
11	DECLARATION ERROR	Error in declaration	1. 1) INTEGER X The order of 1), 2), and 3) 2) DIM X(100) ....is wrong, or 1) and 2) have been 3) X(10) = A + B executed twice. 2. OPEN #2, "US0:" The same Logical Device Number is OPEN #2, "US1:" ······opened twice. 3. A = FNA (X) without DEF FNA.
12	DATA ERROR	Error in data entry	1. READ X DATA ABC ....String data is entered into an arithmetic variable. 2. INPUT X ....String data is entered into an arithmetic variable.
13	FILE NOT OPENED	Specified file is not open	1. GET #1 without OPEN #1.
14	XXXX ALREADY OPENED XXXX: File name	File XXXX has already been opened	1. OPEN #1, "FD0: ABC" OPEN #1, "FD0: XYZ" ......File #1 has been already opened.
15	ENTRY NOT FOUND	Error in name entry	1. MAT ABC ....Function ABC is not entered in MAT statement.

5 Disk Formatting

A new disk must be "formatted" before it is used. This operation checks the disk for irregularities and blocks out a certain format or structure so that Read and Write can be excuted with the CX-1. Disks only need to be formatted once using the following procedure:

1. Prepare the CX-1 for disk formatting.

[B] [Y] [E] [RETURN]   or   [START]

- Display changes from $ □ to 0> □

```
0 >□
```
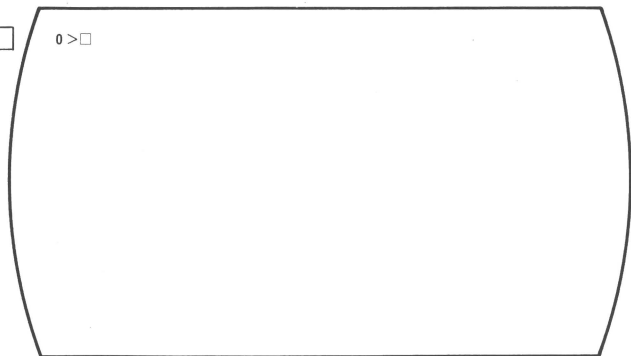
2. Enter a special formatting command.

[F] [M] [T] [5] [RETURN]   or   [START]

```
0 >FMT 5
MOUNT  INITIALIZED-MEDIA  ON  FD1 :
READY (Y/N) ?□
```

- An instruction is given for setting the new disk into Drive 1.
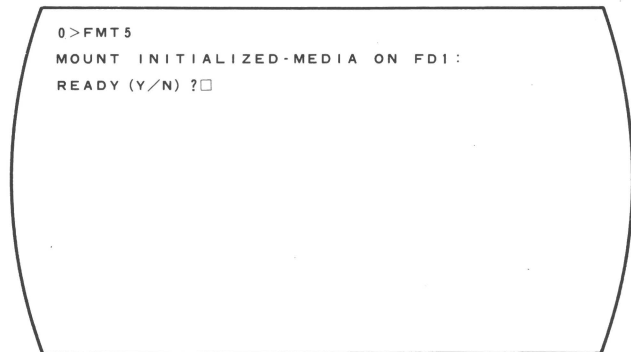
3.Set the new disk into Drive 1 (upper deck) and enter "Y."

• Set the new disk into Drive 1.

[Y] [RETURN] or [S T A R T] (If [N] is entered, the CX-1 automatically changes to the "0>□" state.)

4.Formatting is usually complete in about 40 sec.

• During formatting, the sector numbers are displayed as they are checked. If a bad sector is discovered, its number remains on the CRT screen.
• When formatting is complete, the screen will be as shown at the right.

```
0,>FMT5
MOUNT  INITIALIZED-MEDIA  FD0:
READY (Y/N) ?Y
READ/WRITE CHECK COMPLETED
NORMAL TERM
0>□
```

5.Release the disk formatting state.

[B] [A] [S] [I] [C] [RETURN] or [S T A R T]

```
MCX  BASIC  VC1, 0C




$ □
```

• The CX-1 returns to the normal operating mode.

Note: The disk formatting state deletes all data and programs in the memory.

V. PROGRAMMING OPERATION

This chapter gives descriptions and examples of the operation for entering the program into the CX-1, saving the program to the disk, and confirming and correcting the program until it is completed.

The programming operation from program coding (writing the program on the coding sheet), to entry and actual execution of the program, is shown in the diagram below.

The shadowed portion is described in this chapter.
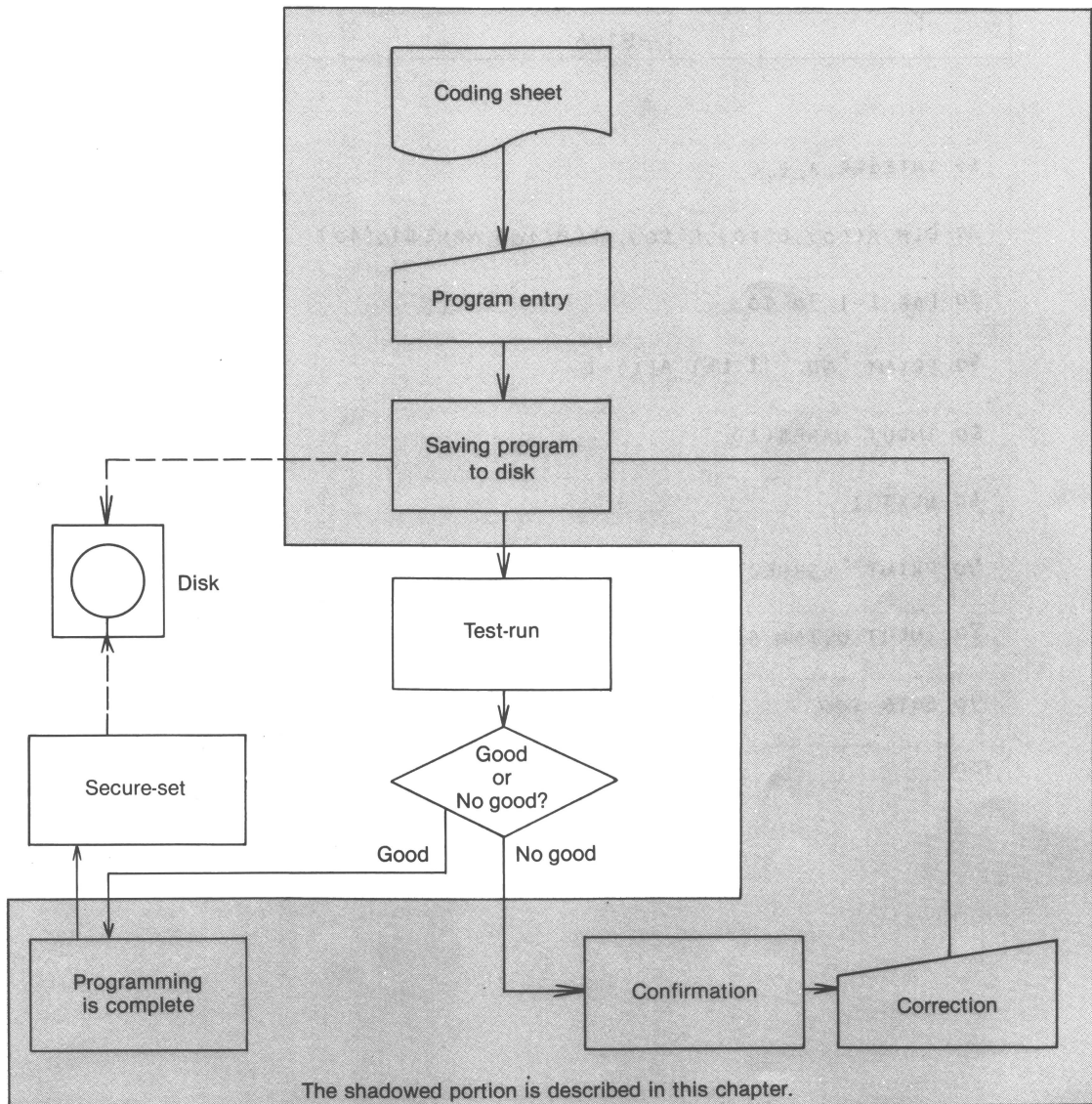
1 Coding

The program is written on the coding sheet in CX-1 BASIC Language coding as shown below and can be entered into the CX-1 directly from the coding sheet. (For the program language, refer to "BASIC Language Manual")

Canon   CODING SHEET

PROGRAM NO.		PROGRAM TITLE	AB106	PROGRAMMER	K.Y

```
10  INTEGER A,B,C
20  DIM A(50),B(50),C(50),AREA(10),NAME$10(40)
30  FOR I=1 TO 40
40  PRINT "NO.";I:LET A(I)=I
50  INPUT NAME$(I)
60  NEXT I
70  PRINT "CORRECTION Y/N ?"
80  INPUT USING 400 X$
90  GOTO 500
100
```

2 Program Entry

The program is entered into the CX-1 through the keyboard. This operation is performed in the following sequence: ·

(1) Setting the Programming mode
(2) Entering program lines
(3) Ending the Programming mode
(4) Saving the program to the Disk

(1) Setting the Programming Mode

To enter the program through the keyboard, set the CX-1 in the Programming mode using the PROG command.

[PROG] ([Program name]) [RETURN] or [START]

*The lamp on the [PROG] key lights, and the display will be as follows:

```
                    BASIC  PROGRAM  EDIT  AAA
                                        └─ Program name



   10  □
```
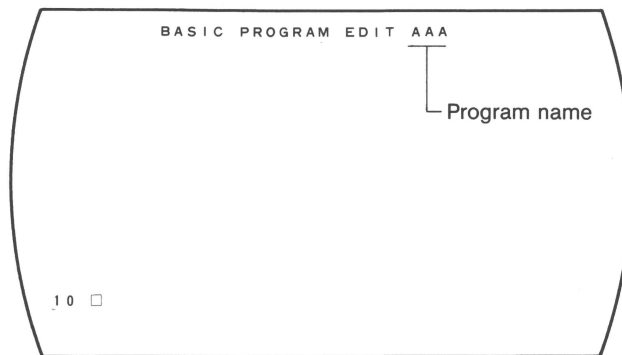
NEW PROGRAM EDITING

- ○ The program name may be omitted from the PROG command when there is no program in the memory, but the program name must be registered by using the N (RENAME) command before the Programming mode is released as explained later.

- ○ EXISTING PROGRAM CORRECTION
  Correction is allowed and %□ is displayed when there is a specified progam in the memory or on the disk, or when there is the program in the memory not specified by name in the PROG command.

(2) Entering Program Lines

After setting the CX-1 in the Programming mode, enter program lines, one by one, into the CX-1 through the keyboard.

Line numbers are automatically increased at 10-line intervals by the auto-numbering function. The end of a line is specified by depressing the [RETURN] or [START] key.

[Ex.]

<Key Operation>   <CRT Display>

[D] [I] [M] [SPACE] [A] [(] [1] [0] [)]

[ESC] [DIM]

```
BASIC  PROGRAM  EDIT  AAA




10  □
```

```
BASIC  PROGRAM  EDIT  AAA




10  DIM  A(10)□
```

[RETURN] or [START]

```
BASIC  PROGRAM  EDIT  AAA
10  DIM  A(10)



20  □
```
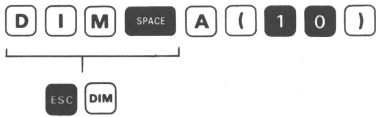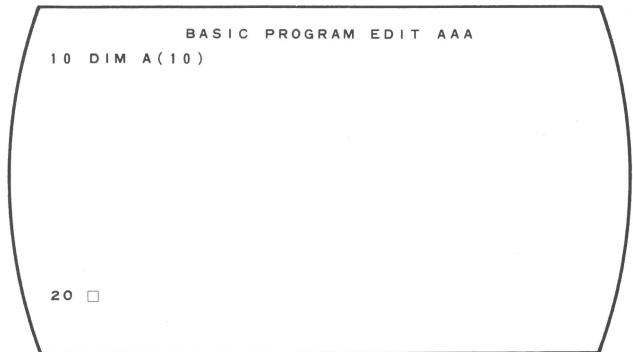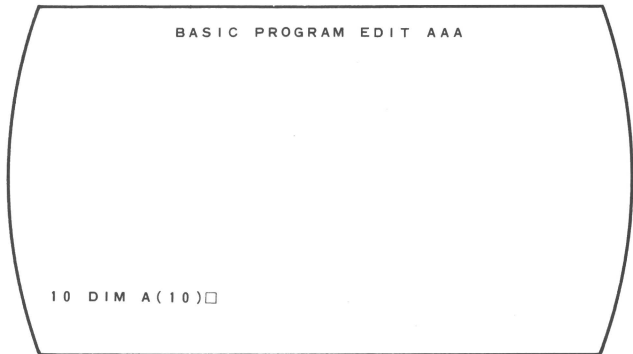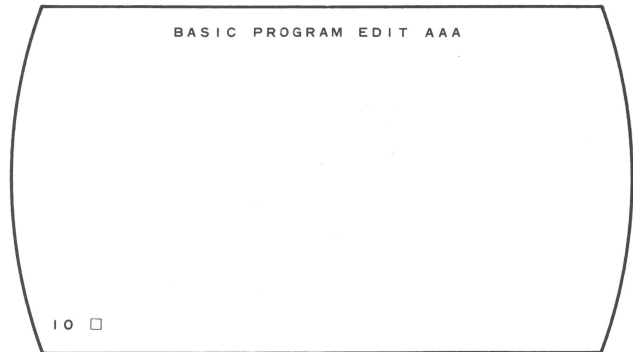
Most of the commands can be entered with the [ESC] key, using the "one key, one instruction" function. It is also possible to enter characters one by one. Use the most convenient method to enter program lines.

[P] [R] [I] [N] [T] [SPACE] [A] [=] [ESC] [PRINT] [A]

[F] [O] [R] [SPACE] [I] [=] [0] [SPACE] [T] [O] [SPACE] [1] [0] [=] [ESC] [FOR] [I] [=] [0] [SPACE] [ESC] [TO] [1] [0]

○ **Correction**

When an entry with incorrect program grammar is made, depressing the [RETURN] or [START] key will not display the line on the upper part of the screen, "SYNTAX ERROR" will appear in the right corner of the screen on the line directly below it, and the cursor will flash to indicate the incorrect portion of the entry.

Correct the line, depress the [RETURN] or [START] key, and the entry will be displayed on the upper part of the screen and stored in the memory.

If an error is detected before depressing the [RETURN] or [START] key, use above the operation to correct the error.

Keys Used for Correction:

Program lines are corrected using the following keys:

1 [←] : The cursor moves to the left, digit by digit.

2 [→] : The cursor moves to the right, digit by digit.

3 [INSERT] : After depressing this key, an entry is inserted immediately before the cursor.

4 [DELETE] : The character at the cursor position is deleted, and the following characters are moved one space to the left.

5 [HOME] : The cursor returns to the left end of the first entry line.

6 [DEL] : The character immediately before the cursor is deleted.

7 [CAN] : The entire current entry line is deleted, and the cursor returns to the left end
or of the current entry line.
[CE]

Examples of Different Correction Operations

Key Operation	CRT Display
[HOME] [→] [→] [→] [→] [→] } [←] 5 times [I] [RETURN] or [START]	40 PRRNT A□ [4]0 PRRNT A 40 PR[R]NT A 40 PRI[N]T A
[←] [←] [←] [INSERT] [A] [+] [RETURN] or [START]	80 LET A = B + C□ 80 LET A = [B] + C 80 LET A = A + [B] + C
[←] [←] [←] [←] [←] [DELETE] [DELETE] [DELETE] [INSERT] [P] [R] [T] [RETURN] or [START]	90 OPEN #1, "US0 : "□ 90 OPEN #1, "[U]S0 : " 90 OPEN #1, "[:]" 90 OPEN #1, "PRT[:]"
[DEL] [DEL] [RETURN] or [START]	100 GOTO 10,00 □ 100 GOTO 10□
[CE] [SPACE] [P] [R] [I] [N] [T] [SPACE] [X] [RETURN] or [START]	70 INPUT A□ 70 □ 70 PRINT X□

[Ex.]   Correction after Display of SYNTAX ERROR

<Key Operation>   <CRT Display>

```
BASIC  PROGRAM  EDIT  AAA
10  DIM···
     ·
     ·
     ·
60···


70  INPT  Ⓐ
                            SYNTAX  ERROR
```

[←] [←] [INSERT] [U]

```
BASIC  PROGRAM  EDIT  AAA
10···
     ·
     ·
     ·
60···


70  INPUⓉ  A
                            SYNTAX  ERROR
```
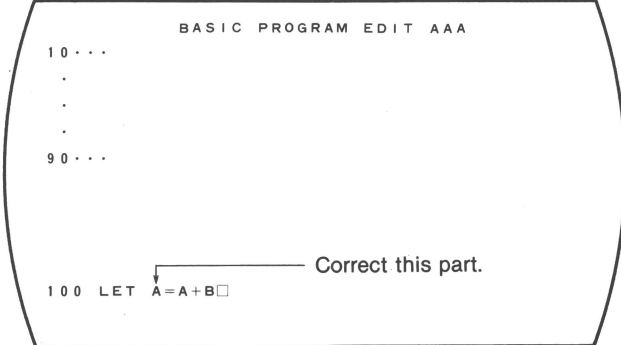
[RETURN] or [START]

```
BASIC  PROGRAM  EDIT  AAA
10···
     ·
     ·
     ·
60···
70  INPUT  A


80  □
```

[Ex.]   Correction before depressing the [RETURN] or [START] key.
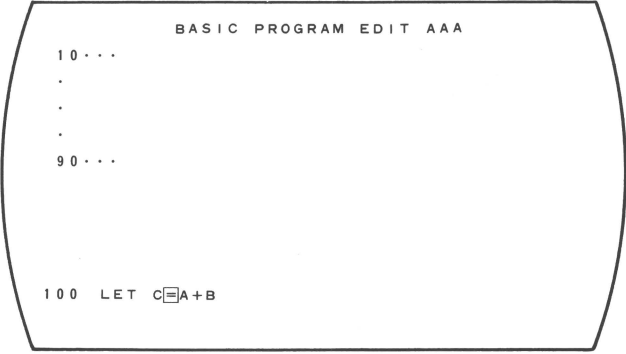
<Key Operation>   <CRT Display>

```
          BASIC  PROGRAM  EDIT  AAA
  1 0 · · ·
        ·
        ·
        ·
  9 0 · · ·


                                      ———— Correct this part.
  1 0 0   L E T   A = A + B □
```
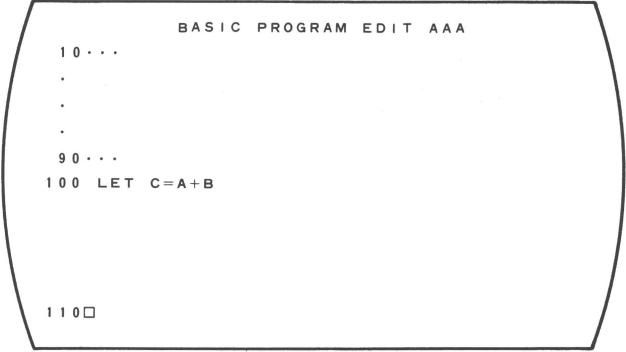
[←][←][←][←][←] [c]

```
          BASIC  PROGRAM  EDIT  AAA
  1 0 · · ·
        ·
        ·
        ·
  9 0 · · ·




  1 0 0   L E T   C ⊟ A + B
```

[RETURN] or [START]

```
          BASIC  PROGRAM  EDIT  AAA
  1 0 · · ·
        ·
        ·
        ·
  9 0 · · ·
  1 0 0   L E T   C = A + B



  1 1 0 □
```

*The correction sequence is the same as in the previous examples.

○ When an error is detected in a previous line during following line entry, use the ⬆ key to reach the line where the correction is necessary.

[Ex.]

<Key Operation>   <CRT Display>

• An error is detected on Line 40.

```
                    BASIC  PROGRAM  EDIT  AAA
        1 0 · · ·
          ·
          ·
        4 0   I N P U T   A
          ·
          ·
        9 0 · · ·


        1 0 0  ☐
```

⬆ ⬆ ⬆ ⬆ ⬆ ⬆

```
                    BASIC  PROGRAM  EDIT  AAA
        1 0 · · ·
          ·
          ·
        4 0   I N P U T   A
          ·
          ·
        9 0 · · ·


        4 0 ☐ I N P U T   A
```

➡ ➡ ➡ ➡ ➡ ➡ ➡ X RETURN or START

```
                    BASIC  PROGRAM  EDIT  AAA
        1 0 · · ·
          ·
          ·
        4 0   I N P U T   A
          ·
          ·
        9 0


        4 0   I N P U T   X ☐
```

• Auto-numbering is respecified starting from unentered line.

I RETURN or START

```
                    BASIC  PROGRAM  EDIT  AAA
        1 0
          ·
          ·
        4 0   I N P U T   X
          ·
          ·
        9 0


        1 0 0 ☐
```

° After correction, the auto-numbering function is release.
Therefore respecification of auto-numbering or line number entry is necessary.

Alteration of Auto-Numbering

When the CX-1 is set in the Programming mode, the auto-numbering function is set at 10-line intervals starting from Line 10, but this interval can be changed. To change the auto-numbering functions enter Editing Command I in the following sequence:
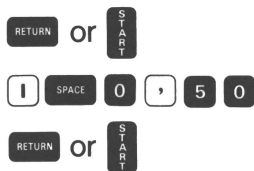
1) Change the line entry portion of the display to % by depressing the [RETURN] or [START] key without entry.
2) [I] [Starting Line No.] [,] [Number of steps] [RETURN] or [START] .

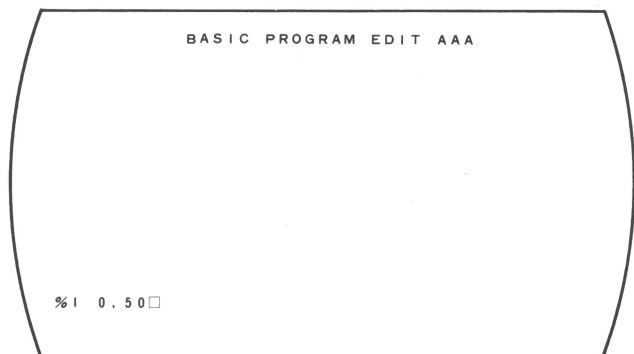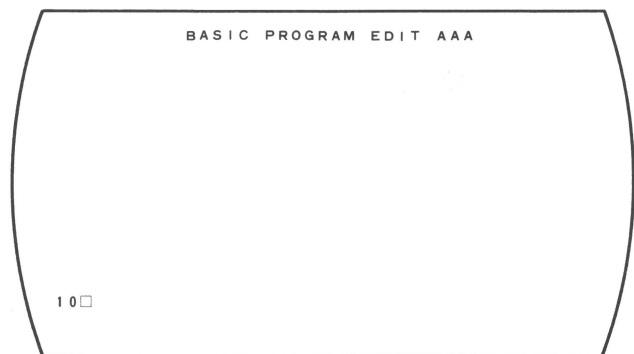With the above operation, auto-numbering is set at [Number of steps] intervals starting from [Starting Line No.].

[Ex.]

<Key Operation>   <CRT Display>

• Auto-numbering is changed to 50-line intervals starting from Line 0.

```
        BASIC  PROGRAM  EDIT  AAA




 1 0□
```

[RETURN] or [START]

[I] [SPACE] [0] [,] [5] [0]

[RETURN] or [START]

```
        BASIC  PROGRAM  EDIT  AAA




 % I  0 , 5 0□
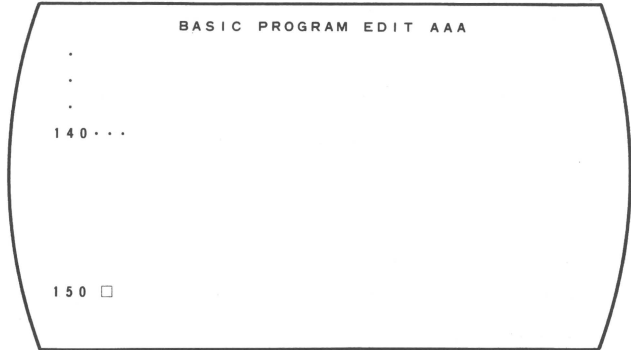```

```
        BASIC  PROGRAM  EDIT  AAA




 0  □
```

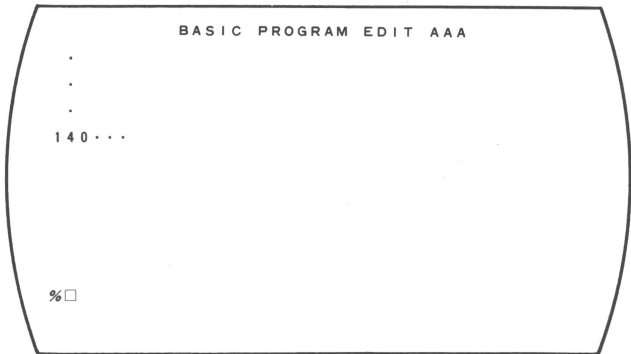*Following line numbers will be "50, 100, 150…".

[Ex.] Feeding Lines without Line Entry

The line of a subroutine or the branch destination can be specified using Editing Command I to feed lines without entry.

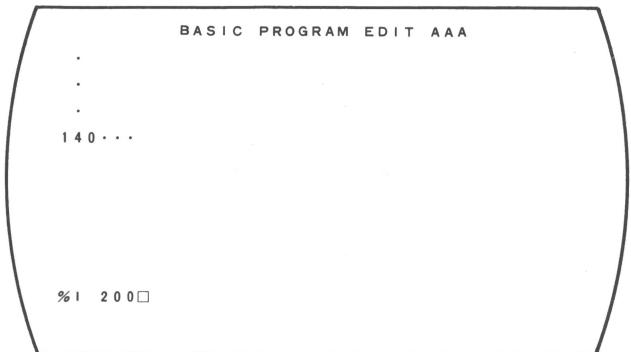- By feeding Lines 150 to 190 without entry, entry is restarted from Line 200.

```
        BASIC  PROGRAM  EDIT  AAA
  .
  .
  .
1 4 0 · · ·




1 5 0  □
```

RETURN or **START**

```
        BASIC  PROGRAM  EDIT  AAA
  .
  .
1 4 0 · · ·




% □
```

- Set auto-numbering at 10-line intervals starting from Line 200 using Editing Command I.

I **SPACE** **2** **0** **0** **RETURN** or **START**

```
        BASIC  PROGRAM  EDIT  AAA
  .
  .
  .
1 4 0 · · ·




% I   2 0 0 □
```

- Auto-numbering is set at 10-line intervals starting from Line 200.

```
        BASIC  PROGRAM  EDIT  AAA
  .
  .
  .
1 4 0 · · ·




2 0 0  □
```

(3) Ending of Programming Mode

When program line entry is complete, release the Programming mode by the following procedure, and set the CX-1 in the Operating mode.

1) Change the line entry part of the display to % □ by depressing the [RETURN] or [START] key.
2) Check to see if the program name has been defined. If it hasn't, define the program name using Editing Command N (refer to 3-(5) N Command).
3)Depress the [OPE] key, and the lamp will light, the line entry protion will change to $ □ ("command-awaiting state"), and the CX-1 will be set in the Operating mode.

(4). Saving the Program to the Disk

To prevent deletion of a program that has just been entered, save the program to the disk by using the SAVE command.

As soon as a program is edited or corrected, it becomes the priority program and its name can be omitted.

Operation is performed in the following sequence:

1) Be sure that $ ■ is displayed.
2) [S] [A] [V] [E] [RETURN] or [START] .
   "SAVE FD0: XXX. BAS (Y/N)?" will be displayed.
   └─ Program name
3) [Y] [RETURN] or [START] (Substitute [N] for [Y] in case of "No")

The above operation saves the program to the disk in Drive 0; if the program is saved to the disk in Drive 1, modify Step 2 above as follows:

[S] [A] [V] [E] [SPACE] [F] [D] [1] [:] [Program name] [RETURN] or [START]

* For details about the SAVE command, see Chapter IV, Section 2-2 "SAVE Command."

3. Program Correction

When a program error is detected by the test-run or when a part of the program needs to be changed, the program can be corrected in the Programming mode. Program correction is performed in the following sequence:

(1) **Setting the disk on which the program requiring correction is saved.**
(2) **Setting the Programming mode**
(3) **Program correction**
(4) **Releasing the Programming mode**
(5) **Saving corrected program to the disk**

(1) Setting the Disk on Which the Program Requiring Correction is Saved

○ When the program requiring correction is on the system disk, set the system disk into Drive 0.

○ When the program requiring correction is not on the system disk, set this disk into Drive 1.

(2) Setting the Programming Mode

To set the CX-1 in the Programming mode, specify the drive of the disk on which the program requiring correction is saved and the program name.
If the program requiring correction is saved on the disk in Drive 0, [Drive] may be omitted.

     [PROG] ([Drive]) [Program name] [RETURN] or [START]

When the Programming mode becomes effective for correction, the contents of programs will be listed and % □ will be displayed on the line entry portion.

```
            BASIC  PROGRAM  EDIT  AAA
   400···
      ·
      ·
      ·

   570···
   %□
```
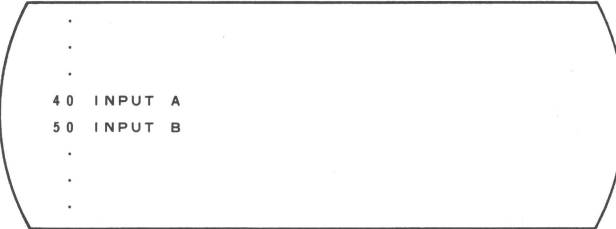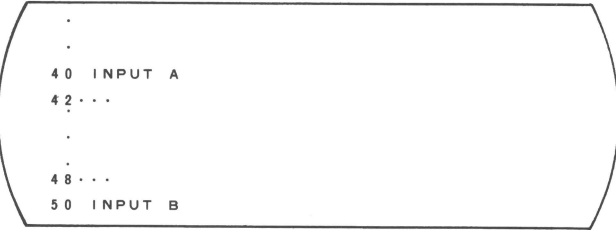
(3) Program Correction

The following editing commands can be used for program correction. These commands can also be used for program editing.

❶ I command ... Alters auto-numbering

⬚ I ⬚ ([Starting Line No.]) ⬚ , ⬚ ([Number of steps])

○ Auto-numbering is performed at [Number of steps] intervals starting from [Starting Line No.].
○ When only ⬚ I ⬚ is entered, auto-numbering is performed at 10-line step intervals starting from the unentered line. Omitting [Starting Line No.] specifies starting from the unentered line; omitting [Number of steps] specifies 10-line intervals.
○ When auto-numbering is performed between existing lines, the function will be released if the new auto-numbered line falls on an existing line.
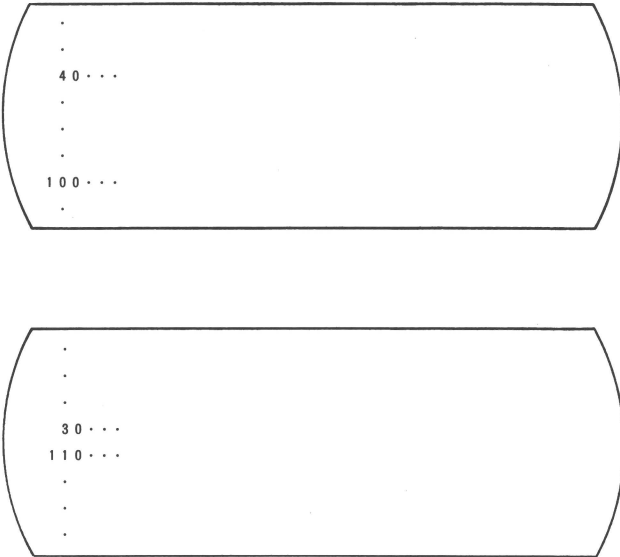
[Ex.]

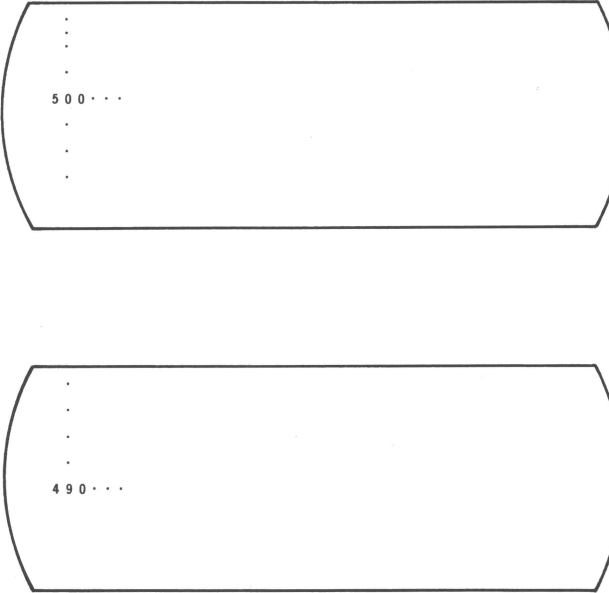| <Key Operation>	<CRT Display>
	. . . 4 0 I N P U T A 5 0 I N P U T B . . .
⬚I⬚ ⬚SPACE⬚ ⬚4⬚ ⬚2⬚ ⬚,⬚ ⬚2⬚ ⬚RETURN⬚ or ⬚START⬚ Entry of additional lines	42 ⬚ 44 ⬚ 46 ⬚ 48 ⬚ % ⬚
	. 4 0 I N P U T A 4 2 · · · . . 4 8 · · · 5 0 I N P U T B

❷ D command ... Deletes the specified line.

⊡ [Starting Line No.] ⊡ [Ending Line No.]

○ Deletes lines from [Starting Line No.] to [Ending Line No.]
○ "F" can be used as the first line of program [Starting Line No.] and "L" as the last line of the program [Ending Line No.]

[Ex.]
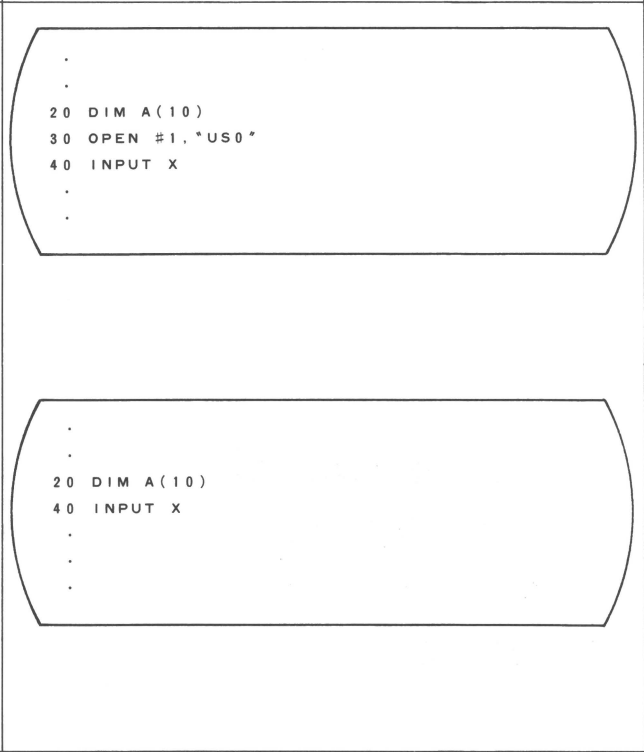
<Key Operation>	<CRT Display>
Delete from Line 40 to Line 100 D SPACE 4 0 , 1 0 0 RETURN or START	. . 4 0 · · · . . . 1 0 0 · · · . . . . 3 0 · · · 1 1 0 · · · . . .

[Ex.]

<Key Operation>	<CRT Display>
Delete from the first line of the program to Line 120. [D] [SPACE] [F] [,] [1] [2] [0] [RETURN] or [START]	10 ・・・ . . . 120 ・・・ . . . . . . 490 ・・・
Delete from Line 500 to the last line of the program. [D] [SPACE] [5] [0] [0] [,] [L] [RETURN] or [START]	. . . 500 ・・・ . . . . . . 490 ・・・

One line can be deleted by using either of the operations below.

[Ex.]

<Key Operation>	<CRT Display>
Delete Line 30. 1) [D] [SPACE] [3] [0] [RETURN] or [START] or 2) [3] [0] [RETURN] or [START]	. . 20 DIM A(10) 30 OPEN #1, "US0" 40 INPUT X . . . . 20 DIM A(10) 40 INPUT X . . .

❸ C command ... Calls the specified line

[c] [Line No.]

○ Calls the specified line to the line entry portion.

[Ex.]

<Key Operation>	<CRT Display>
| | ```
10  DIM A(10)
20  OPEN #1,"USO:"
30  INPUT X,Y,Z
    .
    .
    .
    .
``` |
[C] [SPACE] [3] [0] [RETURN] or [START]	30□ INPUT X,Y,Z
[→] [→] [→] [→] [→] [→] [→]	30 INPUT ⊠,Y,Z
[A] [→] [B] [→] [C]	30 INPUT A,B,C□
| [RETURN] or [START] | ```
10  DIM A(10)
20  OPEN #1,"USO:"
30  INPUT A,B,C
    .
    .
    .
    .
``` |

❹ L command ... Displays specified lines.

L [Line No.]

○ Starting from the specified line number, 18 lines will be displayed.
○ When the program exceeds 18 lines, only the last 18 lines will be displayed on the screen. In this case, lines requiring correction can be arbitrarily displayed using the L command as follows:

[Ex.]

<Key Operation>	<CRT Display>

	`100 PRINT A(1)`
	`.`
	`.`
	`.`
	`.`
	`270 PRINT X`

L SPACE 1 0 RETURN or START	`10 DIM A(10)`
	`.`
	`.`
	`.`
	`.`
	`180 INPUT A(1)`

❺ N command ... Changes the program name.

N   [Program name]

○ Names or renames the program.

[Ex.]

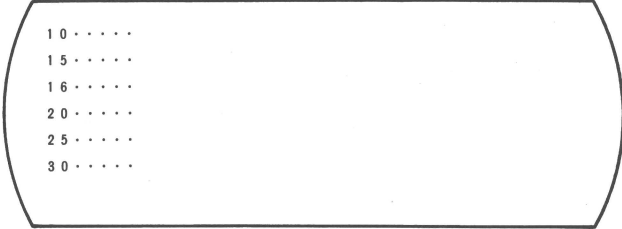| <Key Operation>	<CRT Display>
	BASIC PROGRAM EDIT AAA
N SPACE X X X RETURN or START	BASIC PROGRAM EDIT XXX

Note: The program name cannot be longer than 6 characters.

⑥ R command … Renumbers the line.

[R]   ([Starting Line No.]) [,] ([Number of steps])

○ All lines are renumbered at (Number of steps) intervals starting with the (Starting Line No.) as the leading line.
○ The branch destination will also be renumbered.
○ When only [R] is entered, all lines are renumbered at 10-line intervals starting with Line 10, Omitting [Number of steps] specifies 10-line intervals; omitting [Starting Line No.] specifies starting with the line specified for [Number of steps].

[Ex.]

<Key Operation>	<CRT Display>
	10····· 15····· 16····· 20····· 25····· 30·····
[R] [SPACE] [1] [0] [0] [,] [1] [0] [0] [RETURN] or [START]	100····· 200····· 300····· 400····· 500····· 600·····
[R] [RETURN] or [START]	10····· 20····· 30····· 40····· 50····· 60····· 60·····

❼ E command ... Releases the Programming mode.

E ([OPE])

○ The Programming mode can àlso be released with the [OPE] key.

[Ex.]

<Key Operation>	<CRT Display>
E [RETURN] or [START] or [OPE]	% □ $ □

Correction examples

[Corr. Ex.1]   Display the portion to be corrected.

<Key Operation>

• Display starts from Line 10.

<CRT Display>

```
          BASIC  PROGRAM  EDIT  AAA
470···
  .
  .
  .
  .
  .
  .
640···
%□
```

[L] [SPACE] [SPACE] [1] [0] [RETURN] or [START]

```
          BASIC  PROGRAM  EDIT  AAA
10···
  .
  .
  .
  .
  .
  .
  .
180
%□
```

[Corr. Ex.2]   Insert a line between existing lines.

<Key Operation>   <CRT Display>

• Insert "PRINT A" between
  Lines 160 and 170.

```
BASIC  PROGRAM  EDIT  AAA
  .
  .
1 6 0 · · ·
1 7 0 · · ·
  .
  .
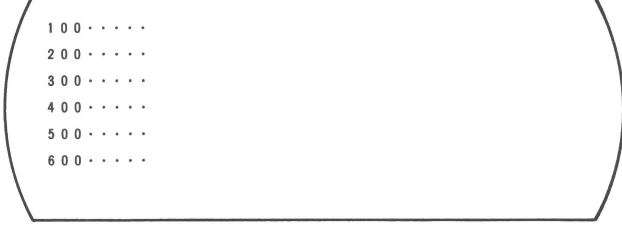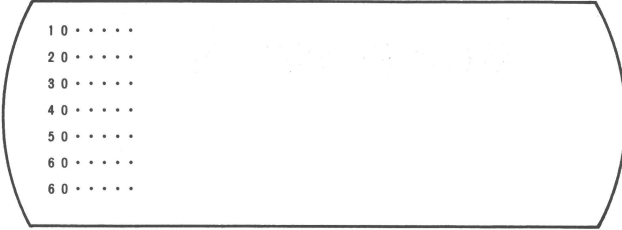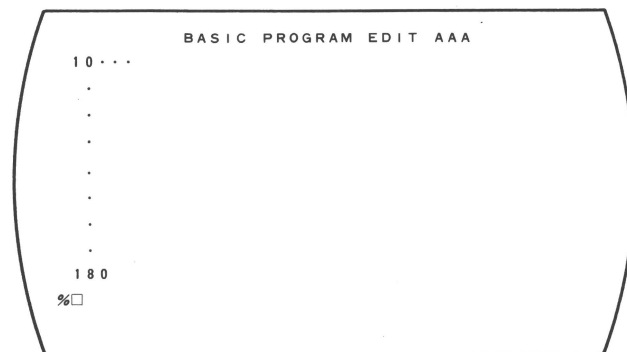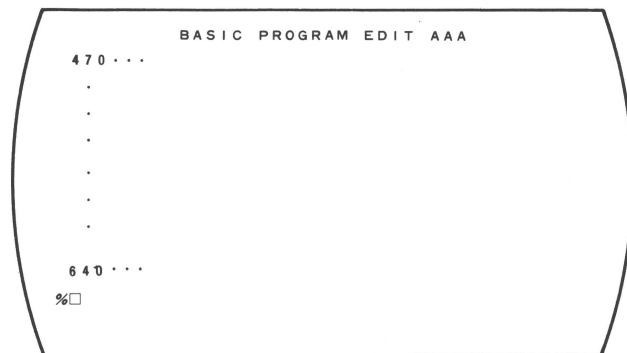
%□
```

[1] [6] [5] [SPACE] [P] [R] [I] [N] [T]

[SPACE] [A] [RETURN] or [START]

```
BASIC  PROGRAM  EDIT  AAA
  .
  .
1 6 0 · · ·
1 6 5  PRINT  A
1 7 0
  .
  .

%□
```

[Corr. Ex.3]   Correct the existing line.

<Key Operation>   <CRT Display>

● Correct Line 140.

```
                    BASIC  PROGRAM  EDIT  AAA
       .
       .
       .
    140   INPUT  A, B, C
       .
       .
       .
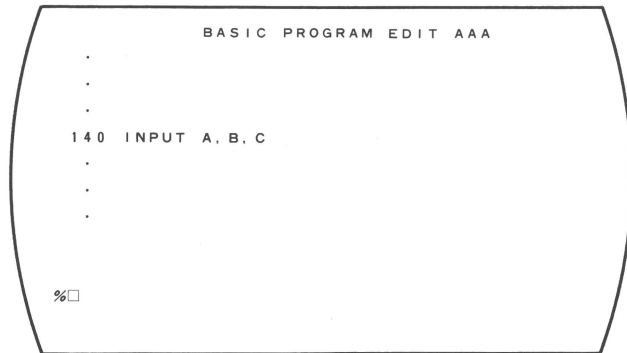

    %□
```

[C] [SPACE] [1] [4] [0] [RETURN] or [START]

```
                    BASIC  PROGRAM  EDIT  AAA
       .
       .
       .
    140   INPUT  A, B, C
       .
       .
       .


    140□INPUT  A, B, C
```

[→] [→] [→] [→] [→] [→] [→] [X] [,] [Y]

[,] [Z]   [RETURN] or [START]

```
                    BASIC  PROGRAM  EDIT  AAA
       .
       .
       .
    140   INPUT  X, Y, Z
       .
       .
       .
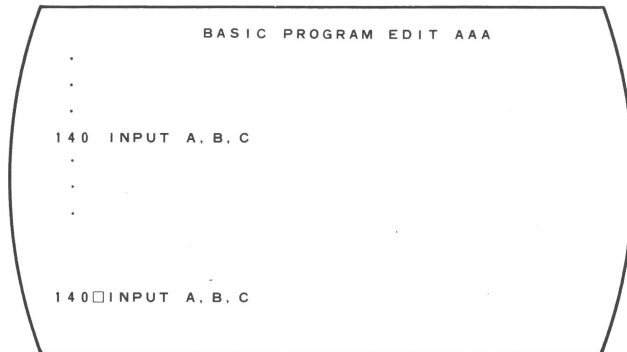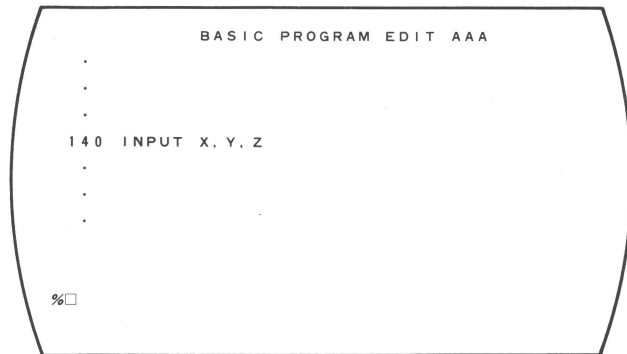

    %□
```

[Corr. Ex.4]   Delete the existing line.

<Key Operation>   <CRT Display>

```
                    BASIC  PROGRAM  EDIT  AAA
          .
          .
          .
        1 7 0
        1 8 0
        1 9 0
          .
          .
          .
      % □
```

D SPACE 1 8 0 RETURN or START

or

1 8 0 RETURN or START

```
                    BASIC  PROGRAM  EDIT  AAA
          .
          .
          .
        1 7 0 · · ·
        1 9 0 · · ·
          .
          .
          .
      % □
```

[Corr. Ex.5]　Enter new lines at 2-line intervals between the existing lines.

<Key Operation>　　　　　　　　　　　<CRT Display>

```
┌─────────────────────────────────────────┐
│          B A S I C   P R O G R A M   E D I T   A A A     │
│     .                                                    │
│     .                                                    │
│     .                                                    │
│   4 0 · · ·                                              │
│   5 0 · · ·                                              │
│     .                                                    │
│     .                                                    │
│     .                                                    │
│                                                          │
│   % □                                                    │
└─────────────────────────────────────────┘
```

[I] [SPACE] [4] [2] [,] [2] [RETURN] or [START]

• Line 42 is displayed.

```
┌─────────────────────────────────────────┐
│          B A S I C   P R O G R A M   E D I T   A A A     │
│     .                                                    │
│     .                                                    │
│     .                                                    │
│   4 0 · · ·                                              │
│   5 0 · · ·                                              │
│     .                                                    │
│     .                                                    │
│     .                                                    │
│                                                          │
│   4 2   □                                                │
└─────────────────────────────────────────┘
```

• Enter Lines 42, 44, 46, and 48.

• After entering Line 48, the line display portion will become %□.

```
┌─────────────────────────────────────────┐
│          B A S I C   P R O G R A M   E D I T   A A A     │
│     .                                                    │
│   4 0 · · ·                                              │
│   4 2 · · ·                                              │
│   4 4 · · ·                                              │
│   4 6 · · ·                                              │
│   4 8 · · ·                                              │
│   5 0 · · ·                                              │
│     .                                                    │
│                                                          │
│   % □                                                    │
└─────────────────────────────────────────┘
```

[Corr. Ex.6]　Renumber program lines at 10-line intervals.

<Key Operation>

<CRT Display>

```
                    B A S I C   P R O G R A M   E D I T   A A A
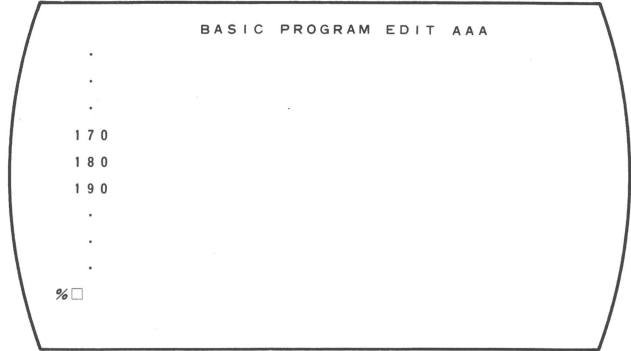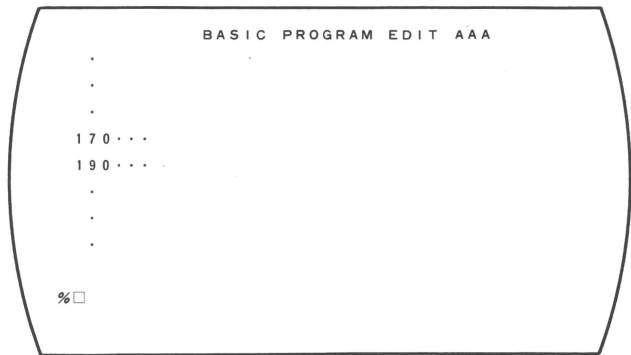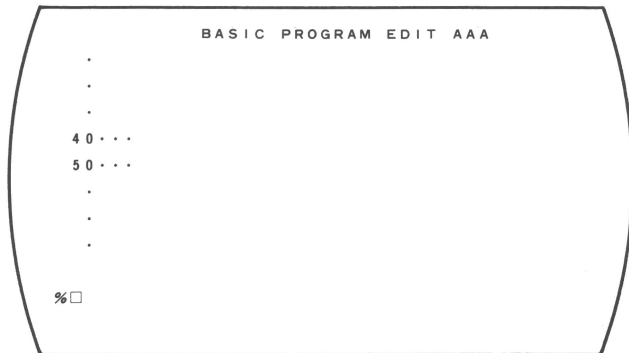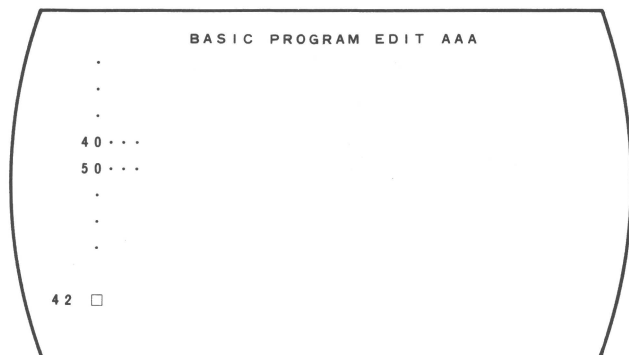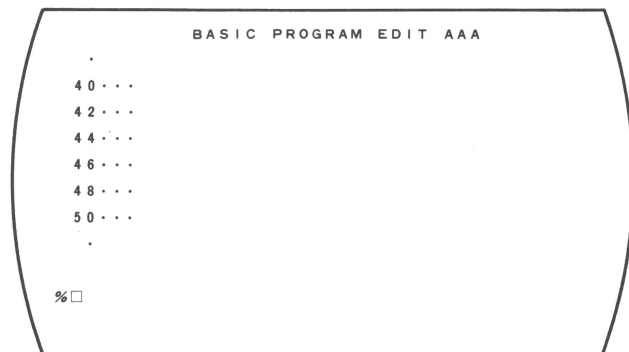
         .
       9 · · ·
      1 0 · · ·
      1 5 · · ·
      1 7 · · ·
      2 0 · · ·
         .

    % □
```

[R] [RETURN] or [START]

```
                    B A S I C   P R O G R A M   E D I T   A A A

         .
      1 0 · · ·
      2 0 · · ·
      3 0 · · ·
      4 0 · · ·
      5 0 · · ·
         .
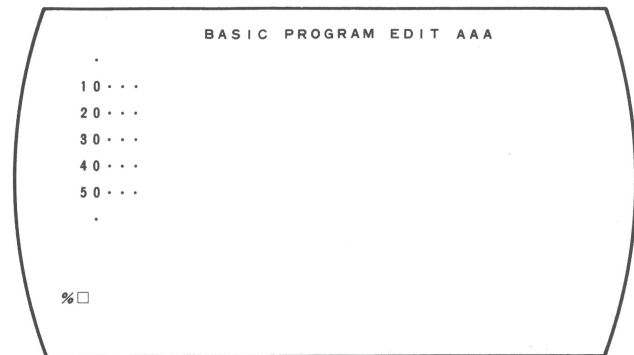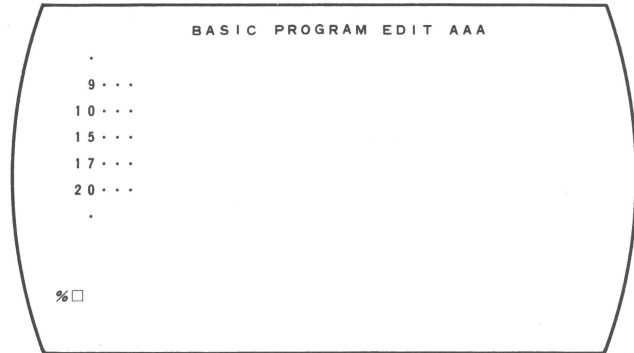
    % □
```

(4) Releasing the Programming Mode

The Programming mode can be released by using the [OPE] key or the E command.

(5) Saving Corrected Program to the Disk

Save the corrected program to the disk.

The saving operation is the same as that for program editing except that the old program is deleted from the disk and the corrected program is saved to the disk.

[Ex.]

<Key Operation>

<CRT Display>

S A V E RETURN or START

```
$SAVE
SAVE TO FD0:AAA    .BAS(Y/N)?□
                   └──────── Program name
```

Y RETURN or START (No: N)

• May the program be deleted?

Y RETURN or START (No: N)

```
$SAVE
SAVE TO FD0:AAA    .BAS(Y/N)?Y
CANCEL OLD FD0:AAA    .BAS(Y/N)?□
```

• The old program is deleted and the corrected program is saved to the disk.

```
$SAVE
SAVE TO FD0:AAA,    BAS(Y/N)?Y
CANCEL OLD FD0:AAA,    BAS(Y/N)?Y




$□
```

VI. PROGRAM EXECUTION

1. Starting Execution

A program can be executed using the two following procedures:
1) **Program Name is Specified**
   ○ When the program is loaded from the disk into the program memory and executed.
   ○ When the program in the program memory is executed.
2) **Program is Executed Only Using the [RETURN] or [START] Key**
   ○ When the program is immediately after edit program or correction.
   ○ When a program which has been executed once is executed again.

(1) Method of Specifying Program Name
The program is usually executed by using the RUN command or by specifying the program name.

[Ex.1]   When the program is in the memory or on the Mini-Floppy Disk in FD0:

<div align="center">[R][U][N][SPACE][A][A][A][RETURN] or [START]
└──Program name</div>

[Ex.2]   When the RUN command is omitted in Ex.1:

<div align="center">[A][A][A][RETURN] or [START]</div>

[Ex.3]   When the program is on the Mini-Floppy Disk in FD1:

<div align="center">[F][D][1][:][A][B][C][RETURN] or [START]</div>

○ When executing the program by specifying a program name, a search is made for the program first in the memory and, if the program is not there, the program search moves to the disk in the specified drive or if the drive is not specified, the disk in FD0 is searched.
When the specified program is not in the memory, the program is automatically loaded from the disk and executed. The same operation is performed regardless of whether the specified program is in the memory or on the disk.
○ When the specified program is not in the memory or on the disk, the following message is displayed: "[Drive] [Program name] . BAS NOT EXIST."

(2) Program Execution Using the [RETURN] or [START] Key

Depressing the [RETURN] or [START] key without entry starts program execution. The program executed will vary depending on the condition at the time.

① The leading program in program memory is usually executed.

② Immediately after program editing or correction (Programming mode), the edited or corrected program is executed. (Priority program)

③ Immediately after program execution, the program is executed again. (Priority program)

* In ② and ③ above, the priority of program execution moves from the leading program in the memory to the last program executed and this priority is retained until another program is executed, edited, or corrected.

2. Data Entry

When the INPUT command in the program is executed, "?" is displayed on the screen, and the CX-1 awaits entry.

```
? □
```

A message may be displayed on the screen, depending on the program.

```
ENTER VALUE OF X □
```

At this time, the program stops and awaits entry. Enter data through the keyboard and then depress the [RETURN] or [START] key.

The data are displayed on the screen as they are keyed-in, but will not be entered into the program until the [RETURN] or [START] key is depressed. Entered data can be corrected with the [CE], [CAN], or [DEL] keys.

[Ex.]

| <Key Operation>	<CRT Display>
[1] [2] [3] [4] [CE] ([CAN]) [1] [2] [3] [5] [RETURN] or [START]	?☐ ?1234☐ ?☐ ?1235☐ (12345 is entered)
[A] [B] [C] [D] [E] [F] [DEL] [DEL] [RETURN] or [START]	?☐ ?ABCDEF☐ ?ABCD☐ (ABCD is entered)

NOTE: [←] , [→] , and [HOME] keys cannot be used for correction of data entry.

3. Pause State

When the PAUSE statement is executed, or the ⌨HLT key is depressed, the CX-1 enters the pause state.

In the pause state the program is not ended. To release the pause state, the ⌨RETURN or ⌨START key is depressed without any entry. When only the ⌨RETURN or ⌨START key is depressed, program execution will restart from the following program line.

In the pause state, the PRINT command and the END command can be used. (Refer to ⑮ PRINT Command, ⑯ END Command)

```
──────────────────────
──────────────────────
──────────────────────
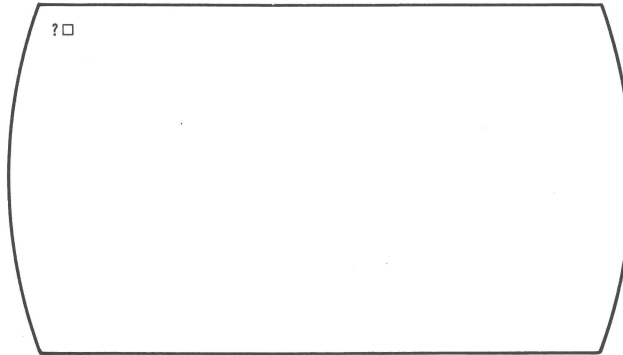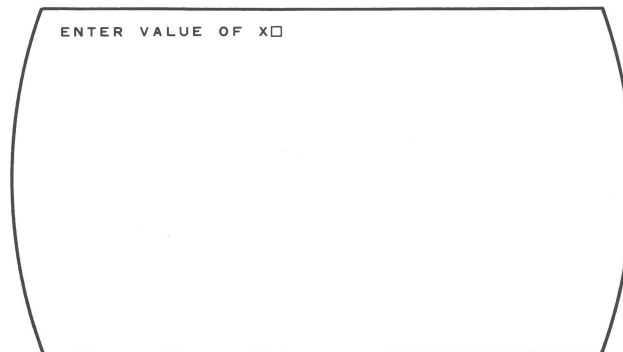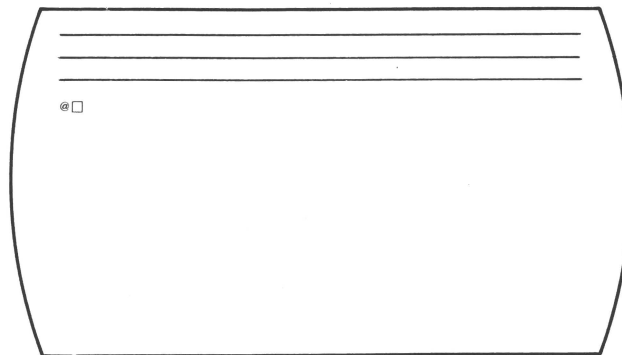
@□
```

VII. SPECIFICATIONS

Specification

1. Operation
(1) Operation Range

$1.0 \times 10^{-64} \leqq |x| < 1.0 \times 10^{64}$

(2) Number of Operation Digits

Mantissa: 14 digits

Exponent: 2 digits

(3) Kind of Operation

Four basic operations $(+, -, *, /), (,), =, <, >, \leqq, \geqq, \neq, **,$ AND, OR, XOR, NOT)

2. Programing
(1) System

Floppy Disk Operating System

(2) Language

Canon Extended BASIC

3. Memory Capacity (Standard)
(1) System Area

ROM: 4 KB

RAM: 28 KB (Minimum)

(2) User Area

RAM: 32 KB (96 KB Maximum)

4. Display Unit
(1) Type

CRT Character Display

(2) CRT Screen

12 inch — Green monochrome

(3) Number of Characters

80 columns × lines

(4) Character Type

Character: 5×7 dots

Semi-graphic pattern: 7×9 dots

Entire screen: 560×216 dots

(5) Size

Screen size: 212 mm (W) × 135 mm (H)

Dot Size: 0.375 mm (W) × 0.625 mm [H]

(6) Kind of Characters

Capital and small alphabet, Numerals, Symbols, Special characters

5. Keyboard
Full ASCII Keyboard.

6. Expandability

      230V, 240V, 115V ...Serial Data I/F (RS232C/V-24): 3ch
      120V ....Parallel Data I/F (Centronics type): 1ch

7. Mini-Floppy Disk Drive

(1) System

      Mini-Floppy Disk System

(2) Capacity

      320 KB/disk × 2 drives

(3) Recording Format

      Canon Specified System

(4) Medium Used

      Canon Mini-Floppy Disk X — 8309

(5) Transmission Speed

      250 K Bit/sec.

(6) Additional Function

      Software Door-Lock Function

8. Power Supply

120V	60Hz	1.85A
230V	50/60Hz	185W
240V	50/60Hz	180W
115V	50/60Hz	175W

9. Working Conditions

      Temperature: 10°C to 40°C (50°F to 104°F)
      Humidity: 20% to 80%

10. External Dimensions and Weight

      Dimensions: 530 mm (W) × 640 mm (L) × 330 mm (H)
               (20-7/8″ × 25-3/16″ × 13″)
      Weight: 25 kg (55 lbs)

Subject to change without notice.

Canon